



**Getting started**  
**April 30, 2004**

**Note**

Before using this information, be sure to read the general information under “Notices” on page 429.

**Compilation date: April 22, 2004**

**© Copyright International Business Machines Corporation 2004. All rights reserved.**

US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

---

# Contents

<b>About this book</b> . . . . .	v
<b>Summary of Changes</b> . . . . .	vii
<b>Migrating</b> . . . . .	ix
<b>How to send your comments</b> . . . . .	xv
<b>Chapter 1. Planning</b> . . . . .	1
<b>Chapter 2. Installing</b> . . . . .	3
<b>Chapter 3. Installing WebSphere Application Server products</b> . . . . .	5
WebSphere Application Server packages for Version 5.1 . . . . .	7
Planning to install an e-business network. . . . .	10
Single server topology. . . . .	13
Example: Choosing a topology for better performance . . . . .	16
Establishing multimachine environments . . . . .	17
Setting up a multinode environment. . . . .	19
Putting it all together - a combined topology. . . . .	38
Running WebSphere Application Server across versions . . . . .	40
Installing the product . . . . .	45
Installing the Integration Server on AIX platforms . . . . .	48
Installing the Integration Server on HP-UX platforms . . . . .	72
Installing the Integration Server on Linux platforms . . . . .	98
Installing the Integration Server on Solaris platforms . . . . .	121
Installing the Integration Server on Windows platforms . . . . .	143
Installing and configuring a JMS provider . . . . .	163
Platform-specific tips for installing and migrating. . . . .	173
Tips for installing the embedded messaging feature . . . . .	222
Using the Launchpad to start the installation . . . . .	224
Installing silently . . . . .	225
Customizing Integration Server option response files . . . . .	226
setup.response . . . . .	228
setup_nd.response . . . . .	236
Automatically restarting server processes . . . . .	240
firststeps command . . . . .	246
Using the installation verification test . . . . .	248
ivt command . . . . .	249
Troubleshooting the installation . . . . .	250
Creating multiple Version 5 configuration instances . . . . .	259
wsinstance command . . . . .	262
Creating servers in coexistence or multiple instance environments . . . . .	269
Changing HTTP transport ports . . . . .	269
Installing interim fixes, cumulative fixes, and fix packs . . . . .	270
updateSilent command . . . . .	277
updateWizard command . . . . .	278
Uninstalling interim fixes, cumulative fixes, and fix packs . . . . .	279
Product version and history information . . . . .	284
versionInfo command . . . . .	306
genVersionReport command . . . . .	308
Uninstalling the product . . . . .	311
uninstall command . . . . .	313

vpd.properties file . . . . .	317
Uninstalling WebSphere Business Integration Server Foundation . . . . .	321
Uninstalling Integration Server on a Network Deployment node . . . . .	322
Uninstalling Integration Server on a base WebSphere Application Server node . . . . .	324
Uninstalling Enterprise or Integration Server in a migration scenario . . . . .	325
Uninstalling Integration Server in a coexistence scenario . . . . .	335
Uninstalling manually. . . . .	335
Reinstalling V5.1 after uninstalling and leaving the embedded messaging feature installed . . . . .	356
Migrating and coexisting . . . . .	356
Migration and coexistence overview . . . . .	359
Configuration mapping during migration . . . . .	361
Migrating configuration data . . . . .	369
Coexistence support . . . . .	401
Setting up Version 3.5.x and Version 5 coexistence . . . . .	405
Setting up Version 4.0.x and Version 5.x coexistence . . . . .	406
Setting up Version 5 coexistence . . . . .	407
Port number settings in WebSphere Application Server versions . . . . .	411
Default coexistence settings for port numbers . . . . .	414
Configuring WebSphere Application Server after migration . . . . .	419
XML parser for Java code . . . . .	421
Installation: Resources for learning . . . . .	424
<b>Notices . . . . .</b>	<b>429</b>
<b>Trademarks and service marks . . . . .</b>	<b>431</b>

---

## About this book

This book is compiled from information center articles that are available at Web address: <http://publib.boulder.ibm.com/infocenter/ws51help/index.jsp>. The information center has many intertopic links that this book is not able to replicate in its subset of information. Although some effort was made to remove such links and replace them with pointers to information center articles, it is possible that some links were missed. Links to information center articles that are not in this PDF do not function properly. Links to articles that are within this document do work correctly.

To view an article in the information center, go to the Web address and search for the title of the document.

This document is superseded by the PDF document in the online information center. Download the current Getting Started PDF at the <http://www-306.ibm.com/software/webservers/appserv/infocenter.html> Web site.



---

## Summary of Changes

This section describes what's new in installation and migration in Version 5.1.

- **New multiple CD-ROM installation on some platforms**

The installation image for some platforms requires more than one CD-ROM.

- **New migration tools**

The WASPreUpgrade and the WASPostUpgrade migration tools in Version 5.1 are updated to work with V5.1. To migrate the configuration from another version of WebSphere Application Server, use the WASPreUpgrade tool from the migration/bin directory on the product CD-ROM. The tool from the previous release is not sufficient for migrating to V5.1.

There are several scripts that the installer program copies to the V5.0.x install\_root/bin directory when you use the installation wizard to migrate a V5.0.x release to V5.1.

- The pre\_uninst50ws and the post\_uninst50ws tools prevent removing the configuration of a migrated node from the deployment manager when you uninstall.
- The pre\_uninst502mq and the post\_uninst502mq tools prevent deleting a messaging queue manager when you uninstall after migrating a configuration of V5.0.2 to V5.1.

- **New service level installed by the installer program**

Installing V5.1 WebSphere Business Integration Server Foundation installs a cumulative fix pack to the product that Integration Server is extending, either the base IBM WebSphere Application Server, Version 5.1 product or the IBM WebSphere Application Server Network Deployment, Version 5.1 product. The new service level is V5.1.0.2, which is the service level of the cumulative fix pack.

- **New options on the uninstaller program**

When uninstalling V5.1 WebSphere Business Integration Server Foundation, there is a prompt for uninstalling the product that Integration Server is extending, either the base IBM WebSphere Application Server, Version 5.1 product or the IBM WebSphere Application Server Network Deployment, Version 5.1 product. You can leave the underlying product but it will remain at service level V5.1.0.2, which is the service level of the cumulative fix pack.

When uninstalling V5.1 WebSphere Business Integration Server Foundation with embedded messaging, there is a prompt for deleting the embedded messaging code. You can leave the code to work with other installation instances that might use it.

When uninstalling V5.1 WebSphere Business Integration Server Foundation, there are prompts for deleting certain changed configuration files. You can leave the changed files or delete them while uninstalling. The uninstaller program leaves changed configuration files and log files by default. You must remove the files by renaming the directory or deleting them before you can reinstall into the same directory. There are other considerations for reinstalling into the same directory. They are described in the uninstalling section of this document.

- **New Web server and new plug-in options**

The base WebSphere Application Server product includes a new level of the IBM HTTP Server powered by Apache 1.3, which is Version 1.3.28. The product also includes a plug-in option for IBM HTTP Server powered by Apache 2.0. The installer can configure either Web server.

The installer requires you to install IBM HTTP Server into a new directory. The installer program requires you to install IBM HTTP Server into a new directory.

- **New level of embedded messaging**

The release level of the embedded messaging feature, which is based on WebSphere MQ technology, is CSD04. Because installation instances on one machine share embedded messaging code, coexistence is affected by the presence of the embedded messaging feature. V5.1 with embedded messaging does not install on a V5.0.0 or V5.0.1 machine with embedded messaging at an earlier level. Stop the installation and upgrade the V5.0.x level to V5.0.2, which can coexist with V5.1. Or clear the selection of the embedded messaging feature and install V5.1 without embedded messaging.

- **New level of GSKit**

The new level of GSKit support is 7.0.1.10.

- **New configuration support for Sun ONE Web server**

The installer program configures the Sun ONE Web Server on AIX for WebSphere Application Server support when you select the Sun ONE plug-in when installing on an AIX machine. Support for other platforms is still included.

- **New support for configuration instance creation**

You can create a configuration instance when the original installation location is read-only.



---

# Migrating

Migrating is an activity in which you take advantage of existing materials. Migration tasks and tools help you upgrade the product and its prerequisites, reuse existing application components when feasible, and transfer administrative configurations from your past version to a current one.

Migration of WebSphere Application Server products is about leveraging the existing environment and applications and changing them to be compatible with the current product version.

Product migration functions are provided by the migration tools in IBM WebSphere Business Integration Server Foundation, Version 5.1. The migration tools perform Version 4.x, and Version 5.0.x migrations. The product installation wizard can call these tools, or you can start these tools directly.

## Migration Redbook

*Migrating to WebSphere V5: An End-to-End Migration Guide* is available from the Redbooks Web site at <http://www.ibm.com/redbooks>. To locate the Redbook, search for the document number SG24-6910-01. The Redbook provides a broader coverage than the information center articles, including more detailed planning information for application migration and WebSphere Studio Application Developer tooling and samples.

## Version 5.0.x migration

Migration from Version 5.0.x to Version 5.1 involves minimal change because both releases implement the Java 2 Platform, Enterprise Edition (J2EE) 1.3 specification. Version 5.0.x supports the Java 2 SDK Version 1.3.1. Version 5.1 supports the Java 2 SDK Version 1.4.1. V5.0.x applications can run on either release without change. V5.1 applications can run on either release without change if you compile applications on a V5.1 node with the compatibility options. See the "Changes for application developers" section for more information.

There are several considerations. There are new migration tools for V5.1 to help migrate federated nodes and nodes with the embedded messaging feature installed. Use the new tools when uninstalling a node you migrate or when uninstalling the V5.1 node, if you decide to keep using the previous node. One set of tools prevent the deployment manager from removing the node as a member of the cell. The other new set of tools prevents uninstalling the messaging queue manager and deleting the code for embedded messaging feature.

The WASPreUpgrade and the WASPostUpgrade migration tools are also updated for V5.1. Verify that you use the WASPreUpgrade tool from the migration directory on the CD-ROM if you intend to save a configuration from a previous product, install V5.1, and restore the configuration. You must use the V5.1 version of the WASPreUpgrade tool to save a configuration that you intend to add to a V5.1 node.

## Version 4.x migration

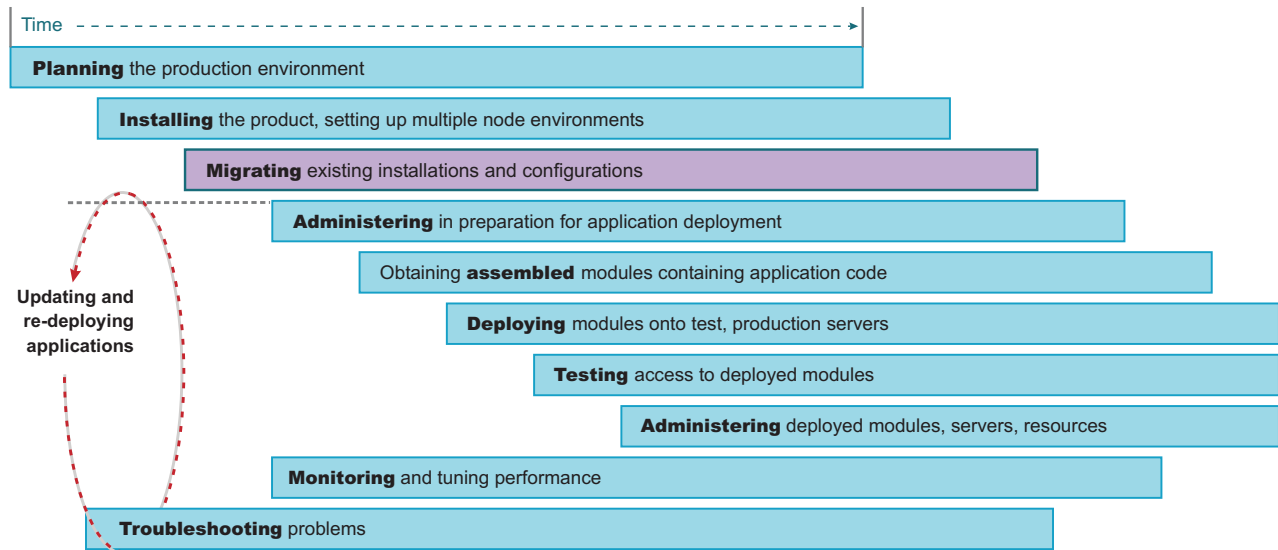
Migration from Version 4.x to Version 5.1 involves minimal change because both releases implement the Java 2 Platform, Enterprise Edition (J2EE) specification. (V4 implements the J2EE 1.2 specification. V5.1 implements the J2EE 1.3 specification.) Most V4.x applications can run without change.

Despite this fact, knowledge of how the migration tools migrate Version 4.x applications is important. For example, extended messaging support service is now a component of WebSphere Business Integration Server Foundation, Version 5.1. Applications that use Version 4.x extended messaging support services require migration to use in an Integration Server system.

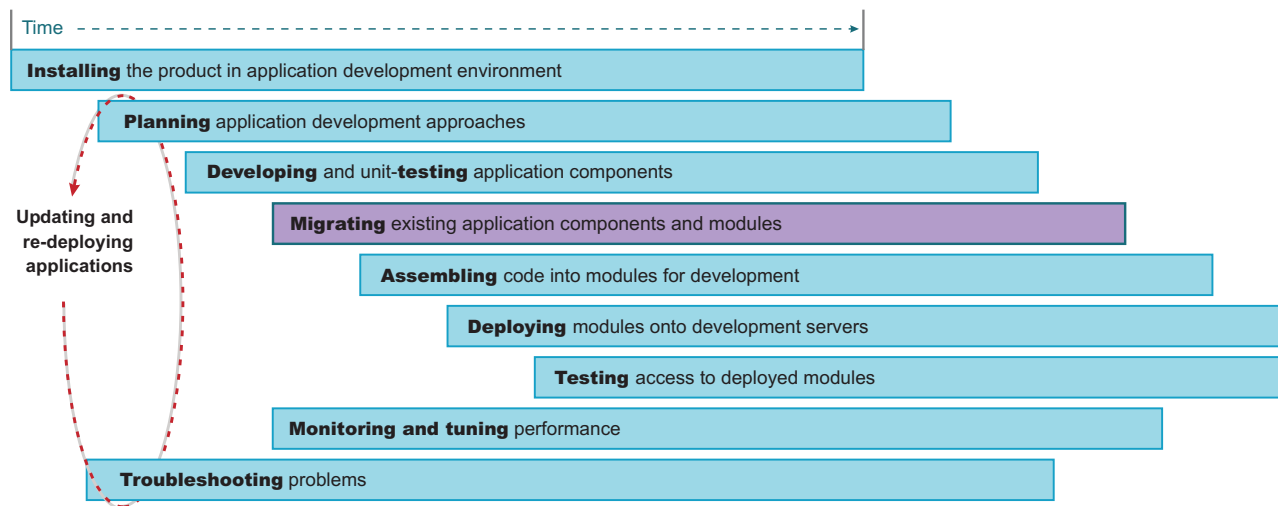
## New assembly and deployment user roles and tools

Version 3.5.x and Version 4.x users perform application tasks through the administrative console.

### A simple timeline of activities for **Planning, Installer and Administrator** roles.



### A simple timeline of activities for an **Application Developer** role.



Suppose you need to update an application that is already deployed to the server. Unless you must change information that affects the bindings of an installed application, you can edit and save the deployment descriptors in place. Redeploy such an application, by opening the assembly toolkit directly on the `installedApps` folder that holds the application.

You can also create or edit applications manually. For example, to add a JSP file or to change a servlet class, place the new or changed file in the appropriate location in the `installedApps` folder. Redeploy an installed application that requires changes to binding by exporting the application through the administrative console, editing the application in the assembly toolkit, and reinstalling the application through the administrative console. Because existing binding information is saved during the export step, the only additional binding information needed is for the components or modules added during editing.

## Version 5 administration

Version 5 administrators can install a Version 5 application onto the server and bind it to an environment. This capability enables administration at the application and module level. Administrators no longer must manage individual servlets, JSP files, or enterprise beans.

The relationship between applications and Application Servers has changed in the move to a J2EE base. After creating a J2EE application, deploy it by installing the application onto Application Servers through the administrative console. Through the administrative console, you can view, start, or stop deployed modules by the application to which they belong or by the Application Server on which they are deployed.

**Support for J2EE resources.** In addition to JDBC drivers and data sources, several resource types are added as the product transitioned to a J2EE base. Administrators now can configure URLs, the Java Message Service (JMS), and the JavaMail API. In each case, you can create a resource provider (such as a JMS provider) and then create resource factories for each provider (such as JMS destinations and JMS connections). The default JavaMail API provider does not appear in the administrative console because it is not configurable. You cannot create additional JavaMail API providers.

**Role based security.** Version 5 security is consistent with J2EE role-based security specifications. Deployment descriptors specify roles for an application. As the administrator installs the application, these roles are bound to users or to groups.

In the administrative console, a Security Center lets you perform all security tasks from a single location. Such tasks include everything from changing the binding information for roles in an application to setting Secure Sockets Layer (SSL) properties to enabling security. Application-specific security tasks are also supported, through the property sheets for each application.

## Changes for application developers

Version 3.5.x and V4.x developers use the administrative console to create, edit, and view application configurations.

V5.1 developers use the assembly toolkit, which is available on the IBM WebSphere Application Server Toolkit (ASTK) CD-ROM to package, edit, and view J2EE applications.

Packaging J2EE applications includes:

- Copying appropriate files into the enterprise archive (EAR) file, including classes, JSP files, HTML files, image files, and so on
- Defining deployment descriptor files for modules and applications

In Version 5.1, the assembly toolkit is available on the IBM WebSphere Application Server Toolkit (ASTK) CD-ROM. The assembly toolkit lets you copy files with appropriate relative paths into the archive and provides a GUI method for defining deployment descriptors. Also, developers can set environment-specific binding information through the assembly toolkit. These bindings are defaults for the administrator to use when installing the application through the administrative console.

You can define IBM extensions to the J2EE specification, for example supporting servlets to be served by class name. These extensions are saved in an XML file that is separate from the standard J2EE deployment descriptor to ensure portability to other Application Servers.

If your existing applications use IBM extensions from earlier product versions, it might be necessary for you to perform mandatory or optional migration to use the same kinds of extensions in Version 5.1.

Version 5.1 supports the Java 2 SDK Version 1.4.1. There are several implications for migration and coexistence. The V5.1 Network Deployment cell is a mixed node environment, where some Application Server nodes might be V5.0.x running Java 2 SDK 1.3.1 and some nodes might be V5.1 nodes running Java 2 SDK 1.4.1.

Applications compiled on V5.0.x nodes can also run on V5.1 nodes. The IBM SDK 1.4.1 in V5.1 provides this backward compatibility.

There is also a cross compiler option for the IBM SDK 1.4.1 that supports compiling code against a bootstrap and extension classes of a previous IBM SDK version. By default, the javac compiler compiles against the bootstrap and extension classes on its platform: the IBM SDK 1.4.1 compiles for 1.4 by default. You can use the IBM SDK 1.4.1 to compile for IBM SDK 1.3.1 compatible output. For example, a developer can issue this command on a V5.1 node to compile against a 1.3 target:

```
C:> javac -target 1.3 -bootclasspath jdk1.3\lib\classes.zip \ -extdirs "" OldCode.java
```

The compiled code runs on a 1.3 Java virtual machine (JVM). The -target 1.3 parameter generates class files that are compatible with 1.3 JVMs. If you do not specify the -target option, the -bootclasspath option and the -extdirs option, the compiled code runs on 1.4 JVMs only. You must specifically compile for 1.3 JVMs on a V5.1 node, to avoid compiling against a Java 2 Platform API that is not present on a 1.3 JVM. A 1.4 application fails at run time on a V5.0.x node.

### Migrating APIs and specifications

Migrating APIs and specifications means moving to the current Java component level and to other technologies that IBM WebSphere Application Server, Version 5.1 supports.

Migrating APIs and specifications also includes moving to the most contemporary open specification levels. If your existing applications currently support different specification levels than those supported by this product version, updating at least some aspects of the applications to comply with the new specifications is probable.

The following table summarizes potential migration areas.

Functional area	Support in V3.5.x or V4.x	Must migrate from V3.5.x?	Must migrate from V4.x?	Must migrate from V5.0.x?	Details
Enterprise beans	EJB 1.0	Yes	Not applicable	Not applicable	Many EJB 1.0 applications can run unchanged in Version 5.1 although some changes might be required or recommended.
	EJB 1.1	Not applicable	No	No	Full support for EJB 1.1 is provided.
Java 2 Connectors	Java 2 Connectors	Not applicable	Yes	No	The preliminary Java 2 Connector support in V4.x is completed in V5.1. Some changes might be necessary to take full advantage of this support.
JDBC API	JDBC API	Yes	Not applicable	No	Many applications can run unchanged in V5.1 although some changes might be required or recommended.
JavaServer Pages (JSP) files	JSP 1.0 Specification	No	No	No	JSP 1.0 APIs are a pure subset of JSP 1.2.
	JSP 1.1 Specification	Not applicable	No	No	JSP 1.1 APIs are a pure subset of JSP 1.2.

Functional area	Support in V3.5.x or V4.x	Must migrate from V3.5.x?	Must migrate from V4.x?	Must migrate from V5.0.x?	Details
Security	IBM security	Yes	Yes	No	Changes might be required due to J2EE security.
Servlets	Servlet 2.1 Specification and IBM extensions	Yes	Yes	No	Many Servlet 2.1 applications can run unchanged in Version 5.1 although changes might be required or recommended.
Servlets	Servlet 2.2 Specification	No	No	No	Servlet 2.2 APIs are a pure subset of Servlet 2.3.
Sessions	IBM sessions	Yes	Yes	No	Many applications can run unchanged in Version 5.1 although changes might be required or recommended.
Transactions	IBM transactions	Yes	No	No	A change in the import statement. Also, one datasource connection cannot be used across multiple user transactions.
Web services	Apache (SOAP) 2.2	Not applicable	Yes	No	Many applications can run unchanged although changes to use new support are recommended.
XML parser	XML 2.0.x supported	Yes	Not applicable	Not applicable	Changes to move to the supported API XML4J V4.2.2 level are required.
XML parser	XML4J V3.1	Not applicable	Yes	Not applicable	Recompilation is required to convert to XML4J V4.2.2.
XML parser	XML4J V4.0.6	Not applicable	Not applicable	Yes	Recompilation is required to convert to XML4J 4.2.2.
XML configuration tool	XMLConfig	Yes	Yes	No	Use the JMX support provided by wsadmin.
WebSphere Control Program (WSCP)	WSCP	Yes	Yes	No	Use the JMX support provided by wsadmin.



---

## How to send your comments

Your feedback is important in helping to provide the most accurate and highest quality information.

- To send comments on articles in the WebSphere Application Server Information Center
  1. Display the article in your Web browser and scroll to the end of the article.
  2. Click on the **Feedback** link at the bottom of the article, and a separate window containing an e-mail form appears.
  3. Fill out the e-mail form as instructed, and click on **Submit feedback**.
- To send comments on PDF books, you can e-mail your comments to: **wasdoc@us.ibm.com** or fax them to 919-254-0206.

Be sure to include the document name and number, the WebSphere Application Server version you are using, and, if applicable, the specific page, table, or figure number on which you are commenting.

When you send information to IBM, you grant IBM a nonexclusive right to use or distribute the information in any way it believes appropriate without incurring any obligation to you.





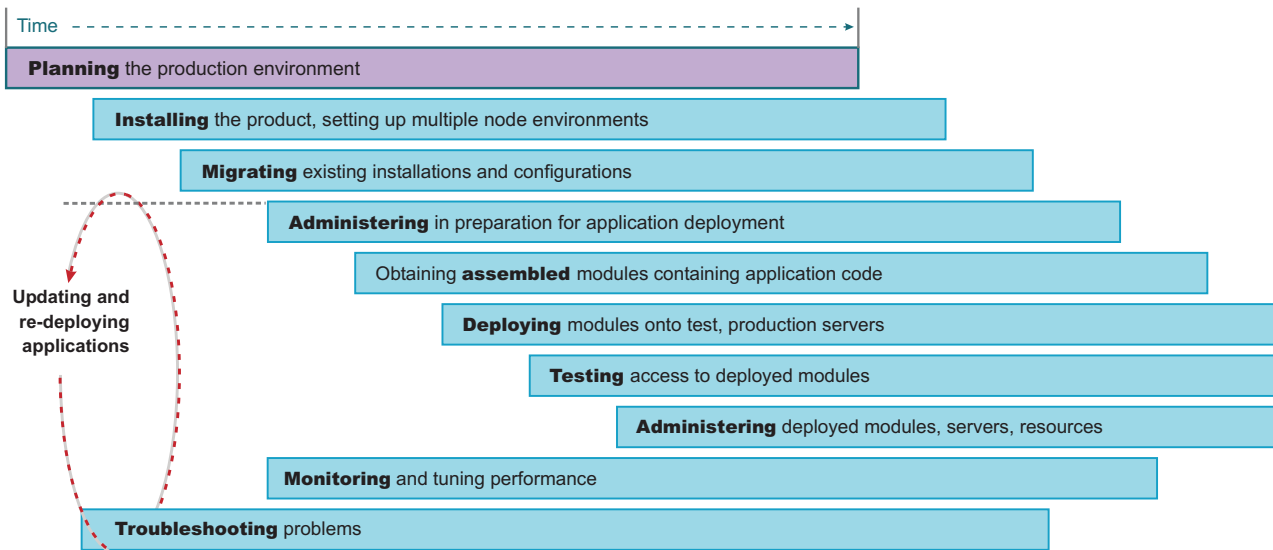
# Chapter 1. Planning

Planning is an activity in which you make decisions that affect one or more subsequent activities.

In this documentation set, you will find pre-installation planning covered in Installing. There, the planning information helps IT architects and various administrators select and implement multiple node server environments comprised of one or more product installations.

Note the topic Establishing multimachine environments, as it is an essential task for users of WebSphere Business Integration Server Foundation in a WebSphere Application Server Network Deployment environment.

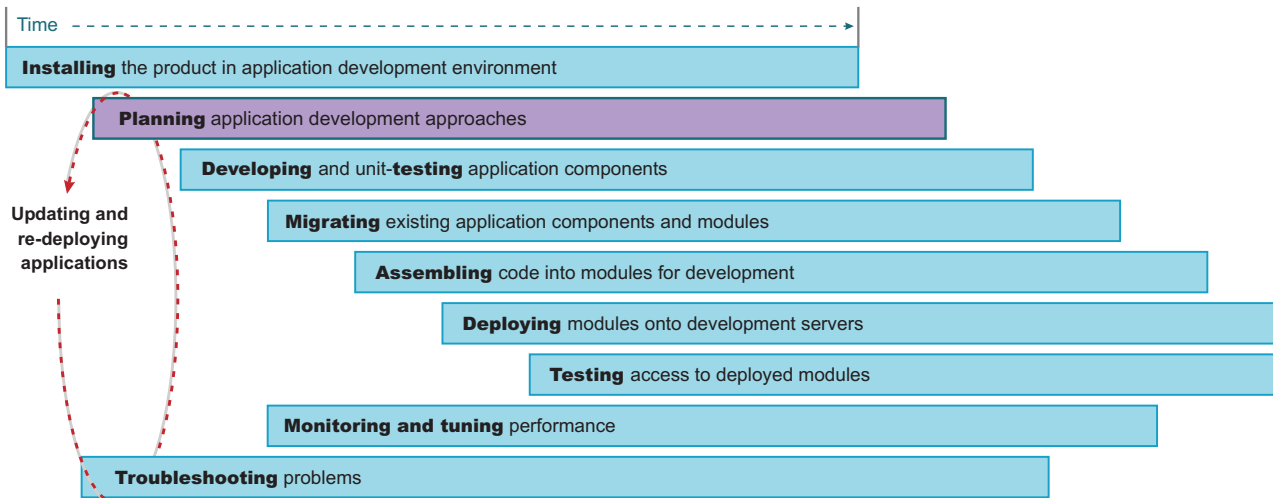
## A simple timeline of activities for Planning, Installer and Administrator roles.



Aside from the planning that precedes product installation, application developers and others encounter various decisions that are smaller in scale, but can have ramifications if not well planned. Those are the kind of decisions outlined under Planning.

For example, selecting a session tracking approach can affect application development, assembly, and administration downstream.

## A simple timeline of activities for an Application Developer role.



Whatever kind of planning you are doing, it is best to review the product documentation of the functional area you are using, to understand the key concepts underlying, as well as the specific product support and limitations in that area.

## Chapter 2. Installing

Installing is an activity in which you put software onto machines. Some installation can be performed after the initial product setup, such as installing the complimentary application clients provided with the product.

For Version 5.1 the Launchpad and the installer wizard use the language setting from the machine locale to determine the language for the interface.

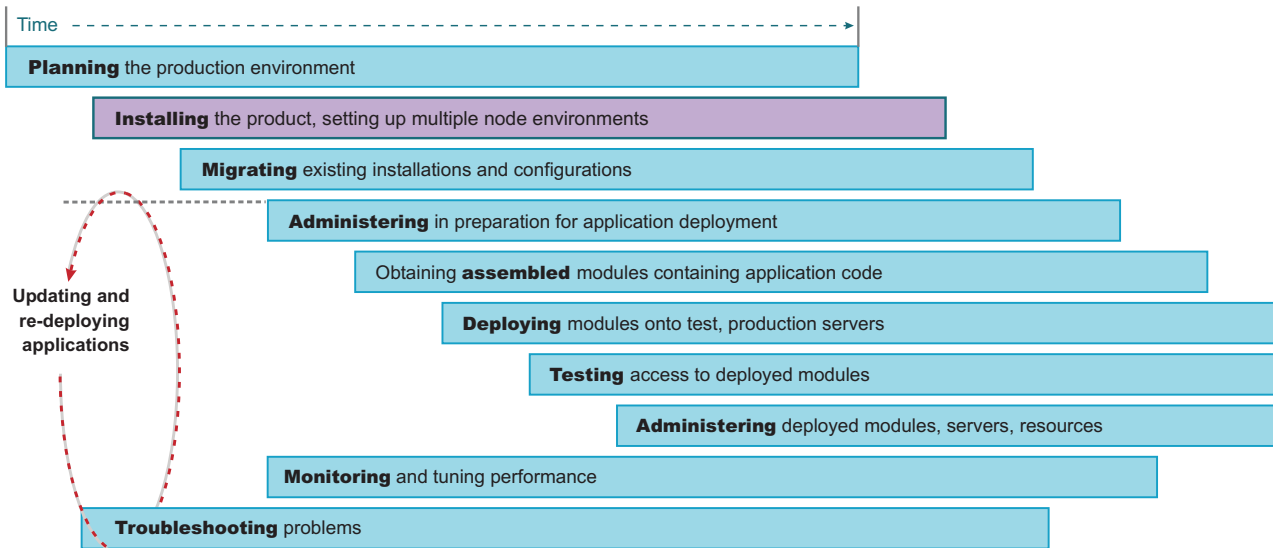
Installation can be part of setting up a multiple node production environment, in which case significant planning is needed.

See "Establishing multimachine environments" for the detailed setup instructions once you have installed WebSphere Application Server and WebSphere Application Server Network Deployment on various machines.

Installing WebSphere Business Integration Server Foundation on a base WebSphere Application Server node adds programming model extensions to the base node. The additional Integration Server code is added to the installation directories of the base product.

Installing WebSphere Business Integration Server Foundation on a Network Deployment node adds administrative console extensions to the deployment manager node so that you can manage base nodes with Integration Server extensions. The additional Integration Server code is added to the installation directories of the Network Deployment product.

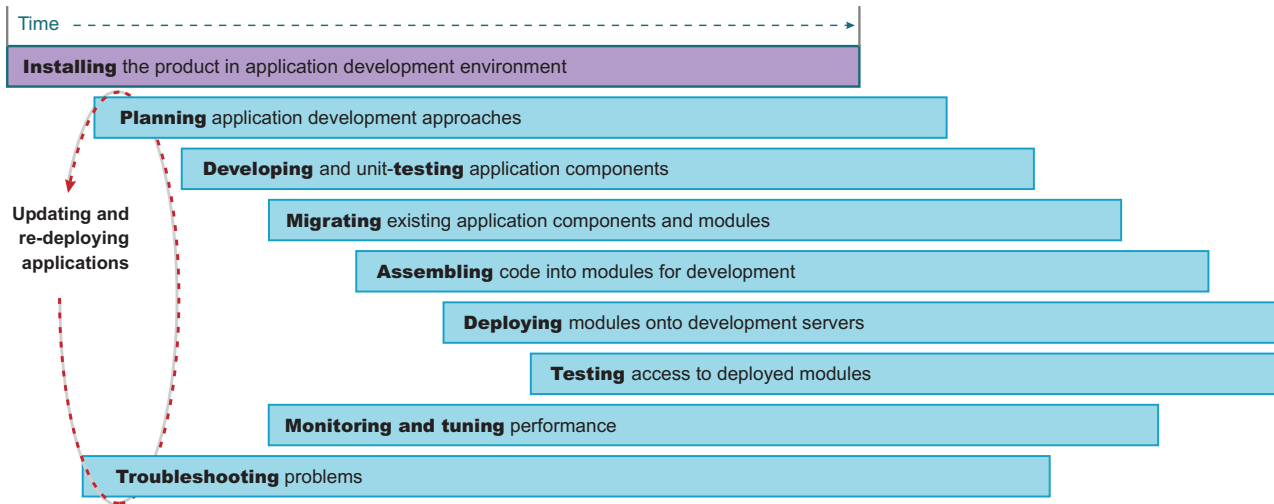
### A simple timeline of activities for **Planning, Installer and Administrator** roles.



Application developers might perform quick, single machine installations to create a realistic server environment for unit-testing code artifacts and applications. This task can require little preparation beyond

checking the software and hardware requirements.

**A simple timeline of activities for an Application Developer role.**



## Chapter 3. Installing WebSphere Application Server products

This topic introduces installing IBM WebSphere Business Integration Server Foundation, Version 5.1, including the tasks you need to perform. IBM WebSphere Business Integration Server Foundation, Version 5.1 is provided in both U.S. English and Japanese.

To create a complete environment for installation, you must install any prerequisites and prepare the operating platform for installation. During installation, you can optionally migrate the configuration from a previous version of the product. After installation, you can run the installation verification test and bring up your Application Server.

Perform the following tasks to create a running version of the product on your machine.

1. Plan to install an e-business network.

This task helps you plan to install an e-business network. It also describes interoperability considerations.

2. Install the product.

This task helps you prepare your machine for installation and explains the different types of installation available to you. It includes information on:

- Using the LaunchPad
- Deciding whether to migrate applications and the configuration from a previous version
- Deciding whether to coexist with a previous version
- Using the silent installation method

This task describes using the installation wizard. Through the installation wizard, you migrate applications and configurations from a previous version of WebSphere Application Server, coexist with the previous version, choose a typical or custom installation, and perform some initial configuration.

A typical installation requires setting up a user and two operating system groups on Linux and UNIX-based platforms for the embedded messaging server and client feature. If you select the embedded messaging server and client feature in a custom installation, you must also set up the operating system groups.

Migrate Enterprise, V5.0.x or Enterprise Edition, V4.x to WebSphere Business Integration Server Foundation, Version 5.1.

Table 1. When to migrate extended applications to Version 5.1

Migration from	Migrate to V5.1?		
	WebSphere Business Integration Server Foundation	WebSphere Application Server	Network Deployment
Enterprise Edition, V4.1.x	Yes	No. You disable programming model extensions in your migrated applications.	
Enterprise, V5.0.x	Yes		

Migrating to base or Network Deployment issues warnings that describe the parts of your configuration that are disabled. The migration tools record these warnings in a log file. If you have already migrated and disabled the extensions in your applications, you can enable the extensions again by installing Integration Server and selecting the migration option.

There is no Enterprise Edition in Version 3.5.x or Version 4.0.x. If you are migrating from a V3.5.x product or a V4.0.x product, migrate when you install the V5.1 base product or the V5.1 Network Deployment product. After migrating, install the WebSphere Business Integration Server Foundation product.

See “Migrating to WebSphere Business Integration Server Foundation” on page 371 for more information.

The Network Deployment node must be at the highest product level within its cell. The following table shows if a particular extended base product is allowed within an extended Network Deployment node.

Table 2. Mixed version cells in Version 5.1

Application Server node	Network Deployment with Enterprise or Integration Server extensions			
	V5.0.0	V5.0.1	V5.0.2	V5.1
V5.0.0 with Enterprise	Yes	Yes	Yes*	Yes*
V5.0.1 with Enterprise	No	Yes	Yes*	Yes*
V5.0.2 with Enterprise	No	No	Yes	Yes
V5.1.x with Integration Server	No	No	No	Yes

\* The base node cannot have the embedded messaging feature installed.

3. Verify the installation.

- a. Use the First Steps tool to run the Installation Verification Test.

The First Steps tool starts automatically at the end of the installation.

- b. Identify and correct any problems using the troubleshooting procedure.

4. Examine the results of migration, or prepare to perform a manual migration.

This task describes exactly what is migrated during the automatic migration. It also describes how to perform a manual migration using the migration tools.

5. Prepare to migrate from an unsupported operating system.

This task describes a basic procedure to follow when migrating from one operating system to another.

6. Configure WebSphere Application Server after migration.

This task explains how to check migrated application and configuration information, to understand and configure exactly what you migrated.

- If you migrate from Version 3.5.x, examine the applications that you are moving. Make any necessary changes to the applications that are converted to Java 2 Platform, Enterprise Edition (J2EE) platform applications. The migration tools create the initial J2EE enterprise applications, based on Version 3.5.x configurations.
- If you migrate from Version 4.x, you have little to review. J2EE 1.2 enterprise archive (EAR) files in Version 4 work in Version 5 of WebSphere Application Server, which also supports the J2EE 1.3 specification.

7. Set up a multinode environment.

This task describes how to set up multiple nodes into a group or *cell* of Application Servers, with centralized configuration under the control of the deployment manager node and its distributed node agents.

8. Set up V3.5.x and V5 coexistence.

This task describes running WebSphere Application Server V3.5.5 and later editions with V5.x, on the same machine.

9. Set up V4.0.x and V5 coexistence.

This task describes running WebSphere Application Server V4.0.2 and later editions with V5.x, on the same machine.

10. Set up V5.x coexistence.

This task describes running multiple WebSphere Application Server product installations on the same machine.

11. Automatically restart WebSphere Application Server processes.

This task describes how to set up WebSphere Application Server processes for the operating system to monitor and restart.

12. Create multiple Version 5 instances on one machine.

This task describes creating multiple configuration instances from one installation. It also describes creating multiple servers in a coexistence or multiple instance environment, and changing port settings for HTTP transport to avoid conflicts.

13. Apply an interim fix or fix pack to an existing installation.

This task helps you apply maintenance to WebSphere Application Server products after you download the maintenance from the Support page.

14. Remove an interim fix or fix pack from an existing installation.

This task helps you remove applied maintenance from WebSphere Application Server products.

15. Tune for performance. For best performance on any platform, see Tuning performance .

The WebSphere Application Server product is installed.

**Uninstalling and reinstalling:** See Uninstalling the product for information about uninstalling and reinstalling any WebSphere Application Server product.

**Deploying applications:** Go to Quickly deploying Web components - Try it out! for a description of how to get started deploying applications.

---

## WebSphere Application Server packages for Version 5.1

The WebSphere Application Server family of interoperable products provides a next-generation application server on an industry-standard foundation. The IBM WebSphere Application Server family is divided into the following packages for Version 5. Each edition addresses a distinct set of scenarios and needs.

WebSphere Application Server includes:

- **WebSphere Application Server Express** (not pictured below)

This edition is a lightweight server for static content, servlets, and JavaServer Pages (JSP) files, but does not support enterprise beans.

- **WebSphere Application Server**

This edition addresses the basic programming and run-time needs of desktop developers and single-server production scenarios. The run-time environment for this edition addresses standards-based programming for Web and component-based programming, as well as Web services.

The administration model for this edition presumes a single-server environment with no clustering for failover or workload balancing, and with no centralized administration of multiple server instances. However, you can add a stand-alone node to a centrally administered network (the cell) at any time after installing the following product, Network Deployment that controls the cell.

- **WebSphere Application Server Network Deployment**

This edition addresses application servers running in multiple-server production scenarios. It provides centralized administration, as well as basic clustering and caching support.

- **WebSphere Business Integration Server Foundation**

IBM WebSphere Business Integration Server Foundation (previously IBM WebSphere Application Server Enterprise) builds on the industry leading IBM WebSphere Application Server Network Deployment to deliver a next generation composite application platform optimized for building service-oriented applications that extend and integrate your existing IT assets.

With the Version 5.1 release, IBM WebSphere Application Server Enterprise has been re-branded as WebSphere Business Integration and renamed to IBM WebSphere Business Integration Server Foundation to improve product alignment and positioning as the foundation for higher value IBM WebSphere Business Integration solutions.

The product value proposition and functionality remain unchanged. Future releases of IBM WebSphere Business Integration Server Foundation will focus on enhancing product integration capabilities, including maintaining and enhancing the process choreography and business rule features and adding new integration capabilities and easier-to-use tools.

IBM WebSphere Business Integration Server Foundation will continue to build on the IBM WebSphere Application Server and will maintain its commitment to J2EE and open standards.

**IBM WebSphere Studio Application Developer Integration Edition** Version 5.1 (name unchanged) is a comprehensive Eclipse-based composite application development environment for building service-oriented applications that extend and integrate your existing IT assets.

IBM WebSphere Studio Application Developer Integration Edition V5.1 is optimized for building integrated applications and business processes that deploy to IBM WebSphere Business Integration Server Foundation V5.1. WebSphere Studio Application Developer Integration Edition includes all of the features available in IBM WebSphere Studio Application Developer v5.1.1.

- **WebSphere Application Server for z/OS** (not pictured)

This edition integrates the WebSphere Application Server product and the Network Deployment product into a single package that leverages the unique qualities of service inherent to the z/OS platform. It addresses standards-based programming for Web and component-based programming, as well as Web services, and provides centralized administration of multiple server instances, as well as basic clustering and caching support.

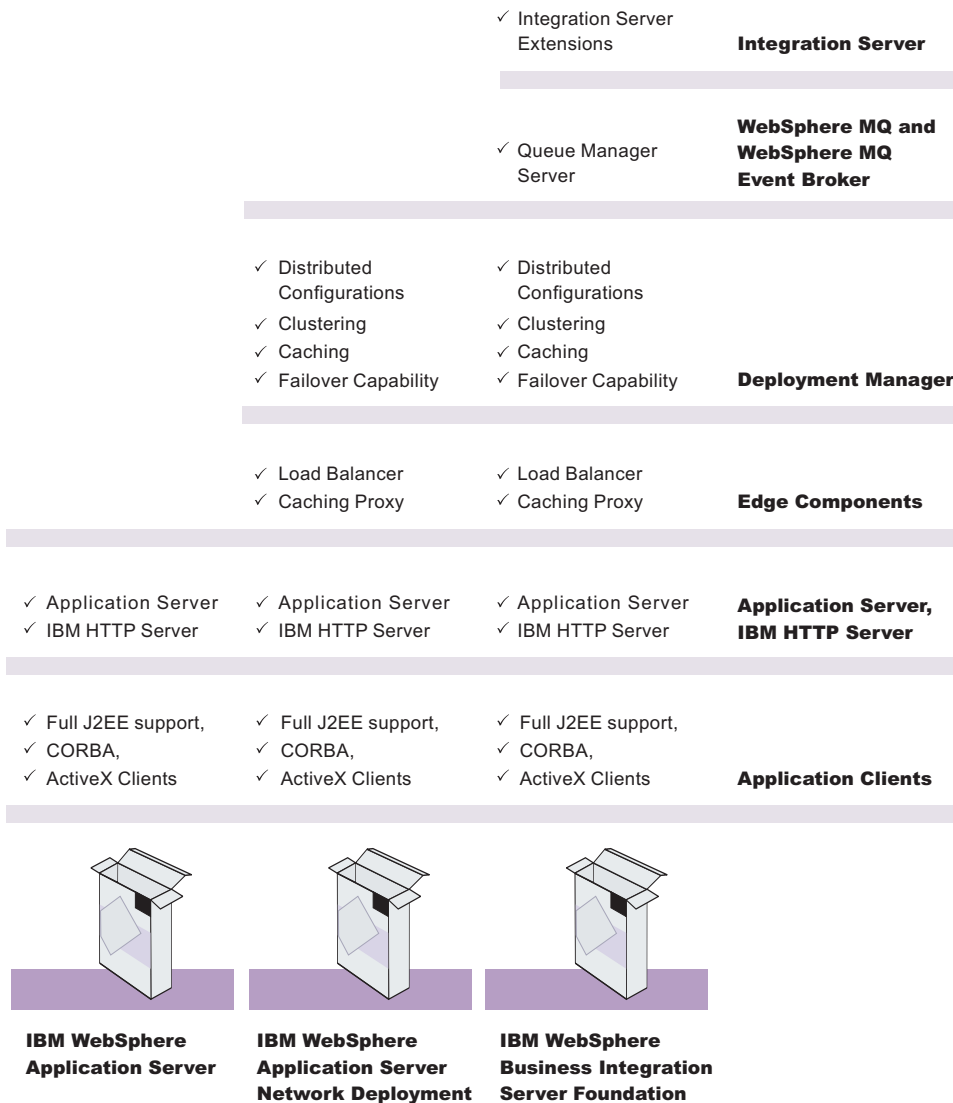


Figure 1. Installation images in WebSphere Application Server packages that are currently available for V5.1. The following packages are available for Version 5.1, which supports the Java 2 SDK 1.4.1 specification.



## Description of installation images

The WebSphere software platform for e-business starts with a foundation formed from Web application serving and integration. The WebSphere Application Server family lets you quickly, reliably and flexibly enable your business for the Web. It provides the core software to deploy, integrate and manage your e-business applications. WebSphere Application Server supports custom-built applications, based on integrated WebSphere software platform products, or on other third-party products. Such applications can range from dynamic Web presentations to sophisticated transaction processing systems.

IBM WebSphere Application Server, WebSphere Application Server Network Deployment, and WebSphere Business Integration Server Foundation are interoperable building blocks. The base product CDs are included in the Network Deployment package. The Network Deployment package CDs are included in the Integration Server package.

- The **Application Clients** installation image contains the Java 2 Enterprise Edition (J2EE) Application Clients support, the WebSphere Business Integration Server Foundation client programming model extensions, the CORBA C++ client (deprecated), the Applet client, and the ActiveX to Enterprise JavaBeans (EJB) bridge client support. The image also contains the embedded messaging client support for the native Java Message Service (JMS) provider in WebSphere Application Server products.
- The **WebSphere Application Server** product installation image contains the core application server runtime, a native JMS provider (the embedded messaging feature), IBM HTTP Server, IBM Developer Kit, IBM Cloudscape, XML and XSL parsers, the deployment tool, the node agent for communicating to the deployment manager when it is part of a cell, and the external adapter library for proxy caching enablement.

The application assembly tool is no longer a feature of the base WebSphere Application Server product beginning with Version 5.1. The assembly toolkit replaces the application assembly tool. The assembly toolkit is available on the IBM WebSphere Application Server Toolkit CD in the product package. The assembly toolkit consists of the J2EE Perspective of the WebSphere Studio Application Developer product, including code generation capabilities.

- The **Deployment Manager** product installation image contains the deployment manager configured for use in departmental production computing scenarios. It includes the embedded messaging client feature, the Version 2 compliant universal description, discovery, and identification (UDDI) registry feature, and the Web services gateway feature. Although the Network Deployment package includes the base Application Server CD, installing the Network Deployment product does not install the base Application Server product. You must use the base product CD to install the base product.
- The **Edge components** installation image contains IBM HTTP Server, and edge of network support for the Load Balancer (Dispatcher) and Caching Proxy (edge caching), as well as support for network authentication and single sign-on.
- The **WebSphere Business Integration Server Foundation** installation image contains programming model extensions to the core Application Server, such as business rule beans and process choreographer, and deployment manager extensions for administering functions included in the programming model extensions. Integration Server supports an *umbrella installation*, which automatically installs the base product in the same installation procedure.

Although the Integration Server package includes the Network Deployment product CD, installing Integration Server does not install the Network Deployment product. You must use the Network Deployment product CD to install the Network Deployment product.

If you install the Integration Server product on a machine with an installed Network Deployment product, the Integration Server product extends the Network Deployment administrative console.

Although the Integration Server package includes a separate base WebSphere Application Server product CD, installing Integration Server on a clean machine automatically installs the base Application Server product in an umbrella installation.

If you install Integration Server on a machine with an installed base Application Server product, Integration Server extends the base Application Server product, while automatically installing any base product features that Integration Server requires.

- The **WebSphere MQ and WebSphere MQ Event Broker** installation images in Version 5.0 provide the non-embedded full-function WebSphere MQ Queue Manager for reliable, dynamically load balanced asynchronous messaging for more than 35 platforms.

Included with all packages are the Data Direct Technologies JDBC Drivers and the IBM WebSphere Application Server Toolkit (ASTK) compact disks (CDs).

Also included with the Version 5.1 base product and the Network Deployment product are the WebSphere Application Server, Version 5 for iSeries CDs. The Integration Server product for V5.1 is not supported on iSeries servers at this time.

In addition, the Network Deployment package and the Integration Server package include the IBM Directory Server and the DB2 Universal Database Enterprise Edition products.

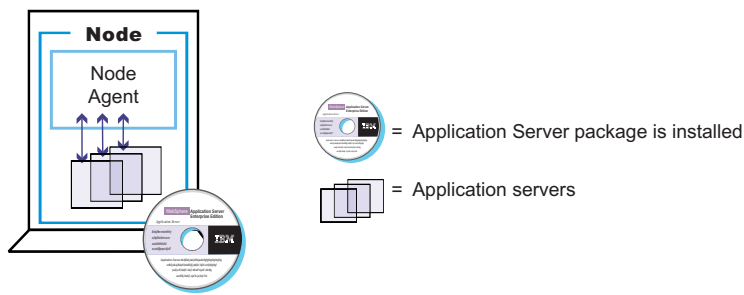
---

## Planning to install an e-business network

Version 5 of the WebSphere Application Server family provides flexible configurations and deployment options for hosting Java 2 Platform, Enterprise Edition (J2EE) applications. The WebSphere Application Server package provides all required components:

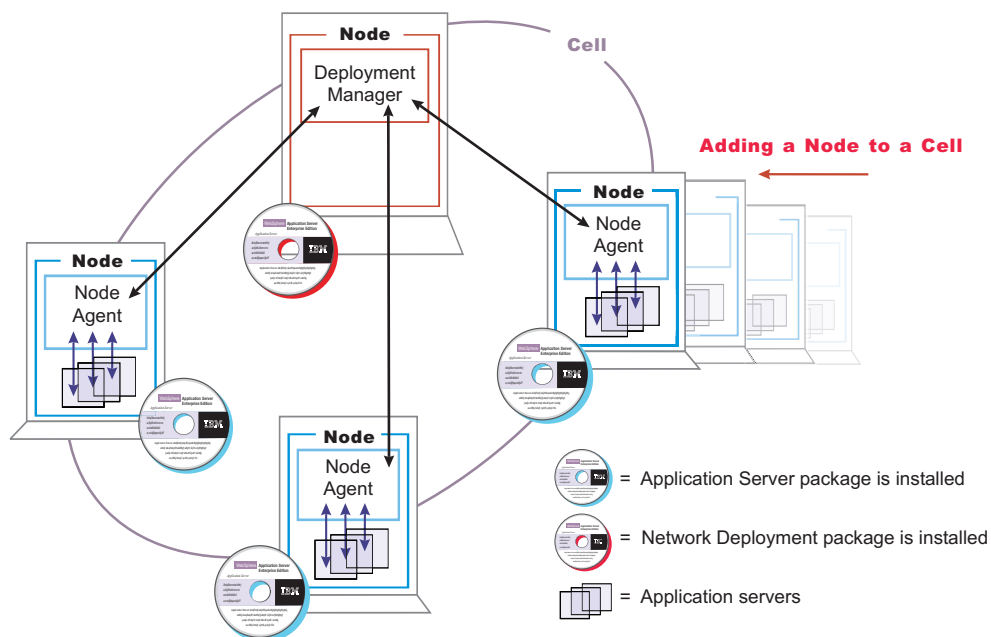
- The WebSphere Application Server
- A Web server
- A J2EE client

### IBM WebSphere Application Server Package



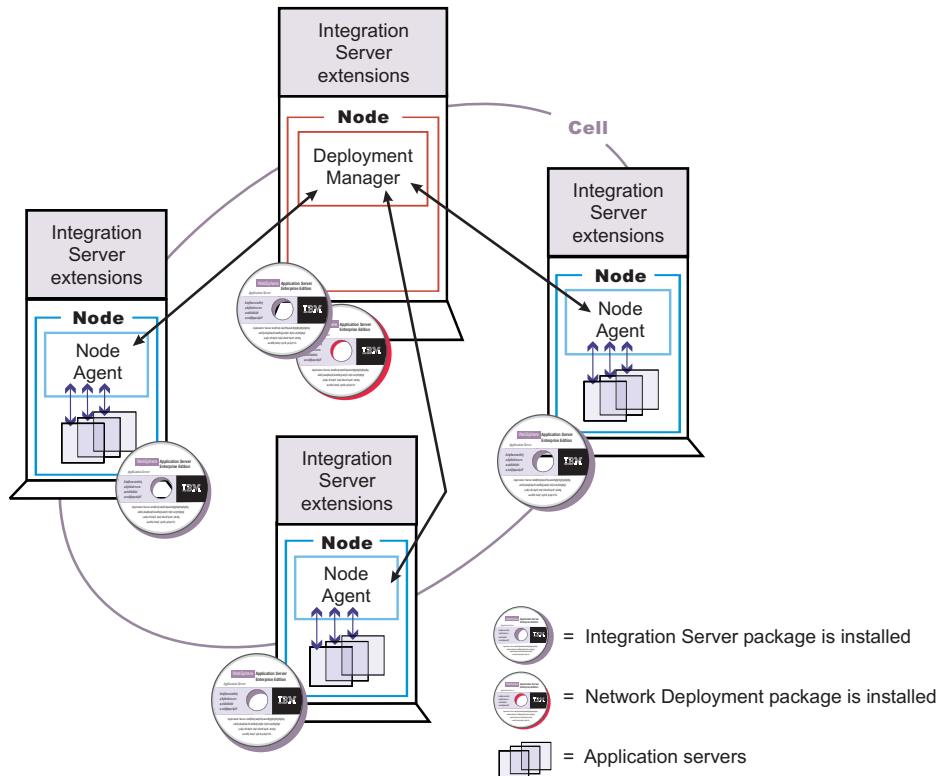
The WebSphere Application Server Network Deployment package includes the core package and provides a smooth transition to deploying and managing applications in a distributed network environment. It includes productivity and scalability enabling components (Edge components). The deployment manager server lets you easily federate single nodes to its group, which it manages as a single image or *cell*, by using the nodeagent server process on each node.

## IBM WebSphere Application Server Network Deployment Package



The WebSphere Business Integration Server Foundation package further extends the topology, by adding WebSphere MQ messaging support for communicating with other systems at your enterprise, and by providing programming model extensions, such as business rule beans and process choreography.

## IBM WebSphere Business Integration Server Foundation Package



Tasks in the installation planning process appear below.

### 1. Plan the general scope of your network.

Review single machine topologies and to learn about WebSphere Application Server, Version 5 product family scalability. With one command you can move an Application Server node from a stand-alone environment into a managed group of server processes, all part of a single-image cell, under the centralized control of the Version 5 deployment manager. Or, you can move an Application Server back to a stand-alone environment. You can start small and *scale up* to larger integrated topologies.

### 2. Review common multinode topologies.

Determine which scalable and reliable e-business environment is a best fit for your requirements as you learn where to install the typical components of a WebSphere Application Server environment. For example, decide whether to install WebSphere Application Server on the same server as the Web server, or whether to create a cluster of application servers on one or several machines.

Decide which WebSphere Application Server package you need. Understanding scalability factors and picking the right design can help you start with the correct package, and can help you achieve your business model objectives for e-business in a timely and cost-efficient manner.

### 3. Review common topologies for WebSphere Application Server Edge components, as described in the information center for Edge components.

After planning how to install the WebSphere Application Server product, you can plan the installation of Edge components, which are included in the Network Deployment package and therefore, in the WebSphere Business Integration Server Foundation package. Edge components include the caching proxy and the load balancer component set, including the dispatcher.

You can find a link to the Edge components information center Web site in the *Installation: Resources for learning* topic.

4. Review the latest research in e-business patterns at the developerWorks Web site. You can find additional information on proven patterns of machine and product configurations, from thousands of actual IBM experiences.

You can find a link to the developerWorks Web site in the *Installation: Resources for learning* topic.

5. Plan for interoperability and coexistence.

Plan to have WebSphere Application Server interoperate with your other e-business systems, including other versions of WebSphere Application Server. *Interoperability* provides a communication mechanism for WebSphere Application Server nodes that are at different versions. *Coexistence* describes multiple versions or instances running on the same machine, at the same time.

Interoperability support enhances migration scenarios with more configuration options. It often is convenient or practical to interoperate during the migration of a configuration from an earlier Application Server version to a later one when some machines are at the earlier version and some machines are at the later version. The mixed environment of machines and application components at different software version levels requires interoperability and coexistence.

It is often impractical, or even physically impossible, to migrate all the machines and applications within an enterprise at the same time. Understanding multiversion interoperability and coexistence is therefore an essential part of a migration between version levels.

- a. Plan to run WebSphere Application Server across platforms.

Support of multiple versions is provided on all operating system platforms supported by WebSphere Application Server, Version 5.

- b. Plan to run WebSphere Application Server across versions.

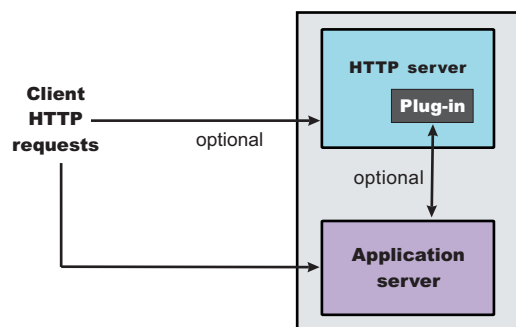
WebSphere Application Server, Version 5 is generally interoperable with WebSphere Application Server Versions 3.5.x and 4.0.x, although each version has specific requirements. However, the ability to run different versions of an Application Server in a configuration does not let you include Version 5 Application Servers in an existing administrative domain, or let you include Version 3.5.x or Version 4.0.x Application Servers in a Version 5 cell.

Reading the information referred to in this topic provides you with a good approach for implementing your WebSphere Application Server environment.

You are now ready for pre-installation planning and installation. Go to *Installing WebSphere Application Server* to continue.

## Single server topology

The following illustrations show examples of single server topologies. Each WebSphere Application Server product can run in a single server environment. The most common topology is a stand-alone base WebSphere Application Server product.

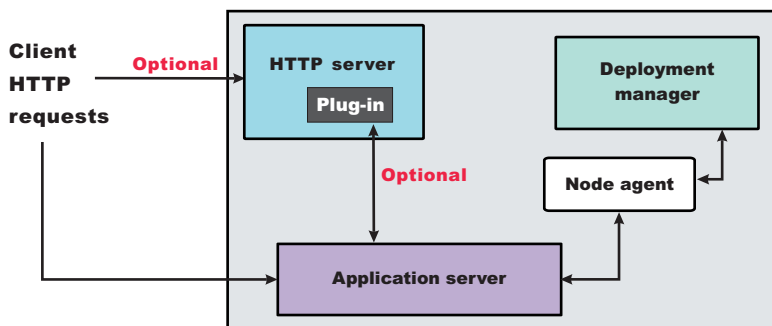


The WebSphere Application Server base product runs on a single machine. You can install the product in a stand-alone configuration or as part of a cell in a multimachine configuration. The stand-alone

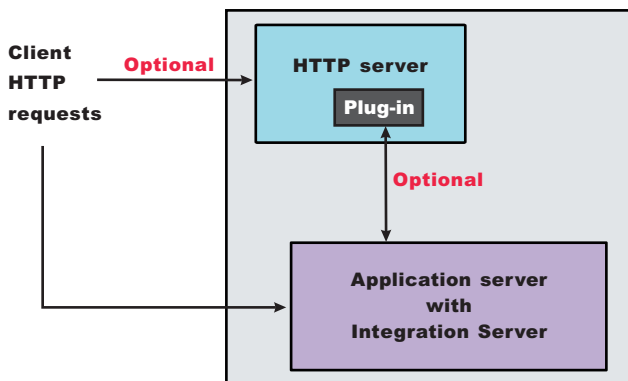
configuration is typically for developer desktops or stand-alone production computing, which involve a single Application Server instance operating independently of any other applications.

You can install an installation image on any supported machine. You can configure the Application Server with the Administrative Console to host one or more applications.

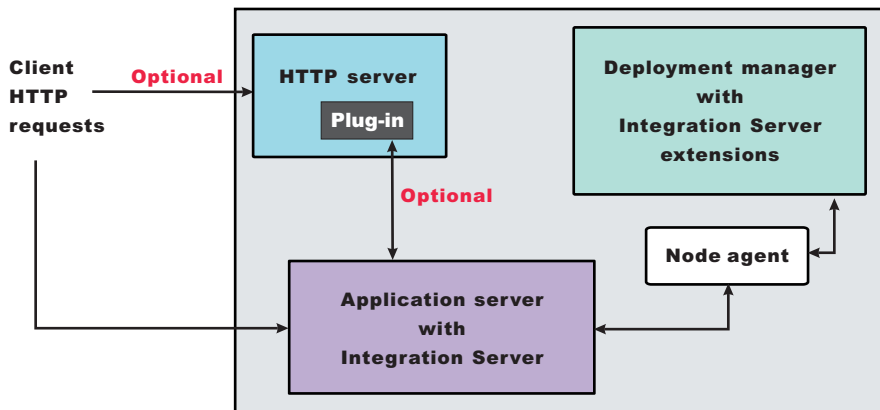
The Network Deployment product can also run on a stand-alone machine or in a multimachine configuration, as described in other topology topics. The following illustration shows a typical developer environment for a Network Deployment product in a stand-alone configuration. This configuration is not recommended for a production environment unless you have a machine with the capacity for both products.



WebSphere Business Integration Server Foundation can also run in a stand-alone configuration, or as part of a cell in a multimachine configuration, as described in other topology topics. The following illustration shows an example of Integration Server extensions in a stand-alone configuration.



You can also run Integration Server extensions with Network Deployment in a stand-alone configuration. The following illustration shows an example of such a configuration.



Integration Server installs a version of the base WebSphere Application Server product if the base product is not already on the machine. If the base product is on the machine, Integration Server verifies that any required base features are installed. The Integration Server product installs base features that are missing.

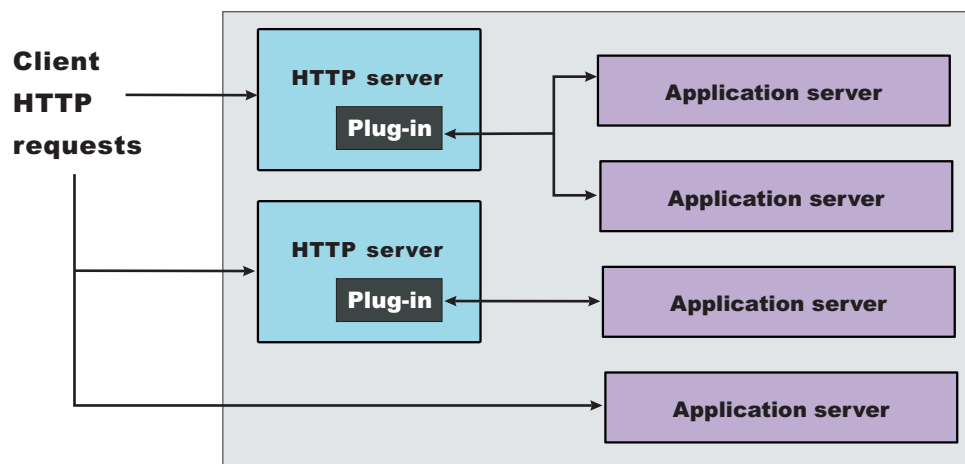
### Multiple instances on one machine

The base WebSphere Application Server product contains three main topologies:

- A single installation, as described previously
- Multiple installations in a coexistence environment
- A single installation with multiple configuration instances

You can install the base WebSphere Application Server product one time as described previously, which creates a default server1 instance. You can create more servers on the machine using the techniques described in Creating servers in coexistence or multiple instance environments.

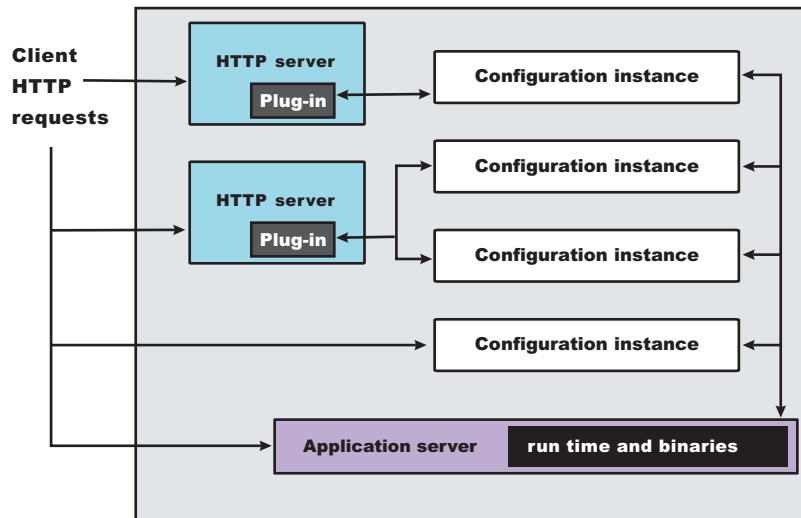
You can install the base WebSphere Application Server product multiple times in separate directories. Each resulting installation instance is a fully functional Application Server. The following illustration shows an example of such a configuration.



You can also install the base WebSphere Application Server product one time and use the **wsinstance** command to create multiple configuration instances. Configuration instances are fully functional Application

Servers that share the run time and command binaries of the initial product installation. The following illustration shows an example of such a configuration.

You can also install the Integration Server extensions on the initial installation. Any configuration instances that you create after installing Integration Server automatically include the Integration Server extensions.



## Example: Choosing a topology for better performance

WebSphere Application Server provides various Workload Management (WLM) topologies. The following case study uses two topologies, Topology A and Topology B to show how the type of topology you choose can affect performance. In the case study, Topology A can improve performance from 10%-20% more than Topology B. You can see performance increase by using the J2EE benchmark Trade, which is included in this release.

Topology A contains a Web server and a WebSphere Application Server plug-in to a cluster of WebSphere Application Servers. Each cluster member contains a Web container and EJB container. Topology B includes a Web server, a plug-in, and one Web container to a cluster of EJB containers. In both topologies, the Object Request Broker pass-by-reference is selected and the backend database is on a dedicated machine.

Topology A has an advantage because the Web container and EJB container are running in a single Java virtual machine (JVM). In Topology B, the Object Request Broker pass-by-reference option is ignored between the Web container cluster member and the EJB container member. In Topology A, the EJB container uses the same thread passed from the Web container. The request does not have to be passed from one thread in one JVM to another thread in another JVM.

Also, if the processor utilization of the cluster member machines is near 100% you can add more members. If the Web server box is not running at capacity and the Web container processing is not heavy, try freeing the processor on the other members by moving to Topology B.

In this test environment, Topology A had the advantage, however, many factors related to the application and environment can influence results.



## Establishing multimachine environments

Setting up a Network Deployment environment involves several steps performed on each of the systems that comprise the cell.

1. Optional: Start the administrative server from an earlier version of WebSphere Application Server.  
If you intend to migrate the applications and configuration from an earlier version, you might need to start the administrative server so that the installation wizard can use XMLConfig to export the configuration data repository as it performs the automated migration that you can select in the next step.

Start the administrative server of WebSphere Application Server Standard Edition (Version 3.5.x) or WebSphere Application Server Advanced Edition (Versions 3.5.x or 4.0.x).

It is not necessary to start the administrative server for WebSphere Application Server Advanced Single Server Edition, Version 4. The migration tools use the XML configuration files directly.

2. Install the base WebSphere Application Server product on each machine to create a WebSphere Application Server node on the machine.

Install the base WebSphere Application Server product for the machine to become a node in the cell. The installation procedure is the same for a node that federates into a cell as it is for a stand-alone Application Server. You can install the base WebSphere Application Server product more than once on a single machine. Coexistence is supported. There are several ways to federate a stand-alone Application Server installation instance into the deployment manager cell.

You can install the base WebSphere Application Server product once and create multiple configuration instances on the machine, using the **wsinstance** command. You can also install the Network Deployment product once and create multiple configuration instances of the deployment manager. Each deployment manager configuration instance can federate stand-alone base WebSphere Application Server product installation instances, but a deployment manager cannot federate base product configuration instances.

Migrate applications, security settings, and the remaining configuration from WebSphere Application Server, Version 3.5.x and later, or WebSphere Application Server, Version 4.0.x and later. You can also choose to coexist with WebSphere Application Server, Versions 3.5.5 and later, or Versions 4.0.2 and later. Both migration and coexistence are described in the installation procedure for the base WebSphere Application Server product, which is available from the information center for the WebSphere Application Server product.

Stop the administrative server from the earlier version before you perform the installation verification test, which starts the new server. This avoids potential port conflicts.

3. Install WebSphere Business Integration Server Foundation on one or more base WebSphere Application Server nodes.

WebSphere Business Integration Server Foundation updates the base product installation, installing any base features that Integration Server requires. You can use an installation procedure that is unique to Integration Server to install both Integration Server and base WebSphere Application Server at the same time, in an *umbrella* installation. This type of installation is described in the installation procedure for WebSphere Business Integration Server Foundation.

Integration Server supports multiple base product installation instances as well as multiple configuration instances. This is also described in the installation procedure.

4. Install the WebSphere Application Server Network Deployment product on a machine. Only one system hosts the deployment manager.

As the deployment manager federates base WebSphere Application Server nodes, it expands the cell that it manages. Although you can install a base WebSphere Application Server on the same machine as the deployment manager, it is not usual in a production environment unless you have a machine with the capacity to host both products.

The deployment manager is the central administrative manager. It does not install the base WebSphere Application Server product on other machines. The only functions supported in the Network Deployment installation are the deployment manager and its associated administrative programs.

Migrate applications, security settings, and the remaining configuration from WebSphere Application Server, Version 3.5.x and later, or WebSphere Application Server, Version 4.0.x and later. You can also choose to coexist with WebSphere Application Server, Versions 3.5.5 and later, or Versions 4.0.2 and later. Migration and coexistence are described in the installation procedure for the WebSphere Application Server Network Deployment product.

5. Install Integration Server on the deployment manager node.

If you plan to use Integration Server extensions on Application Server nodes in the cell, you must install Integration Server on the Network Deployment node.

6. Start the deployment manager process.

There are two ways to start the deployment manager:

- As a monitored process, which restarts automatically if a failure occurs
- As an unmonitored process, which is what the `startManager.sh` or `startManager.bat` script does

Run the `startManager.sh` or `startManager.bat` script from the `/bin` directory of the installation root of the deployment manager.

For production systems, running the deployment manager as a monitored process is recommended.

7. Run the `addNode.sh` or `addNode.bat` script on every node that you plan to federate into the cell.

The **addNode** command incorporates a base WebSphere Application Server product node into a deployment manager cell. You must run this tool on every system that you plan to make part of a Network Deployment cell. There are several parameters for the **addNode** command, but the most important are `includeapps`, the host name of the deployment manager node, the JMX connector type, and the JMX port of the deployment manager node.

For example:

```
./addNode.sh wasdoct 8889 -includeapps
```

The example adds the base node on which the command runs to the cell managed by the `wasdoct` deployment manager node, using the default SOAP JMX connector type at port 8889. (Port 8889 is a coexistence value for the SOAP port. On the `wasdoct` development machine, the base node uses the default SOAP port.) The command adds all applications on the base node into the cell configuration.

As it federates the base node in response to the **addNode** command, the deployment manager also instantiates the node agent process, `nodeagent`, on the Application Server node. If you installed the embedded messaging server feature on the base node, the deployment manager instantiates the Java Message Service (JMS) provider that WebSphere Application Server provides, as the `jmsserver` process on the base node.

Alternatively, you can use the administrative console of the deployment manager to add running Application Server nodes to the cell.

8. Enable the appropriate level of security after the installation is complete.
9. Develop and unit test application components.

Load existing application components and modules into your development environment and debug them.

10. Assemble code into a main application module or enterprise archive (EAR) file.
11. Start all servers in the test environment.
12. Deploy your applications in the test environment.
13. Test all applications thoroughly.

Follow normal test procedures as you move the test environment into production. Review the information in the Migrating topic to understand what you must look for. In particular, review the table at the end of the topic that links you to specific recommendations and practices.

You must configure your migrating applications to verify that they migrate correctly.

14. Prepare and monitor the environment into which you deploy applications.
15. Adjust application code, configurations, and system settings to improve performance.
16. Fix any known problems.
17. Set up your production system by configuring all server processes for monitoring by their operating systems.

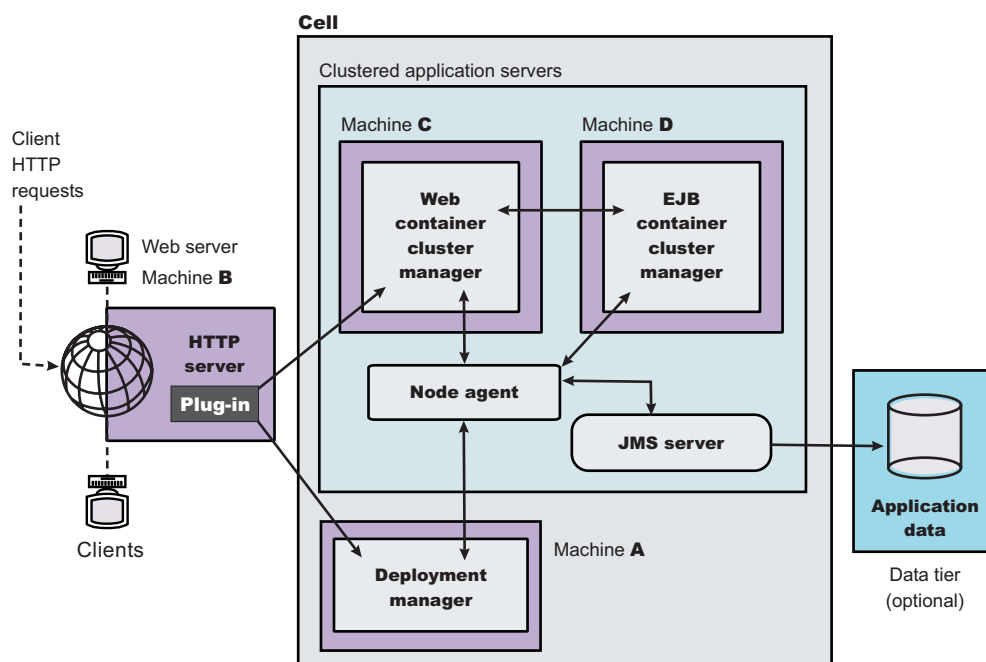
You can create a working WebSphere Application Server cell.

Use the administrative console or other administrative tools to observe and control the incorporated nodes, and the resources on these nodes. The console provides a central location for configuring, monitoring, and controlling all Application Servers on all nodes within the cell.

## Setting up a multinode environment

A multinode environment places WebSphere Application Server processes on separate physical machines, under the central management of the deployment manager process, which groups Application Servers into its managed *cell*. This example topology shows how you can have a tier of Application Servers within the cell in addition to traditional tiers that can contain the Web server, databases, enterprise information systems, and other types of persistent storage.

The following illustration shows an example of multiple nodes and multiple tiers.



In this example, Web container cluster members (Machine C) are closer (in a network sense) to the HTTP server (Machine B), which improves their response to client requests. Application server processes that run enterprise beans (Machine D) are closer in network terms to application data, which is represented in an application by entity beans and stored in a database on the data tier.

Clustered Application Servers on Machines C and D help maximize resource use on each machine. Although the example shows two cluster members in each node, you can have as many as a machine can support. Cluster members in a multitiered topology provide process redundancy and use memory more

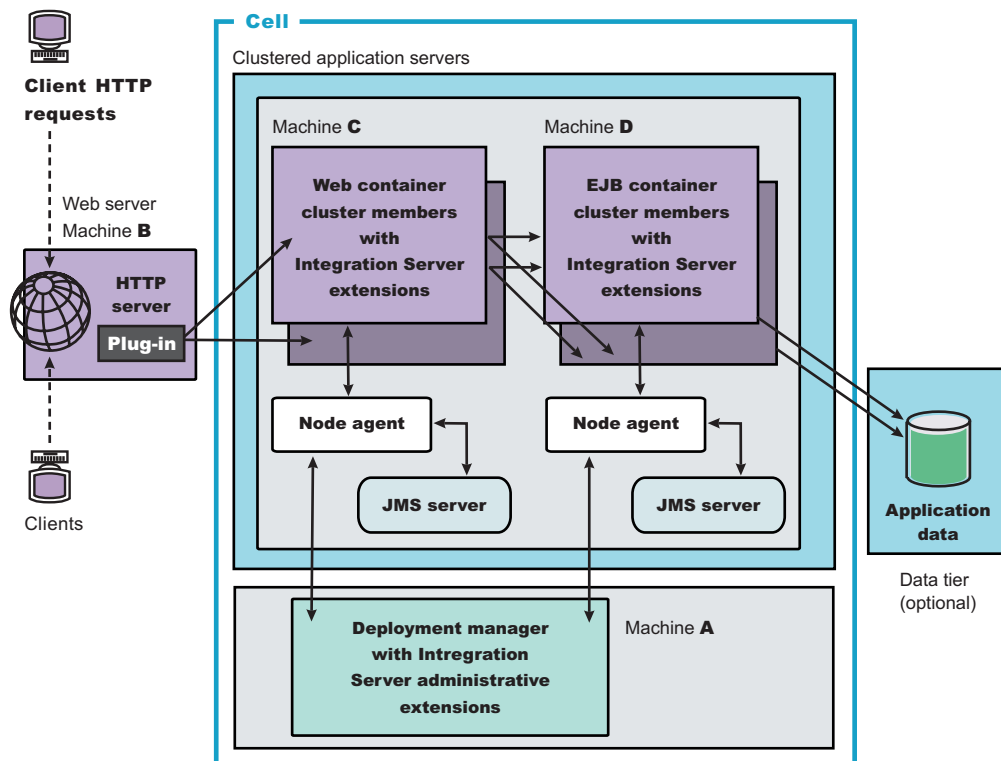
efficiently than in similar topologies that host only single instances of Application Servers. Additional resources on the machines can improve application throughput and performance.

Introducing firewalls between each pair of tiers can provide the same level of security for entity beans as for application data.

A multitiered topology within the cell eliminates local Java virtual machine (JVM) optimizations that occur when the same cluster member runs both the Web container and the EJB container. This topology also introduces network latency, which tends to slow system performance. Although multitiered topologies provide more redundancy for Application Server processes, they also introduce more possible points of failure. The level of redundancy can also complicate maintenance.

The deployment manager on Machine A manages the configuration of cluster members and other Application Server processes on Machines C and D. The deployment manager coordinates all Application Server processes through node agent processes, each of which runs as the nodeagent server on a node.

The following illustration shows an example of WebSphere Business Integration Server Foundation in this type of topology.



Installing Integration Server on Machine A installs administrative extensions on the deployment manager node, adding options to the deployment manager administrative console for managing Application Server nodes that have Integration Server programming extensions. Installing Integration Server on Machines C and D installs Integration Server programming extensions on the Application Server nodes. For example, Machine D might have the Business Rules Beans feature of Integration Server, for example.

Setting up environments such as those shown in the illustrations involves performing several steps on each computer comprising the deployment manager cell.

1. Install the Network Deployment product on Machine A to make Machine A the deployment manager node. Use the product CD-ROM labeled, **Deployment Manager**, from the product package.  
Issue the **install** command on Linux platforms and UNIX platforms or the **install.bat** command on Windows platforms. The command is in the platform root directory on the CD-ROM.  
Machine A is the system for the deployment manager server (dmgr), which provides a centralized administrative console for the entire group, or cell, of application servers that it controls. Installing the Network Deployment product does not install the base Application Servers. The Network Deployment installation installs only the deployment manager process and its associated administrative programs. Install the Network Deployment product on only one computer system from the set that is to make up your administrative cell.
2. Install the base WebSphere Application Server product on Machines C and D to make them Application Server nodes, using the product CD-ROM labeled, **Application Server, IBM HTTP Server**, from the product package.  
Issue the **install** command on Linux platforms and UNIX platforms or the **install.bat** command on Windows platforms. The command is in the platform root directory on the CD-ROM.  
Aside from the one computer where you installed the deployment manager node, you must install the base WebSphere Application Server product on other computers that are to comprise the cell. The installation process is the same for an Application Server (server1) that you federate into a cell as it is for a stand-alone Application Server.
3. Install WebSphere Business Integration Server Foundation on Machine A, to install Integration Server extensions on the deployment manager node, using the product CD-ROM labeled **WebSphere Business Integration Server Foundation** from the product package.  
Issue the **install** command on Linux platforms and UNIX platforms or the **install.bat** command on Windows platforms. The command is in the platform root directory on the CD-ROM.  
If you plan to use Integration Server extensions on any Application Server node in the cell, you must install the Integration Server product on the Network Deployment node.
4. Install the WebSphere Business Integration Server Foundation product on Machines C and D, to install Integration Server extensions on each node, using the product CD-ROM labeled, **Integration Server**, from the product package.  
Issue the **install** command on Linux platforms and UNIX platforms or the **install.bat** command on Windows platforms. The command is in the platform root directory on the CD-ROM.  
If you have not already installed the base WebSphere Application Server product on other computers that are to comprise the cell, you can use the Integration Server CD-ROM from the product package to install the base WebSphere Application Server product. Install a limited version of the base product in an *umbrella* installation by responding affirmatively to the prompt, or locate the base product directory (WAS) on the CD and perform a full installation of the base product.
5. Start the deployment manager process on Machine A.  
The **startManager** command line tool is one way.
6. Run the **addNode** command line tool on every node that you intend to incorporate into the cell, such as Machine C and Machine D.
7. Upgrade an existing Version 5 production cell to Integration Server. If you upgrade your Version 5 production cell to Integration Server, you must upgrade the deployment manager. To avoid having to stop all nodes in your cell during the upgrade, use this procedure for installing Integration Server to an existing WebSphere Application Server cell.
  - a. Stop the deployment manager and install Integration Server.
  - b. Restart the deployment manager.
  - c. Perform the following procedure on a base product node to add the Integration Server extensions.
    - 1) Install Integration Server on a base product node.
    - 2) Stop and restart the base node and its servers in one operation (using the restart operation on the deployment manager administrative console).

This upgrade scenario requires each production node to be down for only a short time. You can also upgrade nodes independently.

Installing Integration Server on a federated base product node does not install the Integration Server administrative console extensions on the base node. Use the administrative console on the Network Deployment node.

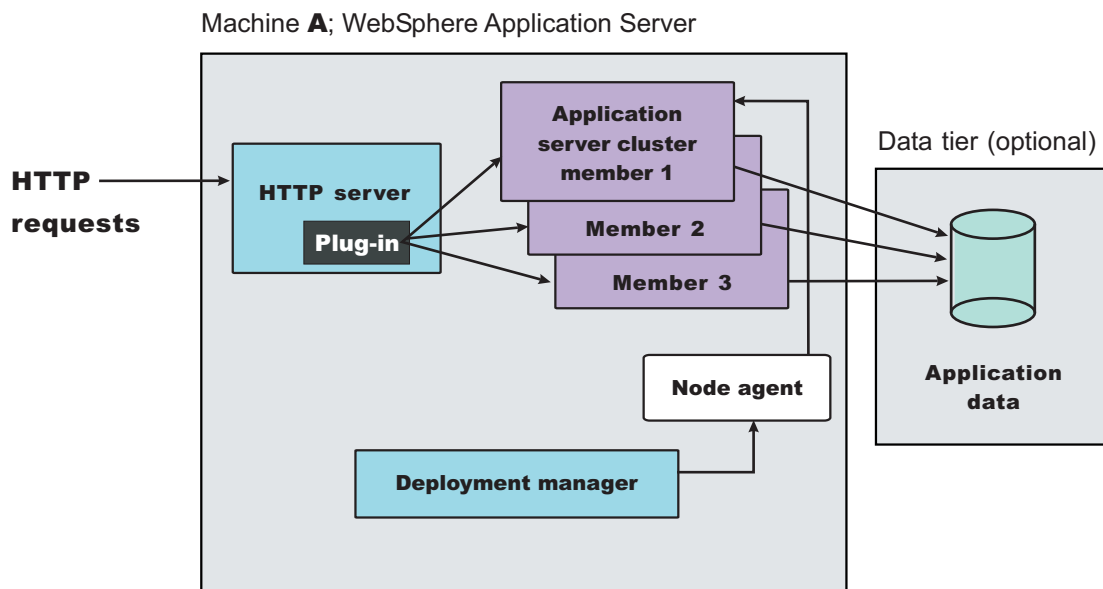
To remove a base node from a cell and still use Integration Server on the stand-alone base node, uninstall and reinstall Integration Server on the base node. Reinstalling Integration Server on the stand-alone node also installs the Integration Server administrative console extensions on the base node.

Use the administrative console or other administrative tools to observe and control the federated nodes and the resources on those nodes. The console provides a central location for configuring, monitoring, and controlling all Application Servers on all nodes within the cell.

Return to Planning to install an e-business network to continue.

## Vertical scaling topology

*Vertical scaling* refers to setting up multiple application servers on one machine, usually by creating cluster members.



This topology illustrates a simple vertical scaling example, with multiple cluster members of an Application Server on Machine A. You can also implement vertical scaling on more than one machine in a configuration. Combine vertical scaling with other topologies to boost performance and throughput.

## Typical use

Vertical scaling offers the following advantages:

- **Increased processing power efficiency.** An instance of an application server runs in a single Java virtual machine (JVM) process. However, the inherent concurrency limitations of a JVM process prevent it from fully utilizing the processing power of a machine. Creating additional JVM processes provides multiple thread pools, each corresponding to the JVM process associated with each Application Server process. This correspondence avoids concurrency limitations and lets the Application Server use the full processing power of the machine.
- **Load balancing.** Vertical scaling topologies can use the WebSphere Application Server workload management facility.



- **Process failover.** A vertical scaling topology also provides failover support among Application Server cluster members. If one Application Server instance goes offline, the other instances on the machine continue to process client requests.

Single machine vertical scaling topologies have the drawback of introducing the host machine as a single point of failure in the system. Vertical scaling on multiple machines avoids the single point of failure.

## Instructions

To set up a vertical scaling topology, use the administrative console to configure a set of Application Server cluster members that reside on the same machine.

It is recommended that you plan vertical scaling configurations ahead of time. However, because vertical scaling does not require any special installation steps, you can implement vertical scaling whenever it is needed.

While you are deciding how many cluster members to create on a machine, take these factors into account:

- **The design of the application.** Applications that use more components require more memory, limiting the number of cluster members you can run on a machine.
- **The hardware environment.** Vertical scaling works best with plenty of memory and processing power. Eventually there is a point of diminishing returns on any machine, where the overhead of running more cluster members cancels out the benefits of adding them.

The best way to ensure good performance in a vertical scaling configuration is to tune a single instance of an Application Server for throughput and performance, then incrementally add cluster members. Test performance and throughput as you add each cluster member. Always monitor memory use when you are configuring a vertical scaling topology, so you do not exceed available physical memory on the machine.

## Multimachine topology concepts

*Multiple machine environments* extend basic single machine WebSphere Application Server configurations by distributing the Application Server over multiple machines, increasing the overall processing power from one machine to contributions from all machines in the configuration.

The flow of data in a WebSphere Application Server environment starts with a Web server receiving requests and routing them to the Application Server for processing. A WebSphere Application Server node stores administrative configuration data in XML files. A database can hold application data for applications that require a place to store data, such as user session information. There are also one or more administrative clients, such as the administrative console, for manipulating configuration data.

Some of the reasons for creating WebSphere Application Server applications that run on multiple machine systems include:

- **Scalability.** Adding more machines increases processing power, which scales up the system to handle a higher client load than that provided by a basic, single machine configuration. Scalability pertains to the capability of a system to adapt readily to a greater or lesser intensity of use, volume, or demand. For example, a scalable system can efficiently adapt to work with larger or smaller networks performing tasks of varying complexity. Ideally, it is possible to handle any given load by adding more servers and machines, assuming each additional machine processes its fair share of client requests. Each machine should process a share of the total system load that is proportional to the processing power of the machine.

Consider these primary scalability factors when adopting a WebSphere Application Server topology:

- **Security.** Address certain security concerns by physically separating the Web server from the Application Server, by using firewalls.
- **Performance.** Maximize performance by ensuring the response time for transactions is as short as possible. You can use two general topologies to improve transaction performance:

- *Vertical scaling*, in which you create additional Application Server processes on a single physical machine. The *Vertical scaling sample topology* topic describes a physical implementation for vertical scaling.
- *Horizontal scaling*, in which you create additional application server processes on multiple physical machines to take advantage of the additional processing power available on each machine. You can also use WebSphere Application Server Edge Components, such as the Caching Proxy Edge component, and the Load Balancer component set (which includes the Dispatcher component), to implement horizontal scaling. The *Horizontal scaling with cluster members sample topology* and *Horizontal scaling with Network Dispatcher sample topology* topics describe physical implementations for horizontal scaling.
- **Throughput.** Add Application Server clusters to scale vertically or horizontally. Application server clusters can increase the number of concurrent transactions that the application can perform, to help process as many transactions as possible within a given time period.
- **Availability and failover support.** Avoid a single point of failure and maximize system availability by ensuring that the topology has some degree of process redundancy. High-availability topologies typically involve horizontal scaling across multiple machines. Vertical scaling can improve availability by creating multiple processes, but the machine becomes a point of failure.

A Dispatcher server performs intelligent load balancing to determine where to send a TCP/IP request. It can direct client HTTP requests to available Web servers, bypassing any that are offline. Another server can back up the Dispatcher server, to eliminate it as a single point of failure. Workload management of Application Servers and administrative servers also improves availability and failover support.

Failover support distributes client requests to the remaining servers, which ensures continued client access without significant interruptions. (In practice, failover is not entirely transparent to clients.)

WebSphere Application Server supports these methods of ensuring availability with multiple machines and applications:

- **Multiple tiers** The components of an application (the Web server, Application Servers, databases, and so forth) are physically separated on different machines.
- **HTTP server separation** The Web (HTTP) server is located on a different physical machine than the Application Server. You can redirect requests to Application Servers through a variety of methods.
- **Demilitarized zone (DMZ)** Firewalls create demilitarized zone machines, which are isolated from both the public Internet and other machines in the configuration. The DMZ scales security processing, which improves security and throughput in the application environment.
- **Multiple cells** Multiple WebSphere Application Server cells provide failover for clustering Application Servers and deploying applications.
- **Multiple applications** Multiple application instances can be on the same physical machine, or on more than one machine in the cell.
- **Maintainability.** Understand that the topology affects the ease with which you can update system hardware and software. For instance, using multiple WebSphere Application Server deployment manager cells or horizontal scaling can make a system easier to maintain because you can take individual machines offline without interrupting other machines, running the application.
 

Maintainability sometimes conflicts with other topology considerations. For example, limiting the number of Application Server instances makes the application easier to maintain but can have a negative effect on throughput, availability, and performance.
- **Maintaining session state between client HTTP requests.** Consider that session state is important for stateful applications, or for applications that run on multiple machines or Application Server instances. You can share a session between multiple Application Server processes (cluster members) by saving the session state to a database. In addition, configuring a network dispatcher affects how the session state is maintained. This consideration does not apply if your application runs on a single Application Server instance or is completely stateless.
- **Shared data access.** Placing backend resources, such as databases, on different machines provides ease of use when sharing these resources.
- **Fault isolation.** Providing more robust failover support through a configuration that includes a degree of fault isolation, reduces the potential for failure of one server to affect other servers. Configurations that



provide simple failover support are concerned only with individual server failures that have no effect on the performance of other servers. However, in some situations, a malfunctioning server can create problems for other servers that are otherwise functioning normally. For example, a failing server can consume more than its share of system and database resources, preventing other servers from gaining adequate access to these resources. You can configure WebSphere Application Server to provide fault isolation between different parts of a system.

- **Dynamic changes to configurations.** Modifying the system configuration without interrupting its operation enhances the manageability and flexibility of the system. For instance, administrators can add or remove cluster members to handle variations in the client load, change server characteristics and propagate the changes to its cluster members, temporarily stop servers for maintenance, and so forth.
- **Mixed Application Server versions.** Migrating a few machines and applications at one time is possible on certain multiple machine configurations. In addition to Version 5 Application Servers, your server configuration can include earlier version Application Servers, where you currently deploy all applications you intend to migrate. You can migrate applications to Version 5 and deploy them in stages. You can also easily upgrade system hardware and software. When combined with the ability to make dynamic changes to the configuration, you can use a configuration of mixed Application Server versions to upgrade an application or machine without any interruption of service.

The ability to run different versions of an Application Server in a configuration does not let you include Version 5 Application Servers in an existing administrative domain, nor does it let you include Version 3.5.x or Version 4.0.x application servers in a Version 5 cell.

You can configure multiple machines to add processing power, improve security, maximize availability, and balance workloads. WebSphere Application Server Network Deployment and WebSphere Application Server Edge Components provide clusters, workload management, and the Dispatcher to implement configurations that address these issues. These scaling techniques are generally combined to maximize benefits and minimize problems associated with multiple machine systems.

There are various ways to scale up the basic, single-machine WebSphere Application Server system to meet the needs of your organization. Some scaling techniques include:

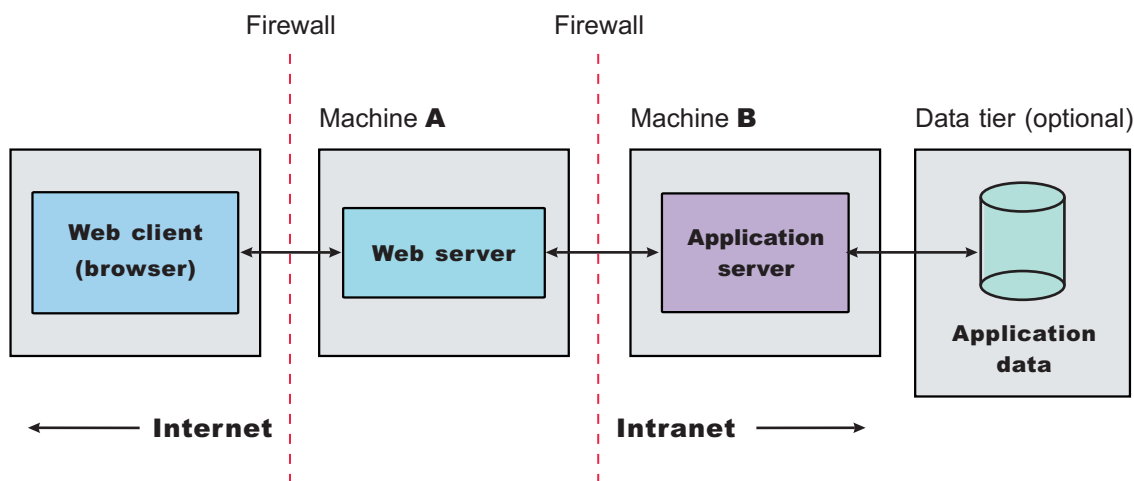
- **Clusters.** Clusters are identical multiple Application Server copies. A cluster member is one Application Server in a cluster. The configuration of each cluster member is based upon the Application Server that you copied to create the cluster member. You can create all cluster members on the same physical machine, or on different machines. Using cluster members can improve the performance of a server, simplify its administration, and enable the use of workload management.
- **Workload management (WLM).** WLM enables both load balancing and failover, improving the reliability and scalability of applications deployed on the WebSphere Application Server server. Incoming processing requests from clients are transparently distributed among the cluster members of an Application Server.
- **Dispatcher.** The Dispatcher transparently redirects incoming HTTP requests from Web clients to a set of Web servers. Although the clients behave as if they are communicating directly with a given Web server, the Dispatcher is actually intercepting all requests and distributing them among all the available Web servers in the cluster. The Dispatcher can provide scalability, load balancing, and failover for Web servers.

Keep in mind that the techniques described above are not mutually exclusive. You can combine their basic elements in various ways.

### ***Firewalls and demilitarized zone configurations:***

*Firewalls* protect backend resources, such as databases in multiple machine systems. You can also use firewalls to protect Application Servers and Web servers from unauthorized outside access. A *demilitarized zone* (DMZ) configuration involves multiple firewalls that add layers of security between the Internet and critical data and business logic.

A wide variety of topologies are appropriate for a DMZ environment. Although WebSphere Application Server provides great flexibility in configuring DMZ topologies, the basic locations of elements in a simple DMZ topology follow:



The main purpose of a DMZ configuration is to protect the business logic and data in the environment from unauthorized access. A typical DMZ configuration includes:

- An outer firewall between the public Internet and the Web server or servers processing the requests originating on the company Web site.
- An inner firewall between the Web server and the Application Servers to which it is forwarding requests. Company data also resides behind the inner firewall.

The area between the two firewalls gives the DMZ configuration its name. Additional firewalls can further safeguard access to databases holding administrative and application data.

### Comparison of DMZ configurations

Somehow, requests for applications that WebSphere Application Server manages must get from the Web server to the Application Servers, passing through firewalls. You can implement DMZ configurations for a wide variety of multitiered systems. WebSphere Application Server offers many configuration choices for accomplishing this goal. The following table summarizes benefits of each DMZ configuration option supported by the product. Criteria for each topology are described after the table.

An **X** represents an advantage.

Benefit (X) or statistic	Remote HTTP	Reverse proxy
Compatible with product security	X	X
Avoids data access from DMZ	X	X
Supports Network Address Translation (NAT)	X	X
Avoids DMZ protocol switch		X
Allows encrypted link between Web server and Application Server	X	Depends on Web server
Avoids single point of failure	X	
Minimum firewall holes	One per Application Server, plus one if WebSphere Application Server security is used on the Web server machine	One

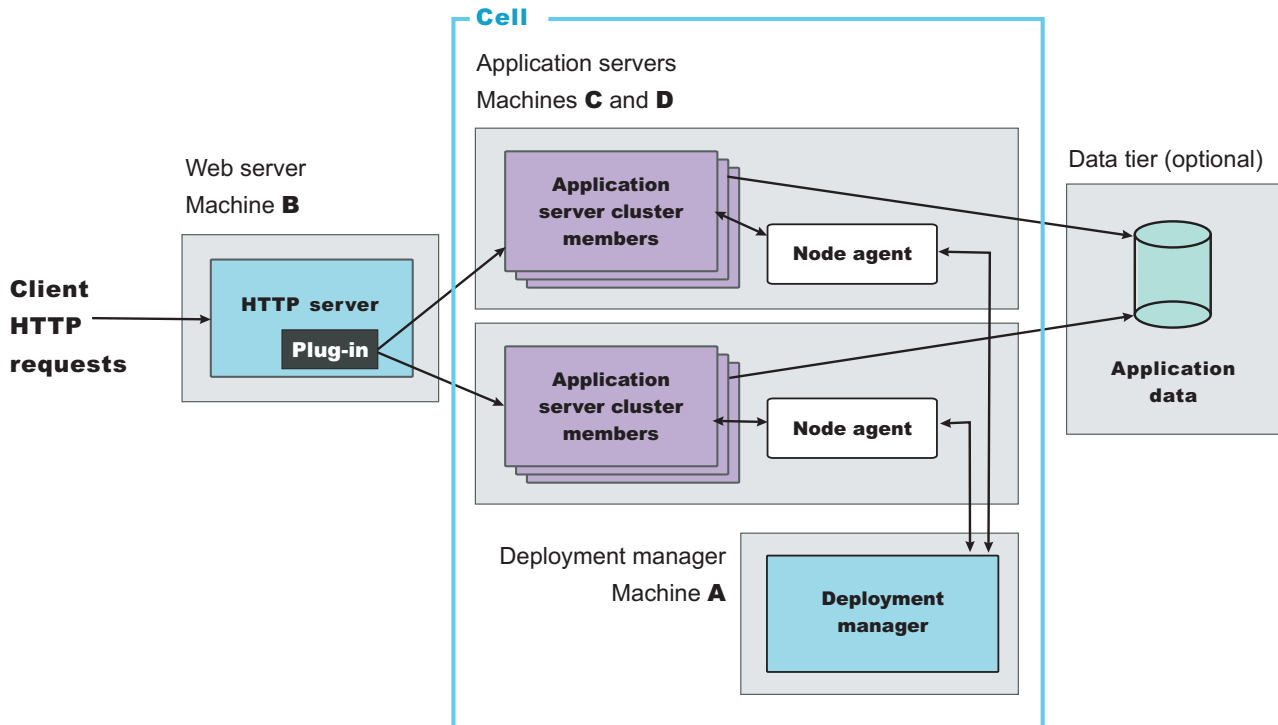
- **Works with product security.** WebSphere Application Server security protects applications and their components, by enforcing authorization and authentication policies. Configuration options compatible with product security are desirable because they do not necessitate alternative security solutions.
- **Avoids critical business data in the DMZ.** A DMZ configuration protects application logic and data, by creating a buffer between the public Internet Web site and the internal intranet, where Application Servers and the data tier reside. Desirable DMZ topologies do not have databases or application servers with critical business data in the DMZ.
- **Supports Network Address Translation (NAT).** A firewall product that runs NAT receives packets for one IP address, and translates the headers of the packet to send the packet to a second IP address. In environments with firewalls employing NAT, avoid configurations involving complex protocols in which IP addresses are embedded in the body of the IP packet, such as Java Remote Method Invocation (RMI) or Internet Inter-Orb Protocol (IIOP). These IP addresses are not translated, making the packet useless.
- **Avoids the DMZ protocol switch.** The Web server sends HTTP requests to Application Servers behind firewalls. It is simplest to open an HTTP port in the firewall to let the requests through. Configurations that require switching to another protocol, such as IIOP, and opening firewall ports corresponding to the protocol, are less desirable. They are often more complex to set up, and the protocol switching overhead can impact performance.
- **Allows an encrypted link between Web server and Application Server.** Configurations that support encryption of communication between the Web server and application server reduce the risk that attackers are able to obtain secure information by *sniffing* packets sent between the Web server and Application Server. A performance penalty usually accompanies such encryption.
- **Avoids a single point of failure.** A point of failure exists when one process or machine depends on another process or machine. A single point of failure is especially undesirable because if the point fails, the whole system becomes unavailable. When comparing DMZ solutions, a single point of failure refers to a single point of failure between the Web server and Application Server. Various failover configurations can minimize downtime and possibly even prevent a failure. However, these configurations usually require additional hardware and administrative resources.
- **Minimizes the number of firewall holes.** Configurations that minimize the number of firewall ports are desirable because each additional firewall port leaves the firewall more vulnerable to attackers.

Some solutions are faster than others, in terms of the number of client requests they can process per unit of time. Some solutions require little or no maintenance after you establish them, while others require periodic administrative steps, such as stopping a server and starting it again after modifying resources that affect the configuration. To learn about the necessary maintenance for a topology, review the instructions for setting up and maintaining that topology. Of course, if you can automate the necessary administrative steps through command line clients and scripting, this might not concern you.

### Horizontal scaling topology

*Horizontal scaling* exists when there are members of an application server cluster on multiple physical machines. Having cluster members on several machines lets a single application span the machines, yet still present a single system image.

The following figure shows an example of horizontal scaling.



In this example, the Web server on Machine B distributes requests to clustered Application Servers on Machines C and D. Cluster members on Machines C and D are created in the same cluster.

You can combine a network dispatcher to distribute client HTTP requests with clustering, to reap the benefits of both types of horizontal scaling. The *Network dispatcher topology* topic describes this system configuration.

### Typical use

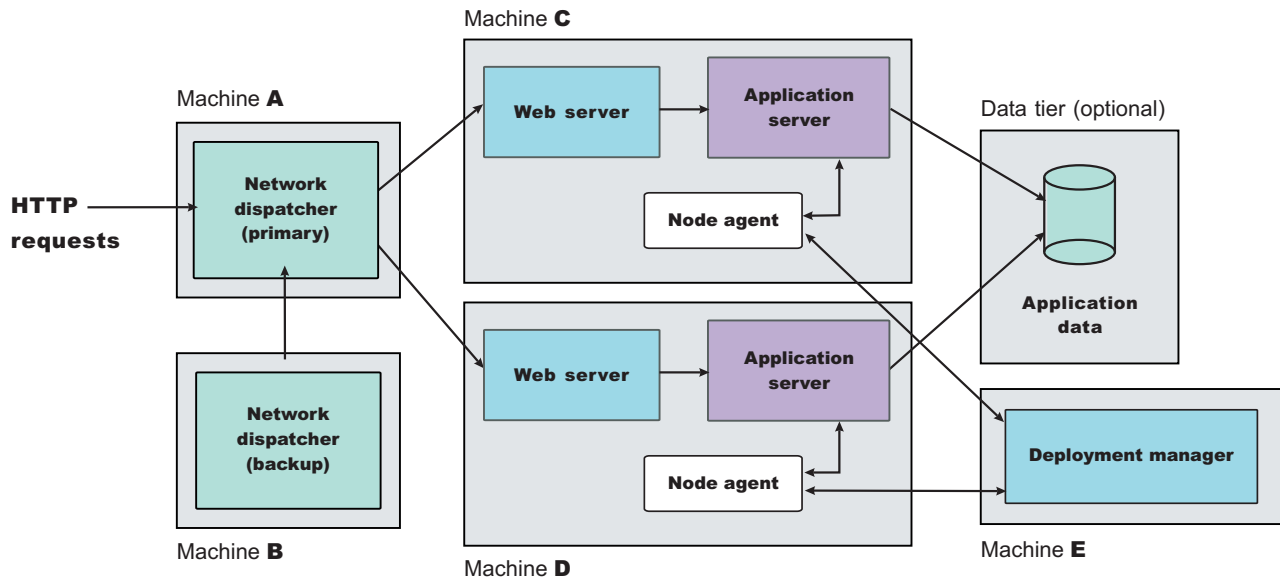
Horizontal scaling provides the increased throughput of vertical scaling topologies but also provides failover support. This topology lets you handle Application Server process failure and hardware failure without significant interruption to client service. You can also use horizontal scaling to optimize the distribution of client requests through mechanisms, such as workload management or remote HTTP transport.

### Dispatcher

The Dispatcher component is part of the Load Balancer component set of the IBM WebSphere Application Server Edge Components product. The Edge components are included in WebSphere Application Server Network Deployment. The Dispatcher performs intelligent load balancing by using server availability, capability, workload, and other criteria you can define, to determine where to send a TCP/IP request. You can use the Dispatcher to distribute HTTP requests among Application Server instances that are running on multiple physical machines.

### A simple Dispatcher topology

The following figure illustrates a simple horizontal scaling configuration that uses the Dispatcher to distribute requests among Application Servers on different machines.

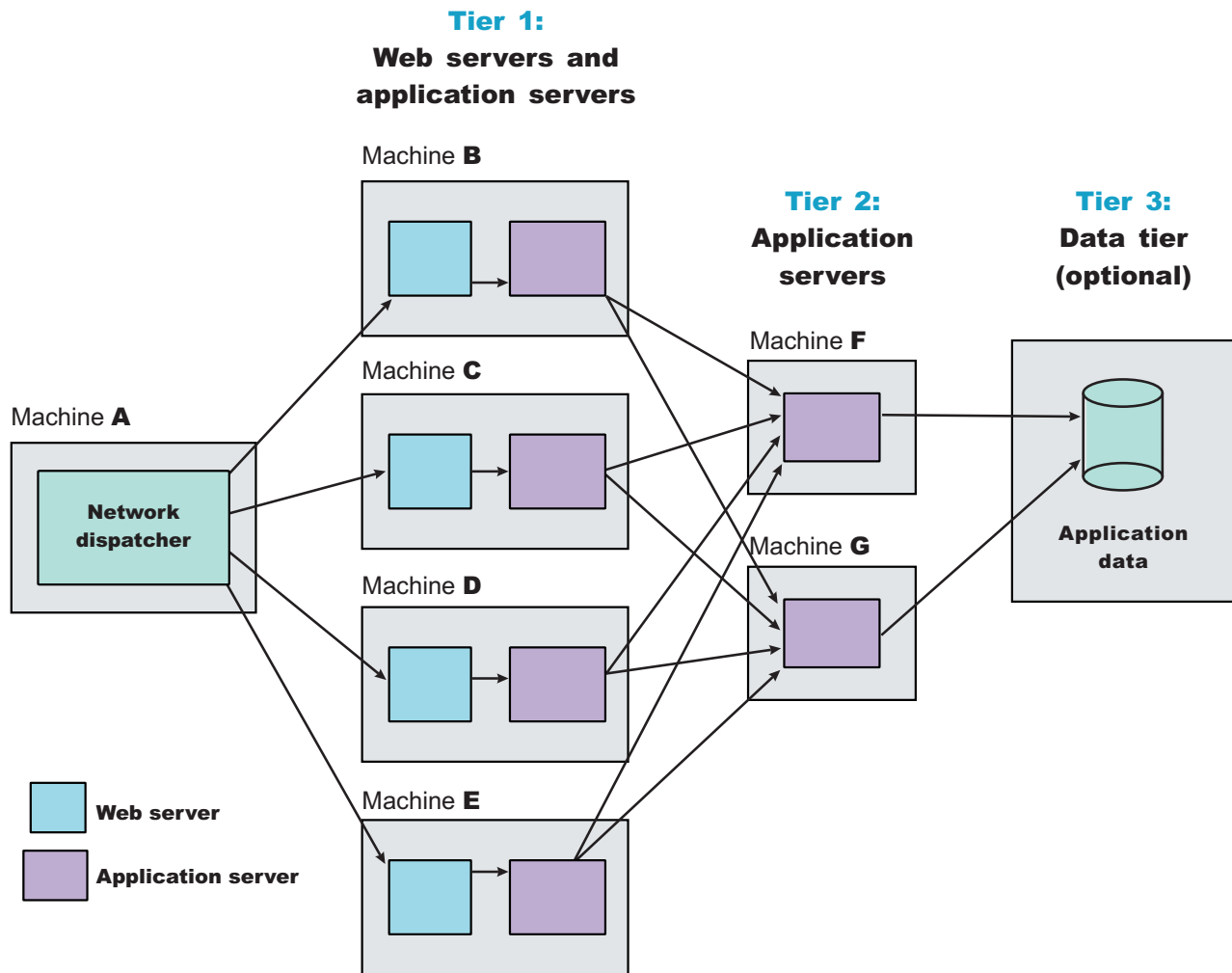


You normally configure a backup node for the Dispatcher machine, to eliminate it as a single point of failure. In this example, you can set up the backup Dispatcher node (Machine B) to take over if the primary Dispatcher node (Machine A) fails.

You can cluster Application Servers in this example from the same model, or configure them independently.

### A more complex Dispatcher topology

The next figure shows a Dispatcher that distributes requests among several machines containing clustered Web servers and Application Servers. Backups are not shown.



The first tier Web server machines host servlet-based applications. The second tier Application Servers contain mostly enterprise beans that access application data and execute business logic. This approach lets you employ numerous, less powerful machines on the first tier and fewer but more powerful machines on the second tier.

### Using the Dispatcher with firewalls

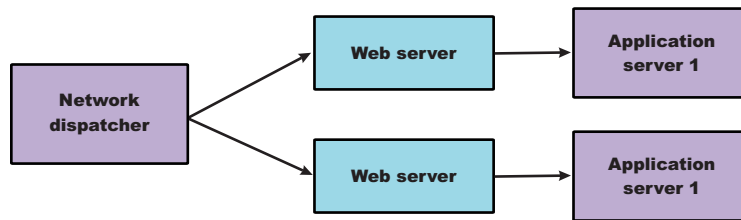
You can also use a load balancing product, such as the Dispatcher with demilitarized zone (DMZ) topologies. The Dispatcher simplifies creating a DMZ topology with two firewalls. One firewall protects the Web server from the public Web site. The second protects backend systems from the Web server in the DMZ, by using proxy services.

The Dispatcher machine is placed between the outside firewall and the cluster of Web servers that it serves. The outside firewall provides filtering to allow only HTTP and HTTPS traffic. The firewall to the backend systems (DBMS, CICS, SAP, and so on) handles non-HTTP protocols, such as IIOP and JDBC. The WebSphere Application Server can reside in the DMZ or on the same side of the firewall as the data tier.

### The Dispatcher and session affinity

In a Dispatcher or similarly configured topology, you must associate a Web server with a separate, rather than clustered, Application Server to preserve affinity between the servers.

#### Supports affinity



### Discussion

Adding a mechanism for the Dispatcher to distribute HTTP requests provides these advantages:

- Improves server performance, by distributing incoming TCP/IP requests - in this case, HTTP requests, among a cluster of servers.
- Increases the number of connected users.
- Eliminates the Web server as a single point of failure. You can also use this mechanism in combination with WebSphere Application Server workload management, to eliminate the Application Server as a single point of failure.
- Improves throughput, by letting multiple servers and CPUs handle the client workload.

### Instructions

Set up machines containing Web servers and Application Servers for the topology you plan to implement.

Place the Dispatcher, or another load balancing product, in front of the Web server machines. See the Edge Component documentation for the Dispatcher, or the other load balancing product documentation. Instructions vary per product.

The load balancing product communicates with the Web server, which in turn communicates with Application Servers. The configuration involves setting up communications between the load balancing product and the Web server.

It does not matter to the Dispatcher whether the Web server is routing requests to an Application Server or processing them itself. Therefore, it is not necessary to perform any special configuration to make the load balancing product and Application Servers aware of one another. This lack of configuration is true with the Dispatcher, based on testing with IBM WebSphere Application Server. Results can vary with other load balancing products.

### Web server separation

*Web server separation* is a topology that physically separates the Web (HTTP) server from the Application Servers, placing the Web server on a different machine in the configuration. Compared to a configuration where the Web server and the Application Servers are located on the same physical server, separating the Web server can improve application performance, provide better fault isolation, and enhance security. These topologies are often used with firewalls to create a secure demilitarized zone (DMZ) surrounding the Web server.

WebSphere Application Server provides these alternatives for physically separating the Web server from the Application Server:

- HTTP transport configurations
- Reverse proxy or IP forwarding configurations

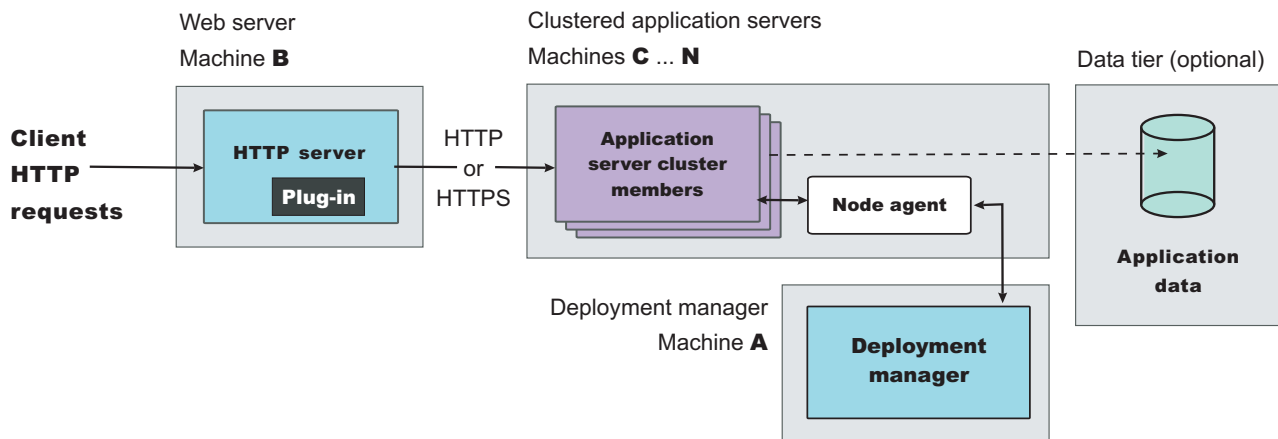
The following table summarizes advantages and disadvantages of each configuration. Criteria are explained after the table.

Topology	Secure Sockets Layer	Database password required?	Workload management	Network Address Translation	Performance	Administration
HTTP server separation	Yes	No	Yes	Yes	High	Manual
Reverse proxy	Yes	No	No	Yes	High	Manual

- **Secure Sockets Layer** Supports Secure Sockets Layer (SSL) security.
- **Database password required?** Requires a stored database user ID and password on the machine used by the database processes.
- **Workload management** Uses the workload management service to balance client workloads.
- **Network Address Translation** Supports Network Address Translation (NAT) firewalls. NAT firewalls receive packets for one IP address, translate the headers of the packets, and send the packets to a second IP address.
- **Performance** Compares the relative performance of each of these configurations.
- **Administration** Specifies whether to administer the configuration manually or through the administrative console.

These criteria give you a basis to compare the relative difficulty of administering each configuration.

**HTTP Request routing:** WebSphere Application Server can use HTTP to route requests from a Web server to Application Servers on remote machines.



In the diagram, Machine B hosts the Web server and the WebSphere Web server plug-in, and receives HTTP requests from clients. The Web server plug-in forwards the requests to an HTTP transport in the Application Server on Machine C, using HTTP or HTTPS protocol.

Variations on this configuration include vertical scaling of the application servers by creating new application servers on the same machine. Alternatively, for a horizontal scaling scenario, add machines (D, E, ....N) running application servers to the environment.

The Web server plug-in supports Network Address Translation (NAT) firewalls. See Default settings for port numbers for a list of default ports that WebSphere Application Server uses. See Default coexistence settings for port numbers for a list of default port settings in the coexistence panel. The installer program for the Application Server displays the coexistence panel when it detects another installation of Application Server.

## Load balancing support



The Web server plug-in is fully integrated with WebSphere Application Server workload management and the clustering facility. HTTP transport balances loads within a cluster.

If you are using a third party load balancer in between the plug-in and the Application Server for HTTP requests that are not subject to an existing affinity, you can override the round robin algorithm that determines where to route a request. To override this algorithm, specify the IP address of your third party load balancer on the `ClusterAddress` element within the `ServerCluster` tag in `plugin-cfg.xml` file. Specifying this IP address delegates load balancing for the servers within this cluster to the third party load balancer.

- **Load balancing between Application Servers.** You can configure the Web server plug-in to forward requests from each URL to a different application server and its cluster members, enabling manual load balancing. For instance, you can forward URLs that generate a large number of requests to application servers on more powerful machines.
- **Load balancing among cluster members.** The Web server plug-in automatically distributes requests among members of a cluster that is defined to respond to a single URL. The method for selecting which cluster member handles a particular request combines a round-robin selection policy with server affinity. If session persistence is not enabled, which is the default, requests are distributed among all available cluster members using a strict round-robin policy. Each cluster member gets the next request in turn. The only exception is when a cluster member is added or restarted. See the failover support information later in this topic for details.

If session affinity is enabled, requests are distributed as follows:

- The Web server plug-in distributes the first request of each session and all requests that are not associated with a session, as if session persistence is not enabled. They are distributed using a round-robin policy, except when cluster members are added or restarted.
- The Web server plug-in attempts to distribute all requests associated with a particular session to the same cluster member. Different sessions are assigned to different cluster members of the Application Server.

Be aware that there is no guarantee that the same cluster member is used for all requests within a session. You cannot always maintain session affinity in situations where the number of available cluster members changes during the lifetime of a session. The Session Manager session clustering facility ensures that session state is not lost if requests are switched to another cluster member during a session. In any case, applications that require available session information across multiple client invocations must store session information in a database.

## Failover support

The Web server plug-in automatically handles failover and changes in the number of available cluster members.

- If a cluster member is stopped or unexpectedly fails, all subsequent requests are distributed among the remaining cluster members. The unavailable cluster member is skipped.
- If a cluster member is added or restarted, the system automatically begins to distribute requests to it. The next several requests are dispatched to that cluster member before HTTP resumes its normal methods for distributing requests to the cluster members of an Application Server, based on whether session persistence is enabled. See the load balancing support information for details.

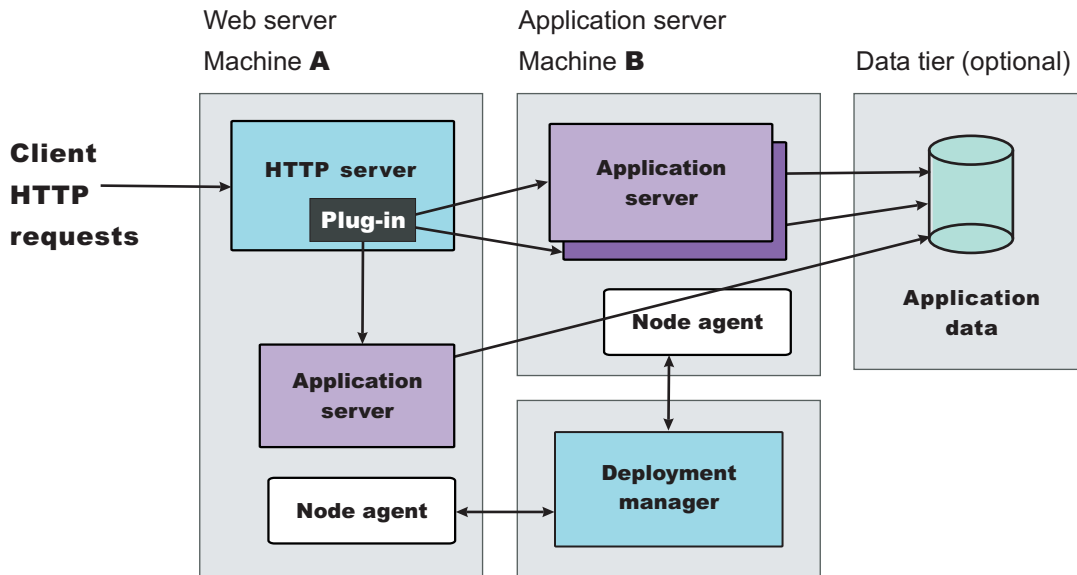
## Typical use

The Web server plug-in has the following advantages:

- Supports load balancing and failover.
- Requires no requirements for database access through the firewall.
- Supports WebSphere Application Server security.
- Supports Secure Sockets Layer (SSL) encryption for communications between the Web server and the Application Server.
- Supports Network Address Translation (NAT) firewalls.
- Supports relatively fast performance.

The Web server plug-in has the disadvantage of requiring at least one firewall port, more if multiple Application Server cluster members are configured, or WebSphere Application Server security is used on the machine hosting the Web server.

A variation of the Web server plug-in topology occurs when an instance of the Application Server runs on the same machine as the Web server. Such a configuration is illustrated in the following figure.



Such configurations can direct client requests to additional application server cluster members on other machines. This example redirects client requests to both the Application Server instance running on Machine A and the cluster members running on Machine B. You can administer all Application Server instances from the deployment manager node, which can exist on Machine A, Machine B, or another machine. The deployment manager communicates with the node agent server process on each machine, to coordinate configuration changes.

### Typical use

This topology is recommended only in situations where hardware limitations prevent you from hosting the Web server on a dedicated machine.

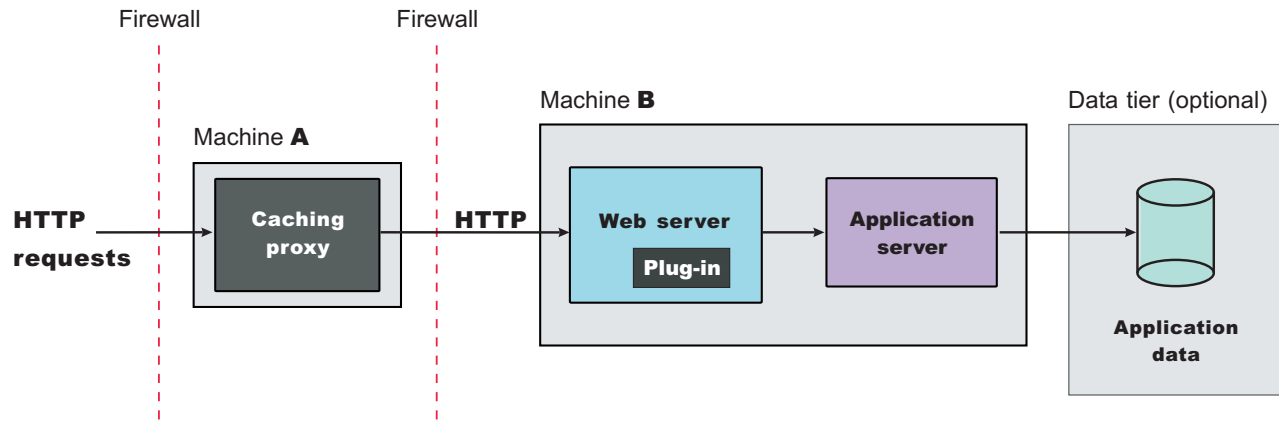
In many production environments, one set of servers is configured to run Web servers and another set of servers is configured to run Application Servers. This configuration lets you add capacity in a production environment. You might also use this topology to more fully replicate a production configuration in a test environment. This topology provides a means of load distribution between a machine hosting both the Web server and Application Server, and machines hosting just the Application Server.

You can also use this topology to distribute the workload in situations where there are a limited number of machines.

### Reverse proxy (IP forwarding):

*Reverse proxy*, or *IP-forwarding* topologies use a reverse proxy server, such as the Caching Proxy in WebSphere Application Server Edge Components, to receive incoming HTTP requests and forward them to a Web server. The Web server forwards the requests to the Application Servers for actual processing. The reverse proxy returns completed requests to the client, hiding the originating Web server.

The following figure shows a simple reverse proxy topology.



In this example, a reverse proxy resides in a demilitarized zone (DMZ) between the outer and inner firewalls. It listens on an HTTP port, typically port 80, for HTTP requests. The reverse proxy then forwards such requests to an HTTP server that resides on the same machine as WebSphere Application Server. After the requests are fulfilled, they are returned through the reverse proxy to the client, hiding the originating Web server.

### Typical use

Reverse proxy servers are typically used in DMZ configurations to provide additional security between the public Internet and the Web servers (and application servers) servicing requests. A reverse proxy product used with WebSphere Application Server must support Network Address Translation (NAT) and WebSphere Application Server security.

Reverse proxy configurations support high performance DMZ solutions that require as few open ports in the firewall as possible. The reverse proxy capabilities of the Web server inside the DMZ require as few as one open port in the second firewall, potentially two if using Secure Sockets Layer (SSL) - port 443.

Advantages of using a reverse proxy server in a DMZ configuration include:

- The reverse proxy server does not need database access through the firewall.
- The reverse proxy configuration supports WebSphere Application Server security and NAT firewalls.
- The basic reverse proxy configuration is well known and tested in the industry, resulting in less customer confusion than other DMZ configurations.
- The reverse proxy configuration is reliable and its performance is relatively fast.
- The reverse proxy configuration eliminates protocol switching, by using the HTTP protocol for all forwarded requests.
- The reverse proxy configuration does not affect the configuration and maintenance of an application deployed on WebSphere Application Server.
- The reverse proxy server uses only one HTTP firewall port for requests and responses.

The reverse proxy configuration is also a disadvantage in some environments where security policies prohibit using the same port or protocol for inbound and outbound traffic across a firewall.

Disadvantages of using a reverse proxy server in a DMZ configuration include the following:

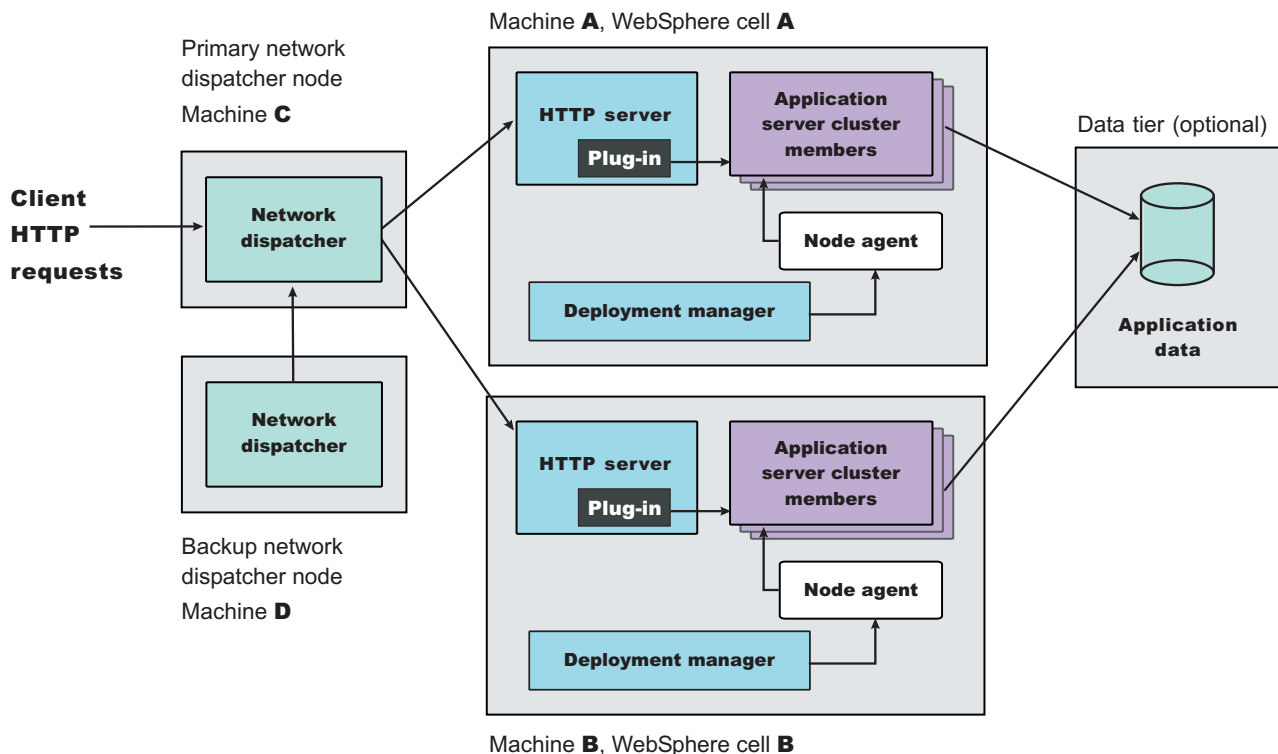
- The presence of a reverse proxy server in a DMZ is not suitable for some environments.
- The reverse proxy configuration requires more hardware and software than similar topologies that do not include a reverse proxy server, which makes it more complicated to configure and maintain.
- The reverse proxy server does not participate in WebSphere Application Server workload management.

### Instructions

Implementation specifics are determined by the reverse proxy server. Refer to the documentation for the product you are using. No additional WebSphere Application Server administration is required for the reverse proxy server, although you might need it for other elements of the reverse proxy topology.

## Multiple deployment manager cells

The following figure shows an example of how you can implement an application over multiple WebSphere Application Server deployment manager cells.



The example application runs simultaneously in two cells, each hosted on a different physical machine (Machines A and B). Network Dispatcher is used to distribute incoming HTTP requests between the two cells, presenting a single image of the application to clients. A backup Network Dispatcher node provides failover support.

Installing enterprise applications on the cluster in each deployment manager node ensures that identical versions of the application run in each cluster member. However, you administer each cell independently. Each cell has its own set of XML configuration files.

You can also run a different version of the application in each cell cluster. Because the cells are isolated from one another, you can also run different versions of the WebSphere Application Server software in each cell. For example, you can have a Version 5 cell and a Version 4 domain interoperating in your network.

## Typical use

Topologies that incorporate more than one cell have the following advantages:

- Isolation of hardware failure. If one cell goes offline due to hardware problems, the others can still process client requests.
- Isolation of software failure. Running an application in two or more cells isolates any problems that occur within a cell, while the other cells continue to handle client requests. This isolation is helpful in a variety of situations:
  - When rolling out a new application or a revision of an existing application.

You can bring the new application or revision online in one cell, and test it in a live situation while other cells continue to handle client requests with the production version of the application.

- When deploying a new version of the WebSphere Application Server software.

You can bring the new version into production, and test it in a live situation without interrupting service.

- When applying fixes or patches to the WebSphere Application Server software.

You can take each cell offline to upgrade it, without interrupting the application.

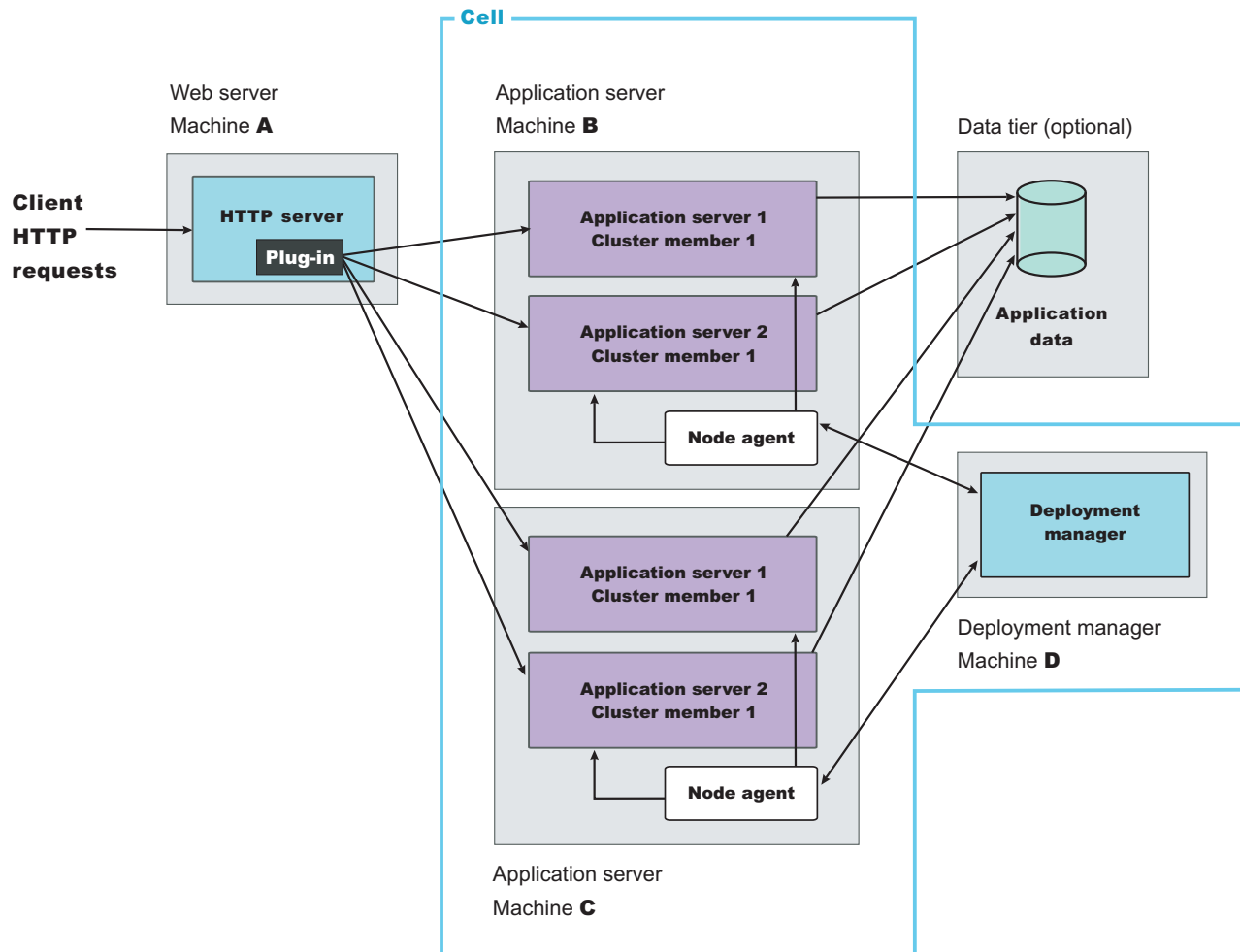
If an unforeseen problem occurs with the new software, using multiple cells can prevent an outage to an entire site. You can also rollback to a previous software version more quickly. You can handle hardware and software upgrades on a cell-by-cell basis during off-peak hours.

Using multiple cells has several drawbacks:

- Deployment is more complicated than for a single administrative cell.
- Multiple cells require more administration effort because each cell is administered independently. Use scripts to standardize and automate common administrative tasks to reduce this problem.

### Multiple Application Servers within a node

The following figure shows a topology in which cluster members of more than one Application Server are hosted on a physical node.



The example topology is a variation of the basic horizontal scaling topology. Cluster members are not hosted on just a single machine, but are distributed throughout all of the machines in the system. In this

example, a cluster member is hosted on Machines B and C. Machine A serves as the Web server for the application and distributes client requests to the Application Server cluster members on each node.

### **Typical use**

Hosting cluster members of multiple Application Servers within a node provides the following benefits:

- Improved throughput. Clustering an Application Server enables it to handle more client requests simultaneously.
- Improved performance. Hosting cluster members on multiple machines lets cluster members have full use of the processing resources on their machines.
- Hardware failover. Hosting cluster members on multiple nodes isolates hardware failures and provides failover support. Redirect client requests to the Application Server cluster members on other nodes if one node goes offline.
- Application server failover. Hosting cluster members on multiple nodes also isolates application software failures and provides failover support if a cluster member stops running. Redirect client requests to cluster members on other nodes.
- Process isolation. If one Application Server process fails, its cluster members on the other nodes are unaffected.

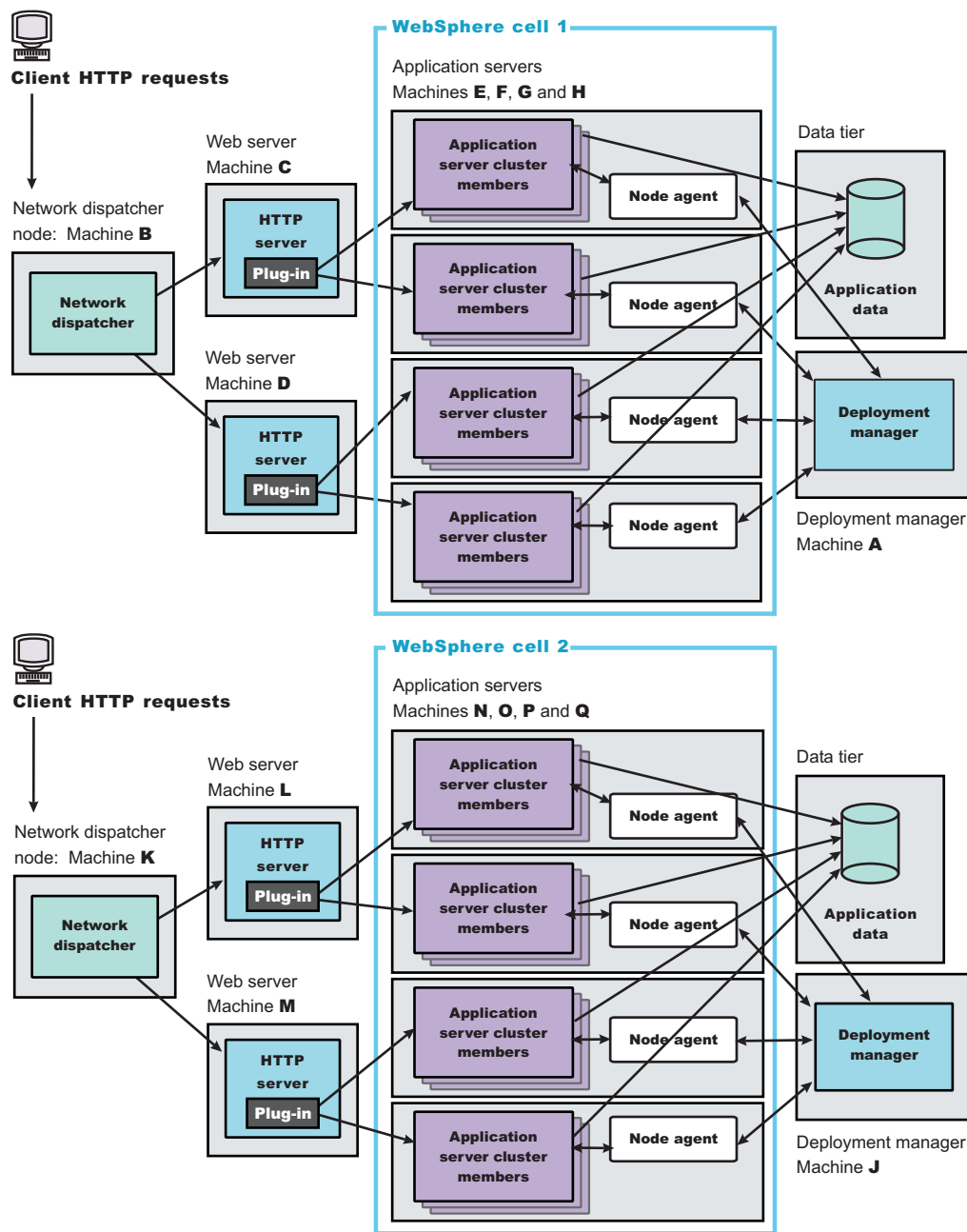
A drawback of this topology is more complex maintenance. You must maintain cluster members of each Application Server on multiple machines.

### **Having more than one Application Server on a stand-alone base node**

It is possible to use the administrative console of a stand-alone WebSphere Application Server node to create new servers on the node. You must install the administrative console application on each new server to administer the new server. Each Application Server on a stand-alone base node must have its own administrative console.

### **Putting it all together - a combined topology**

An example of a topology that combines the best elements of the other topologies discussed in this section is shown in the following figure.



This topology combines elements of several different basic topologies:

- Two deployment manager cells
- A deployment manager node to manage each cell (Machine A in cell 1; Machine J in cell 2)
- Two Network Dispatcher nodes (Machine B in cell 1; Machine K in cell 2)
- Two HTTP Servers for each cell (Machines C and D in cell 1; Machines L and M in cell 2)
- Four Application Server nodes for each cell (Machines E, F, G, and H in cell 1; Machines N, O, P, and Q in cell 2)
- The use of cluster members for both vertical and horizontal scaling. In the example topology, each node hosts three cluster members; in practice, the number of cluster members is limited by the computing resources of each node.
- A data tier for each cell.



## Typical use

This topology is designed to maximize throughput, availability, and performance. It incorporates the best practices of the other topologies discussed in this section:

- Having more than one Network Dispatcher node, HTTP server, and application server in each cell eliminates single points of failure.
- Multiple cells provide both hardware and software failure isolation, especially when upgrades of the application or the Application Server software are rolled out. You can handle hardware and software upgrades on a cell-by-cell basis during off-peak hours.
- Horizontal scaling uses both clustering and a Network Dispatcher to maximize availability and eliminate single points of process and hardware failure.
- Application performance is improved by using several techniques:
  - Hosting Application Servers on multiple physical Machines to boost the available processing power.
  - Creating multiple smaller cells instead of one large cell. There is less interprocess communication in a smaller cell, which lets you devote more resources to processing client requests.
  - Using cluster members to vertically scale Application Servers on each node, which makes more efficient use of machine resources.
- Applications with this topology can use several workload management techniques. In this example, you can perform workload management through one or both of the following:
  - Using the WebSphere Application Server Network Deployment workload management (WLM) facility to distribute work among Application Server cluster members.
  - Using Network Dispatcher to distribute client HTTP requests to each Web server.

For example, an application can manage workloads at the Web server level with Network Dispatcher and at the Application Server level with WebSphere Application Server workload management. Using multiple workload management techniques in an application provides finer control of load balancing.

Regardless of which workload management techniques are used in the application, Network Deployment participates in workload management to provide failover support.

In this topology, users notice an interruption only when an entire cell is lost. If this situation occurs, the active HTTP sessions are lost for half of the clients. The system can still process HTTP requests, although its performance is degraded.

The combined topology has several drawbacks:

- Deployment is more complicated. WebSphere Application Server software and application files must deploy in each cell, which is not the case for applications that run only in a single cell.
- Multiple cells require more administration effort because each cell is administered independently. Reduce this problem by using scripting to standardize and automate common administrative tasks.

## Running WebSphere Application Server across versions

WebSphere Application Server Version 5.1 is generally interoperable with WebSphere Application Server Versions 3.5.x, 4.0.x, and 5.0.x. However, there are specific requirements to address for each version. Make the following changes to support interoperability between versions.

1. Apply required interim fixes.

*Table 3. Interim fixes to apply to Version 3.5.x*

Interim fix	Version 3.5.3	Version 3.5.4	Version 3.5.5	Version 3.5.6
PQ51387	Apply	Apply		
PQ60074	Apply	Apply	Apply	Apply
PQ60335			Apply	
PQ63548	Apply	Apply	Apply	Apply



Table 4. Interim fixes to apply to Version 4.0.x

Interim fix	Version 4.0.1	Version 4.0.2	Version 4.0.3
PQ60074	Apply	Apply	
PQ60336	Apply	Apply	
PQ63548	Apply	Apply	Apply

Table 5. Interim fixes to apply to Version 5.0.x client

Interim fix	Version 5.0.0	Version 5.0.1	Version 5.0.2
PQ81989	Apply	Apply	Apply

Table 6. Interim fixes to apply to Version 5.0.x Enterprise

Interim fix	Version 5.0.0	Version 5.0.1	Version 5.0.2
PQ80354		Apply	

All fixes are available on the Support site for WebSphere Application Server products. There is a link to the Support site for WebSphere Application Server products at the bottom of each information center topic. Scroll all the way to the bottom of each page to see the link.

**Interim fix PQ51387**

A naming client fix that supports Version 3.5.x naming client access to the V5.0.x or V5.1.x name server.

**Interim fix PQ60074**

An Object Request Broker (ORB) fix that supports V5.0.x or V5.1.x naming client access to the Version 3.5.x or 4.0.x name server. A down-level client has no problem accessing a V5.0.x or V5.1.x name server, even when using corbaloc.

**Interim fix PQ60335**

An ORB fix to reconcile `java.math.BigDecimal` and other class differences in IBM Software Development Kits 122 and 131.

**Note:** This fix does not apply to IBM Software Development Kits on the Solaris Operating Environment.

**Interim fix PQ60336**

An ORB fix to reconcile `java.math.BigDecimal` and other class differences in IBM Software Development Kits 130 and 131.

**Note:** This fix does not apply to IBM Software Development Kits on Solaris platforms.

**Interim fix PQ63548**

A fix to correct problems that might occur when passing embedded valueTypes between WebSphere Application Server releases.

The best solution is to upgrade all your installations to the latest release and PTF levels, such as Versions 3.5.7 or 4.0.4, which do not require this fix. If this solution is not possible, apply the fix to your version.

Symptoms include `org.omg.CORBA.MARSHAL` exceptions when passing embedded valueTypes across the versions. Sometimes, other symptoms might mask `org.omg.CORBA.MARSHAL` exceptions, which makes them difficult to identify.

If symptoms reoccur in spite of the fix, re-export existing IORs.

**Interim fix PQ80354**

V5.0.0 and V5.0.1 Enterprise create incompatible MBean names for asynchronous beans thread pools, when compared to the MBean names that V5.0.2 Enterprise creates. V5.0.2 Enterprise is compliant with the Java Management Extension (JMX 1.2) specification. WebSphere Business Integration Server Foundation, Version 5.1 is also compliant with the specification.

The V5.0.0 and V5.0.1 WorkManager thread pool and the AlarmManager thread pool use invalid characters when naming thread pools. PQ80354 changes the name format for V5.0.0 MBeans and V5.0.1 MBeans to be compliant with the Java Management Extension (JMX 1.2) specification.

To make V5.0.0 Enterprise MBeans compatible with V5.0.2 Enterprise MBeans and V5.1 Integration Server MBeans, upgrade to V5.0.1 and install interim fix PQ80354 on the V5.0.1 Enterprise product. Or upgrade to V5.0.2 Enterprise.

To make V5.0.1 Enterprise MBeans compatible with V5.0.2 Enterprise MBeans and V5.1 Integration Server MBeans, install interim fix PQ80354 on the V5.0.1 Enterprise product. Or upgrade to V5.0.2 Enterprise.

Update your scripts and programs to use the updated MBean name format.

The PQ80354 interim fix is available at <http://www-1.ibm.com/support/docview.wss?uid=swg1PQ80354> Support page.

**Interim fix PQ81989**

An interim fix to upgrade the Software Development Kit (SDK) used by the Version 5.0.x client. The evolution of a number of core classes causes interoperability errors between a WebSphere Application Server, Version 5.0.x client and a Version 5.1 server.

You might see the following message when running an interoperability scenario between a WebSphere Application Server, Version 5.0.x client and a WebSphere Application Server, Version 5.1 server:

```
java.rmi.MarshalException:
  CORBA MARSHAL 0x4942f89a No;
  nested exception is: org.omg.CORBA.MARSHAL:
  Unable to read value from underlying bridge :
  Invalid start_value valuetag: c
minor code: 4942F89A
completed: No
```

A number of core classes evolved between Software Development Kit (SDK) 1.3.x and SDK 1.4.x. You can experience problems interoperating with WebSphere Application Server, Version 5.1, which is the first WebSphere Application Server release to use SDK 1.4.x.

The recommended response is to upgrade the 5.0.x SDK 1.3.1 to a newer Service Release (SR). The SDK Service Release update is available at: <http://www-1.ibm.com/support/docview.wss?uid=swg24006169>.

2. Follow the required guidelines.

Table 7. Guidelines to apply for Version 3.5.x and Version 4.0.x

Guideline	Version 3.5.x	Version 4.0.x
1	Apply	
2	Apply	Apply
3	Apply	
4	Apply	
5	Apply	Apply
6	Apply	Apply
7	Apply	Apply

**Guideline 1**

Use the context of the lowest common denominator when interoperating at the naming level. For example, always use the 3.5.x context `com.ibm.ejs.ns.jndi.CNInitialContextFactory` when a client or server is at 3.5.x. For later versions, use the current `com.ibm.websphere.naming.WsnInitialContextFactory` context.

## Guideline 2

Make required naming changes to support V3.5.x or V4.0.x client access to V5.0.x or V5.1.x enterprise beans. This issue is new, introduced by V5. There are several ways to make it work, such as:

- Updating the `namebindings.xml` file if you do not use the V5.0.x or V5.1.x migration tools, but have installed V3.5.x or V4.0.x applications on V5.0.x or V5.1.x. To allow V3.5.x or V4.0.x client access to the applications, add additional information to the bind information in the V5.0.x or V5.1.x namespace to make the old JNDI names work. Add the information to the `namebindings.xml` configuration file at the cell level using the administrative console.

**Note:** Applications that you migrate to V5.0.x or V5.1.x during installation, or that you migrate using the WASPreUpgrade and WASPostUpgrade migration tools, already have this update.

After federating an application server node into a deployment manager cell, you cannot use the migration tools. To use these tools again, remove the node from the cell, use the tools, and add the node to the cell again.

- Calling V5.0.x or V5.1.x enterprise beans directly using the naming path that includes the server on which the enterprise beans are running, such as `cell/node/server1/some/ejb/name`, for example.
- Using the Version 4.0.x client `java:/comp` location to find V5.0.x or V5.1.x enterprise beans. (You cannot use the command from a V3.5.x client.)

## Guideline 3

Ensure that programs performing a JNDI lookup of the `UserTransaction` interface, use an `InitialContext` that resolves to a local implementation of the interface. Also ensure that such programs use a JNDI location appropriate for the enterprise bean version.

Prior to the EJB 1.1 Specification, the JNDI location of the `UserTransaction` interface was not specified. Earlier versions up to and including Version 3.5.x do not use the EJB 1.1 Specification. They bind the `UserTransaction` interface to a JNDI location of `jta/usertransaction`.

Version 4, and later releases, bind the `UserTransaction` interface at the location defined by the EJB 1.1 Specification, which is `java:comp/UserTransaction`.

Version 5.0.x and Version 5.1.x no longer provide the earlier `jta/usertransaction` binding within Web and EJB containers to applications at a J2EE specification level of 1.3 or later, to enforce use of the newer `UserTransaction` interface. For example, EJB 2.0 applications can use only the `java:comp/UserTransaction` location.

## Guideline 4

Be aware of limitations when calling WorkLoad Management (WLM)-enabled enterprise beans.

Some clients cannot call WLM-enabled enterprise beans on remote clusters when there is a local WLM-enabled enterprise bean of the same name. If there is a cluster local to the client with the same enterprise bean as the remote cluster that the client is trying to call, the client ends up talking to the local cluster. The following table lists supported combinations of clients calling WLM-enabled enterprise beans on remote application servers.

All clients at Version:	Server at Version:	Supported interoperability
3.5.6	5.0.x, 5.1.x	Yes
4.02, 4.03	5.0.x, 5.1.x	Yes
5.0.x, 5.1.x	5.0.x, 5.1.x	Yes
5.0.x, 5.1.x	3.5.x	No
5.0.x, 5.1.x	4.02, 4.03	Yes

### **Guideline 5**

Be aware of administrative console limitations.

You cannot use the administrative interfaces for V5.0.x or V5.1.x to administer a V3.5.x or V4.0.x administrative server. Likewise, you cannot use a Version 3.5.x or Version 4.0.x administrative console to administer a V5.0.x or V5.1.x environment. If you use the administrative console on a remote machine to administer V3.5.x or V4.0.x WebSphere Application Server domains, migrating any of the nodes or domains to V5.0.x or V5.1.x renders the remote administration console ineffective for administering any V5.0.x or V5.1.x environment.

### **Guideline 6**

Use Secure Sockets Layer Version 3 (SSL v3) when interoperating with Version 3.5.x for secure connections. You cannot use Common Secure Interoperability Version 2 (CSIv2) for interoperability, because Versions 3.5.x and 4.0.x do not support CSIv2.

### **Guideline 7**

The evolution of a number of core classes causes interoperability errors between a V3.5.x or V4.0.x WebSphere Application Server client and a Version 5.1 Application Server.

You might see an error message similar to the following example when running an interoperability scenario between a WebSphere Application Server V3.5.x or V4.0.x client and a Version 5.1 Application Server:

```
java.rmi.MarshalException: CORBA MARSHAL 0 No; nested exception is:
org.omg.CORBA.MARSHAL: Unable to read value from underlying bridge :
  Custom marshaling of RMI:java.lang.Throwable:
  F8678B4F4D2EB705:D5C635273977B8CB not compatible with local class
  (local class not custom marshal capable) minor code : 0
  completed: No
```

The exception is provoked by the evolution of the class you are trying to marshal. For example, the `readObject()` and `writeObject()` methods are inconsistent at the sender and the receiver.

The problem is provoked by an enterprise bean `CreateException` exception, as a result of its inheritance from the `Throwable` object, which evolves between Software Development Kit (SDK) 1.3.1 and SDK 1.4.0.

A number of core classes evolve between SDK 1.3.x and SDK 1.4.x. Therefore, you see the problems when you interoperate with WebSphere Application Server, Version 5.1, which is the first release to use SDK 1.4.x.

Migrate WebSphere Application Server, Version 3.5.x to Version 4.0.0 and upgrade to WebSphere Application Server, Version 4.0.7 to solve the problem.

Or upgrade WebSphere Application Server, Version 4.0.x to Version 4.0.7 or later to solve the problem.

See “Federating multiple Version 5 installation instances” on page 410 for information about mixed version cells, where a Version 5.1 deployment manager cell can include Version 5.0.x base nodes.

This information is dynamic and might be augmented by information in technical articles that are available on the IBM DeveloperWorks WebSphere site. Check the site for the latest information.

Return to Planning to install an e-business network.

---

## Installing the product

This topic describes how to install WebSphere Business Integration Server Foundation as the root user on a Linux platform or on a UNIX-based platform, or from a user ID that belongs to the administrator group on a Windows platform. Some steps of the installation procedure on a Windows platform require the user to belong to the administrator group and have the following advanced user rights, *Act as part of the operating system* and *Log on as a service*. You cannot install the product correctly as a non-root user. You cannot install the product correctly on a Windows platform unless you belong to the administrators group. If you back up the product CD-ROM on a Linux or UNIX platform, do so as root. Backup copies made from non-root users do not preserve the correct file attributes and do not work.

You cannot install the product as a non-root user on a Linux or UNIX-based operating system platform, or from a user ID on a Windows platform that is not part of the administrators group.

Install WebSphere Business Integration Server Foundation, Version 5.1 on the Network Deployment product before installing WebSphere Business Integration Server Foundation on a base node within the cell. The deployment manager node must always be at the highest fix level or extension level with the cell.

The installation image for the WebSphere Business Integration Server Foundation product is on two CDs. When you use an installation method that requires you to swap CDs, it is important that no application or window is accessing the CD. Otherwise, you might not be able to unmount one CD and mount the next one. Any of the following actions can lock a CD:

- Browsing a readme file on the CD with a browser
- Browsing any file on the CD with an editor
- Viewing the *Installation Guide* on the CD with Acrobat Reader
- Opening a command window and changing directories to the CD
- Accessing the CD from a telnet session
- Accessing the CD from any other process

WebSphere Business Integration Server Foundation, Version 5.1 extends Network Deployment, V5.1 and the base WebSphere Application Server, V5.1 product. Version 5.0.x of the Enterprise product does not extend Version 5.1 of the WebSphere Application Server Network Deployment product. V5.0.x of the Enterprise product also does not extend V5.1 of the base WebSphere Application Server product.

Read through this topic and its related topics to prepare for installation and to make yourself familiar with installation options, before you start to use the installation tools. Review the prerequisite requirements on the IBM WebSphere Application Server supported hardware, software, and APIs Web site to get started.

After verifying prerequisites, read these topics before installing the product:

- Platform-specific tips for installing and migrating
- Tips for installing the embedded messaging feature
- Migrating and coexisting
- Using the Launchpad to start the installation
- Installing silently

If you encounter a problem such as not having enough disk space or temporary space or not having prerequisite packages on your Linux or UNIX-based system, cancel the installation, make the required changes, and restart the installation to pick up the changes that you made.

The installation uses InstallShield for Multiplatforms (ISMP) to perform the installation. You can use the Installation wizard or perform the installation from a command line, using the silent installation method.

The Installation wizard does not support hot keys, such as Alt-Y. You can tab to the Yes key and press **Enter** to select it, for example.

Install the base product before installing the Network Deployment product when installing both products on the same machine. The embedded messaging feature that is included in the default installation requires this specific order of installation.

Table 8. Installation tip

Operating platform	Tip
All platforms	Installing WebSphere Application Server products in order on the same machine, when installing the embedded messaging component

This topic describes installing the Integration Server product, using the installation image on the product CD-ROM labeled, **Integration Server**. The Integration Server product package also contains CD-ROMs for installing the WebSphere Application Server Network Deployment product and the base WebSphere Application Server product.

- Open the information center for the Network Deployment product to install the Network Deployment product if that is your goal.
- Open the information center for the base WebSphere Application Server product to install the base WebSphere Application Server product if that is your goal. However, the Integration Server product can also install the base product at the same time that you are installing the Integration Server product. This type of installation is referred to as an *umbrella* installation.

The Integration Server product requires the base WebSphere Application Server product. If the base product is not present, the Installation wizard for the Integration Server product installs a version of the base product with the base features that the Integration Server product requires, installs the V5.1.0.1 cumulative fix pack for the base product, and installs the *Service pack update for IBM SDK for Java for WebSphere Application Server V5.1.0.x* products. If the base product is present, the Installation wizard updates the base product with any base features that the Integration Server product requires and installs the cumulative fix pack and the service pack update.

You can use the CD labeled **Integration Server** to install the base product. You can perform an *umbrella installation*, which means that the installer program for the Integration Server installs the Integration Server, the base WebSphere Application Server product, the cumulative fix pack, and the service pack update during the same installation procedure. The umbrella installation function installs only those base features that the Integration Server requires. The umbrella installation function of the Integration Server installs the base WebSphere Application Server product without these features:

- IBM HTTP Server
- Web server plug-ins
- Performance and analysis tools

To install a Web server plug-in or another base product feature that is not available during the umbrella installation, you can find an installation image of the base product on the Integration Server CD-ROM as well, in the WAS directory.

You can install the IBM HTTP Server separately with its **InstallIHS** command script, by accessing the IHS folder on the product CD labeled **Application Server, IBM HTTP Server**. The **InstallIHS** command does not install the binary plug-in for the IBM HTTP Server, which you must also install to use HTTP Server.

Using the **InstallIHS** command does let you retain the Web server if you uninstall the Application Server. Installing the IBM HTTP Server product as a feature of the base IBM WebSphere Application Server product includes the Web server in the uninstaller program for the base Application Server. In this case, if you uninstall the base WebSphere Application Server, you also uninstall its features, including IBM HTTP Server.

This topic is available in Adobe PDF format, on the product CD-ROMs, and online in an information center that is available from the IBM WebSphere Application Server Web site at <http://publib.boulder.ibm.com/infocenter/ws51help/index.jsp>. When possible, access the most current version of this information by selecting the information center. The information center displays in the language of your machine locale.



The Launchpad tool lets you access the product overview, the `readme.html` file, and installation guides. You also use the Launchpad during the installation procedure to install the product. The Installation wizard performs the following actions:

- Automatically checks prerequisites
- Looks for an existing product in the WebSphere Application Server family of products in Version 4.x or Version 5.0.x, to determine whether to display the Migration panel or the Coexistence panel during the installation
- Installs the required base V5.1.0 WebSphere Application Server product, if the product is not already installed
- Adds required features to an existing WebSphere Application Server base product if you are extending a V5.1.0 base product
- Installs Cumulative Fix 2 (V5.1.0.2) to a base node or to a Network Deployment node
- Installs the V5.1.0 Cumulative Fix 1 for SDKs that V5.1.0.x WebSphere Application Server products use
- Installs the WebSphere Business Integration Server Foundation product to extend either the base product or the Network Deployment product

If you plan to install the WebSphere Business Integration Server Foundation product on a node that you federate into a cell, you must also install the product on the Network Deployment node, to provide Integration Server administrative extensions that extend the administrative console and the scripting facility. When installing on an existing Network Deployment node, the Installation wizard automatically installs the administrative console extensions feature. It does not install the base product, or the Integration Server programming model extensions that extend the base product.

If you have both the base WebSphere Application Server product and the Network Deployment product on the same machine, the Installation wizard for the Integration Server product installation displays a panel for you to select whether you want to install the administrative console extensions feature on the Network Deployment product, or the programming model extensions on the base product.

1. Install WebSphere Business Integration Server Foundation on your operating platform. Use the following procedures to install the Integration Server software on your operating platform:
  - Install WebSphere Business Integration Server Foundation on AIX platforms.
  - Install WebSphere Business Integration Server Foundation on HP-UX platforms.
  - Install WebSphere Business Integration Server Foundation on Linux platforms.
  - Install WebSphere Business Integration Server Foundation on Solaris platforms.
  - Install WebSphere Business Integration Server Foundation on Windows platforms.
2. Verify the success of the installer program by examining the Exit summary panel and the `install_root/logs/WAS.WBISF.install.log` file.

If you performed an umbrella installation of the base product or if you installed new base product features, also examine the `install_root/logs/log.txt` file. ISMP records a success message in the `WAS.WBISF.install.log` file: "INSTFIN: The installation is complete." The logs are the only source of status information for a silent installation.

Look for severe errors that the installer records in the `/logs/WAS.WBISF.install.log` file in the installation root directory to verify that no file system or other unusual errors occurred during installation.

You can ignore the following error messages that might appear during installation of the base product in an umbrella installation:

```
WASBase, com.ibm.wizard.platform.aix.AixProductServiceImpl,
    wrn, - WARNING:
Got invalid size of 0 for file:
    /usr/WebSphere/AppServer/
    config/cells/
    BaseApplicationServerCell/
    nodes/
    DefaultNode/
```

```
spi.policy:
WASBase, com.ibm.wizard.platform.aix.AixRegistryServiceImpl,
    wrn, AixRegistryServiceImpl:
Error attempting to modify AIX VPD.
```

If the `/logs/log.txt` file and the `/logs/WAS.WBISF.install.log` file do not contain a record of any problems but problems exist, verify or troubleshoot the installation, as described in Troubleshooting the installation and Installation component troubleshooting tips.

3. Tune your system for performance. For best performance on any platform, see Tuning performance.

The Installation wizard configures the product. It is not necessary to perform further configuration at this time.

## Installing the Integration Server on AIX platforms

This topic describes how to install WebSphere Business Integration Server Foundation as the root user on an AIX operating system platform. If you back up the product CD-ROM, do so as root. Backup copies made from non-root users do not preserve the correct file attributes and do not work. This topic guides you through preparing for Integration Server, which includes choosing and installing the variety of options and features provided.

If you encounter a problem such as not having enough temporary space or not having the right packages on your system, cancel the installation, make the required changes, and restart the installation.

The installation image for the WebSphere Business Integration Server Foundation product is on two CDs. The installation CDs are platform specific. Each CD label identifies the platform for which it is designed to be used. The CDs for a particular platform should only be inserted and run from a CD drive that is mounted on the platform that is identified on the CD.

When you use an installation method that requires you to swap CDs, it is important that no application or window is accessing the CD. Otherwise, you might not be able to unmount one CD and mount the next one. Any of the following actions can lock a CD:

- Browsing a readme file on the CD with a browser
- Browsing any file on the CD with an editor
- Viewing the *Installation Guide* on the CD with Acrobat Reader
- Opening a command window and changing directories to the CD
- Accessing the CD from a telnet session
- Accessing the CD from any other process

This topic describes installing the Integration Server product, using the installation image on the two product CD-ROMs labeled, **Integration Server**. The Integration Server product package also contains CD-ROMs for installing the WebSphere Application Server Network Deployment product and the base WebSphere Application Server product.

This topic is available in Adobe PDF format, on the product CD-ROMs, and online in an information center that is available from the IBM WebSphere Application Server Web site at <http://publib.boulder.ibm.com/infocenter/ws51help/index.jsp>. When possible, access the most current version of this information by selecting the information center. The information center displays in the language of your machine locale.

The Launchpad tool lets you access the product overview, the `readme.html` file, and installation guides.

If you use the Mozilla browser and you do not have the Netscape browser, some links might not work. The Launchpad attempts to call the Netscape browser in the `/usr/bin/netscape` directory. Try a symbolic link to the Mozilla browser to fix the problem as shown in the following example:

```
ln -sf /usr/bin/mozilla /usr/bin/netscape
```



After using the Launchpad to view product documentation, perform the following procedure. The procedure includes several preliminary steps before actually launching the installer program.

1. Stop all WebSphere Application Server-related Java processes on the machine where you are installing the product.
2. Stop any Web server process such as the IBM HTTP Server, if you are extending the base product.
3. Install the prerequisite Java130.rte.lib version 1.3.0 on AIX Version 5.2 maintenance level 1. You must install Java130.rte.lib Version 1.3.0 to verify that the embedded messaging feature installs correctly. To download a copy of Java 1.3.0:
  - a. Go to the <http://www-106.ibm.com/developerworks/java/jdk/aix/index.html> Web page.  
If the link is unavailable, search for IBM Developer Kit for AIX.
  - b. Click **Download and service information** in the Contents box.
  - c. Click **Java 1.3.0** from the **Java Version** column in the table.
  - d. (Optional) Register for a user ID and password.

To correct an existing problem:

- a. Uninstall the following components, if present:
    - WebSphere Application Server
    - WebSphere MQ (MQSeries)
    - WebSphere MQ (MQSeries) classes for Java and WebSphere MQ (MQSeries) for Java Message Service
    - IBM HTTP Server
    - WebSphere Embedded Messaging Publishing and Subscribe Edition
  - b. Clean up the system registry and edit the `vpd.properties` file on AIX to remove any entry related to WebSphere Application Server products. Entries related to WebSphere Application Server products begin with:
    - **WSB** for the base WebSphere Application Server, V5.0.x product
    - **WSB..51** for the base WebSphere Application Server, V5.1 product
    - **WSC** for the WebSphere Application Server Application Clients
    - **WSE** for the Enterprise product, V5.0.x
    - **WSE..51** for WebSphere Business Integration Server Foundation, V5.1
    - **WSN** for the Network Deployment product, V5.0.x
    - **WSN..51** for the Network Deployment product, V5.1
    - **WSM** for the WebSphere MQ product
  - c. Reinstall the WebSphere Application Server product in an umbrella installation of the WebSphere Business Integration Server Foundation product.
4. Install the prerequisite x1C.rte 6.0 run-time code on AIX 5.2 maintenance level 1. You must install the x1C.rte 6.0 run-time code, which is a prerequisite of GSKit7. Download the run-time code as a fix from the AIX Support site.
  5. Provide adequate disk space.

The WebSphere Business Integration Server Foundation installer program installs Cumulative Fix 2 to the V5.1.0 base product or to the V5.1.0 Network Deployment product that the Integration Server extends. The cumulative fix leaves the service level of each product at the V5.1.0.2 level. If you have applied interim fixes that are not part of the cumulative fix, you must reinstall them. Installing the cumulative fix removes all interim fixes that you might have installed.

After the installation is complete, install Cumulative Fix 3 and any recommended fixes that are described in WebSphere Business Integration Server Foundation V5.1 recommended interim fixes.

The installer program also installs a cumulative fix from the *V5.1.0 Cumulative Fix 1 for SDKs* service offering. The cumulative fix updates the IBM Developer Kit for AIX, Java Technology Edition software that IBM uses with the WebSphere Business Integration Server Foundation product and other V5.1 WebSphere Application Server products. The new service level is 1.4.1 SR1B.

The Integration Server, Cumulative Fix 2, and Cumulative Fix 1 for SDKs require the following disk space:

**1750 MB for the /usr/WebSphere/AppServer or the /usr/WebSphere/DeploymentManager directory**

The installation root directory includes either the base product or the Network Deployment

product. The installation program extends the installation root directory with WebSphere Business Integration Server Foundation software.

### 500MB for the /tmp directory

The temporary directory is the working directory for the installation program. Some components of the installation process require a specific amount of free space in the /tmp directory.

Although you might see an installation message for an incremental amount of free space that is less than 500 MB, the overall cumulative requirement for free space in the /tmp directory is 500 MB.

For example, if you do not have enough free space to start the installation, a message notifies you that you must have 200 MB of free space in the /tmp directory. The 200 MB of free space is what you must have when you have already installed Cumulative Fix 2 to an existing base product or to an existing Network Deployment product.

The 500 MB of free space is required to install the base product, Cumulative Fix 2, and the Integration Server product in the same *umbrella* installation procedure. An umbrella installation installs the base product as it installs Integration Server software.

Installing Integration Server software on the Network Deployment product also installs Cumulative Fix 2 (V5.1.0.2), which increases the amount of space required over the 200 MB in the message.

Verify that you have 500 MB of free space to avoid problems.

A second message about free space occurs when less than 4 MB of free space remains after starting the installation. The InstallShield for MultiPlatforms (ISMP) program displays a message about using the `-is:tempdir` parameter to identify an alternate temporary space directory.

Ignore any `-is:tempdir` message. The `-is:tempdir` parameter is not supported. Cancel the installation, allocate a total of 500 MB of free space in the /tmp directory, and start the installation again.

### 2250 MB

The total amount of space required for both directories is 2250 MB. A significant amount of the required space is temporarily required during installation and is released after installation. If you have already installed the cumulative fix on either the base product or the Network Deployment product that you are extending, the space requirement is reduced.

The Installation wizard displays required space for individual features on the Feature selection panel. The Installation wizard also warns you if you do not have enough space to install the product and the cumulative fixes.

If you plan to migrate applications and the configuration from a previous version, verify that application objects have available disk space. As a rough guideline, plan for space equal to 110 percent of the size of the application objects:

- **For Version 4.0.x:** The size of enterprise archive (EAR) files
- **For Version 5.0.x:** The size of EAR files

6. Allocate adequate disk space for the embedded messaging feature if you are planning to install the feature. The installation locations for the embedded messaging feature are fixed as shown in the following table, which lists the locations for the base messaging functions and the messaging broker functions for publish/subscribe messaging.

Table 9. Space requirements for the embedded messaging feature on AIX

Component	Base code	Broker code	Base data	Broker data
<b>Path</b>	/usr/ mqm	/usr/ opt/ wemps	/var/ mqm	/var/ wemps
<b>Server and client subfeature</b>	40 MB	80 MB	8 MB	5 MB

Table 9. Space requirements for the embedded messaging feature on AIX (continued)

Component	Base code	Broker code	Base data	Broker data
Client subfeature	15 MB	15 MB	5 MB	N/A

7. Set up the display environment for a real root login on AIX systems. In a normal root login, issue the command `su`. For a real root login, issue the command `su -`.  
Display settings for a normal root login are automatic. For a real root login, you must set your display environment properly to successfully view the installation wizard. Otherwise, you see a message about Preparing Java(™) Virtual Machine..., and seven rows of dots, but no installation GUI and no further messages. Refer to the documentation for your AIX platform to determine proper display settings.
8. Prepare to install the embedded messaging feature. The embedded messaging feature is based on the IBM WebSphere MQ product. The feature and the product each provide a Java message service (JMS) function that supports queues for point-to-point messaging and topics for publish and subscribe messaging. You can install WebSphere Business Integration Server Foundation with the embedded messaging feature with or without the WebSphere MQ product on the same machine. To support both the embedded messaging feature and the WebSphere MQ product on the same machine, the WebSphere MQ product must be at a certain fix level and must have several of its features installed. If you already have WebSphere MQ installed, you can configure it as the JMS provider. Otherwise, you can install the embedded messaging feature during the installation of the Integration Server or install the WebSphere MQ product or another JMS provider after you install the Integration Server. Even though you might decide now to install only the embedded messaging feature, you can install the WebSphere MQ product later and use the IBM WebSphere MQ product as the JMS provider instead.
9. Verify that you have upgraded to WebSphere MQ 5.3 with the CSD04 update to install embedded messaging on a machine where you already have WebSphere MQ installed. The WebSphere Business Integration Server Foundation package includes copies of the WebSphere MQ 5.3 and Event Broker installation images, with restricted licensing. Use the MQ CD-ROMs to install the required MQ features or WebSphere MQ 5.3 for use with Integration Server.  
Determine if your WebSphere MQ 5.3 installation is at the required level by running the **mqver** utility provided by WebSphere MQ.  
The required level as indicated by mqver is shown below:  

```
Name:      WebSphere MQ
Version:   530.4 CSD04
...
```
10. Verify that you have installed the required WebSphere MQ 5.3 features to install embedded messaging on a machine where you already have WebSphere MQ installed. Verify that you have installed the following features:
  - When installing the embedded messaging server and client feature, the required MQ features are *Server* and *Java messaging*.
  - When installing the embedded messaging client feature, the required MQ feature is *Java messaging*.

If you attempt to install the embedded messaging feature when WebSphere MQ is already installed, the level of WebSphere MQ must be Version 5.3 with the required MQ features. Otherwise, the installation of the embedded messaging feature fails with prerequisite check errors.
11. Create and mount a journalized file system called `/var/mqm` for your messaging working data. Use a partition strategy with a separate volume for embedded messaging or WebSphere MQ data to isolate system activity from the potentially high volume of messaging work that can build up in the `/var/mqm` directory.
12. Create separate file systems for log data in the `var/mqm/log` directory and error files in the `var/mqm/errors` directory. Store log files on a different physical volume from the embedded

messaging queues, which are in the `/var/mqm` directory. This ensures data integrity in the case of a hardware failure. If you are creating separate file systems, allow the following minimum free space:

**30 MB** `/var/mqm`

**20 MB** `/var/mqm/log`

**4 MB** `/var/mqm/errors`

The `/var` file system stores all the security logging information for the system and stores the temporary files for e-mail and printing. Therefore, it is critical that you maintain free space in `/var` for these operations. If you do not create a separate file system for messaging data, and `/var` fills up, all security logging stops on the system until free space is available in `/var`. Also, e-mail and printing do not work without some available free space in `/var`.

You have the same options for creating file systems for the embedded messaging feature as you do for WebSphere MQ. For example, if you cannot install the embedded messaging options in the required file system (for example, if it is too small), you can do one of the following *before* installing the Embedded Messaging options:

- Create and mount a new file system for the installation directory.
- Create a new directory anywhere on your machine, and create a symbolic link from the required installation directory to the new directory. For example, on AIX:

```
mkdir /bigdisk/mqm
ln -s /bigdisk/mqm /usr/mqm
```

13. Unmount file systems with broken links to avoid `java.lang.NullPointerException` errors. Unmount file systems with broken links before installing.

The installation of the cumulative fix can fail with the following error when broken links exist to file systems:

An error occurred during wizard bean change notification:

```
java.lang.NullPointerException
  at com.ibm.wizard.platform.aix.AixFileUtils.
    getFileSystemData(AixFileUtils.java:388)
  at com.ibm.wizard.platform.aix.AixFileUtils.
    getPartitionDataWithExecs(AixFileUtils.java:172)
  at com.ibm.wizard.platform.aix.AixFileUtils.
    getPartitionData(AixFileUtils.java:104)
  at com.ibm.wizard.platform.aix.AixFileServiceImpl.
    getPartitionNames(AixFileServiceImpl.java:397)
...

```

Use the `df -k` command to check for broken links to file systems. Look for file systems that list blank values in the `1024-blocks size` column. Columns with a value of "-" (dash) are not a problem. The following example shows a problem with the `/dev/lv00` file system:

```
> df -k
Filesystem      1024-blocks      Free %Used    Iused %Iused Mounted on
/dev/hd4         1048576      447924  58%      2497    1% /
/dev/hd3         4259840     2835816  34%        484    1% /tmp
/proc            -             -      -         -      - /proc
/dev/lv01        2097152     229276  90%       3982    1% /storage
/dev/lv00
/dev/hd2         2097152     458632  79%      42910    9% /usr
iw031864:/cdrom/db2_v72_eee_aix32_sbcs
```

The `/proc` file system is not a problem. The `iw031864:/cdrom/db2_v72_eee_aix32_sbcs` file system is a definite problem. The `/dev/lv00` file system is also a likely problem. Use one of the following commands to solve this problem:

```
> umount /cdrom/db2_v72_eee_aix32_sbcs
> umount /cdrom
```

If the problem continues, unmount any file systems that have blank values, such as the `/dev/lv00` file system in the example. If you cannot solve the problem by unmounting file systems with broken links, reboot the machine and begin this procedure again.

14. Define the user groups and the user needed for the embedded messaging feature.

A user ID of the name `mqm`, with a primary group of `mqm`, owns the directories and files that contain the resources associated with the embedded messaging feature:

- a. Use the System Management Interface Tool (`smit`) to create the `mqm` and `mqbrkrs` user groups:
  - 1) Click **Security & Users > Groups > Add a Group**.
  - 2) Set the name field to `mqm` and create the user group.
  - 3) Create the `mqbrkrs` user group in the same way.
- b. Use `smit` to create the `mqm` user:
  - 1) Click **Security & Users > Users > Add a User**.
  - 2) Set the name field to `mqm` and create the user.
  - 3) Click **Security & Users > Change a Users Password > Passwords** to add a password to the new user ID.
- c. Use `smit` to add the `mqm` and `root` users to the `mqm` group:
  - 1) Click **Security & Users > Users > Change / Show Characteristics of a User**.
  - 2) Enter `mqm` in the User Name field.
  - 3) Add `mqm` to the Group SET field, which is a comma-separated list of the groups to which the user belongs.
  - 4) Add `root` to the `mqm` group and the `mqbrkrs` group.

The recommended user ID for running the `jmsserver` process is `root`. If you do run the `jmsserver` process under another user ID, add that user ID to the `mqm` and `mqbrkrs` groups. User IDs longer than 12 characters cannot be used for authentication with the embedded WebSphere JMS provider.

The `mqm` user starts the `jmsserver` for general JMS support and the WebSphere embedded broker for WebSphere Application Server topic connections.

Put the user groups into effect when you next start WebSphere Business Integration Server Foundation. For example, either log off and on again with the process user ID or open a new shell in which to start WebSphere Business Integration Server Foundation.

15. Log in appropriately to pick up the secondary user groups, `mqm` and `mqbrkrs`, for `root`. Use `ssh` instead of `telnet` to log in or run the following command after logging on:

```
su -
```

16. Verify that prerequisites and corequisites are at the required release levels. Although the Installation wizard checks for prerequisite operating system patches with the `prereqChecker` application, review the prerequisites on the IBM WebSphere Application Server supported hardware, software, and APIs Web site if you have not already done so. Refer to the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

Some operating systems that were not supported at the time that this product was shipped on CD-ROM might now be supported. You might receive a message from the `prereqChecker` program that an operating system is not supported when, in fact, the operating system is supported.

Always consult the IBM WebSphere Application Server supported hardware, software, and APIs Web site to determine whether your operating system is supported when you receive a message from the `prereqChecker` program. The Web site lists all supported operating systems and the operating system fixes and patches that you must install to have a compliant operating system. After confirming that your operating system is supported and that you have installed all necessary patches, you can click **Next** to continue an installation when you receive an error message from the `prereqChecker` program.

17. Remove any entries from the `/usr/bin/jitk.db` file if you have uninstalled WebSphere Application Server Enterprise Edition Version 4.1. Remove any remaining artifacts from an uninstalled Enterprise Edition V4.1 system to prevent the display of the Coexistence panel or the Migration panel during installation.

The Installation wizard for WebSphere Business Integration Server Foundation might display the Migration panel or the Coexistence panel even though you have uninstalled WebSphere Application Server Enterprise Edition Version 4.1. You can prevent the Installation wizard from recognizing a previously deleted version of Enterprise Edition by removing the following entry from the `/usr/bin/jitk.db` file:

```
WebSphere Enterprise Edition Server 4.1
```



Remove other Version 4.x entries for WebSphere Application Server products that are no longer on your system.

18. Verify the system **cp** command when using emacs or other freeware.

If you have emacs or other freeware installed on your AIX system, verify that the system **cp** command is being used.

- a. Type `which cp` at the command prompt before running the installation program for the WebSphere Business Integration Server Foundation product.
- b. Remove the freeware directory from your PATH if the resulting directory output includes freeware. For example, if the output is similar to this `/usr/freeware/bin/cp` message, remove the directory from the PATH.
- c. Install the WebSphere Business Integration Server Foundation product.
- d. Add the freeware directory back to the PATH.

If you install with a **cp** command that is part of a freeware package, the installation might appear to complete successfully, but the IBM Developer Kit for AIX, Java Technology Edition (IBM SDK for Java) that the product installs can have missing files in the `install_root/java` directory.

Missing files can destroy required symbolic links. If you remove the freeware **cp** command from the PATH, you can install the Integration Server product successfully.

Perform the following procedure to verify that the Java 2 SDK software is working correctly.

19. Verify the Java 2 SDK on the WebSphere Business Integration Server Foundation CD. Perform the following steps to verify that the Java 2 SDK on the product CD-ROM is working correctly.

- a. Change directories to the `/aix/WAS/jdk/java/bin` directory on the product CD-ROM. For example:  

```
cd /mnt/aix/WAS/jdk/java/bin
```

- b. Verify the Java 2 SDK version. Type the following command:

```
./java -version
```

The command completes successfully with no errors when the Java 2 SDK is intact.

20. Unfederate a base node if you require certain WebSphere Business Integration Server Foundation features.

If you are planning to install WebSphere Business Integration Server Foundation on a federated base node, the installer program does not allow you to install certain features. These Integration Server features are always hidden and deactivated on a federated base node:

- Samples
- Embedded messaging

Unfederate the base node. When you install the Integration Server product you can select any Sample features or the embedded messaging server and client feature. You can refederate the base node after the installation is complete.

A federated base node must have both the administrative console feature and the administrative scripting feature to install the following Integration Server features:

- Business Rule Beans
- Process choreographer

Otherwise the two features are hidden and deactivated when installing Integration Server on a federated base node.

Unfederate the base node. When you install the Integration Server product you can select the Business Rule Beans feature or the process choreographer feature. You can refederate the base node after the installation is complete.

21. Select the Installation wizard method or the silent installation method but do not start the installation yet. The installer program has two interfaces, the Installation wizard and a silent command-line installation.

### **Performing the installation with the wizard**

You can start the Installation wizard in two ways. The default installation method is to open a command window to a read/write directory, issue the fully qualified command to start the Launchpad tool, and click the **Install the product** option. This option launches the Installation wizard, which is an InstallShield for MultiPlatforms (ISMP) application. This action launches the Installation wizard in the language of your machine locale unless no translation exists for your locale, in which case you receive the English version. A short delay occurs before the ISMP wizard displays. You do not need to click the Install the product option more than once to cause the wizard to display. The delay is particularly noticeable on x-windows platforms.

You can also start the Installation wizard using the `/cdrom/aix/install` command, where `/cdrom` is the mount point for the product CD-ROM and `aix` is the platform directory. Start the installation from a read/write location and not from the CD-ROM.

The WebSphere Business Integration Server Foundation installer program applies a cumulative fix to the V5.1.0.0 base product or V5.1.0.0 Network Deployment product that the Integration Server extends. The cumulative fix leaves the service level of each product at the V5.1.0.2 level. If you have applied interim fixes that are not part of the cumulative fix, you must reinstall them. Installing the cumulative fix removes all interim fixes that you might have installed.

The Launchpad copies certain files to your disk drive to avoid locking the CD during the installation, which requires you to change CDs. Expect a slight delay as you open the Launchpad while it copies the readme files and the installation document to disk.

### Performing a silent installation

You can also perform a silent installation using the `-options setup.response` parameter (or the `-options setup_nd.response` parameter for use with the Network Deployment product) with the command method:

```
fully_qualified_CD_pathname/install
  -options fully_qualified_HDD_pathname/setup.response
```

```
# /cdrom/aix/install -options /tmp/setup.response
```

Start the silent installation with a fully qualified path to the options response file. Otherwise, the Installation wizard starts. Start the silent installation from a read/write location and not from the CD-ROM or another read-only directory.

A silent installation causes the installation program to read your responses from the options response file, instead of from the wizard interface. You must customize the *response files* before installing silently.

The response file passed to the installer program must not contain ASCII line-end characters (0x0D0A). The response file must contain UNIX line-end characters only. When the options response file contains ASCII line-end characters, the **install** command is unsuccessful and does not log an error nor display an error.

To verify that ASCII line-end characters are the cause of failure, use the Java argument `-Dis.debug=1` on the **install** command. The resulting debug information describes a service exception about invalid characters in the options response file.

After customizing one of the files, you can issue the command to silently install. After issuing the command, the following text displays:

```
# .....
.InstallShield Wizard
```

```
Initializing InstallShield Wizard...
```

```
Searching for Java(tm) Virtual Machine...
```

The silent installation runs without displaying status to the window. If you copy both CDs to your disk drive, press **Enter** when the installation is complete to return to the command prompt. If you copy disk 2 only to your disk drive and you start the installation by issuing a fully qualified **install** command that refers to disk 1 in the CD drive, you can press **Enter** at any time to return from the background job to the command prompt. For more information, see the description of the asynchronous command line at the end of the next step.

You can change the `-W launchPRTBean.active` option to display the Registration panel to indicate the completion of a silent installation on a local system with a graphical user interface.

To determine the status of the silent installation, review the installation logs in the `install_root/logs` directory or in the `/tmp` directory.

Silent installation is particularly useful if you install the product often.

The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard. Review the description of the `setup.response` file and the `setup_nd.response` file for more information. Comments in each file describe how to customize their options.

22. Select one of the four installation methods for installing from the two-CD installation image. The installation image is on two CDs. The cumulative fixes are on disk 2. Although four methods exist for installing the product from the two CDs, the recommended Method 1 begins with the next step in the overall procedure.

The installation CDs are platform specific. Each CD label identifies the platform for which it is designed to be used. The CDs for a particular platform should only be inserted and run from a CD drive that is mounted on the platform that is identified on the CD.

Plan to start the installation from a read/write location and not from the CD or a read-only directory. Issue a command with a fully qualified path name to the install program on the CD. Do not change directories to the CD drive to issue a command that uses a relative, local path.

The following description provides an overview of all four methods.

**Method 1:** This method is recommended when using the Installation wizard to install WebSphere Business Integration Server Foundation. This method of installing does not support silent installations.

- a. Insert disk 1 and mount the CD drive.
- b. Unmount disk 1 at the prompt.
- c. Insert disk 2 and mount the CD drive.
- d. Identify the location of disk 2 (which includes the `WAS_update` directory).
- e. Continue the installation.

After the installation wizard reads the cumulative fixes from disk 2, the wizard displays a prompt for disk 1:

- a. Unmount disk 2.
- b. Insert disk 1 and mount the drive to continue the installation.

Verify that no other windows or applications access the CD-ROM drive. If any process accesses the CD-ROM, you might not be able to unmount one disk and mount the next one.

To begin installing with this method, go to the next step in the overall installation.

### Other installation options

The next few steps in the overall procedure assume that you are using the recommended method of installing. However, you have three other options for installing from the two CDs, all of which support both the Installation wizard method of installing and the silent installation method:

- **Method 2:** This method copies disk 2 to a specific default location on the hard drive and does not require you to switch disks. This method is recommended for installing silently:
  - a. Open a shell window and log on as root. Use the same shell window throughout the installation procedure.
  - b. Insert disk 2.
  - c. Mount the CD-ROM drive.
  - d. Copy the CD to the `/tmp` directory using parameters to maintain symbolic links as shown in the following example:

```
cp -frp /cdrom/aix/WAS_update /tmp
```
  - e. Unmount disk 2 and mount disk 1 to continue the installation. No prompts to switch disks occur.



- **Method 3:** Create the *CDROM2* environment variable to identify the location of disk 2. The location of disk 2 can be another CD-ROM mount point or a disk location where you copy the data. The installation proceeds without prompts for either disk. This method of installing also supports silent installations:
  - a. Open a shell window and log on as root. Use the same shell window throughout the installation procedure. The *CDROM2* environment variable is only available to the current shell window.
  - b. Mount a second CD drive as */cdrom2*.
  - c. Insert disk 2 into the */cdrom2* drive.
  - d. Define the *CDROM2* environment variable with the following commands:
 

```
CDROM2=/cdrom2/aix
export CDROM2
```
  - e. Remove disk 2 and insert Disk 1 as described in the next step to continue the installation. No prompts to switch disks occur.
- **Method 4:** Copy both CDs to any directory and start the installation from that directory. The installation proceeds without prompting for either disk. This method of installing also supports silent installations:
  - a. Open a shell window and log on as root. Use the same shell window throughout the installation procedure.
  - b. Insert disk 1.
  - c. Mount the CD-ROM drive.
  - d. Copy the contents to any directory. The commands in the following example create and use the */tmp/wbisf51* directory:
 

```
cd /tmp
mkdir wbisf51
cp -frp /cdrom/* /tmp/wbisf51
```
  - e. Unmount the CD-ROM drive.
  - f. Insert disk 2 and mount the drive.
  - g. Copy the data from the CD-ROM to the disk drive directory:
 

```
cp -frp /cdrom/* /tmp/wbisf51
```
  - h. Run the Launchpad program with the ***/tmp/wbisf51/aix/launchpad.sh*** command or run the installer program directly with the ***/tmp/wbisf51/aix/install*** command.
  - i. Skip the next two steps to continue the installation.

### Asynchronous and synchronous command lines

After running the **install** command, the command line returns asynchronously. Because of the need to support a two-CD installation, it is not possible to run the **install** command synchronously for Methods 1, 2, and 3. A synchronous **install** command returns the command line after the installation is complete.

Because you can switch CDs in the middle of the installation, the installation process and its children processes all run as background processes. After running the **install** command, the command line returns immediately. Do not misinterpret this to mean that the installation has finished. Although the command line returns, either the Installation wizard or a silent installation might still be in progress.

Confirm the successful completion of the Installation wizard by viewing the Summary panel. Confirm the successful completion of a silent installation (or the Installation wizard) by examining the *install\_root/logs/WAS.WBISF.install.log* file for the following message:

```
INSTFIN: The installation is complete.
```

Method 4 is the exception to the asynchronous behavior. If you copy both CDs to any directory and start the installation from that directory, the installation proceeds without prompting for either disk. The installer program does support a synchronous command line when installing from a disk drive. The command line returns after the installation is complete.

### Installing with a network file system mount

When installing from a drive mounted on a network file system (NFS), use NFS client and server platforms with identical versions of the operating system and a well-tuned NFS, if possible. For example, when installing on an AIX 5.2 machine, the recommended NFS server is also an AIX 5.2 machine.

If you are forced to use a cross-platform NFS mount, mount the drive with the `-o tcp` option if the option is available. For example:

```
mount -o tcp mycdrom.hostname:/media/cdrom /mnt
```

Refer to the man pages for the **mount** command to see if the `tcp` option is the default option. Using a CD drive or a disk drive mounted with the `udp` mount option is known to cause errors on some platforms.

If you must copy CD images for one platform to an NFS disk on another operating system platform, use a command that preserves symbolic links. For example, on an AIX platform use the **cp -hrp** command to copy data from an HP-UX disk and preserve the symbolic links. Without the `-h` option, the `cp` command on an AIX platform attempts to resolve symbolic links when copying an HP-UX disc instead of preserving the links.

Even with the `-h` option, the **cp** command on a Solaris platform does not preserve symbolic links when copying an HP-UX disk. On a Solaris platform, use the **tar -cvf** command to copy data from an HP-UX disk and preserve the symbolic links.

Consult the man page for the copy command on the NFS system to understand how the platform supports copying symbolic links.

Because many NFS incompatibilities can exist among various platforms, do not use a drive mounted on a network file system to install from one operating system platform to another without first verifying that the NFS configuration is robust. For example, if your mounted CD is `/mnt`, issue the following command to see if you have an NFS problem:

```
unzip -l /mnt/aix/WAS/setup.jar
```

The proper output from the command lists all the files in the `setup.jar` file without error. If you encounter problems in running the command, verify that your `/etc/exports` file includes the `no_root_squash` option.

See Troubleshooting the installation for more information about symptoms you can experience when installing with a faulty NFS mount. Contact your system administrator for help if you continue to have NFS problems.

### Recovering from a failed installation

If the installation program cannot locate the `WAS_update` directory from disk 2, the installation program fails immediately. The immediate failure leaves the `WAS.WBISF.install.log` file only in the `/tmp` directory. Normally, the installation program creates installation logs in the `install_root/logs/wbisf` directory.

In some instances, such as the one where the `WAS_update` directory does not exist, the installation program fails before it can copy the log files from the system temporary directory to the `/logs` directory. If you cannot find the installation log files in the `install_root/logs/wbisf` directory, look in the system temporary directory. Correct any problems and reinstall.

If you do not copy the `WAS_update` directory correctly from disk 2 to the `/tmp` directory or if you use the `CDROM2` variable incorrectly, error messages might exist in the `was_update_apply.err` file and in the `was_update_apply.out` file in the `install_root/logs/wbisf` directory. Correct any problems and reinstall.

The installer program might prompt for disk 2 if it cannot locate disk 2 in the `/tmp` directory or at the location specified by the `CDROM2` variable. In such a case, insert disk 2 and continue the installation.

If the application of Cumulative Fix 2 fails, check the logs for more information. The solution might be as simple as rerunning the installation after selecting a different installation option:

- Method 1: Using the prompts and switching CDs
- Method 2: Copying the second disk to the `/tmp` directory
- Method 3: Using the `CDROM2` variable to identify the location of disk 2

- Method 4: Copying both CDs to the hard drive and running the installation from the hard drive  
Using a second method can be successful after a failed first attempt using a different method.

23. Open a shell window to mount the product CD-ROM labeled, *Integration Server Disk 1 of 2*. Use the same shell window throughout the installation procedure. Verify that you are in a read/write directory and not the CD-ROM directory or another read-only directory before you start the installation.
24. Start the installation with the `/cdrom/aix/launchpad.sh` command, where `/cdrom` is the mount point for the product CD-ROM and `aix` is the platform directory on the CD-ROM. You can also start the installation directly with the `/cdrom/aix/install` command. The following example shows a fully qualified call to the installer program:

```
fully_qualified_CD_pathname/install
```

```
# /cdrom/aix/install
```

The readme link in the Launchpad is to the `readme.html` file in the CD root directory. The `readme` directory off the root of the CD has more detailed readme files. The *Getting Started* document that contains installation information is in the `docs` directory on the CD. You can download the current version of the *Getting Started* document from the Library Web page.

The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard. Review the description of the `setup.response` file and the `setup_nd.response` file for more information. Comments in each file describe how to customize the options.

25. Click **Next** to continue. The license agreement appears for you to read.
26. Click the radio button beside the **I accept the terms in the license agreement** message if you agree to the license agreement and click **Next** to continue. After you accept the licensing terms, the Installation wizard checks for prerequisites and for previous versions, with which it can either migrate or coexist.

The prerequisites checker program recognizes the official supported level for AIX 5.2 as ML1 + APAR IY44183. AIX 5.2 ML2 is also supported. If you receive a message from the prerequisites checker program that AIX 5.2 ML2 is an unsupported operating system, ignore the message and continue the installation.

Update your operating system if it is missing required file sets. If you receive a message that a file set is missing, such as file set `X11.fnt.ucs.ttf`, cancel the installation, update the operating system, and restart the installation.

As the WebSphere Business Integration Server Foundation product version changes, its prerequisites and corequisites change. It is probably necessary to update your database, Web server, Software Development Kit (SDK), and other software.

As mentioned in the introduction to this topic, the Integration Server product can install the base WebSphere Application Server product. The base product simplifies migrating product prerequisites, by providing the option to install a complimentary Java 2 SDK on your supported operating system. You can uninstall back-level prerequisites and let the Installation wizard install current versions.

If the wizard finds a previous version of a WebSphere Application Server product, the wizard prompts you to migrate applications and the configuration from the previous version, or to coexist with the previous version. If the installer program finds more than one previous version, the Installation wizard lists them for you to select which one to migrate.

Use the same cell name when migrating Enterprise V5.0.x on Network Deployment to Integration Server on Network Deployment, V5.1.x. If you use a different cell name, federated nodes cannot successfully migrate to the V5.1.x cell. You can use a different node name, if you prefer, when migrating Enterprise V5.0.x on Network Deployment from V5.0.x to V5.1.x. However, you must use the administrative console after installation, to change the Secure Sockets Layer (SSL) settings that mention the node name.

27. Install the administrative console extensions on the Network Deployment product or the programming model extensions on the base WebSphere Application Server product, when both products are installed on the same machine. If you have both the base WebSphere Application Server product and

the Network Deployment product on the same machine, the Installation wizard for the Integration Server product displays a panel for you to select the part of the Integration Server product to install. When no product exists on the machine, the Installation wizard prompts you to identify an installation location for an umbrella installation of the base product, Cumulative Fix 2, Cumulative Fix 1 for SDKs, and the Integration Server.

28. Install additional features or install another instance of the Integration Server product when a previous installation of the same level product exists. When the installer program detects a previous installation at the same product level, a panel appears to let you add features to the existing installation or perform a new installation to another directory. When adding features, previously installed features are checked and grayed out with the term **(Installed)** at the end of the feature name.

You can add Integration Server features to Integration Server on an unfederated base node or to Integration Server on a deployment manager node at any time, by running the Installation wizard again and choosing to add features.

If you are installing WebSphere Business Integration Server Foundation on a federated node, the installer program does not allow you to install certain features. These Integration Server features are always hidden and deactivated on a federated base node:

- Samples
- Embedded messaging

Integration Server features that are not grayed out are available for installation on a federated base node. You do not have to unfederate the base node to add available Integration Server features.

If the federated base node does not have the administrative console feature and the administrative scripting features, these additional Integration Server features are hidden and deactivated:

- Business Rule Beans
- Process choreographer

Federated nodes must be unfederated before adding base product features to avoid conflicts while the deployment manager owns the configuration of the base node. To install any of these deactivated features, you must perform the following procedure.

Use the **backupConfig** command to save the Network Deployment configuration so that you can restore the configuration if necessary. Although you can use the **backupConfig** command to save the configuration, the **restoreConfig** command restores the configuration without any features you add to the base node. However, you can refer to the saved configuration after adding features and adding the base node back to the cell. Refer to the saved configuration as you use the administrative console of the deployment manager to reconfigure the base node.

- a. Cancel the installation.
- b. Copy configuration files if you installed the Integration Server product on a federated base node after the base node was federated. If you installed the Integration Server product on an unfederated base node or before the base node was federated, you can skip this step. Copy the following files on the base node from the *install\_root/config/cells/cellname/nodes/nodename/servers/server1/* directory to the *install\_root/config/backup/base/cells/cellname/nodes/nodename/servers/server1/* directory:

- server-pme.xml
- server-pme502.xml
- server-pme51.xml
- resources-pme.xml
- resources-pme502.xml

Copy the following files on the base node from the *install\_root/config/cells/cellname/nodes/nodename/* directory to the *install\_root/config/backup/base/cells/cellname/nodes/nodename/* directory:

- resources-pme.xml
- resources-pme502.xml

- c. Unfederate a federated base product node with the **removeNode** command. Removing the base node from the cell also removes the configuration for the base node, which resides at the cell level.
- d. Use the update installer program to uninstall any interim fixes or fix packs that you installed after installing the Integration Server product.
- e. Log off and back on.
- f. Launch the Integration Server installation program again.
- g. Install the new features that you require instead of installing a new product instance.

Continue the installation by performing the remaining steps in the overall procedure. After completing the installation, plan to perform the following steps:

- a. Use the update installer program to reinstall any interim fixes or fix packs that are available.  
If you are updating a node that you intend to federate, install only fix packs and interim fixes that are installed on the deployment manager node. The deployment manager must be at the highest fix level in the cell.

When attempting to federate a WebSphere Business Integration Server Foundation node into a deployment manager cell that does not have the Integration Server installed, you are prompted to install the Integration Server extensions before proceeding. The WebSphere Business Integration Server Foundation code installs Cumulative Fix 2 (5.1.0.2) for the deployment manager and also installs the Integration Server administrative console extensions.

- b. Rejoin the node to the cell with the **addNode** command or the deployment manager administrative console.

This action synchronizes the master cell configuration with changes that you make to the Application Server configuration during the installation of the new features.

- c. Reconfigure the base node with the Network Deployment administrative console.

Consult the configuration that you saved to determine how to configure the node, if necessary.

- 29. Choose to migrate applications and the configuration from a previous version, or to coexist with another version, or to do neither, and click **Next** to continue.

All WebSphere Application Server products on a single machine share some of the code in the embedded messaging feature, if installed. The required level of the embedded messaging feature for V5.1 (CSD04) is not the same as for V5.0.0 or V5.0.1. The required level of the embedded messaging feature for V5.1 is the same as for V5.0.2.

If you attempt to install V5.1 on a machine where a version of the embedded messaging feature is at a release level earlier than CSD04, the installer program displays the message log in a panel. The message that you see is similar to one of the messages in the following example:

```
MQSeries or WebSphere MQ server at an earlier release than required to support
embedded messaging is already installed on the system.
Unsupported earlier maintenance level of MQSeries or WebSphere MQ detected.
Unsupported earlier release of MQSeries client or WebSphere MQ client detected.
Unsupported maintenance level of MQSeries client or WebSphere MQ client detected.
Software conflict with MQSeries JMS SupportPac MA88 detected.
```

To correct the problem, perform one of the following actions:

- Upgrade the full MQSeries or WebSphere MQ product to WebSphere MQ at the level that supports embedded messaging for V5.1 (CSD04). Refer to “Installing WebSphere embedded messaging as the JMS provider” on page 169 for more information.
- Uninstall the existing MQSeries or WebSphere MQ product if MQSeries or WebSphere MQ is not required on this system and reinstall the WebSphere Application Server product. Select the embedded messaging feature.

The MQSeries JMS SupportPac MA88 problem is slightly different. Uninstall the MQSeries JMS SupportPac MA88 and reinstall the WebSphere Application Server product, selecting the embedded messaging feature. The function provided by SupportPac MA88 is included in the embedded messaging feature.



You can upgrade the WebSphere Application Server product to V5.0.2 to avoid any problem with an incorrect level of the embedded messaging feature.

You can perform the procedure for migrating V5.0.0 or V5.0.1 Enterprise with embedded messaging on a base node to Integration Server V5.1.

You can perform the procedure for migrating V5.0.0 or V5.0.1 Enterprise with embedded messaging to V5.1 Integration Server on Network Deployment.

To share embedded messaging in a coexistence environment, the node names for each installation must be unique, so that each installation has a message queue manager that is named uniquely. To migrate V5.0.2 to V5.1, the node names must be identical. Therefore, the queue manager names are also identical, if you are migrating from V5.0.2 to V5.1. To prevent losing the queue manager when you uninstall V5.0.2 (or V5.1), you must create a dummy queue manager before uninstalling one of the WebSphere Application Server versions.

The first rule of migration is to migrate after you install WebSphere Business Integration Server Foundation:

If you are planning to install these products:		Select the migration option while installing this product:	
Base product	Integration Server	Base product	Integration Server
X		X	
X	X		X

The exception to the rule is to migrate V3.5.x to V5.1 during the installation of the base product or the Network Deployment product, before installing the Integration Server product.

If you are planning to install these products:		Select the migration option while installing this product:	
Network Deployment	Integration Server	Network Deployment	Integration Server
X		X	
X	X		X

If you migrate Enterprise Edition V4.x or Enterprise V5.0.x to WebSphere Business Integration Server Foundation, Version 5.1, you cannot select the Sample configuration for the process choreographer feature. Migrating the process choreographer feature is not compatible with installing the Sample configuration feature because there can be only one Sample configuration. If you migrate the previous configuration, you cannot install another configuration. Clear the migration check box to install the Sample configuration feature.

Migrating Integration Server also migrates the product that Integration Server extends.

When you perform an umbrella installation of the base WebSphere Application Server product, you can choose to migrate applications and the configuration from a previous version, or to coexist with another version of the base WebSphere Application Server product, or to do neither.

You can also perform a silent migration or configure for coexistence during a silent installation. Refer to Installing silently for a description of performing a silent installation, including the options that you can specify.

The migration prompt appears only when the Installation wizard detects a previous version. The coexistence prompt appears when the Installation wizard detects any other installation, including another Version 5 installation.

If you choose to coexist, the wizard displays a Port selection panel, where you can specify port assignments that do not conflict with existing ports. For example, you can change the HTTP transport port for coexistence, from 9081 (one more than the default Version 5 port number) to 9085 or higher, to avoid potential conflicts with port numbers that previous versions of WebSphere Application Server commonly use.

Use the **netstat -a** command to display all ports in use.

In some cases, such as when installing a non-English version, the Installation wizard might not detect a previous version. You can force the Migration panel or the Coexistence panel to appear, by starting the installation with an option on the `/cdrom/aix/install` command, where `mnt/cdrom` is the mount point for the product CD-ROM and `aix` is the platform directory on the CD-ROM.

For example, use this command:

```
/cdrom/aix/install
-W showPreviousVersionDetectedPanel.active="true"
```

You can also force the appearance of the Coexistence panel to change conflicting port number assignments. For example, the AIX WebSM system management server listens on port 9090 by default. To avoid a conflict with the WebSphere HTTPS Administrative Console Secure Port (`HTTP_TRANSPORT_ADMIN`) assignment, which is also 9090 by default, force the Coexistence panel to appear using this command:

```
/cdrom/aix/install
-W showCoexistencePanel.active="true"
```

The AIX WebSM system management server listens on port 9090 by default. If you suspect you have a port conflict, verify it by shutting down WebSphere Application Server and issuing the following command:

```
netstat -an |grep 9090
```

If you get a match, another process is already listening on port 9090. If you want the WebSM server and WebSphere Application Server to coexist, change the WebSphere Application Server administrative console port when installing WebSphere Application Server, or after installation. You can also disable the WebSM server. To disable the WebSM server, issue the following command to permanently disable WebSM server startup:

```
/usr/websm/bin/wmsserver -disable
```

If you choose neither the migration option nor the coexistence option, you can run Version 5.1.x and the previous version, but not at the same time. Although it is possible that both versions might coexist without port conflicts, you can ensure that both versions run together by selecting the coexistence option and checking for conflicting port assignments.

The Migration panel lists all previous releases that it can identify. If you highlight a release, the text boxes labeled, "select previous version," show the location of the previous product. Select the product to migrate. If you do not see the previous version that you intend to migrate, click **Select previous version** to enter a location and configuration file name if you are migrating a WebSphere Application Server Advanced Edition Single Server Edition, Version 4.0.x installation.

The field labeled "Configuration file" is valid only for WebSphere Application Server Advanced Edition Single Server Edition, Version 4.0.x. For the other versions of WebSphere Application Server that are supported by migration (Version 3.5 Standard Edition, Version 3.5 Extended Edition, and Version 4.0 Advanced Edition), the `admin.config` file provides the host and port values for the administrative server. If you use a file name other than `admin.config`, issue the commands that call the migration tools instead of migrating while installing. Issuing the commands that call the migration tools is described in Migrating and coexisting.

Migrate V3.5.x to V5.1 during the installation of the base product or the Network Deployment product, before installing the Integration Server product.

You must start the administrative server of some previous versions so that the Installation wizard can export the configuration from the `admin.config` file.

Although you might select migration at this point in the installation process, the actual migration does not begin until after the Version 5 installation is complete. At that time, if the `WASPreUpgrade` tool fails, the Installation wizard does not call the `WASPostUpgrade` tool to complete the migration, but instead displays the `WASPreUpgrade.log` and `WASPostUpgrade.log` log files for you to diagnose the problem. After fixing the problem, such as starting the administrative server of a previous release, you can start the migration again, as described in Migrating and coexisting.

30. Choose a type of installation and click **Next**.
  - Choose **Typical install** to install the following features on your system:
    - Embedded messaging server and client

- Embedded messaging message-driven bean Samples (requires the server and client feature to work)
- Business rule beans
- Extended (container-managed) messaging
- Dynamic query
- Additional Integration Server extensions
- Scheduler and asynchronous beans
- Process choreographer
- Samples

If you choose a typical installation, skip the next step.

- Choose **Custom install** to select features to install.

After selecting a typical installation, the wizard prompts you to select the directory for the program code. After selecting a custom installation, the wizard displays a list of features.

31. Select features to install and click **Next** to continue, when performing a custom installation. This step is available only when you choose the custom installation type. A description of each feature appears at the bottom of the panel when you roll the cursor over the feature.

Selecting certain features causes the installation of other prerequisite features. The following table shows this feature relationship.

Table 10. Features and feature dependencies

If you select these features:	These Integration Server features are also installed:	
<b>Embedded Messaging</b>		
Sub-features:	Server and Client	
	Client Only	
	Message-driven Bean Samples (for the server and not for the client)	
<p>You can install the MDBSamples application without installing the embedded messaging server and client feature. Perhaps you have already installed the server and client feature. Or perhaps you intend to reconfigure the MDBSamples to use messaging resources that WebSphere MQ software provides.</p> <p>In any case, if you install the MDBSamples application and do not have the server and client feature installed, errors occur. The Application Server starts the MDBSamples application at start up. The MDBSamples application cannot start the required messaging resources in the Java Naming and Directory Interface (JNDI).</p> <p>Because of the lack of required resources, the message-driven beans fail to start, which causes an exception that the Application Server logs. The Application Server is not affected other than being unable to start the MDBSamples application.</p>		
<b>Business Rule Beans</b>		
Sub-features:	Business Rule Beans Sample	
<b>Event Infrastructure Technical Preview</b>		
(Tech preview: For use on a stand-alone base node.)		
<b>Extended Messaging</b>		
Sub-features:	Extended Messaging Sample	Embedded Messaging
<b>Dynamic Query</b>		
Sub-features:	Dynamic Query Sample	
<b>Additional Integration Server Extensions</b>		
Sub-features:	Additional Integration Server Extensions Samples	
<b>Scheduler and Asynchronous Beans</b>		



Table 10. Features and feature dependencies (continued)

If you select these features:		These Integration Server features are also installed:
Sub-features:	Scheduler and Asynchronous Beans Samples	Embedded Messaging
<b>Process Choreographer</b>		Additional Integration Server Extensions
		Scheduler and Asynchronous Beans
Sub-features:	Process Choreographer Sample	Additional Integration Server Extensions
		Scheduler and Asynchronous Beans
		Embedded Messaging
Configure a sample business process container		Additional Integration Server Extensions
		Scheduler and Asynchronous Beans
<b>CORBA C++ SDK (deprecated)</b>		
Sub-features:	Interface Repository Support (Requires DB2)	
		CORBA C++ SDK Samples
<b>Javadocs</b>		

If you do not have the prerequisite base WebSphere Application Server product installed, the Integration Server installation can install it for you. The Integration Server Installation wizard installs the base WebSphere Application Server product without these features:

- IBM HTTP Server
- Web server plug-ins
- Performance and analysis tools

If you want one or more of the features, cancel the Integration Server installation and issue the **/cdrom/WAS/install** command, where `mnt/cdrom` is the mount point for the product CD-ROM and `WAS` is the directory on the CD-ROM for installing the base WebSphere Application Server product.

If you already have an unfederated base node installed, but select an Integration Server feature that requires a base product feature that you have not installed, the Integration Server installation installs the feature on the unfederated base node. The following table describes which base features are required when you select an Integration Server feature.

Table 11. Integration Server features and unfederated base product feature dependencies

If you select these features:		These base product features are also installed:
<b>Embedded Messaging</b>		
Sub-features:	Server and Client	
		Client Only
		Message-driven Bean Samples (These Samples are the MDBSamples application, which is for the server and not for the client.)
<b>Business Rule Beans</b>		WebSphere Application Server
		Admin Scripting
		Administrative Console
Sub-features:	Business Rule Beans Sample	Application Server Samples

Table 11. Integration Server features and unfederated base product feature dependencies (continued)

If you select these features:		These base product features are also installed:
<b>Event Infrastructure Technical Preview</b>		
<b>Extended Messaging</b>		WebSphere Application Server
		Application Server Samples
Sub-features:	Extended Messaging Sample	Embedded Messaging
		Messaging-driven Bean Samples
<b>Dynamic Query</b>		WebSphere Application Server
Sub-features:	Dynamic Query Sample	Application Server Samples
<b>Additional Integration Server Extensions</b>		Application Server
		Application Assembly Tool Discontinued as of V5.1.
		Administrative Console
Sub-features:	Additional Integration Server Extensions Samples	Application Server Samples
<b>Scheduler and Asynchronous Beans</b>		Application Server
Sub-features:	Scheduler and Asynchronous Beans Samples	Application Server Samples
<b>Process Choreographer</b>		Application Server
		Admin Scripting
		Administrative Console
Sub-features:	Process Choreographer Samples	Application Server Samples
		Configure a sample business process container
		Embedded Messaging
<b>CORBA C++ SDK (Deprecated)</b>		
Sub-features:	Interface Repository Support (Requires DB2)	
		CORBA C++ SDK Samples
		Application Server Samples
<b>Javadocs</b>		

These Integration Server features are always hidden and deactivated on a federated base node:

- Samples
- Embedded messaging

If the federated base node does not have the administrative console feature and the administrative scripting features, these additional features are hidden and deactivated:

- Business Rule Beans
- Process choreographer

To install any of these deactivated features, you must unfederate the base node, install the Integration Server product again, select the features you require, and add the node to the cell again. Federated nodes must be unfederated before adding base product features to avoid conflicts while the deployment manager owns the configuration of the base node.

You do not have to unfederate a federated base node to add Integration Server features that appear in the list of available features.

You can run the uninstaller program to remove all of the installed features.

32. Specify a destination directory and click **Next** to continue. Deleting the default target location and leaving an installation directory field empty stops you from continuing the installation process. The Installation wizard does not proceed when you click **Next**. Enter the required target directory to proceed to the next panel. Non-ASCII special characters are not supported in the name of the installation directory. Spaces are also not supported in the name of the installation directory.

The installer program for WebSphere Business Integration Server Foundation checks twice for required temporary space. The program checks once at the beginning of the installation before it copies a Java 2 SDK to the temporary directory to support the Installation wizard Java process. Later, the program checks for enough space to install Cumulative Fix 2 and the Cumulative Fix 1 for SDKs.

If not enough space is available, cancel the installation, allocate the 500 MB of temporary space that is required, and reinstall. The actual space required depends on the features that you are installing.

The installer program does not let you install the base product during an umbrella installation if sufficient space is not available to apply Cumulative Fix 2 and Cumulative Fix 1 for SDKs.

Suppose the installer program installs the base product and then runs into an error during the installation of the cumulative fix because of an insufficient amount of temporary space. In such a case, cancel the installation, allocate enough temporary space to install the cumulative fix, and restart the installation. The installer program picks up the installation where it left off, installing the cumulative fix to the base product, which you can select at the beginning of the installation.

If you have problems accessing the administrative console after installation, check the `installAdminConsole.log` file for a failure indication. Clean up the `/tmp` space and reinstall the administrative console using the `wsadmin` scripting facility.

If you must increase the `/tmp` allocation, stop the installation program, increase the allocation, and restart the installation.

If you select the embedded messaging feature and prerequisites are missing, the Installation wizard displays the `mq_prereq.log` error log and takes you back to the Installation type panel. Choose **Custom** installation and clear the embedded messaging feature to continue. The `mq_prereq.log` file is in the system temp directory.

33. Specify node information and click **Next**. Specify the node name and host name. Although the wizard inserts the machine name (of the installation platform) as the node name, you can specify any unique name. The node name is an arbitrary WebSphere Application Server-specific name that must be unique within a cell.

The host name is the network name for the physical machine on which the node is installed. The host name must resolve to a physical network node on the server. When multiple network cards exist in the server, the host name or IP address must resolve to one of the network cards. Remote WebSphere Application Server nodes use the host name to connect to and to communicate with this node. Selecting a host name that other machines can reach within your network is extremely important. Do not use the generic `localhost` identifier for this value.

If you define coexisting nodes on the same computer with unique IP addresses, define each IP address in the `/etc/hosts` file or in a domain name server (DNS) look-up table. WebSphere Application Server configuration files do not provide domain name resolution for multiple IP addresses on a machine with a single network address.

The value that you specify for the host name is used as the value of the `hostName` property in WebSphere Application Server configuration documents. Specify the host name value in one of the following formats:

- Fully qualified domain name servers (DNS) host name string, such as `xmachine.manhattan.ibm.com`
- The default short DNS host name string, such as `xmachine`
- Numeric IP address, such as `127.1.255.3`

The fully qualified DNS host name has the advantage of being totally unambiguous and also flexible. You have the flexibility of changing the actual IP address for the host system without having to change the WebSphere Application Server configuration. This value for host name is particularly

useful if you plan to change the IP address frequently when using Dynamic Host Configuration Protocol (DHCP) to assign IP addresses. A format disadvantage is being dependent on DNS. If DNS is not available, then connectivity is compromised.

The short host name is also dynamically resolvable. A short name format has the added ability of being redefined in the local hosts file so that the system can run WebSphere Application Server even when disconnected from the network. Define the short name to 127.0.0.1 (local loopback) in the hosts file to run disconnected. A format disadvantage is being dependent on DNS for remote access. If DNS is not available, then connectivity is compromised.

A numeric IP address has the advantage of not requiring name resolution through DNS. A remote node can connect to the node you name with a numeric IP address without DNS being available. A format disadvantage is that the numeric IP address is fixed. You must change the setting of the `hostName` property in WebSphere Application Server configuration documents whenever you change the machine IP address. Therefore, do not use a numeric IP address if you use DHCP, or if you change IP addresses regularly. Another format disadvantage is that you cannot use the node if the host is disconnected from the network.

34. Configure the sample business process container, if you selected it and click **Next** to continue. Specify values for the following fields:

**User ID to authenticate with the embedded messaging queue manager**

This field is the JMS user ID who authenticates the connection to the JMS provider. This user ID must have administration rights for the messaging service.

The JMS user ID must be less than or equal to 12 characters.

You can create the user ID later and add the user to the `mqm` user group. Or specify the root user as the value for the field:

root

**Password**

Type the password for the user you specified as the JMS user ID in the first field.

**Confirmation password**

Repeat the password for the user you specified as the JMS user ID in the first field.

**Security role for the business process system administrator**

This field is the security role mapping. Specify the user or group from the domain user registry that is mapped onto the role of Business Process Administrator. The value to use depends on the local settings. For example, you can specify that the Administrator group is to perform the security role on some systems.

The user registry can be the local operating system, Lightweight Directory Access Protocol (LDAP), or custom registry. The user or group specified must already exist in the user registry being used.

35. Review the summary information and click **Next** to install the product code or **Back** to change your specifications. When the installation is complete, the wizard displays the `install_root\logs\mq_install.log` installation log if you selected the embedded messaging feature and errors occur with its installation.
36. Review the `mq_install.log` installation log if it displays. Click **Next** to continue. The wizard displays the Registration panel.
37. Click **Next** to register the product, or clear the check box and click **Next** to register at a later time. The Registration panel is in English when the machine locale uses a double byte character set (DBCS) language.

You can register the product now by using the link on this panel or later, by using the Web address in the `install_root/prt/readme_prt.txt` file. The Web address in the file is encoded for your locale. A known problem for some locales corrupts the Web address so that it is similar to the following example. (The Web address is all one line in the file. The following example shows the address on two lines for clarity.)

```
http%3A%2F%2Fwww.ibm.com%2Fsoftware%2Fwebprt%2Fregister%2Fprodreg.nsf%  
2Fcontact%3F0penForm%26lang%3DENU%26pid%3D45P8842%26q2%3DWindows+2000
```

Use one of the following Web addresses if your *install\_root/prt/readme\_prt.txt* file is corrupt:

- <http://www.ibm.com/software/webprt/register/prodreg.nsf/contact?OpenForm&>
- <https://www6.software.ibm.com/reg/prt/prt-r>

The Installation wizard starts the First Steps tool.

If you are migrating a federated node as you install, close the First Steps tool. Migrated federated nodes have configuration differences that prevent you from using the First Steps tool.

38. Verify the success of the installer program by examining the Exit summary panel and the *install\_root/logs/wbisf/WAS.WBISF.install.log* file.

If you perform an umbrella installation of the base product or if you install new base product features, also examine the *install\_root/logs/log.txt* file. ISMP records a success message in the *WAS.WBISF.install.log* file: "INSTFIN: The installation is complete."

The logs are the only source of status information for a silent installation.

Look for severe errors that the installer records in the *WAS.WBISF.install.log* file in the installation root directory to verify that no file system or other unusual errors occurred during installation.

You can ignore the following error messages that might appear during installation of the base product in an umbrella installation:

```
WASBase, com.ibm.wizard.platform.aix.AixProductServiceImpl,  
    wrn, - WARNING:
```

```
Got invalid size of 0 for file:  
  /usr/WebSphere/AppServer/  
    config/cells/  
      BaseApplicationServerCell/  
        nodes/  
          DefaultNode/  
            spi.policy:
```

```
WASBase, com.ibm.wizard.platform.aix.AixRegistryServiceImpl,  
    wrn, AixRegistryServiceImpl:  
Error attempting to modify AIX VPD.
```

If the *log.txt* file and the *WAS.WBISF.install.log* file do not contain a record of any problems but problems exist, verify or troubleshoot the installation, as described in Troubleshooting the installation.

39. Click **Finish** to close the Installation wizard.
40. Restrict access to the */var/mqm/errors* directory and messaging logging files. After installing the embedded messaging feature, you must restrict access to the */var/mqm* directory and to log files that are needed for embedded messaging, such that only the *mqm* user or members of the *mqm* user group have write access. For detailed information, see Installing WebSphere embedded messaging as the JMS provider.
41. Install WebSphere Application Server 5.1 Cumulative Fix 3.

Always install the latest cumulative fixes as they are released. See Cumulative Fix Strategy for WebSphere Application Server V5.0 and V5.1 for more information.

This collection of fixes for Version 5.1 updates the WebSphere Application Server base product or the Network Deployment product to Version 5.1.0.3. Cumulative Fix 3 includes all of the interim fixes in Cumulative Fix 2 and other fixes that are required for some components.

Cumulative Fix 3 is available at the <http://www-1.ibm.com/support/docview.wss?uid=swg24006675> Web address.

You can find a list of currently recommended fixes at the WebSphere Business Integration Server Foundation V5.1 recommended interim fixes Web site.

42. Tune your system for performance. For best performance on any platform, see "Tuning performance" in the information center.

The Installation wizard configures the product. It is not necessary to perform further configuration at this time.

You have now successfully installed WebSphere Business Integration Server Foundation and the features that you selected.

## Uninstalling and reinstalling

See Uninstalling the product for information about uninstalling any WebSphere Application Server product.

If you uninstalled WebSphere Business Integration Server Foundation but left the embedded messaging feature installed, and now you want to reinstall the V5.1 product, see “Reinstalling V5.1 after uninstalling and leaving the embedded messaging feature installed” on page 356.

After uninstalling a WebSphere Application Server product, reinstalling into the same directory without first deleting all directory contents results in invalid XML configurations because of the retention of old files. Uninstall manually to delete all of the files so that you can reinstall with a clean system, as described in Manually uninstalling on AIX platforms.

Symptoms that you might experience if you reinstall without uninstalling manually include:

1. The **versionInfo.sh** command states that WebSphere Business Integration Server Foundation is installed but the product is not installed. Or the report might state that the base product is installed when it is not installed. Or the report might state that Cumulative Fix 2 is installed when it is not.
2. Specific directories might be missing in the installation root directory, such as the *install\_root/ProcessChoreographer* directory or the *install\_root/BRBeans* directory.

If you experience symptoms such as these, uninstall everything manually and reinstall. The installation is successful if you manually uninstall before reinstalling.

After manually uninstalling and before reinstalling with the embedded messaging component, look for the following directory: */var/mqm/log/WAS\_system\_name\_server\_name*. If this directory exists, confirm that the directory is empty and that the user, mqm, can open and write to it. If it is not accessible, the embedded messaging installation program throws the following error:

```
AMQ7064: Log path not valid or inaccessible is written in the
        createMQ.system_name_server_name.log file.
```

If this error occurs, the installation of the embedded messaging component fails.

## Miscellaneous tips for AIX platforms

Table 12. Installation and migration tips

Operating platform	Tip
AIX platforms	<p>AIX platforms</p> <ul style="list-style-type: none"> <li>• Avoiding corrupt display characters when installing V5.1 on AIX 5.2 in a Simplified Chinese locale</li> <li>• A core dump might occur when running WebSphere Application Server with DB2 V7.2 FP8 client in AIX 5.2</li> <li>• Avoiding a segmentation fault error when installing or uninstalling</li> <li>• Ignoring DBCS messages when you do not require DBCS support. Otherwise, install the necessary patches.</li> <li>• Navigating if the scroll bar disappears on the installation feature panel</li> <li>• Avoiding a DSAPI filter-loading error when the Lotus Domino Server starts</li> <li>• Uninstalling IBM WebSphere Application Server Enterprise might leave extraneous information in the server registries</li> </ul>
All platforms	All platforms
All Linux and UNIX platforms	All Linux and UNIX-based platforms



## Mounting a CD-ROM drive on AIX

This topic describes how to mount a CD-ROM drive as the root user on an AIX operating system platform.

This topic describes a procedure for using SMIT to mount a CD-ROM drive. Before using SMIT to mount a CD-ROM drive, try the following command:

```
# mount -rv cdrfs /dev/cd0 /cdrom
```

The cd0 device is the name assigned to your CD-ROM. Your system might use another device name. You can use `smit` to see the device name.

The `/cdrom` directory is the mount directory. If a CD-ROM drive has ever been mounted on your system, there is a mount directory created with `smit`. It might be a different directory than the `/cdrom` directory.

If the command was successful, you can unmount the CD-ROM drive with the following command:

```
# umount /cdrom
```

If you cannot determine the device name and the mount directory, use the procedure in this topic to mount the CD-ROM drive.

This topic describes mounting a local CD-ROM drive. This procedure assumes you are already logged on as root.

1. Insert the CD-ROM labeled, *Integration Server Disk 1 of 2* into the CD-ROM drive.
2. If the `/cdrom` directory does not already exist, enter the following command to create it:  

```
# mkdir /cdrom
```
3. Start SMIT by entering the following command:  

```
# smit
```
4. From the SMIT System Management menu, select **System Storage Management (Physical & Logical Storage)**.
5. Click **File Systems**.
6. Click **Add/Change/Show/Delete File Systems**.
7. Click **CDROM File Systems**.
8. Click **Add a CDROM File System**.
9. Click **List** and select **CD0** as the device name.
10. Enter `/cdrom` in the Mount Point field.
11. Click **OK**. The Output: field contains messages about any errors that can occur at this point in the procedure. If another device is already mounted on the mount point, the process fails.
12. Click **Done**.
13. Click **Cancel** to clear the Add CDROM File System dialog box.
14. Press **F12** to close SMIT or click **Exit > Exit SMIT**.
15. Enter the following command:  

```
# smit mountfs
```

The Mount a File System dialog box appears.
16. Click **List** and select the **CD0** CD-ROM device.
17. Type `/cdrom` in the DIRECTORY field.
18. Click **List** in the Type of File System field.
19. Click **cdrfs** as the file system type.
20. Click **yes** for the Set the Mount as Read-Only system field.
21. Click **OK**. A successful mount generates no errors in the Output: field.
22. Click **Done**.

23. Click **Cancel** to exit SMIT.

For more detailed instructions, consult your AIX documentation.

## Installing the Integration Server on HP-UX platforms

This topic describes how to install WebSphere Business Integration Server Foundation as the root user on an HP-UX operating system platform. If you back up the product CD-ROM, do so as root. Backup copies made from non-root users do not preserve the correct file attributes and do not work. This topic guides you through preparing for Integration Server, which includes choosing and installing the variety of options and features provided.

If you encounter a problem such as not having enough temporary space or not having the right packages on your system, cancel the installation, make the required changes, and restart the installation.

The installation image for the WebSphere Business Integration Server Foundation product is on two CDs. The installation CDs are platform specific. Each CD label identifies the platform for which it is designed to be used. The CDs for a particular platform should only be inserted and run from a CD drive that is mounted on the platform that is identified on the CD.

When you use an installation method that requires you to swap CDs, it is important that no application or window is accessing the CD. Otherwise, you might not be able to unmount one CD and mount the next one. Any of the following actions can lock a CD:

- Browsing a readme file on the CD with a browser
- Browsing any file on the CD with an editor
- Viewing the *Installation Guide* on the CD with Acrobat Reader
- Opening a command window and changing directories to the CD
- Accessing the CD from a telnet session
- Accessing the CD from any other process

This topic describes installing the Integration Server product, using the installation image on the two product CD-ROMs labeled, **Integration Server**. The Integration Server product package also contains CD-ROMs for installing the WebSphere Application Server Network Deployment product and the base WebSphere Application Server product.

This topic is available in Adobe PDF format, on the product CD-ROMs, and online in an information center that is available from the IBM WebSphere Application Server Web site at <http://publib.boulder.ibm.com/infocenter/ws51help/index.jsp>. When possible, access the most current version of this information by selecting the information center. The information center displays in the language of your machine locale.

The Launchpad tool lets you access the product overview, the `readme.html` file, and installation guides.

There is a known problem with the Launchpad that prevents it from using Netscape to open the documentation links. You can launch the following links directly from your browser:

### Button Link

#### Product Overview

<http://www.ibm.com/software/webservers/appserv/>

It is possible that your security options might prevent redirection, such as to the <http://www-306.ibm.com/software/info1/websphere/index.jsp?tab=products/appserv> Web site. If so, you can identify the IBM Web site as a trusted site to allow the redirection. For example, on Internet Explorer, add <http://www-306.ibm.com> to the list of Trusted Sites by selecting **Tools > Internet Options > Security (tab) > Trusted Sites**.



## Readme File

*CD-ROM mount point/readme/readme\_en.html*

## Installation Guide

*CD-ROM mount point/docs/InstallGuide\_en.PDF*

The *Installation Guide* is in Adobe PDF format. Viewing this document requires you to have Adobe Acrobat Reader, which is a free download from the Adobe Acrobat Web site.

If you use the Mozilla browser, some Launchpad links do not work. The Launchpad attempts to call the Netscape browser in the `/usr/bin/netscape` directory. Try a symbolic link to the Mozilla browser to fix the problem as shown in the following example:

```
ln -sf /usr/bin/mozilla /usr/bin/netscape
```

After using the Launchpad to view product documentation, perform the following procedure. The procedure includes several preliminary steps before actually launching the installer program.

1. Stop all WebSphere Application Server-related Java processes on the machine where you are installing the product.
2. Stop any Web server process such as the IBM HTTP Server, if you are extending the base product.
3. Provide adequate disk space.

The WebSphere Business Integration Server Foundation installer program installs Cumulative Fix 2 to the V5.1.0 base product or to the V5.1.0 Network Deployment product that the Integration Server extends. The cumulative fix leaves the service level of each product at the V5.1.0.2 level. If you have applied interim fixes that are not part of the cumulative fix, you must reinstall them. Installing the cumulative fix removes all interim fixes that you might have installed.

After the installation is complete, install Cumulative Fix 3 and any recommended fixes that are described at the WebSphere Business Integration Server Foundation V5.1 recommended interim fixes Web site.

The installer program also installs a cumulative fix from the *V5.1.0 Cumulative Fix 1 for SDKs* service offering. The cumulative fix updates the Java 2 platform Standard Edition for HP-UX software that IBM uses with the WebSphere Business Integration Server Foundation product and other V5.1 WebSphere Application Server products. The changes are to IBM additional libraries and to specific override JAR files, such as the one to update the XERCES XML parser. The changes do not raise the service level beyond the 1.4.1 level but are important to ensure that migration and interoperability function correctly.

The Integration Server, Cumulative Fix 2, and Cumulative Fix 1 for SDKs require the following disk space:

### **1650 MB for the `/opt/WebSphere/AppServer` or the `/opt/WebSphere/DeploymentManager` directory**

The installation root directory includes either the base product or the Network Deployment product. The installation program extends the installation root directory with WebSphere Business Integration Server Foundation software.

### **500 MB for the `/tmp` directory**

The temporary directory is the working directory for the installation program. Some components of the installation process require a specific amount of free space in the `/tmp` directory.

Although you might see an installation message for an incremental amount of free space that is less than 500 MB, the overall cumulative requirement for free space in the `/tmp` directory is 500 MB.

For example, if you do not have enough free space to start the installation, a message notifies you that you must have 200 MB of free space in the `/tmp` directory. The 200 MB of free space is what you must have when you have already installed Cumulative Fix 2 to an existing base product or to an existing Network Deployment product.

The 500 MB of free space is required to install the base product, Cumulative Fix 2, and the Integration Server product in the same *umbrella* installation procedure. An umbrella installation installs the base product as it installs Integration Server software.

Installing Integration Server software on the Network Deployment product also installs Cumulative Fix 2 (V5.1.0.2), which increases the amount of space required over the 200 MB in the message.

Verify that you have 500 MB of free space to avoid problems.

A second message about free space occurs when less than 4 MB of free space remains after starting the installation. The InstallShield for MultiPlatforms (ISMP) program displays a message about using the `-is:tempdir` parameter to identify an alternate temporary space directory.

Ignore any `-is:tempdir` message. The `-is:tempdir` parameter is not supported. Cancel the installation, allocate a total of 500 MB of free space in the `/tmp` directory, and start the installation again.

## 2150 MB

The total amount of space required for both directories is 2150 MB. A significant amount of the required space is temporarily required during installation and is released after installation. If you have already installed the cumulative fix on either the base product or the Network Deployment product that you are extending, the space requirement is reduced.

The Installation wizard displays required space for individual features on the Feature selection panel. The Installation wizard also warns you if you do not have enough space to install the product and the cumulative fixes.

If you plan to migrate applications and the configuration from a previous version, verify that application objects have available disk space. As a rough guideline, plan for space equal to 110 percent of the size of the application objects:

- **For Version 4.0.x:** The size of enterprise archive (EAR) files
- **For Version 5.0.x:** The size of EAR files

4. Define the user groups and the user needed for the embedded messaging feature.
  - a. Use the System Administration Manager (SAM) to create the **mqm** and **mqbrkrs** user groups.
  - b. Use SAM to create the **mqm** user.
  - c. Use SAM to add the **mqm** and **root** users to the **mqm** group.
  - d. Use SAM to add **root** to the **mqbrkrs** group.

The recommended user ID for running the JMS server process is **root**. If you do run the JMS server process under another user ID, add that user ID to the **mqm** and **mqbrkrs** groups. User IDs longer than 12 characters cannot be used for authentication with the embedded WebSphere JMS provider.

The **mqm** user starts the JMS server for general JMS support and the WebSphere embedded broker for WebSphere Application Server topic connections.

Put the user groups into effect when you next start WebSphere Business Integration Server Foundation. For example, either log off and on again with the process user ID or open a new shell in which to start WebSphere Business Integration Server Foundation.

Use the **id** command or the **groups** command to see defined groups for **root**. If **mqm** and **mqbrkrs** are not in the list that is returned, you cannot install the embedded messaging feature:

```
[root@was2 root]# id
uid=0(root) gid=0(root)
groups=0(root),1(bin),2(daemon),
3(sys),4(adm),6(disk),10(wheel),500(mqm),501(mqbrkrs)
```

```
[root@was2 root]# groups
root bin daemon sys adm disk wheel mqm mqbrkrs
```

5. Log in appropriately to pick up the secondary user groups, **mqm** and **mqbrkrs**, for **root**. Use **ssh** instead of **telnet** to log in or run the following command after logging on:

```
su -
```

- Allocate adequate disk space for the embedded messaging feature if you are planning to install the feature. The installation locations for the embedded messaging feature are fixed as shown in the following table, which lists the locations for the base messaging functions and the messaging broker functions for publish/subscribe messaging.

Table 13. Space requirements for the embedded messaging feature on HP-UX

Component	Base code	Broker code	Base data	Broker data
Path	/usr/ mqm	/usr/ opt/ wemps	/var/ mqm	/var/ wemps
Server and client subfeature	40 MB	100 MB	8 MB	5 MB
Client subfeature	15 MB	15 MB	5 MB	N/A

- Prepare to install the embedded messaging feature. The embedded messaging feature is based on the IBM WebSphere MQ product. The feature and the product each provide a Java message service (JMS) function that supports queues for point-to-point messaging and topics for publish and subscribe messaging. You can install WebSphere Business Integration Server Foundation with the embedded messaging feature with or without the WebSphere MQ product on the same machine. To support both the embedded messaging feature and the WebSphere MQ product on the same machine, the WebSphere MQ product must be at a certain fix level and must have several of its features installed. If you already have WebSphere MQ installed, you can configure it as the JMS provider. Otherwise, you can install the embedded messaging feature during the installation of the Integration Server or install the WebSphere MQ product or another JMS provider after you install the Integration Server. Even though you might decide now to install only the embedded messaging feature, you can install the WebSphere MQ product later and use the IBM WebSphere MQ product as the JMS provider instead.

- Verify that you have upgraded to WebSphere MQ 5.3 with the CSD04 update to install embedded messaging on a machine where you already have WebSphere MQ installed. The WebSphere Business Integration Server Foundation package includes copies of the WebSphere MQ 5.3 and Event Broker installation images, with restricted licensing. Use the MQ CD-ROMs to install the required MQ features or WebSphere MQ 5.3 for use with Integration Server.

Determine if your WebSphere MQ 5.3 installation is at the required level by running the **mqver** utility provided by WebSphere MQ.

The required level as indicated by mqver is shown below:

```
Name:      WebSphere MQ
Version:   530.4 CSD04
...
```

- Verify that you have installed the required WebSphere MQ 5.3 features to install embedded messaging on a machine where you already have WebSphere MQ installed. Verify that you have installed the following features:
  - When installing the embedded messaging server and client feature, the required MQ features are *Server and Java messaging*.
  - When installing the embedded messaging client feature, the required MQ feature is *Java messaging*.

If you attempt to install the embedded messaging feature when WebSphere MQ is already installed, the level of WebSphere MQ must be Version 5.3 with the required MQ features. Otherwise, the installation of the embedded messaging feature fails with prerequisite check errors.

- Create and mount a journalized file system called `/var/mqm` for your messaging working data. Use a partition strategy with a separate volume for embedded messaging or WebSphere MQ data to isolate system activity from the potentially high volume of messaging work that can build up in the `/var/mqm` directory.
- Create separate file systems for log data in the `var/mqm/log` directory and error files in the `var/mqm/errors` directory. Store log files on a different physical volume from the embedded

messaging queues, which are in the `/var/mqm` directory. This ensures data integrity in the case of a hardware failure. If you are creating separate file systems, allow the following minimum free space:

**30 MB** `/var/mqm`

**20 MB** `/var/mqm/log`

**4 MB** `/var/mqm/errors`

The `/var` file system stores all the security logging information for the system and stores the temporary files for e-mail and printing. Therefore, it is critical that you maintain free space in `/var` for these operations. If you do not create a separate file system for messaging data, and `/var` fills up, all security logging stops on the system until free space is available in `/var`. Also, e-mail and printing do not work without some available free space in `/var`.

You have the same options for creating file systems for the embedded messaging feature as you do for WebSphere MQ. For example, if you cannot install the embedded messaging options in the required file system (for example, if it is too small), you can do one of the following *before* installing the Embedded Messaging options:

- Create and mount a new file system for the installation directory.
- Create a new directory anywhere on your machine, and create a symbolic link from the required installation directory to the new directory. For example:

```
mkdir /bigdisk/mqm
ln -s /bigdisk/mqm /usr/mqm
```

## 12. Set kernel values to support Integration Server.

Several HP-UX kernel values are typically too small for the product and the embedded messaging feature. Starting the internal JMS server or client with insufficient kernel resources produces a First Failure Support Technology (FFST) file in the `/var/mqm/errors` directory.

Before installing embedded messaging, review the machine configuration and, if needed, set appropriate HP-UX kernel settings.

Queue managers are generally independent of each other. Therefore system kernel parameters, for example `shmmni`, `semmni`, `semmns`, and `semmnu` need to allow for the number of queue managers in the system.

To set kernel parameters, perform the following steps:

- a. Log into the host machine as root.
- b. Determine the physical memory, which you must know to avoid setting certain kernel parameters above the physical capacity:
  - 1) Start the HP-UX System Administration Manager (SAM) utility.
  - 2) Select **Performance Monitors > System Properties > Memory**.
  - 3) Note the value for Physical Memory and click **OK**.
  - 4) Exit from the SAM utility.
- c. Set the `maxfiles` and `maxfiles_lim` parameters to at least 4096. (The following table recommends 8000 and 8196, respectively. You must first edit the `/usr/conf/master.d/core-hpux` file, to allow the SAM utility to set values greater than 2048:
  - 1) Open the file `/usr/conf/master.d/core-hpux` in a text editor.
  - 2) Change the line, "`*range maxfiles<=2048`" to "`*range maxfiles<=60000`"
  - 3) Change the line, "`*range maxfiles_lim<=2048`" to "`*range maxfiles_lim<=60000`"
  - 4) Save and close the file. Old values might be stored in the `/var/sam/boot.config` file. Force the SAM utility to create a new `boot.config` file:
    - a) Move the existing version of the `/var/sam/boot.config` file to another location, such as the `/tmp` directory.
    - b) Start the SAM utility.
    - c) Select **Kernel Configuration > Configurable Parameters**. When the Kernel Configuration window opens, a new `boot.config` file exists.

Alternatively, rebuild the `boot.config` file with the following command:

```
# /usr/sam/sbin/getkinfo -b
```

- d. Set new kernel parameter values:

- 1) Start the SAM utility.
- 2) Select **Kernel Configuration > Configurable Parameters**.
- 3) For each of the parameters in the following table, perform this procedure:
  - a) Highlight the parameter to change.
  - b) Select **Actions > Modify Configurable Parameter**.
  - c) Type the new value in the **Formula/Value** field.
  - d) Click **OK**.

Some kernel values for WebSphere Application Server IBM DB2 on the same machine, are higher than those shown in the following table.

- Recommended HP-UX kernel configuration parameters for DB2 Version 8
- Recommended HP-UX kernel configuration parameters for DB2 V7

Typical kernel settings for running WebSphere Application Server appear in the following table:

Parameter	Value
dbc_max_pct	25
maxdsiz	805306358
maxdsiz	2048000000 (when the base and Network Deployment products are on one machine)
maxfiles_lim	8196 (Change this one before maxfiles.)
maxfiles	8000
maxssiz	8388608
maxswapchunks	8192
max_thread_proc	3000
maxuprc	512
maxusers	512
msgmap	2048
msgmax	65535
msgmax	131070 (when the base and Network Deployment products are on one machine)
msgmnb	65535
msgmnb	131070 (when the base and Network Deployment products are on one machine)
msgmni	50
msgseg	32767
msgssz	32
msgtql	2046
nfile	58145
nflocks	3000
ninode	60000
nkthread	7219
nproc	4116
npty	2024
nstrpty	1024
nstrtel	60
sema	1 (with embedded messaging)
semaem	16384 (with embedded messaging)

Parameter	Value
semmap	514
semmni	2048
semmns	16384 (with embedded messaging)
semmnu	1024
semume	200
semvmx	32767 (with embedded messaging)
shmmax	2147483647
shmem	1 (with embedded messaging)
shmmni	1024
shmseg	1024
STRMSGSZ	65535

e. Select **Actions > Process New Kernel**.

f. Click **Yes** on the information window to confirm your decision to restart the machine.

Follow on-screen instructions to restart your machine and to enable the new settings.

g. If you plan to redirect displays to non-HP machines, do the following before running the WebSphere Application Server installation wizard:

1) Issue the following command to obtain information on all public locales accessible to your application:

```
# locale -a
```

2) Choose a value for your system from the output that is displayed and set the LANG environment variable to this value. Here is an example command that sets the value of LANG to en\_US.iso88591

```
# export LANG=en_US.iso88591
```

13. Verify that prerequisites and corequisites are at the required release levels. Although the Installation wizard checks for prerequisite operating system patches with the prereqChecker application, review the prerequisites on the IBM WebSphere Application Server supported hardware, software, and APIs Web site if you have not already done so. Refer to the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

Some operating systems that were not supported at the time that this product was shipped on CD-ROM might now be supported. You might receive a message from the prereqChecker program that an operating system is not supported when, in fact, the operating system is supported.

Always consult the IBM WebSphere Application Server supported hardware, software, and APIs Web site to determine whether your operating system is supported when you receive a message from the prereqChecker program. The Web site lists all supported operating systems and the operating system fixes and patches that you must install to have a compliant operating system. After confirming that your operating system is supported and that you have installed all necessary patches, you can click **Next** to continue an installation when you receive an error message from the prereqChecker program.

#### **Ignoring a prerequisite checker error for a patch when a superset of the patch has been installed.**

If you apply a superset patch that includes a specific patch that the prerequisite checker program requires, you can ignore the message from the installer program and continue the installation. You can always continue the installation whenever you see an error message about a missing prerequisite. It is your option to ignore the messages and continue the installation. Although the list of prerequisite patches that the installer program checks is extensive, the list does not include all superset patches.

For example, the installer program checks for patch PHCO\_29109. The HP-UX Web site recommends that you install a superset patch, PHCO\_29960, instead of PHCO\_29109. After installing the patch and rebooting the machine, reinstalling the base WebSphere Application Server during an



umbrella installation of WebSphere Business Integration Server Foundation results in the same message about the missing PHCO\_29109 prerequisite. You can ignore the error because you know that you have installed a superset patch.

14. If you have uninstalled WebSphere Application Server Enterprise Edition Version 4.1, remove any entries from the `/usr/bin/jitk.db` file. Remove any remaining artifacts from an uninstalled Enterprise Edition V4.1 system to prevent the display of the Coexistence panel or the Migration panel during installation.

The Installation wizard for WebSphere Business Integration Server Foundation might display the Migration panel or the Coexistence panel even though you have uninstalled WebSphere Application Server Enterprise Edition Version 4.1. You can prevent the Installation wizard from recognizing a previously deleted version of Enterprise Edition by removing the following entry from the `/usr/bin/jitk.db` file:

```
WebSphere Enterprise Edition Server 4.1
```

Remove other Version 4.x entries for WebSphere Application Server products that are no longer on your system.

15. Verify the system **cp** command when using emacs or other freeware.

If you have emacs or other freeware installed on your HP-UX system, verify that the system **cp** command is being used.

- a. Type `which cp` at the command prompt before running the installation program for the WebSphere Business Integration Server Foundation product.
- b. Remove the freeware directory from your PATH if the resulting directory output includes freeware. For example, if the output is similar to this `/opt/freeware/bin/cp` message, remove the directory from the PATH.
- c. Install the WebSphere Business Integration Server Foundation product.
- d. Add the freeware directory back to the PATH.

If you install with a **cp** command that is part of a freeware package, the installation might appear to complete successfully, but the Java 2 SDK that the product installs might have missing files in the `install_root/java` directory.

Missing files can destroy required symbolic links. If you remove the freeware **cp** command from the PATH, you can install the Integration Server product successfully.

Perform the following step to verify that the Java 2 SDK is working correctly.

16. Verify the Java 2 SDK on the WebSphere Business Integration Server Foundation CD. Perform the following steps to verify that the Java 2 SDK on the product CD-ROM is working correctly.

- a. Change directories to the `/hpux/WAS/jdk/java/bin` directory on the product CD-ROM.

For example:

```
cd /mnt/hpux/WAS/jdk/java/bin
```

- b. Verify the Java 2 SDK version.

Type the following command:

```
./java -version
```

The command completes successfully with no errors when the Java 2 SDK is intact.

17. Unfederate a base node if you require certain WebSphere Business Integration Server Foundation features.

If you are planning to install WebSphere Business Integration Server Foundation on a federated base node, the installer program does not allow you to install certain features. These Integration Server features are always hidden and deactivated on a federated base node:

- Samples
- Embedded messaging

Unfederate the base node. When you install the Integration Server product you can select any Sample features or the embedded messaging server and client feature. You can refederate the base node after the installation is complete.

A federated base node must have both the administrative console feature and the administrative scripting feature to install the following Integration Server features:

- Business Rule Beans
- Process choreographer

Otherwise the two features are hidden and deactivated when installing Integration Server on a federated base node.

Unfederate the base node. When you install the Integration Server product you can select the Business Rule Beans feature or the process choreographer feature. You can refederate the base node after the installation is complete.

18. Select the Installation wizard method or the silent installation method but do not start the installation yet. The installer program has two interfaces, the Installation wizard and a silent command-line installation.

### Performing the installation with the wizard

You can start the Installation wizard in two ways. The default installation method is to open a command window to a read/write directory, issue the fully qualified command to start the Launchpad tool, and click the **Install the product** option. This option launches the Installation wizard in the language of your machine locale unless there is no translation for your locale, in which case you receive the English version. A short delay occurs before the ISMP wizard displays. You do not need to click the Install the product option more than once to cause the wizard to display. The delay is particularly noticeable on x-windows platforms.

You can also start the Installation wizard using the `/cdrom/hpux/install` command, where `/cdrom` is the mount point for the product CD-ROM and `hpux` is the platform directory. Start the installation from a read/write location and not from the CD-ROM.

The WebSphere Business Integration Server Foundation installer program applies a cumulative fix to the V5.1.0.0 base product or V5.1.0.0 Network Deployment product that the Integration Server extends. The cumulative fix leaves the service level of each product at the V5.1.0.2 level. If you have applied interim fixes that are not part of the cumulative fix, you must reinstall them. Installing the cumulative fix removes all interim fixes that you might have installed.

The Launchpad copies certain files to your disk drive to avoid locking the CD during the installation, which requires you to change CDs. Expect a slight delay as you open the Launchpad while it copies the readme files and the installation document to disk.

### Performing a silent installation

You can also perform a silent installation using the `-options setup.response` parameter (or the `-options setup_nd.response` parameter for use with the Network Deployment product) with the command method:

```
fully_qualified_CD_pathname/install  
-options fully_qualified_HDD_pathname/setup.response
```

```
# /cdrom/hpux/install -options /tmp/setup.response
```

Start the silent installation with a fully qualified path to the options response file. Otherwise, the Installation wizard starts. Start the silent installation from a read/write location and not from the CD-ROM or another read-only directory.

A silent installation causes the installation program to read your responses from the options response file, instead of from the wizard interface. You must customize the *response files* before installing silently.

After customizing one of the files, you can issue the command to silently install. After issuing the command, the following text displays:

```
# .....  
.InstallShield Wizard  
  
Initializing InstallShield Wizard...  
  
Searching for Java(tm) Virtual Machine...
```



The silent installation runs without displaying status to the window. If you copy both CDs to your disk drive, press **Enter** when the installation is complete to return to the command prompt. If you copy disk 2 only to your disk drive and you start the installation by issuing a fully qualified **install** command that refers to disk 1 in the CD drive, you can press **Enter** at any time to return from the background job to the command prompt. For more information, see the description of the asynchronous command line at the end of the next step.

You can change the `-W launchPRTBean.active` option to display the Registration panel to indicate the completion of a silent installation on a local system with a graphical user interface.

To determine the status of the silent installation, review the installation logs in the `install_root/logs` directory or in the `/tmp` directory.

Silent installation is particularly useful if you install the product often.

The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard. Review the description of the `setup.response` file and the `setup_nd.response` file for more information. Comments in each file describe how to customize their options.

19. Select one of the four installation methods for installing from the two-CD installation image. The installation image is on two CD-ROMs. The cumulative fixes are on disk 2. Although four methods exist for installing the product from the two CD-ROMs, the recommended Method 1 begins with the next step in the overall procedure.

The installation CDs are platform specific. Each CD label identifies the platform for which it is designed to be used. The CDs for a particular platform should only be inserted and run from a CD drive that is mounted on the platform that is identified on the CD.

Plan to start the installation from a read/write location and not from the CD or a read-only directory. Issue a command with a fully qualified path name to the install program on the CD. Do not change directories to the CD drive to issue a command that uses a relative, local path.

The following description provides an overview of all four methods.

**Method 1:** This method is recommended when using the Installation wizard to install WebSphere Business Integration Server Foundation. This method of installing does not support silent installations.

- a. Insert disk 1.
- b. Mount the CD-ROM drive.
- c. Unmount disk 1 at the prompt.
- d. Insert and mount disk 2.
- e. Identify the location of disk 2 (which includes the `WAS_update` directory).
- f. Continue the installation.

After the installation wizard reads the cumulative fixes from disk 2, the wizard displays a prompt for disk 1:

- a. Unmount disk 2.
- b. Insert and mount disk 1.
- c. Continue the installation.

Verify that no other windows or applications access the CD-ROM drive. If any process accesses the CD-ROM, you might not be able to unmount one disk and mount the next one.

To begin installing with this method, go to the next step in the overall installation.

### Other installation options

The next few steps in the overall procedure assume that you are using the recommended method of installing. However, three other methods exist for installing from the two CDs. Each method supports both the Installation wizard method of installing and the silent installation method.

- **Method 2:** This method copies disk 2 to a specific default location on the hard drive and does not require you to switch disks.

This method of installation does not require you to switch disks. This method is recommended for installing silently:

- a. Open a shell window and log on as the root user. Use the same shell window throughout the installation procedure.
  - b. Insert disk 2.
  - c. Mount a CD-ROM drive.
  - d. Copy the data from the CD-ROM to the /tmpdirectory using parameters to maintain symbolic links as shown in the following example:
 

```
cp -frp /cdrom/hpux/WAS_update /tmp
```
  - e. Unmount disk 2 and mount disk 1 to continue the installation. Prompts to switch disks do not occur.
- **Method 3:** Create the *CDROM2* environment variable to identify the location of disk 2. The location of disk 2 can be another CD-ROM mount point or a disk location where you copy the data. The installation proceeds without prompts for either disk. This method of installing also supports silent installations:
    - a. Open a shell window and log on as root. Use the same shell window throughout the installation procedure. The CDR0M2 environment variable is only available to the current shell window.
    - b. Insert disk 2 into a second CD drive.
    - c. Mount the second CD drive as cdrom2.
    - d. Define the CDR0M2 environment variable with the following commands:
 

```
CDROM2=/cdrom2/hpux
export CDR0M2
```
    - e. Unmount disk 2.
    - f. Insert disk 1 in the first CD drive to continue the installation. Prompts to switch disks do not occur.
  - **Method 4:** Copy both CDs to any directory and start the installation from that directory. The installation proceeds without prompting for either disk. This method of installing also supports silent installations:
    - a. Open a shell window and log on as root. Use the same shell window throughout the installation procedure.
    - b. Insert disk 1.
    - c. Mount the CD-ROM drive.
    - d. Copy disk 1 to any directory. The commands in the following example create and use the /tmp/wbisf51 directory. Use the following **cp** command parameters to maintain symbolic links:
 

```
cd /tmp
mkdir wbisf51
cp -frp /cdrom/* /tmp/wbisf51
```
    - e. Unmount disk 1.
    - f. Insert disk 2 and mount the drive.
    - g. Copy the CD to the same directory:
 

```
cp -frp /cdrom/* /tmp/wbisf51
```
    - h. Start the installation with the **/tmp/wbisf51/hpux/launchpad.sh** command or the **/tmp/wbisf51/hpux/install** command to continue the installation. Prompts to switch disks do not occur.
    - i. Skip the next two steps in the overall procedure to continue the installation.

### Asynchronous and synchronous command lines

After running the **install** command, the command line returns asynchronously. Because of the need to support a two-CD installation, it is not possible to run the **install** command synchronously for Methods 1, 2, and 3. A synchronous **install** command returns the command line after the installation is complete.

Because you can switch CDs in the middle of the installation, the installation process and its children processes all run as background processes. After running the **install** command, the command line returns immediately. Do not misinterpret this to mean that the installation has finished. Although the command line returns, either the Installation wizard or a silent installation might still be in progress. Confirm the successful completion of the Installation wizard by viewing the Summary panel. Confirm the successful completion of a silent installation (or the Installation wizard) by examining the *install\_root/logs/WAS.WBISF.install.log* file for the following message:

```
INSTFIN: The installation is complete.
```

Method 4 is the exception to the asynchronous behavior. If you copy both CDs to any directory and start the installation from that directory, the installation proceeds without prompting for either disk. The installer program does support a synchronous command line when installing from a disk drive. The command line returns after the installation is complete.

### Installing with a network file system mount

When installing from a drive mounted on a network file system (NFS), use NFS client and server platforms with identical versions of the operating system and a well-tuned NFS, if possible. For example, when installing on an HP-UX 11iv1 machine, the recommended NFS server is also an HP-UX 11iv1 machine.

If you must copy CD images for one platform to an NFS disk on another operating system platform, use a command that preserves symbolic links. For example, on an AIX platform use the **cp -hrp** command to copy data from an HP-UX disk and preserve the symbolic links. Without the **-h** option, the **cp** command on an AIX platform attempts to resolve symbolic links when copying an HP-UX disc instead of preserving the links.

Even with the **-h** option, the **cp** command on a Solaris platform does not preserve symbolic links when copying an HP-UX disk. On a Solaris platform, use the **tar -cvf** command to copy data from an HP-UX disk and preserve the symbolic links.

Consult the man page for the copy command on the NFS system to understand how the platform supports copying symbolic links.

Because many NFS incompatibilities can exist among various platforms, do not use a drive mounted on a network file system to install from one operating system platform to another without first verifying that the NFS configuration is robust. For example, if your mounted CD is */mnt*, issue the following command to see if you have an NFS problem:

```
unzip -l /mnt/hpux/WAS/setup.jar
```

The proper output from the command lists all the files in the *setup.jar* file without error. If you encounter problems in running the command, verify that your */etc/exports* file includes the *no\_root\_squash* option.

See Troubleshooting the installation for more information about symptoms you can experience when installing with a faulty NFS mount. Contact your system administrator for help if you continue to have NFS problems.

### Recovering from a failed installation

If the installation program cannot locate the *WAS\_update* directory from disk 2, the installation program fails immediately. The immediate failure leaves the *WAS.WBISF.install.log* file only in the */tmp* directory. Normally, the installation program creates installation logs in the *install\_root/logs/wbisf* directory.

In some instances, such as the one where the *WAS\_update* directory does not exist, the installation program fails before it can copy the log files from the system temporary directory to the */logs* directory. If you cannot find the installation log files in the *install\_root/logs/wbisf* directory, look in the system temporary directory. Correct any problems and reinstall.

If you do not copy the *WAS\_update* directory correctly from disk 2 to the */tmp* directory or if you use the *CDROM2* variable incorrectly, error messages might exist in the *was\_update\_apply.err* file and in the *was\_update\_apply.out* file in the *install\_root/logs/wbisf* directory. Correct any problems and reinstall.

The installer program might prompt for disk 2 if it cannot locate disk 2 in the /tmp directory or at the location specified by the CDRROM2 variable. In such a case, insert disk 2 and continue the installation. If the application of Cumulative Fix 2 fails, check the logs for more information. The solution might be as simple as rerunning the installation after selecting a different installation option:

- Method 1: Using the prompts and switching CDs
- Method 2: Copying the second disk to the /tmp directory
- Method 3: Using the CDRROM2 variable to identify the location of disk 2
- Method 4: Copying both CDs to the hard drive and running the installation from the hard drive

Using a second method can be successful after a failed first attempt using a different method.

20. Open a shell window and mount the product CD-ROM labeled, *Integration Server Disk 1 of 2*. Use the same shell window throughout the installation procedure. Verify that you are in a read/write directory and not the CD-ROM directory or another read-only directory before you start the installation.
21. Start the installation with the `/cdrom/hpux/launchpad.sh` command, where /cdrom is the mount point for the product CD-ROM and hpux is the platform directory on the CD-ROM. You can also start the installation with the `/cdrom/hpux/install` command:

```
# /cdrom/hpux/install
```

The readme link in the Launchpad is to the `readme.html` file in the CD root directory. The `readme` directory off the root of the CD has a more detailed readme file. The *Getting Started* document that contains installation information is in the `docs` directory on the CD. You can download the current version of the *Getting Started* document from the Library Web page.

The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard. Review the description of the `setup.response` file and the `setup_nd.response` file for more information. Comments in each file describe how to customize the options.

22. Click **Next** to continue. The license agreement appears for you to read.
23. Click the radio button beside the **I accept the terms in the license agreement** message if you agree to the license agreement and click **Next** to continue. After you accept the licensing terms, the Installation wizard checks for prerequisites and for previous versions, with which it can either migrate or coexist.

As the WebSphere Business Integration Server Foundation product version changes, its prerequisites and corequisites change. It is probably necessary to update your database, Web server, Software Development Kit (SDK), and other software.

As mentioned in the introduction to this topic, the Integration Server product can install the base WebSphere Application Server product. The base product simplifies migrating product prerequisites, by providing the option to install a complimentary Java 2 SDK on your supported operating system. You can uninstall back-level prerequisites and let the Installation wizard install current versions.

If the wizard finds a previous version of WebSphere Application Server, it prompts you to migrate applications and the configuration from the previous version, or to coexist with it. If it finds more than one previous version, the Installation wizard lists them for you to select which one to migrate.

**Migrating or coexisting with an existing WebSphere Application Server node that HP-UX does not recognize.**

In some cases, the InstallShield for MultiPlatforms (ISMP) program does not detect a previously installed version of WebSphere Application Server because of a failure to read the registry keys on HP-UX. You can force the migration and coexistence panel to display, by starting the installation with an option on the `/cdrom/hpux/install` command.

For example, use this command:

```
/cdrom/hpux/install  
-W showPreviousVersionDetectedPanel.active="true"
```

You can also force the appearance of the coexistence panel to change conflicting port number assignments. For example, force the coexistence panel to appear using this command:

```
/cdrom/hpux/install
-W showCoexistencePanel.active="true"
```

On either panel, identify the location of the existing product instance that is not being recognized.

### **Migrating Enterprise V5.0.2 during an umbrella installation of WebSphere Business Integration Server Foundation**

There are always two ways to install Integration Server and migrate the configuration of an existing Enterprise system:

- Install the base WebSphere Application Server V5.1 product and do not select migration. Then install Integration Server to extend the base product and select migration during the Integration Server installation.
- Do not install the base WebSphere Application Server V5.1 product before you install Integration Server. When you install Integration Server, select the umbrella installation of the base product by selecting to install a new instance of the base product on the installation panel that lets you select a product to extend. Select the migration option during the Integration Server installation.

On HP-UX, you must install and migrate using the umbrella installation method. The installShield wizard is not always able to recognize an existing base product installation because of registration problems with the HP-UX native registry. The umbrella installation and migration scenario works and is the preferred migration path for HP-UX platforms.

Use the same cell name when migrating Network Deployment from V5.0.x to V5.1.x. If you use a different cell name, federated nodes cannot successfully migrate to the Network Deployment V5.1.x cell.

You can use a different node name, if you prefer, when migrating Network Deployment from V5.0.x to V5.1.x. However, you must use the administrative console after installation, to change the Secure Sockets Layer (SSL) settings that mention the node name.

24. Install the administrative console extensions on the Network Deployment product or the programming model extensions on the base WebSphere Application Server product, when both products are installed on the same machine. If you have both the base WebSphere Application Server product and the Network Deployment product on the same machine, the Installation wizard for the Integration Server product displays a panel for you to select the part of the Integration Server product to install.

When no product exists on the machine, the Installation wizard prompts you to identify an installation location for an umbrella installation of the base product, Cumulative Fix 2, Cumulative Fix 1 for SDKs, and the Integration Server.

25. Install additional features or install another instance of the Integration Server product when a previous installation of the same level product exists. When the installer program detects a previous installation at the same product level, a panel appears to let you add features to the existing installation or perform a new installation to another directory. When adding features, previously installed features are checked and grayed out with the term **(Installed)** at the end of the feature name.

You can add Integration Server features to Integration Server on an unfederated base node or to Integration Server on a deployment manager node at any time, by running the Installation wizard again and choosing to add features.

If you are installing WebSphere Business Integration Server Foundation on a federated node, the installer program does not allow you to install certain features. These Integration Server features are always hidden and deactivated on a federated base node:

- Samples
- Embedded messaging

Integration Server features that are not grayed out are available for installation on a federated base node. You do not have to unfederate the base node to add available Integration Server features.

If the federated base node does not have both the administrative console feature and the administrative scripting features, these additional Integration Server features are hidden and deactivated:

- Business Rule Beans



- Process choreographer

Federated nodes must be unfederated before adding base product features to avoid conflicts while the deployment manager owns the configuration of the base node. To install any of these deactivated features, you must perform the following procedure.

Use the **backupConfig** command to save the Network Deployment configuration so that you can restore the configuration if necessary. Although you can use the **backupConfig** command to save the configuration, the **restoreConfig** command restores the configuration without any features you add to the base node. However, you can refer to the saved configuration after adding features and adding the base node back to the cell. Refer to the saved configuration as you use the administrative console of the deployment manager to reconfigure the base node.

- Cancel the installation.
- Copy configuration files if you installed the Integration Server product on a federated base node after the base node was federated. If you installed the Integration Server product on an unfederated base node or before the base node was federated, you can skip this step. Copy the following files on the base node from the *install\_root/config/cells/cellname/nodes/nodename/servers/server1/* directory to the *install\_root/config/backup/base/cells/cellname/nodes/nodename/servers/server1/* directory:
  - server-pme.xml
  - server-pme502.xml
  - server-pme51.xml
  - resources-pme.xml
  - resources-pme502.xml

Copy the following files on the base node from the *install\_root/config/cells/cellname/nodes/nodename/* directory to the *install\_root/config/backup/base/cells/cellname/nodes/nodename/* directory:

  - resources-pme.xml
  - resources-pme502.xml
- Unfederate a federated base product node with the **removeNode** command. Removing the base node from the cell also removes the configuration for the base node, which resides at the cell level.
- Use the update installer program to uninstall any interim fixes or fix packs that you installed after installing the Integration Server product.
- Log off and back on.
- Launch the Integration Server installation program again.
- Install the new features that you require instead of installing a new product instance.

Continue the installation by performing the remaining steps in the overall procedure. After completing the installation, plan to perform the following steps:

- Use the update installer program to reinstall any interim fixes or fix packs that are available.
 

If you are updating a node that you intend to federate, install only fix packs and interim fixes that are installed on the deployment manager node. The deployment manager must be at the highest fix level in the cell.

When attempting to federate a WebSphere Business Integration Server Foundation node into a deployment manager cell that does not have the Integration Server installed, you are prompted to install the Integration Server extensions before proceeding. The WebSphere Business Integration Server Foundation code installs Cumulative Fix 2 (5.1.0.2) for the deployment manager and also installs the Integration Server administrative console extensions.
- Rejoin the node to the cell with the **addNode** command or the deployment manager administrative console.
 

This action synchronizes the master cell configuration with changes that you make to the Application Server configuration during the installation of the new features.

c. Reconfigure the base node with the Network Deployment administrative console.

Consult the configuration that you saved to determine how to configure the node, if necessary.

26. Choose to migrate applications and the configuration from a previous version, or to coexist with another version, or to do neither, and click **Next** to continue.

All WebSphere Application Server products on a single machine share some of the code in the embedded messaging feature, if installed. The required level of the embedded messaging feature for V5.1 (CSD04) is not the same as for V5.0.0 or V5.0.1. The required level of the embedded messaging feature for V5.1 is the same as for V5.0.2.

If you attempt to install V5.1 on a machine where a version of the embedded messaging feature is at a release level earlier than CSD04, the installer program displays the message log in a panel. The message that you see is similar to one of the messages in the following example:

```
MQSeries or WebSphere MQ server at an earlier release than required to support
embedded messaging is already installed on the system.
Unsupported earlier maintenance level of MQSeries or WebSphere MQ detected.
Unsupported earlier release of MQSeries client or WebSphere MQ client detected.
Unsupported maintenance level of MQSeries client or WebSphere MQ client detected.
Software conflict with MQSeries JMS SupportPac MA88 detected.
```

To correct the problem, perform one of the following actions:

- Upgrade the full MQSeries or WebSphere MQ product to WebSphere MQ at the level that supports embedded messaging for V5.1 (CSD04). Refer to “Installing WebSphere embedded messaging as the JMS provider” on page 169 for more information.
- Uninstall the existing MQSeries or WebSphere MQ product if MQSeries or WebSphere MQ is not required on this system and reinstall the WebSphere Application Server product. Select the embedded messaging feature.

The MQSeries JMS SupportPac MA88 problem is slightly different. Uninstall the MQSeries JMS SupportPac MA88 and reinstall the WebSphere Application Server product, selecting the embedded messaging feature. The function provided by SupportPac MA88 is included in the embedded messaging feature.

You can also upgrade the WebSphere Application Server product to V5.0.2 to avoid any problem with an incorrect level of the embedded messaging feature.

You can perform the procedure for migrating V5.0.0 or V5.0.1 Enterprise with embedded messaging on a base node to Integration Server V5.1.

You can perform the procedure for migrating V5.0.0 or V5.0.1 Enterprise with embedded messaging to V5.1 Integration Server on Network Deployment.

To share embedded messaging in a coexistence environment, the node names for each installation must be unique, so that each installation has a message queue manager that is named uniquely. To migrate V5.0.2 to V5.1, the node names must be identical. Therefore, the queue manager names are also identical, if you are migrating from V5.0.2 to V5.1. To prevent losing the queue manager when you uninstall V5.0.2 (or V5.1), you must create a dummy queue manager before uninstalling one of the WebSphere Application Server versions.

The first rule of migration is to migrate after you install WebSphere Business Integration Server Foundation:

If you are planning to install these products:		Select the migration option while installing this product:	
Base product	Integration Server	Base product	Integration Server
X		X	
X	X		X

The exception to the rule is to migrate V3.5.x to V5.1 during the installation of the base product or the Network Deployment product, before installing the Integration Server product.



If you are planning to install these products:		Select the migration option while installing this product:	
Network Deployment	Integration Server	Network Deployment	Integration Server
X		X	
X	X		X

If you migrate Enterprise Edition V4.x or Enterprise V5.0.x to WebSphere Business Integration Server Foundation, Version 5.1, you cannot select the Sample configuration for the process choreographer feature. Migrating the process choreographer feature is not compatible with installing the Sample configuration feature because there can be only one Sample configuration. If you migrate the previous configuration, you cannot install another configuration. Clear the migration check box to install the Sample configuration feature.

Migrating Integration Server also migrates the product that Integration Server extends.

When you perform an umbrella installation of the base WebSphere Application Server product, you can choose to migrate applications and the configuration from a previous version, or to coexist with another version of the base WebSphere Application Server product, or to do neither.

You can also perform a silent migration or configure for coexistence during a silent installation. Refer to Installing silently for a description of performing a silent installation, including the options that you can specify.

The migration prompt appears only when the Installation wizard detects a previous version. The coexistence prompt appears when the Installation wizard detects any other installation, including another Version 5 installation.

If you choose to coexist, the wizard displays a Port selection panel, where you can specify port assignments that do not conflict with existing ports. For example, you can change the HTTP transport port for coexistence, from 9081 (one more than the default Version 5 port number) to 9085 or higher, to avoid potential conflicts with port numbers that previous versions of WebSphere Application Server commonly use.

Use the **netstat -a** command to display all ports in use.

If you choose neither the migration option nor the coexistence option, you can run Version 5.1.x and the previous version, but not at the same time. Although it is possible that both versions might coexist without port conflicts, you can ensure that both versions run together by selecting the coexistence option and checking for conflicting port assignments.

The Migration panel lists all previous releases that it can identify. If you highlight a release, the text boxes labeled, "select previous version," show the location of the previous product. Select the product to migrate. If you do not see the previous version that you intend to migrate, click **Select previous version** to enter a location and configuration file name if you are migrating a WebSphere Application Server Advanced Edition Single Server Edition, Version 4.0.x installation.

The field labeled "Configuration file" is valid only for WebSphere Application Server Advanced Edition Single Server Edition, Version 4.0.x. For the other versions of WebSphere Application Server that are supported by migration (Version 3.5 Standard Edition, Version 3.5 Extended Edition, and Version 4.0 Advanced Edition), the `admin.config` file provides the host and port values for the administrative server. If you use a file name other than `admin.config`, issue the commands that call the migration tools instead of migrating while installing. Issuing the commands that call the migration tools is described in Migrating and coexisting.

Migrate V3.5.x to V5.1 during the installation of the base product or the Network Deployment product, before installing the Integration Server product.

You must start the administrative server of some previous versions so that the Installation wizard can export the configuration from the `admin.config` file.

Although you might select migration at this point in the installation process, the actual migration does not begin until after the Version 5 installation is complete. At that time, if the `WASPreUpgrade` tool fails, the Installation wizard does not call the `WASPostUpgrade` tool to complete the migration, but instead displays the `WASPreUpgrade.log` and `WASPostUpgrade.log` log files for you to diagnose the

problem. After fixing the problem, such as starting the administrative server of a previous release, you can start the migration again, as described in Migrating and coexisting.

27. Choose a type of installation and click **Next**.

- Choose **Typical install** to install the following features on an unfederated base node:
  - Embedded messaging server and client
  - Embedded messaging message-driven bean Samples (requires the server and client feature to work)
  - Business rule beans
  - Extended (container-managed) messaging
  - Dynamic query
  - Additional Integration Server extensions
  - Scheduler and asynchronous beans
  - Process choreographer
  - Samples

If you choose a typical installation, skip the next step.

- Choose **Typical install** to install the following features on an unfederated base node:
  - Embedded messaging server and client
  - Embedded messaging message-driven bean Samples (requires the server and client feature to work)
  - Business rule beans
  - Extended (container-managed) messaging
  - Dynamic query
  - Additional Integration Server extensions
  - Scheduler and asynchronous beans
  - Process choreographer
  - Samples

If you are installing WebSphere Business Integration Server Foundation on a federated node, the installer program does not allow you to install certain features. Choose **Typical install** to install the following features on a federated base node:

- Business rule beans (if the base node has the administrative console and the administrative scripting features)
- Extended (container-managed) messaging
- Dynamic query
- Additional Integration Server extensions
- Scheduler and asynchronous beans
- Process choreography beans (if the base node has the administrative console and the administrative scripting features)

You do not have to unfederate the base node to add Integration Server features that appear in the list of available features.

These Integration Server features are always hidden and deactivated when installing on a federated base node:

- Samples
- Embedded messaging

If the federated base node does not have the administrative console feature and the administrative scripting features, then the following Integration Server features are hidden and deactivated:

- Samples
- Embedded messaging
- Business rule beans
- Process choreography beans

To install any of these deactivated features, you must unfederate the base node, install the Integration Server product again, select the features you require, and add the node to the cell again. Federated nodes must be unfederated before adding base product features to avoid conflicts while the deployment manager owns the configuration of the base node.

If you choose a typical installation, skip the next step.

- Choose **Custom install** to select features to install.

After selecting a typical installation, the wizard prompts you to select the directory for the program code. After selecting a custom installation, the wizard displays a list of features.

28. Select features to install and click **Next** to continue, when performing a custom installation. This step is available only when you choose the custom installation type. A description of each feature appears at the bottom of the panel when you roll the cursor over the feature.

Selecting certain features causes the installation of other prerequisite features. The following table shows this feature relationship.

Table 14. Features and feature dependencies

If you select these features:	These Integration Server features are also installed:	
<b>Embedded Messaging</b>		
Sub-features:	Server and Client	
	Client Only	
	Message-driven Bean Samples (for the server and not for the client)	
<p>You can install the MDBSamples application without installing the embedded messaging server and client feature. Perhaps you have already installed the server and client feature. Or perhaps you intend to reconfigure the MDBSamples to use messaging resources that WebSphere MQ software provides.</p> <p>In any case, if you install the MDBSamples application and do not have the server and client feature installed, errors occur. The Application Server starts the MDBSamples application at start up. The MDBSamples application cannot start the required messaging resources in the Java Naming and Directory Interface (JNDI).</p> <p>Because of the lack of required resources, the message-driven beans fail to start, which causes an exception that the Application Server logs. The Application Server is not affected other than being unable to start the MDBSamples application.</p>		
<b>Business Rule Beans</b>		
Sub-features:	Business Rule Beans Sample	
<b>Event Infrastructure Technical Preview</b>		
(Tech preview: For use on a stand-alone base node.)		
<b>Extended Messaging</b>		
Sub-features:	Extended Messaging Sample	Embedded Messaging
<b>Dynamic Query</b>		
Sub-features:	Dynamic Query Sample	
<b>Additional Integration Server Extensions</b>		
Sub-features:	Additional Integration Server Extensions Samples	
<b>Scheduler and Asynchronous Beans</b>		
Sub-features:	Scheduler and Asynchronous Beans Samples	Embedded Messaging
<b>Process Choreographer</b>		Additional Integration Server Extensions
		Scheduler and Asynchronous Beans

Table 14. Features and feature dependencies (continued)

If you select these features:	These Integration Server features are also installed:
Sub-features:	Additional Integration Server Extensions
Process Choreographer Sample	Scheduler and Asynchronous Beans
	Embedded Messaging
Configure a sample business process container	Additional Integration Server Extensions
	Scheduler and Asynchronous Beans
<b>CORBA C++ SDK (deprecated)</b>	
Sub-features:	Interface Repository Support (Requires DB2)
	CORBA C++ SDK Samples
<b>Javadocs</b>	

If you do not have the prerequisite base WebSphere Application Server product installed, the Integration Server installation can install it for you. The Integration Server Installation wizard installs the base WebSphere Application Server product without these features:

- IBM HTTP Server
- Web server plug-ins
- Performance and analysis tools

If you want one or more of the features, cancel the Integration Server installation and issue the **/cdrom/WAS/install** command, where `mnt/cdrom` is the mount point for the product CD-ROM and `WAS` is the directory on the CD-ROM for installing the base WebSphere Application Server product.

If you already have an unfederated base node installed, but select an Integration Server feature that requires a base product feature that you have not installed, the Integration Server installation installs the feature on the unfederated base node. The following table describes which base features are required when you select an Integration Server feature.

Table 15. Integration Server features and unfederated base product feature dependencies

If you select these features:	These base product features are also installed:
<b>Embedded Messaging</b>	
Sub-features:	Server and Client
	Client Only
	Message-driven Bean Samples (These Samples are the MDBSamples application, which is for the server and not for the client.)
<b>Business Rule Beans</b>	
	WebSphere Application Server
	Admin Scripting
	Administrative Console
Sub-features:	Business Rule Beans Sample
	Application Server Samples
<b>Event Infrastructure Technical Preview</b>	
<b>Extended Messaging</b>	
	WebSphere Application Server

Table 15. Integration Server features and unfederated base product feature dependencies (continued)

If you select these features:		These base product features are also installed:
Sub-features:	Extended Messaging Sample	Application Server Samples
		Embedded Messaging
		Messaging-driven Bean Samples
<b>Dynamic Query</b>		WebSphere Application Server
Sub-features:	Dynamic Query Sample	Application Server Samples
		Application Server
<b>Additional Integration Server Extensions</b>		Application Assembly Tool Discontinued as of V5.1.
		Administrative Console
Sub-features:	Additional Integration Server Extensions Samples	Application Server Samples
		Application Server
<b>Scheduler and Asynchronous Beans</b>		Application Server
Sub-features:	Scheduler and Asynchronous Beans Samples	Application Server Samples
		Application Server
<b>Process Choreographer</b>		Admin Scripting
		Administrative Console
Sub-features:	Process Choreographer Samples Configure a sample business process container	Application Server Samples
		Embedded Messaging
<b>CORBA C++ SDK (Deprecated)</b>		
Sub-features:	Interface Repository Support (Requires DB2) CORBA C++ SDK Samples	
		Application Server Samples
<b>Javadocs</b>		

These Integration Server features are always hidden and deactivated when installing on a federated base node:

- Samples
- Embedded messaging

If the federated base node does not have the administrative console feature and the administrative scripting features, these additional features are hidden and deactivated:

- Business Rule Beans
- Process choreographer

To install any of these deactivated features, you must unfederate the base node, install the Integration Server product again, select the features you require, and add the node to the cell again. Federated nodes must be unfederated before adding base product features to avoid conflicts while the deployment manager owns the configuration of the base node.

You do not have to unfederate a federated base node to add Integration Server features that appear in the list of available features.

You can run the uninstaller program to remove all of the installed features.

- Specify a destination directory and click **Next** to continue. Deleting the default target location and leaving an installation directory field empty stops you from continuing the installation process. The Installation wizard does not proceed when you click **Next**. Enter the required target directory to

proceed to the next panel. Non-ASCII special characters are not supported in the name of the installation directory. Spaces are also not supported in the name of the installation directory.

The installer program for WebSphere Business Integration Server Foundation checks twice for required temporary space. The program checks once at the beginning of the installation before it copies a Java 2 SDK to the temporary directory to support the Installation wizard Java process. Later, the program checks for enough space to install Cumulative Fix 2 and the Cumulative Fix 1 for SDKs.

If not enough space is available, cancel the installation, allocate the 500 MB of temporary space that is required on most platforms, and reinstall. The actual space required depends on the operating system and the features that you are installing. The installer program does not let you install the base product during an umbrella installation if sufficient space is not available to apply Cumulative Fix 2 and Cumulative Fix 1 for SDKs. If the installation fails during the installation of a cumulative fix, cancel the installation, review the installation logs in the *install\_root/logs* directory or in the */tmp* directory to identify and correct the problem. Reinstall after correcting the problem to continue the installation.

Suppose the installer program installs the base product and then runs into an error during the installation of the cumulative fix because of an insufficient amount of temporary space. In such a case, cancel the installation, allocate enough temporary space to install the cumulative fix, and restart the installation. The installer program picks up the installation where it left off, installing the cumulative fix to the base product.

If you have problems accessing the administrative console after installation, check the *installAdminConsole.log* file for a failure indication. Clean up the */tmp* space and reinstall the administrative console using the *wsadmin* scripting facility.

If you must increase the */tmp* allocation, stop the installation program, increase the allocation, and restart the installation.

If you select the embedded messaging feature and prerequisites are missing, the Installation wizard displays the *mq\_prereq.log* error log and takes you back to the Installation type panel. Choose **Custom** installation and clear the embedded messaging feature to continue. The *mq\_prereq.log* file is in the system temp directory.

30. Specify node information and click **Next**. Specify the node name and host name. Although the wizard inserts the machine name (of the installation platform) as the node name, you can specify any unique name. The node name is an arbitrary WebSphere Application Server-specific name that must be unique within a cell.

The host name is the network name for the physical machine on which the node is installed. The host name must resolve to a physical network node on the server. When multiple network cards exist in the server, the host name or IP address must resolve to one of the network cards. Remote WebSphere Application Server nodes use the host name to connect to and to communicate with this node. Selecting a host name that other machines can reach within your network is extremely important. Do not use the generic *localhost* identifier for this value.

If you define coexisting nodes on the same computer with unique IP addresses, define each IP address in the */etc/hosts* file or in a domain name server (DNS) look-up table. WebSphere Application Server configuration files do not provide domain name resolution for multiple IP addresses on a machine with a single network address.

The value that you specify for the host name is used as the value of the *hostName* property in WebSphere Application Server configuration documents. Specify the host name value in one of the following formats:

- Fully qualified domain name servers (DNS) host name string, such as *xmachine.manhattan.ibm.com*
- The default short DNS host name string, such as *xmachine*
- Numeric IP address, such as *127.1.255.3*

The fully qualified DNS host name has the advantage of being totally unambiguous and also flexible. You have the flexibility of changing the actual IP address for the host system without having to change the WebSphere Application Server configuration. This value for host name is particularly



useful if you plan to change the IP address frequently when using Dynamic Host Configuration Protocol (DHCP) to assign IP addresses. A format disadvantage is being dependent on DNS. If DNS is not available, then connectivity is compromised.

The short host name is also dynamically resolvable. A short name format has the added ability of being redefined in the local hosts file so that the system can run WebSphere Application Server even when disconnected from the network. Define the short name to 127.0.0.1 (local loopback) in the hosts file to run disconnected. A format disadvantage is being dependent on DNS for remote access. If DNS is not available, then connectivity is compromised.

A numeric IP address has the advantage of not requiring name resolution through DNS. A remote node can connect to the node you name with a numeric IP address without DNS being available. A format disadvantage is that the numeric IP address is fixed. You must change the setting of the `hostName` property in WebSphere Application Server configuration documents whenever you change the machine IP address. Therefore, do not use a numeric IP address if you use DHCP, or if you change IP addresses regularly. Another format disadvantage is that you cannot use the node if the host is disconnected from the network.

31. Configure the sample business process container, if you selected it and click **Next** to continue. Specify values for the following fields:

**User ID to authenticate with the embedded messaging queue manager**

This field is the JMS user ID who authenticates the connection to the JMS provider. This user ID must have administration rights for the messaging service.

The JMS user ID must be less than or equal to 12 characters.

You can create the user ID later and add the user to the `mqm` user group. Or specify the root user as the value for the field:

root

**Password**

Type the password for the user you specified as the JMS user ID in the first field.

**Confirmation password**

Repeat the password for the user you specified as the JMS user ID in the first field.

**Security role for the business process system administrator**

This field is the security role mapping. Specify the user or group from the domain user registry that is mapped onto the role of Business Process Administrator. The value to use depends on the local settings. For example, you can specify that the Administrator group is to perform the security role on some systems.

The user registry can be the local operating system, Lightweight Directory Access Protocol (LDAP), or custom registry. The user or group specified must already exist in the user registry being used.

32. Review the summary information and click **Next** to install the product code or **Back** to change your specifications. When the installation is complete, the wizard displays the `install_root\logs\mq_install.log` installation log if you selected the embedded messaging feature and errors occur with its installation.
33. Review the `mq_install.log` installation log if it displays. Click **Next** to continue. The wizard displays the Registration panel.
34. Click **Next** to register the product, or clear the check box and click **Next** to register at a later time. The Registration panel is in English when the machine locale uses a double byte character set (DBCS) language.

You can register the product now by using the link on this panel or later, by using the Web address in the `install_root/prt/readme_prt.txt` file. The Web address in the file is encoded for your locale. A known problem for some locales corrupts the Web address so that it is similar to the following example. (The Web address is all one line in the file. The following example shows the address on two lines for clarity.)

```
http%3A%2F%2Fwww.ibm.com%2Fsoftware%2Fwebprt%2Fregister%2Fprodreg.nsf%  
2Fcontact%3F0penForm%26lang%3DENU%26pid%3D45P8842%26q2%3DWindows+2000
```



Use one of the following Web addresses if your *install\_root/prt/readme\_prt.txt* file is corrupt:

- <http://www.ibm.com/software/webprt/register/prodreg.nsf/contact?OpenForm&>
- <https://www6.software.ibm.com/reg/prt/prt-r>

The Installation wizard starts the First Steps tool.

If you are migrating a federated node as you install, close the First Steps tool. Migrated federated nodes have configuration differences that prevent you from using the First Steps tool.

35. Verify the success of the installer program by examining the Exit summary panel and the *install\_root/logs/WAS.WBISF.install.log* file.

If you performed an umbrella installation of the base product or if you installed new base product features, also examine the *install\_root/logs/log.txt* file. ISMP records a success message in the *WAS.WBISF.install.log* file: "INSTFIN: The installation is complete." The logs are the only source of status information for a silent installation.

Look for severe errors that the installer records in the *WAS.WBISF.install.log* file in the installation root directory to verify that no file system or other unusual errors occurred during installation.

If the *log.txt* file and the *WAS.WBISF.install.log* file do not contain a record of any problems but problems exist, verify or troubleshoot the installation, as described in Troubleshooting the installation.

When installing WebSphere Application Server with embedded messaging from the CD-ROM, the following warning messages are issued despite successful installation:

```
MQSERIES.MQM-CL-HPUX: A test command parameter is not valid." and "*
"hostname:/cdrom/hpux/messaging/images": Cannot open the
logfile on this target or source. Possibly the media is
read-only or there is a permission problem." on mq_install.log.
```

You can ignore the warning messages, because the problem does not affect the successful installation of WebSphere Application Server with embedded messaging.

36. Click **Finish** to close the Installation wizard.
37. Restrict access to the */var/mqm/errors* directory and messaging logging files. After installing the embedded messaging feature, you must restrict access to the */var/mqm* directory and to log files that are needed for embedded messaging, such that only the *mqm* user or members of the *mqm* user group have write access. For detailed information, see *Installing WebSphere embedded messaging as the JMS provider*.
38. Install WebSphere Application Server 5.1 Cumulative Fix 3.  
Always install the latest cumulative fixes as they are released. See *Cumulative Fix Strategy for WebSphere Application Server V5.0 and V5.1* for more information.  
This collection of fixes for Version 5.1 updates the WebSphere Application Server base product or the Network Deployment product to Version 5.1.0.3. Cumulative Fix 3 includes all of the interim fixes in Cumulative Fix 2 and other fixes that are required for some components.  
Cumulative Fix 3 is available at the <http://www-1.ibm.com/support/docview.wss?uid=swg24006675> Web address.  
You can find a list of currently recommended fixes at the *WebSphere Business Integration Server Foundation V5.1 recommended interim fixes* Web site.
39. Tune your system for performance. For best performance on any platform, see "Tuning performance" in the information center.

The Installation wizard configures the product. It is not necessary to perform further configuration at this time.

You have now successfully installed WebSphere Business Integration Server Foundation and the features that you selected.

## Uninstalling and reinstalling

See *Uninstalling the product* for information about uninstalling any WebSphere Application Server product.

## Reinstalling a V5.1 instance after uninstalling and leaving the embedded messaging feature installed

If you uninstall a V5.1 instance but leave the embedded messaging feature installed because of other WebSphere Application Server instances on the machine, rename the `/opt/WebSphere/AppServer51` directory to cause HP-UX to be unable to locate the previous installation that is still registered. Reinstall into a directory other than the `/opt/WebSphere/AppServer51` directory or the renamed directory. Use a new directory name for reinstalling the V5.1 instance.

If you uninstall all WebSphere Application Server products on the machine and are now reinstalling, follow the procedure in “Manually uninstalling on HP-UX platforms” on page 340 instead.

For example, assume that V5.0.2 Enterprise exists in `/opt/WebSphere/AppServer502` with the embedded messaging server and client feature. You then install V5.1 WebSphere Business Integration Server Foundation to the following directory, `/opt/WebSphere/AppServer51`, but later you uninstall Integration Server and the base product with the **uninstall** command and select to leave the embedded messaging feature installed. And now you decide to reinstall V5.1 WebSphere Business Integration Server Foundation and the base product in an umbrella installation.

Rename `/opt/WebSphere/AppServer51` to `/opt/WebSphere/AppServer51_bk` before reinstalling V5.1 into the `/opt/WebSphere/AppServer51New` directory.

This step is required before you can reinstall the product onto the same system. Reinstalling into the same directory without first deleting all directory contents results in invalid XML configurations because of the retention of old files. If you want to correct the registry entries and uninstall all WebSphere Application Server products on the machine, uninstall manually to delete all of the files so that you can reinstall with a clean system, as described in “Manually uninstalling on HP-UX platforms” on page 340.

## Miscellaneous tips for HP-UX platforms

Table 16. Installation and migration tips

Operating platform	Tip
HP-UX platforms	HP-UX platforms <ul style="list-style-type: none"><li>• Migrating Enterprise V5.0.2 during an umbrella installation</li><li>• Migrating or coexisting with an existing WebSphere Application Server node that HP-UX does not recognize</li><li>• Avoiding using Netscape 4.79 on HP-UX 11 in Japanese, to avoid problems in viewing the administrative console</li><li>• Configuring the <code>converter.properties</code> file to use EUC-JP (Japanese) encoding on HP-UX</li></ul>
All platforms	All platforms
All Linux and UNIX platforms	All Linux and UNIX-based platforms

## Mounting a CD drive on HP-UX

This topic describes how to mount a CD drive as the root user on a Linux platform or as the root user on a UNIX-based operating system platform.

Product CDs for WebSphere Application Server products for HP-UX platforms are formatted for the Rock-Ridge file system type, which is an extension to the International Standards Organization ISO-9660 file system type.

HP-UX uses a mechanism called portable file system (PFS) on PA-RISC machines to mount Rock-Ridge CDs. This procedure describes how to use the PFS method.

The following procedure guides you through using the portable file system (PFS) to mount a CD drive.

1. Log on as root.
2. Determine the CD-ROM device name by using the **ioscan** command or **sam**. Run the **/usr/sbin/ioscan -funC disk** command to return a table of disk devices. If you cannot determine the name of the CD-ROM device, run the sam system maintenance interface to find more information about disk devices.
3. Start the pfsd daemon. PFS mounting is not active on HP-UX systems by default. The pfsd daemon must be running to mount a CD-ROM device. To start the daemon, run the following commands:
 

```
# /usr/sbin/pfs_mountd &
# /usr/sbin/pfsd &
```
4. Insert the product CD-ROM labeled, *Integration Server Disk 1 of 2* into the CD-ROM.
5. Mount the CD-ROM with the following command:
 

```
# /usr/sbin/pfs_mount -t rrip -o xlat=unix /dev/dsk/c0t0d0 /cdrom
```

The CD-ROM drive is the **/dev/dsk/c0t0d0** device. The **/cdrom** directory is where the CD-ROM drive mounts. The **rrip** parameter forces the CD-ROM drive to mount in the Rock Ridge Interchange Format. The **xlat=unix** parameter translates file names properly for HP-UX.
6. Use the following procedures if you have a problem with mounting the CD-ROM because it contains files with long names. The **mount** command can fail on any CD-ROM that contains files with long file names. Two methods exist for working around the problem and mounting the product CD-ROM:
  - Edit the **pfs\_fstab** file.
  - Use **pfs\_mount** to read the Rock Ridge system type.

#### Editing the pfs\_fstab file

To avoid the mount problem, perform the following steps:

- a. Log in as a user with root authority.
- b. In the **/etc** directory, add the following line to the **pfs\_fstab** file:

```
/dev/dsk/c0t0d0 mount_point pfs-rrip ro,hard
```

The **mount\_point** variable represents the mount point of the CD-ROM.

- c. Start the pfs daemon by entering the following commands (if they are not already running):

```
/usr/sbin/pfs_mountd &
/usr/sbin/pfsd 4 &
```

- d. Insert the CD-ROM in the drive and enter the following commands:

```
mkdir /cdrom
/usr/sbin/pfs_mount /cdrom
```

Where **/cdrom** represents the mount point of the CD-ROM.

#### Using pfs\_mount to read the Rock Ridge system type

- a. The standard HP-UX mount procedure does not read the Rock Ridge file system type correctly. You must mount the CD using the **pfs\_mount** command. Start pfs daemons by entering these commands:

```
pfs_mountd&
pfsd&
```

- b. Mount the CD as shown in the following example, where **device** represents the raw device (for example, **/dev/rdisk/c0t0d0**), and **mntpnt** represents the mount point (for example, **/cdrom**):

```
pfs_mount -x unix device /mntpnt
```

- c. Add the following line to **/etc/pfs\_exports**, where **remotemnt** represents the mount point, and **server** represents the name of the HP-UX system where you are installing the product:

```
/remotemnt -access=server
```

- d. Enter the following command:

```
pfs_exportfs -a
```

Run the remaining steps in this procedure on the local HP-UX system:

e. Log in as root.

f. Start pfs daemons by entering the following commands:

```
pfs_mountd&  
pfsd&
```

g. Enter the following command, where *remote\_server* represents your remote system, *remotemnt* represents the CD-ROM drive on the remote HP-UX system, and *localmnt* represents the mount point on your local HP-UX system:

```
pfs_mount -x unix remote_server:/remotemnt /localmnt
```

h. Change the directory to the package location, where *localmnt* represents the directory mount point.

```
cd /localmnt/tas
```

After installation, you can unmount the CD-ROM using the following command:

```
/usr/sbin/pfs_umount /cdrom
```

For more detailed instructions, consult your HP-UX documentation.

## Installing the Integration Server on Linux platforms

This topic describes how to install WebSphere Business Integration Server Foundation as the root user on a Linux platform. If you back up the product CD, do so as root. Backup copies made from non-root users do not preserve the correct file attributes and do not work. This topic guides you through preparing for Integration Server, which includes choosing and installing the variety of options and features provided.

If you encounter a problem such as not having enough temporary space or not having the right packages on your system, cancel the installation, make the required changes, and restart the installation.

The installation image for the WebSphere Business Integration Server Foundation product is on two CDs. The installation CDs are platform specific. Each CD label identifies the platform for which it is designed to be used. The CDs for a particular platform should only be inserted and run from a CD drive that is mounted on the platform that is identified on the CD.

When you use an installation method that requires you to swap CDs, it is important that no application or window is accessing the CD. Otherwise, you might not be able to unmount one CD and mount the next one. Any of the following actions can lock a CD:

- Browsing a readme file on the CD with a browser
- Browsing any file on the CD with an editor
- Viewing the *Installation Guide* on the CD with Acrobat Reader
- Opening a command window and changing directories to the CD
- Accessing the CD from a telnet session
- Accessing the CD from any other process

This topic describes installing the Integration Server product, using the installation image on the two product CDs labeled, **Integration Server**. The Integration Server product package also contains CDs for installing the WebSphere Application Server Network Deployment product and the base WebSphere Application Server product.

This topic is available in Adobe PDF format, on the product CDs, and online in an information center that is available from the IBM WebSphere Application Server Web site at <http://publib.boulder.ibm.com/infocenter/ws51help/index.jsp>. When possible, access the most current version of this information by selecting the information center. The information center displays in the language of your machine locale.

The Launchpad tool lets you access the product overview, the `readme.html` file, and installation guides.

If you use the Mozilla browser and you do not have the Netscape browser, some links might not work. The Launchpad attempts to call the Netscape browser in the `/usr/bin/netscape` directory. Try a symbolic link to the Mozilla browser to fix the problem as shown in the following example:

```
ln -sf /usr/bin/mozilla /usr/bin/netscape
```

After using the Launchpad to view product documentation, perform the following procedure. The procedure includes several preliminary steps before actually launching the installer program.

1. Stop all WebSphere Application Server-related Java processes on the machine where you are installing the product.
2. Stop any Web server process such as the IBM HTTP Server, if you are extending the base product.
3. Provide adequate disk space.

The WebSphere Business Integration Server Foundation installer program installs Cumulative Fix 2 to the V5.1.0 base product or to the V5.1.0 Network Deployment product that the Integration Server extends. The cumulative fix leaves the service level of each product at the V5.1.0.2 level. If you have applied interim fixes that are not part of the cumulative fix, you must reinstall them. Installing the cumulative fix removes all interim fixes that you might have installed.

After the installation is complete, install Cumulative Fix 3 and any recommended fixes that are described at the WebSphere Business Integration Server Foundation V5.1 recommended interim fixes Web site.

The installer program also installs a cumulative fix from the *V5.1.0 Cumulative Fix 1 for SDKs* service offering. The cumulative fix updates the IBM Developer Kit for Linux, Java Technology Edition software that IBM uses with the WebSphere Business Integration Server Foundation product and other V5.1 WebSphere Application Server products. The new service level is 1.4.1 SR1B.

The Integration Server, Cumulative Fix 2, and Cumulative Fix 1 for SDKs require the following disk space:

**1750 MB for the `/opt/WebSphere/AppServer` or the `/opt/WebSphere/DeploymentManager` directory**

The installation root directory includes either the base product or the Network Deployment product. The installation program extends the installation root directory with WebSphere Business Integration Server Foundation software.

**500MB for the `/tmp` directory**

The temporary directory is the working directory for the installation program. Some components of the installation process require a specific amount of free space in the `/tmp` directory.

Although you might see an installation message for an incremental amount of free space that is less than 500 MB, the overall cumulative requirement for free space in the `/tmp` directory is 500 MB.

For example, if you do not have enough free space to start the installation, a message notifies you that you must have 200 MB of free space in the `/tmp` directory. The 200 MB of free space is what you must have when you have already installed Cumulative Fix 2 to an existing base product or to an existing Network Deployment product.

The 500 MB of free space is required to install the base product, Cumulative Fix 2, and the Integration Server product in the same *umbrella* installation procedure. An umbrella installation installs the base product as it installs Integration Server software.

Installing Integration Server software on the Network Deployment product also installs Cumulative Fix 2 (V5.1.0.2), which increases the amount of space required over the 200 MB in the message.

Verify that you have 500 MB of free space to avoid problems.

A second message about free space occurs when less than 4 MB of free space remains after starting the installation. The InstallShield for MultiPlatforms (ISMP) program displays a message about using the `-is:tempdir` parameter to identify an alternate temporary space directory.

Ignore any `-is:tempdir` message. The `-is:tempdir` parameter is not supported. Cancel the installation, allocate a total of 500 MB of free space in the `/tmp` directory, and start the installation again.

## 2250 MB

The total amount of space required for both directories is 2250 MB. A significant amount of the required space is temporarily required during installation and is released after installation. If you have already installed the service pack on either the base product or the Network Deployment product that you are extending, the space requirement is reduced.

The Installation wizard displays required space for individual features on the Feature selection panel. The Installation wizard also warns you if you do not have enough space to install the product and the cumulative fixes.

If you plan to migrate applications and the configuration from a previous version, verify that application objects have available disk space. As a rough guideline, plan for space equal to 110 percent of the size of the application objects:

- **For Version 4.0.x:** The size of enterprise archive (EAR) files
- **For Version 5.0.x:** The size of EAR files

4. Define the user groups and the user needed for the embedded messaging feature.
  - a. If you have not already done so, create the **mqm** and **mqbrkrs** user groups.
  - b. Create the **mqm** user.
  - c. Add the **mqm** and **root** users to the **mqm** group.
  - d. Add the user **root** to the **mqbrkrs** group.

The recommended user ID for running the JMS server process is **root**. If you do run the JMS server process under another user ID, add that user ID to the **mqm** and **mqbrkrs** groups. User IDs longer than 12 characters cannot be used for authentication with the embedded WebSphere JMS provider.

The **mqm** user starts the JMS server for general JMS support and the WebSphere embedded broker for WebSphere Application Server topic connections.

Put the user groups into effect when you next start WebSphere Business Integration Server Foundation. For example, either log off and on again with the process user ID or open a new shell in which to start WebSphere Business Integration Server Foundation.

Use the **id** command or the **groups** command to see defined groups for **root**. If **mqm** and **mqbrkrs** are not in the list that is returned, you cannot install the embedded messaging feature:

```
[root@wasdoc2 root]# id
uid=0(root) gid=0(root)
groups=0(root),1(bin),2(daemon),
3(sys),4(adm),6(disk),10(wheel),500(mqm),501(mqbrkrs)
```

```
[root@wasdoc2 root]# groups
root bin daemon sys adm disk wheel mqm mqbrkrs
```

On many Linux Systems, such as SuSe, if you telnet and issue the **id** command or the **groups** command, you cannot see the groups **mqm** or **mqbrkrs** even though they might exist. Solve this problem in one of two ways:

- Use the **ssh** command to log in
- Issue the **su -** command

After using one of the commands, verify the required groups with the **id** command or the **groups** command.

In a normal root login, issue the **su** command. For a real root login, issue the **su -** command.

Display settings for a normal root login are automatic. For a real root login, you must set your display environment properly to successfully view the GUI installation wizard. Otherwise, you see a message



about Preparing Java(™) Virtual Machine... and seven rows of dots, but no installation GUI and no further messages. Refer to the documentation for your Linux platform to determine proper display settings.

- Allocate adequate disk space for the embedded messaging feature if you are planning to install the feature. The installation locations for the embedded messaging feature are fixed as shown in the following table, which lists the locations for the base messaging functions and the messaging broker functions for publish/subscribe messaging.

Table 17. Space requirements for the embedded messaging feature on Linux

Component	Base code	Broker code	Base data	Broker data
Path	/usr/ mqm	/usr/ opt/ wemps	/var/ mqm	/var/ wemps
Server and client subfeature	40 MB	100 MB	8 MB	5 MB
Client subfeature	15 MB	15 MB	5 MB	N/A

- Prepare to install the embedded messaging feature. The embedded messaging feature is based on the IBM WebSphere MQ product. The feature and the product each provide a Java message service (JMS) function that supports queues for point-to-point messaging and topics for publish and subscribe messaging. You can install WebSphere Business Integration Server Foundation with the embedded messaging feature with or without the WebSphere MQ product on the same machine. To support both the embedded messaging feature and the WebSphere MQ product on the same machine, the WebSphere MQ product must be at a certain fix level and must have several of its features installed.

If you already have WebSphere MQ installed, you can configure it as the JMS provider. Otherwise, you can install the embedded messaging feature during the installation of the Integration Server or install the WebSphere MQ product or another JMS provider after you install the Integration Server.

Even though you might decide now to install only the embedded messaging feature, you can install the WebSphere MQ product later and use the IBM WebSphere MQ product as the JMS provider instead.

- Verify that you have upgraded to WebSphere MQ 5.3 with the CSD04 update to install embedded messaging on a machine where you already have WebSphere MQ installed. The WebSphere Business Integration Server Foundation package includes copies of the WebSphere MQ 5.3 and Event Broker installation images, with restricted licensing. Use the MQ CDs to install the required MQ features or WebSphere MQ 5.3 for use with Integration Server.

Determine if your WebSphere MQ 5.3 installation is at the required level by running the **mqver** utility provided by WebSphere MQ.

The required level as indicated by mqver is shown below:

```
Name:      WebSphere MQ
Version:   530.4 CSD04
...
```

- Verify that you have installed the required WebSphere MQ 5.3 features to install embedded messaging on a machine where you already have WebSphere MQ installed. Verify that you have installed the following features:
  - When installing the embedded messaging server and client feature, the required MQ features are *Server and Java messaging*.
  - When installing the embedded messaging client feature, the required MQ feature is *Java messaging*.

If you attempt to install the embedded messaging feature when WebSphere MQ is already installed, the level of WebSphere MQ must be Version 5.3 with the required MQ features. Otherwise, the installation of the embedded messaging feature fails with prerequisite check errors.

- Create and mount a journalized file system called /var/mqm for your messaging working data. Use a partition strategy with a separate volume for embedded messaging or WebSphere MQ data to isolate system activity from the potentially high volume of messaging work that can build up in the /var/mqm directory.



10. Create separate file systems for log data in the `var/mqm/log` directory and error files in the `var/mqm/errors` directory. Store log files on a different physical volume from the embedded messaging queues, which are in the `var/mqm` directory. This ensures data integrity in the case of a hardware failure. If you are creating separate file systems, allow the following minimum free space:

**30 MB** /var/mqm

**20 MB** /var/mqm/log

**4 MB** /var/mqm/errors

The `/var` file system stores all the security logging information for the system and stores the temporary files for e-mail and printing. Therefore, it is critical that you maintain free space in `/var` for these operations. If you do not create a separate file system for messaging data, and `/var` fills up, all security logging stops on the system until free space is available in `/var`. Also, e-mail and printing do not work without some available free space in `/var`.

You have the same options for creating file systems for the embedded messaging feature as you do for WebSphere MQ. For example, if you cannot install the embedded messaging options in the required file system (for example, if it is too small), you can do one of the following *before* installing the Embedded Messaging options:

- Create and mount a new file system for the installation directory.
- Create a new directory anywhere on your machine, and create a symbolic link from the required installation directory to the new directory, as shown in the following example:

```
mkdir /bigdisk/mqm
ln -s /bigdisk/mqm /usr/mqm
```

11. Verify that prerequisites and corequisites are at the required release levels. Although the Installation wizard checks for prerequisite operating system patches with the `prereqChecker` application, review the prerequisites on the IBM WebSphere Application Server supported hardware, software, and APIs Web site if you have not already done so. Refer to the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

Some operating systems that were not supported at the time that this product was shipped on CD-ROM might now be supported. You might receive a message from the `prereqChecker` program that an operating system is not supported when, in fact, the operating system is supported.

Always consult the IBM WebSphere Application Server supported hardware, software, and APIs Web site to determine whether your operating system is supported when you receive a message from the `prereqChecker` program. The Web site lists all supported operating systems and the operating system fixes and patches that you must install to have a compliant operating system. After confirming that your operating system is supported and that you have installed all necessary patches, you can click **Next** to continue an installation when you receive an error message from the `prereqChecker` program.

12. Provide necessary prerequisites for Red Hat Enterprise Linux V3.0. A known limitation exists in the prerequisites checker program when examining prerequisite packages on Linux systems.

You must install the following packages on Red Hat Enterprise Linux V3.0 for xSeries platforms:

- `compat-gcc-7.3-2.96.122`
- `compat-libstdc++-7.3-2.96.122`
- `compat-libstdc++-devel-7.3-2.96.122`
- `compat-glibc-7.x-2.2.4.32.5`
- `compat-gcc-c++-7.3-2.96.122`
- `compat-db-4.0.14-5`
- `rpm-build-4.2.1-4.2`

The following package is required for Red Hat Enterprise Linux V3.0 for pSeries platforms:  
`rpm-build-4.2.1-4.2`.

You must install the following packages on Red Hat Enterprise Linux V3.0 for S/390 (z/VM and VM/ESA) platforms:

- `compat-db-4.0.14-5`

- compat-pwdb-0.62-3
- compat-libstdc++-7.2-2.95.3.77
- rpm-build-4.2.1-4.2

You can install a later release of any of these packages.

13. Upgrade Red Hat Enterprise Linux V3.0 to service level 1 (update 1).

Upgrade RHEL 3.0 to service level 1 by downloading and installing the service updates from Red Hat.

If you do not upgrade to service level 1, certain national language issues in the released version of GLIBC included in Red Hat Enterprise Linux V3 might cause Java virtual machine (JVM) failures due to segmentation faults. These failures can occur during installation when the locale is set to anything other than an English locale.

The prerequisites checker program for the base V5.1.0.0 product does not recognize Red Hat Enterprise Linux 3.0 as a supported operating system. If you receive a message from the prerequisites checker program that RHEL 3.0 is an unsupported operating system, ignore the message and continue the installation if you installed all prerequisite packages from the previous step and downloaded and installed the service level 1 update.

Also, do not install, log off, and log back on when you are installing from the operator console attached to the machine. This can produce segmentation faults that cause the installation to fail, as described in [tins\\_trouble.dita#tins\\_trouble/192656.RN](#).

14. Prepare the SuSE Linux Enterprise Server 8.0 - Powered by UnitedLinux 1.0 operating platform for WebSphere Application Server installation.

- a. Install SP2 for the United Linux 1.0 operating platform to let you use the LaunchPad.

It is your responsibility to install this service pack. The prereqChecker function of the installer cannot detect service pack versions definitively on United Linux. Kernel unames and versions between 8.0 and 8.0.2 are identical. No signature RPM denotes a service pack install.

- b. Use the IBM Developer Kit that WebSphere Application Server provides to support the Java 2 SDK on the SuSE SLES 8.0 operating system to avoid potential problems when uninstalling an interim fix or a fix pack. To use the IBM Developer Kit, remove the java2-jre-1.3.1-524 and java2-1.3.1-524 RPMs from the machine before installing WebSphere Application Server.

15. Correct font problems on SuSE Linux Enterprise Server 8.0 in Simplified Chinese and Traditional Chinese locales.

On the Linux for Power platform that SuSE Linux Enterprise Server 8.0 provides, a missing package causes a font problem. The `ttf-hanyi` package is not installed during the normal product installation of the SuSE 8.0 operating system. The missing package causes the Installation wizard for WebSphere Application Server products to display garbled characters in the Simplified Chinese locale and in the Traditional Chinese locale.

Copy the `ttf-hanyi-2021016-0.noarch.rpm` package on the SuSE 8.0 for i386 CD to the Power PC system. Install the package on the Power PC machine and reboot the machine to solve the problem.

16. If you have uninstalled WebSphere Application Server Enterprise Edition Version 4.1, remove any entries from the `/usr/bin/jitk.db` file. Remove any remaining artifacts from an uninstalled Enterprise Edition V4.1 system to prevent the display of the Coexistence panel or the Migration panel during installation.

The Installation wizard for WebSphere Business Integration Server Foundation might display the Migration panel or the Coexistence panel even though you have uninstalled WebSphere Application Server Enterprise Edition Version 4.1. You can prevent the Installation wizard from recognizing a previously deleted version of Enterprise Edition by removing the following entry from the `/usr/bin/jitk.db` file:

```
WebSphere Enterprise Edition Server 4.1
```

Remove other Version 4.x entries for WebSphere Application Server products that are no longer on your system.

17. Verify the system `cp` command when using emacs or other freeware.

If you have emacs or other freeware installed on your Linux system, verify that the system **cp** command is being used.

- a. Type which cp at the command prompt before running the installation program for the WebSphere Business Integration Server Foundation product.
- b. Remove the freeware directory from your PATH if the resulting directory output includes freeware. For example if the output shows /opt/freeware/bin/cp, remove the directory from the PATH.
- c. Install the WebSphere Business Integration Server Foundation product.
- d. Add the freeware directory back to the PATH.

If you install with a **cp** command that is part of a freeware package, the installation might appear to complete successfully, but the IBM Developer Kit for Linux, Java Technology Edition (IBM SDK for Java) that the product installs can have missing files in the *install\_root/java* directory.

Missing files can destroy some required symbolic links. If you remove the freeware **cp** command from the PATH, you can install the Integration Server product successfully.

Perform the following step to verify that the IBM SDK for Java software is working correctly.

18. Verify the Java 2 SDK on the WebSphere Business Integration Server Foundation CD. Perform the following steps to verify that the Java 2 SDK on the product CD-ROM is working correctly.

- a. Change directories to the /linux386/WAS/jdk/java/bin directory on the product CD-ROM.

For example:

```
cd /mnt/linux386/WAS/jdk/java/bin
```

- b. Verify the Java 2 SDK version.

Type the following command:

```
./java -version
```

The command completes successfully with no errors when the Java 2 SDK is intact.

19. Unfederate a base node if you require certain WebSphere Business Integration Server Foundation features.

If you are planning to install WebSphere Business Integration Server Foundation on a federated base node, the installer program does not allow you to install certain features. These Integration Server features are always hidden and deactivated on a federated base node:

- Samples
- Embedded messaging

Unfederate the base node. When you install the Integration Server product you can select any Sample features or the embedded messaging server and client feature. You can refederate the base node after the installation is complete.

A federated base node must have both the administrative console feature and the administrative scripting feature to install the following Integration Server features:

- Business Rule Beans
- Process choreographer

Otherwise the two features are hidden and deactivated when installing Integration Server on a federated base node.

Unfederate the base node. When you install the Integration Server product you can select the Business Rule Beans feature or the process choreographer feature. You can refederate the base node after the installation is complete.

20. Select the Installation wizard method or the silent installation method but do not start the installation yet. The installer program has two interfaces, the Installation wizard and a silent command-line installation.

#### **Performing the installation with the wizard**

You can start the Installation wizard in two ways. The default installation method is to open a command window to a read/write directory, issue the fully qualified command to start the Launchpad tool, and click the **Install the product** option. This option launches the Installation wizard, which is an

InstallShield for Multiplatforms (ISMP) application. This action launches the Installation wizard in the language of your machine locale unless no translation is available for your locale, in which case you receive the English version. A short delay occurs before the ISMP wizard displays. You do not need to click the Install the product option more than once to cause the wizard to display. The delay is particularly noticeable on x-windows platforms.

You can also start the Installation wizard using the `/mnt/cdrom/linuxi386/install` command, where `mnt/cdrom` is the mount point for the product CD-ROM and `linuxi386` is the platform directory for Linux xSeries platforms. Start the installation from a read/write location and not from the CD-ROM.

Three separate Linux CDs exist, one for each unique platform directory:

- `linuxi386` for xSeries platforms
- `linuxs390` for 31-bit S/390 zSeries platforms
- `linuxppc` for Power platforms

The WebSphere Business Integration Server Foundation installer program applies a cumulative fix to the V5.1.0.0 base product or V5.1.0.0 Network Deployment product that the Integration Server extends. The cumulative fix leaves the service level of each product at the V5.1.0.2 level. If you have applied interim fixes that are not part of the cumulative fix, you must reinstall them. Installing the cumulative fix removes all interim fixes that you might have installed.

The Launchpad copies certain files to your disk drive to avoid locking the CD during the installation, which requires you to change CDs. Expect a slight delay as you open the Launchpad while it copies the readme files and the installation document to disk.

### Performing a silent installation

You can also perform a silent installation using the `-options setup.response` parameter (or the `-options setup_nd.response` parameter for use with the Network Deployment product) with the command method:

```
fully_qualified_CD_pathname/install
  -options fully_qualified_HDD_pathname/setup.response
```

#### Examples:

```
# /mnt/cdrom/linuxi386/install -options /tmp/setup.response
# /mnt/cdrom/linuxs390/install -options /tmp/setup.response
# /mnt/cdrom/linuxppc/install -options /tmp/setup.response
```

Start the silent installation with a fully qualified path to the options response file. Otherwise, the Installation wizard starts. Start the silent installation from a read/write location and not from the CD-ROM or another read-only directory.

A silent installation causes the installation program to read your responses from the options response file, instead of from the wizard interface. You must customize the *response files* before installing silently.

After customizing one of the files, you can issue the command to silently install. After issuing the command, the following text displays:

```
# .....
.InstallShield Wizard
```

```
Initializing InstallShield Wizard...
```

```
Searching for Java(tm) Virtual Machine...
```

The silent installation runs without displaying status to the window. If you copy both CDs to your disk drive, press **Enter** when the installation is complete to return to the command prompt. If you copy disk 2 only to your disk drive and you start the installation by issuing a fully qualified **install** command that refers to disk 1 in the CD drive, you can press **Enter** at any time to return from the background job to the command prompt. For more information, see the description of the asynchronous command line at the end of the next step.

You can change the `-W launchPRTBean.active` option to display the Registration panel to indicate the completion of a silent installation on a local system with a graphical user interface.

To determine the status of the silent installation, review the installation logs in the *install\_root/logs* directory or in the */tmp* directory.

Silent installation is particularly useful if you install the product often.

The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard. Review the description of the *setup.response* file and the *setup\_nd.response* file for more information. Comments in each file describe how to customize their options.

21. Select one of the four installation methods for installing from the two-CD installation image. The installation image is on two CD-ROMs. The cumulative fixes are on disk 2. Although four methods exist for installing the product from the two CD-ROMs, the recommended procedure is Method 1.

The installation CDs are platform specific. Each CD label identifies the platform for which it is designed to be used. The CDs for a particular platform should only be inserted and run from a CD drive that is mounted on the platform that is identified on the CD.

Plan to start the installation from a read/write location and not from the CD or a read-only directory. Issue a command with a fully qualified path name to the install program on the CD. Do not change directories to the CD drive to issue a command that uses a relative, local path.

The following description provides an overview of all four installation methods.

**Method 1:** This method is recommended when using the Installation wizard to install WebSphere Business Integration Server Foundation. This method of installing does not support silent installations.

- a. Insert disk 1 and mount the disk if necessary using the `mount /dev/cdrom /mnt` command, where */mnt* is the name of your CD directory.
- b. Change your directory to a read/write directory, such as the */tmp* directory. Start the installation using a fully qualified path name, such as:  
`/mnt/linuxPPC/launchpad.sh`
- c. Unmount disk 1 at the prompt:  
`umount /mnt`
- d. Remove disk 1, insert disk 2 and mount the disk if necessary.
- e. Identify the location of disk 2 (which includes the *WAS\_update* directory).
- f. Continue the installation.

After the installation wizard reads the cumulative fix from disk 2, the wizard displays a prompt for disk 1:

- a. Unmount and remove disk 2.
- b. Insert disk 1 and mount the drive.
- c. Continue the installation.

Verify that no other windows or applications access the CD-ROM drive. If any process accesses the CD-ROM, you might not be able to unmount one disk and mount the next one.

To begin installing with this method, go to the next step in the overall installation.

### Other installation options

The next few steps in the overall procedure assume that you are using the recommended method of installing. However, you have three other options for installing from the two CDs, all of which support both the Installation wizard method of installing and the silent installation method:

- **Method 2:** This method copies Disk 2 to a specific default location on the hard drive and does not require you to switch disks. This method is recommended for installing silently:
  - a. Open a shell window and log on as root. Use the same shell window throughout the installation procedure.
  - b. Insert disk 2.
  - c. Mount the CD-ROM drive using the `mount /dev/cdrom /mnt` command.
  - d. Copy the data from the CD-ROM to the */tmp* directory using parameters to maintain symbolic links as shown in the following example:

```
cp -frp /mnt/cdrom/linuxi386/WAS_update /tmp
```

- e. Unmount disk 2 and mount disk 1 to continue the installation. Prompts to switch disks do not occur.
- **Method 3:** Create the *CDROM2* environment variable to identify the location of disk 2. The location of disk 2 can be another CD-ROM mount point or a disk location where you copy the data. The installation proceeds without prompts for either disk. This method of installing also supports silent installations:
  - a. Open a shell window and log on as root. Use the same shell window throughout the installation procedure. The *CDROM2* environment variable is only available to the current shell window.
  - b. Mount the CD-ROM drive labeled *CDROM2*.
  - c. Insert disk 2 into *CDROM2*.
  - d. Define the *CDROM2* environment variable with the following commands:

```
CDROM2=/mnt/cdrom2/linuxi386
export CDROM2
```
  - e. Mount disk 1 to continue the installation. Prompts to switch disks do not occur.
- **Method 4:** Copy both CDs to any directory and start the installation from that directory. The installation proceeds without prompting for either disk. This method of installing also supports silent installations:
  - a. Open a shell window and log on as root. Use the same shell window throughout the installation procedure.
  - b. Insert disk 1 into the CD-ROM drive and mount the drive, if necessary.
  - c. Copy the contents to any directory. The commands in the following example create and use the */tmp/wbisf51* directory:

```
cd /tmp
mkdir wbisf51

cp -frp /mnt/cdrom/* /tmp/wbisf51
```
  - d. Remove disk 1 and unmount the CD-ROM drive, if necessary.
  - e. Insert disk 2 into the CD-ROM drive and mount the drive, if necessary.
  - f. Copy the contents to the same directory:

```
cp -frp /mnt/cdrom/* /tmp/wbisf51
```
  - g. Start the installation with the ***/tmp/wbisf51/linuxi386/launchpad.sh*** command or the ***/tmp/wbisf51/linuxi386/install*** command to continue the installation. Prompts to switch disks do not occur.
  - h. Skip the next three steps to continue the installation.

### Asynchronous and synchronous command lines

After running the **install** command, the command line returns asynchronously. Because of the need to support a two-CD installation, it is not possible to run the **install** command synchronously for Methods 1, 2, and 3. A synchronous **install** command returns the command line after the installation is complete.

Because you can switch CDs in the middle of the installation, the installation process and its children processes all run as background processes. After running the **install** command, the command line returns immediately. Do not misinterpret this to mean that the installation has finished. Although the command line returns, either the Installation wizard or a silent installation might still be in progress.

Confirm the successful completion of the Installation wizard by viewing the Summary panel. Confirm the successful completion of a silent installation (or the Installation wizard) by examining the *install\_root/logs/WAS.WBISF.install.log* file for the following message:

```
INSTFIN: The installation is complete.
```

Method 4 is the exception to the asynchronous behavior. If you copy both CDs to any directory and start the installation from that directory, the installation proceeds without prompting for either disk. The



installer program does support a synchronous command line when installing from a disk drive. The command line returns after the installation is complete.

### Installing with a network file system mount

When installing from a drive mounted on a network file system (NFS), use NFS client and server platforms with identical versions of the operating system and a well-tuned NFS, if possible. For example, if installing on an xSeries (i386) RHEL3 machine, the recommended NFS server is also an xSeries (i386) RHEL3 machine.

If you are forced to use a cross-platform NFS mount, such as when installing from CD on a Linux for S/390 system, mount the drive with the `-o tcp` option if the option is available. For example:

```
mount -o tcp mycdrom.hostname:/media/cdrom /mnt
```

Refer to the man pages for the **mount** command to see if the `tcp` option is available. Using a CD drive or a disk drive mounted with the default mount option (`udp`) is known to cause errors on some versions of Linux. Red Hat Enterprise Linux 3.0 UL1 on a S/390 platform is particularly sensitive to this problem, but the recommendation applies to all Linux platforms.

If you must copy CD images for one platform to an NFS disk on another operating system platform, use a command that preserves symbolic links. For example, on an AIX platform use the **cp -hrp** command to copy data from an HP-UX disk and preserve the symbolic links. Without the `-h` option, the `cp` command on an AIX platform attempts to resolve symbolic links when copying an HP-UX disc instead of preserving the links.

Even with the `-h` option, the **cp** command on a Solaris platform does not preserve symbolic links when copying an HP-UX disk. On a Solaris platform, use the **tar -cvf** command to copy data from an HP-UX disk and preserve the symbolic links.

Consult the man page for the copy command on the NFS system to understand how the platform supports copying symbolic links.

Because many NFS incompatibilities can exist among various platforms, do not use a drive mounted on a network file system to install from one operating system platform to another without first verifying that the NFS configuration is robust. For example, if your mounted CD is `/mnt`, issue the following command on a Linux for S/390 system to see if you have an NFS problem:

```
unzip -l /mnt/linuxs390/WAS/setup.jar
```

The proper output from the command lists all the files in the `setup.jar` file without error. If you encounter problems in running the command, verify that your `/etc/exports` file includes the `no_root_squash` option.

See <http://www.redhat.com/docs/manuals/enterprise/RHEL-3-Manual/sysadmin-guide/s1-nfs-mount.html> for more information about the `-o tcp` option.

See Troubleshooting the installation for more information about symptoms you can experience when installing with a faulty NFS mount. Contact your system administrator for help if you continue to have NFS problems.

### Recovering from a failed installation

If the installation program cannot locate the `WAS_update` directory from disk 2, the installation program fails immediately. The immediate failure leaves the `WAS.WBISF.install.log` file only in the `/tmp` directory. Normally, the installation program creates installation logs in the `install_root/logs/wbisf` directory.

In some instances, such as the one where the `WAS_update` directory does not exist, the installation program fails before it can copy the log files from the system temporary directory to the `/logs` directory. If you cannot find the installation log files in the `install_root/logs/wbisf` directory, look in the system temporary directory. Correct any problems and reinstall.

If you do not copy the `WAS_update` directory correctly from disk 2 to the `/tmp` directory or if you use the `CDROM2` variable incorrectly, error messages might exist in the `was_update_apply.err` file and in the `was_update_apply.out` file in the `install_root/logs/wbisf` directory. Correct any problems and reinstall.

The installer program might prompt for disk 2 if it cannot locate disk 2 in the `/tmp` directory or at the location specified by the `CDROM2` variable. In such a case, insert disk 2 and continue the installation.



If the application of Cumulative Fix 2 fails, check the logs for more information. The solution might be as simple as rerunning the installation after selecting a different installation option:

- Method 1: Using the prompts and switching CDs
- Method 2: Copying the second disk to the /tmp directory
- Method 3: Using the CDRROM2 variable to identify the location of disk 2
- Method 4: Copying both CDs to the hard drive and running the installation from the hard drive

Using a second method can be successful after a failed first attempt using a different method.

22. Insert the product CD labeled, *Integration Server Disk 1 of 2*. Most Linux systems are configured to automatically mount CD-ROM drives. Mount your CD-ROM drive if necessary:

```
mount /mnt/cdrom
```

If a file explorer window opens, close it.

23. Open a shell window and mount the CD-ROM drive if necessary. Mount the CD drive with the following command:

```
mount /mnt/cdrom
```

Use the same shell window throughout the installation procedure. Verify that you are in a read/write directory and not the CD-ROM directory or another read-only directory before you start the installation.

24. Start the installation with the `/mnt/cdrom/linuxi386/launchpad.sh` command, where `mnt/cdrom` is the mount point for the product CD-ROM and `linuxi386` is the platform directory for the xSeries CD-ROM. The default installation method is to click **Install the product** on the Launchpad tool to launch the Installation wizard, which is an InstallShield for MultiPlatforms (ISMP) application. You can also start the installation directly using the `/mnt/cdrom/linuxi386/install` command. The following examples show how to issue the command:

**Syntax:**

```
fully_qualified_CD_pathname/install
```

**Examples:**

```
# /mnt/cdrom/linuxi386/install
# /mnt/cdrom/linuxs390/install
# /mnt/cdrom/linuxppc/install
```

The readme link in the Launchpad is to the `readme.html` file in the CD root directory. The `readme` directory off the root of the CD has more detailed readme files. The *Getting Started* document that contains installation information is in the `docs` directory on the CD. Download the most current version of the *Getting Started* document from the Library Web page.

The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard. Review the description of the `setup.response` file and the `setup_nd.response` file for more information. Comments in each file describe how to customize the options.

25. Click **Next** to continue. The license agreement appears for you to read.
26. Click the radio button beside the **I accept the terms in the license agreement** message if you agree to the license agreement and click **Next** to continue. After you accept the licensing terms, the Installation wizard checks for prerequisites and for previous versions, with which it can either migrate or coexist.

As the WebSphere Business Integration Server Foundation product version changes, its prerequisites and corequisites change. It is probably necessary to update your database, Web server, Software Development Kit (SDK), and other software.

As mentioned in the introduction to this topic, the Integration Server product can install the base WebSphere Application Server product. The base product simplifies migrating product prerequisites, by providing the option to install a complimentary Java 2 SDK on your supported operating system. You can uninstall back-level prerequisites and let the Installation wizard install current versions.

If the wizard finds a previous version of WebSphere Application Server, it prompts you to migrate applications and the configuration from the previous version, or to coexist with it. If it finds more than

one previous version, the Installation wizard lists them for you to select which one to migrate. As of V5.1, the Installation wizard also lists WebSphere Application Server - Express as a candidate for automatic migration, when detected.

Use the same cell name when migrating Network Deployment from V5.0.x to V5.1.x. If you use a different cell name, federated nodes cannot successfully migrate to the Network Deployment V5.1.x cell.

You can use a different node name, if you prefer, when migrating Network Deployment from V5.0.x to V5.1.x. However, you must use the administrative console after installation, to change the Secure Sockets Layer (SSL) settings that mention the node name.

27. Install the administrative console extensions on the Network Deployment product or the programming model extensions on the base WebSphere Application Server product, when both products are installed on the same machine. If you have both the base WebSphere Application Server product and the Network Deployment product on the same machine, the Installation wizard for the Integration Server product displays a panel for you to select the part of the Integration Server product to install. When no product exists on the machine, the Installation wizard prompts you to identify an installation location for an umbrella installation of the base product, the cumulative fix, the service pack upgrade, and the Integration Server.
28. Install additional features or install another instance of the Integration Server product when a previous installation of the same level product exists. When the installer program detects a previous installation at the same product level, a panel appears to let you add features to the existing installation or perform a new installation to another directory. When adding features, previously installed features are checked and grayed out with the term **(Installed)** at the end of the feature name.

You can add Integration Server features to Integration Server on an unfederated base node or to Integration Server on a deployment manager node at any time, by running the Installation wizard again and choosing to add features.

If you are installing WebSphere Business Integration Server Foundation on a federated node, the installer program does not allow you to install certain features. These Integration Server features are always hidden and deactivated on a federated base node:

- Samples
- Embedded messaging

Integration Server features that are not grayed out are available for installation on a federated base node. You do not have to unfederate the base node to add available Integration Server features.

If the federated base node does not have the administrative console feature and the administrative scripting features, these additional Integration Server features are hidden and deactivated:

- Business Rule Beans
- Process choreographer

Federated nodes must be unfederated before adding base product features to avoid conflicts while the deployment manager owns the configuration of the base node. To install any of these deactivated features, you must perform the following procedure.

Use the **backupConfig** command to save the Network Deployment configuration so that you can restore the configuration if necessary. Although you can use the **backupConfig** command to save the configuration, the **restoreConfig** command restores the configuration without any features you add to the base node. However, you can refer to the saved configuration after adding features and adding the base node back to the cell. Refer to the saved configuration as you use the administrative console of the deployment manager to reconfigure the base node.

- a. Cancel the installation.
- b. Copy configuration files if you installed the Integration Server product on a federated base node after the base node was federated. If you installed the Integration Server product on an unfederated base node or before the base node was federated, you can skip this step. Copy the following files on the base node from the `install_root/config/cells/cellname/nodes/nodename/servers/server1/` directory to the `install_root/config/backup/base/cells/cellname/nodes/nodename/servers/server1/` directory:

- server-pme.xml
- server-pme502.xml
- server-pme51.xml
- resources-pme.xml
- resources-pme502.xml

Copy the following files on the base node from the *install\_root/config/cells/cellname/nodes/nodename/* directory to the *install\_root/config/backup/base/cells/cellname/nodes/nodename/* directory:

- resources-pme.xml
- resources-pme502.xml

- Unfederate a federated base product node with the **removeNode** command. Removing the base node from the cell also removes the configuration for the base node, which resides at the cell level.
- Use the update installer program to uninstall any interim fixes or fix packs that you installed after installing the Integration Server product.
- Log off and back on.
- Launch the Integration Server installation program again.
- Install the new features that you require instead of installing a new product instance.

Continue the installation by performing the remaining steps in the overall procedure. After completing the installation, plan to perform the following steps:

- Use the update installer program to reinstall any interim fixes or fix packs that are available.  
If you are updating a node that you intend to federate, install only fix packs and interim fixes that are installed on the deployment manager node. The deployment manager must be at the highest fix level in the cell.

When attempting to federate a WebSphere Business Integration Server Foundation node into a deployment manager cell that does not have the Integration Server installed, you are prompted to install the Integration Server extensions before proceeding. The WebSphere Business Integration Server Foundation code installs Cumulative Fix 2 (5.1.0.2) for the deployment manager and also installs the Integration Server administrative console extensions.

- Rejoin the node to the cell with the **addNode** command or the deployment manager administrative console.

This action synchronizes the master cell configuration with changes that you make to the Application Server configuration during the installation of the new features.

- Reconfigure the base node with the Network Deployment administrative console.

Consult the configuration that you saved to determine how to configure the node, if necessary.

- Choose to migrate applications and the configuration from a previous version, or to coexist with another version, or to do neither, and click **Next** to continue.

All WebSphere Application Server products on a single machine share some of the code in the embedded messaging feature, if installed. The required level of the embedded messaging feature for V5.1 (CSD04) is not the same as for V5.0.0 or V5.0.1. The required level of the embedded messaging feature for V5.1 is the same as for V5.0.2.

If you attempt to install V5.1 on a machine where a version of the embedded messaging feature is at a release level earlier than CSD04, the installer program displays the message log in a panel. The message that you see is similar to one of the messages in the following example:

```
MQSeries or WebSphere MQ server at an earlier release than required to support
embedded messaging is already installed on the system.
```

```
Unsupported earlier maintenance level of MQSeries or WebSphere MQ detected.
```

```
Unsupported earlier release of MQSeries client or WebSphere MQ client detected.
```

Unsupported maintenance level of MQSeries client or WebSphere MQ client detected.

Software conflict with MQSeries JMS SupportPac MA88 detected.

To correct the problem, perform one of the following actions:

- Upgrade the full MQSeries or WebSphere MQ product to WebSphere MQ at the level that supports embedded messaging for V5.1 (CSD04). Refer to “Installing WebSphere embedded messaging as the JMS provider” on page 169 for more information.
- Uninstall the existing MQSeries or WebSphere MQ product if MQSeries or WebSphere MQ is not required on this system and reinstall the WebSphere Application Server product. Select the embedded messaging feature.

The MQSeries JMS SupportPac MA88 problem is slightly different. Uninstall the MQSeries JMS SupportPac MA88 and reinstall the WebSphere Application Server product, selecting the embedded messaging feature. The function provided by SupportPac MA88 is included in the embedded messaging feature.

You can also upgrade the WebSphere Application Server product to V5.0.2 to avoid any problem with an incorrect level of the embedded messaging feature.

You can perform the procedure for migrating V5.0.0 or V5.0.1 Enterprise with embedded messaging on a base node to Integration Server V5.1.

You can perform the procedure for migrating V5.0.0 or V5.0.1 Enterprise with embedded messaging to V5.1 Integration Server on Network Deployment.

To share embedded messaging in a coexistence environment, the node names for each installation must be unique, so that each installation has a message queue manager that is named uniquely. To migrate V5.0.2 to V5.1, the node names must be identical. Therefore, the queue manager names are also identical, if you are migrating from V5.0.2 to V5.1. To prevent losing the queue manager when you uninstall V5.0.2 (or V5.1), you must create a dummy queue manager before uninstalling one of the WebSphere Application Server versions.

The first rule of migration is to migrate after you install WebSphere Business Integration Server Foundation:

If you are planning to install these products:		Select the migration option while installing this product:	
Base product	Integration Server	Base product	Integration Server
X		X	
X	X		X

The exception to the rule is to migrate V3.5.x to V5.1 during the installation of the base product or the Network Deployment product, before installing the Integration Server product.

If you are planning to install these products:		Select the migration option while installing this product:	
Network Deployment	Integration Server	Network Deployment	Integration Server
X		X	
X	X		X

If you migrate Enterprise Edition V4.x or Enterprise V5.0.x to WebSphere Business Integration Server Foundation, Version 5.1, you cannot select the Sample configuration for the process choreographer feature. Migrating the process choreographer feature is not compatible with installing the Sample configuration feature because there can be only one Sample configuration. If you migrate the previous configuration, you cannot install another configuration. Clear the migration check box to install the Sample configuration feature.

Migrating Integration Server also migrates the product that Integration Server extends.

When you perform an umbrella installation of the base WebSphere Application Server product, you can choose to migrate applications and the configuration from a previous version, or to coexist with another version of the base WebSphere Application Server product, or to do neither.

You can also perform a silent migration or configure for coexistence during a silent installation. Refer to *Installing silently* for a description of performing a silent installation, including the options that you can specify.

The migration prompt appears only when the Installation wizard detects a previous version. The coexistence prompt appears when the Installation wizard detects any other installation, including another Version 5 installation.

If you choose to coexist, the wizard displays a Port selection panel, where you can specify port assignments that do not conflict with existing ports. For example, you can change the HTTP transport port for coexistence, from 9081 (one more than the default Version 5 port number) to 9085 or higher, to avoid potential conflicts with port numbers that previous versions of WebSphere Application Server commonly use.

Use the **netstat -a** command to display all ports in use.

In some cases, such as when installing a non-English version, the Installation wizard might not detect a previous version. You can force the Migration panel or the Coexistence panel to appear, by starting the installation with an option on the **/mnt/cdrom/linuxi386/install** command, where `mnt/cdrom` is the mount point for the product CD-ROM and `linuxi386` is the platform directory for Linux xSeries platforms.

For example, use this command:

```
# /mnt/cdrom/linuxi386/install
  -W showPreviousVersionDetectedPanel.active="true"
```

You can also force the appearance of the Coexistence panel to change conflicting port number assignments using the following command:

```
# /mnt/cdrom/linuxi386/install
  -W showCoexistencePanel.active="true"
```

If you choose neither the migration option nor the coexistence option, you can run Version 5.1.x and the previous version, but not at the same time. Although it is possible that both versions might coexist without port conflicts, you can ensure that both versions run together by selecting the coexistence option and checking for conflicting port assignments.

The Migration panel lists all previous releases that it can identify. If you highlight a release, the text boxes labeled, "select previous version," show the location of the previous product. Select the product to migrate. If you do not see the previous version that you intend to migrate, click **Select previous version** to enter a location and configuration file name if you are migrating a WebSphere Application Server Advanced Edition Single Server Edition, Version 4.0.x installation.

The field labeled "Configuration file" is valid only for WebSphere Application Server Advanced Edition Single Server Edition, Version 4.0.x. For the other versions of WebSphere Application Server that are supported by migration (Version 3.5 Standard Edition, Version 3.5 Extended Edition, and Version 4.0 Advanced Edition), the `admin.config` file provides the host and port values for the administrative server. If you use a file name other than `admin.config`, issue the commands that call the migration tools instead of migrating while installing. Issuing the commands that call the migration tools is described in *Migrating and coexisting*.

Migrate V3.5.x to V5.1 during the installation of the base product or the Network Deployment product, before installing the Integration Server product.

You must start the administrative server of some previous versions so that the Installation wizard can export the configuration from the `admin.config` file.

Although you might select migration at this point in the installation process, the actual migration does not begin until after the Version 5 installation is complete. At that time, if the `WASPreUpgrade` tool fails, the Installation wizard does not call the `WASPostUpgrade` tool to complete the migration, but instead displays the `WASPreUpgrade.log` and `WASPostUpgrade.log` log files for you to diagnose the problem. After fixing the problem, such as starting the administrative server of a previous release, you can start the migration again, as described in *Migrating and coexisting*.

30. Choose a type of installation and click **Next**.
- Choose **Typical install** to install the following features on your system:
    - Embedded messaging server and client
    - Embedded messaging message-driven bean Samples (requires the server and client feature to work)
    - Business rule beans
    - Extended (container-managed) messaging
    - Dynamic query
    - Additional Integration Server extensions
    - Scheduler and asynchronous beans
    - Process choreographer
    - Samples

If you choose a typical installation, skip the next step.

- Choose **Custom install** to select features to install.

After selecting a typical installation, the wizard prompts you to select the directory for the program code. After selecting a custom installation, the wizard displays a list of features.

31. Select features to install and click **Next** to continue, when performing a custom installation. This step is available only when you choose the custom installation type. A description of each feature appears at the bottom of the panel when you roll the cursor over the feature.

Selecting certain features causes the installation of other prerequisite features. The following table shows this feature relationship.

Table 18. Features and feature dependencies

If you select these features:	These Integration Server features are also installed:	
<b>Embedded Messaging</b>		
Sub-features:	Server and Client	
	Client Only	
	Message-driven Bean Samples (for the server and not for the client)	
<p>You can install the MDBSamples application without installing the embedded messaging server and client feature. Perhaps you have already installed the server and client feature. Or perhaps you intend to reconfigure the MDBSamples to use messaging resources that WebSphere MQ software provides.</p> <p>In any case, if you install the MDBSamples application and do not have the server and client feature installed, errors occur. The Application Server starts the MDBSamples application at start up. The MDBSamples application cannot start the required messaging resources in the Java Naming and Directory Interface (JNDI).</p> <p>Because of the lack of required resources, the message-driven beans fail to start, which causes an exception that the Application Server logs. The Application Server is not affected other than being unable to start the MDBSamples application.</p>		
<b>Business Rule Beans</b>		
Sub-features:	Business Rule Beans Sample	
<b>Event Infrastructure Technical Preview</b>		
(Tech preview: For use on a stand-alone base node.)		
<b>Extended Messaging</b>		
Sub-features:	Extended Messaging Sample	Embedded Messaging
<b>Dynamic Query</b>		
Sub-features:	Dynamic Query Sample	
<b>Additional Integration Server Extensions</b>		



Table 18. Features and feature dependencies (continued)

If you select these features:	These Integration Server features are also installed:
Sub-features:	Additional Integration Server Extensions Samples
<b>Scheduler and Asynchronous Beans</b>	
Sub-features:	Scheduler and Asynchronous Beans Samples
<b>Process Choreographer</b>	
Sub-features:	Additional Integration Server Extensions
Scheduler and Asynchronous Beans	
Sub-features:	Additional Integration Server Extensions
Process Choreographer Sample	Scheduler and Asynchronous Beans
Embedded Messaging	
Configure a sample business process container	Additional Integration Server Extensions
Scheduler and Asynchronous Beans	
<b>CORBA C++ SDK (deprecated)</b>	
Sub-features:	Interface Repository Support (Requires DB2)
CORBA C++ SDK Samples	
<b>Javadocs</b>	

If you do not have the prerequisite base WebSphere Application Server product installed, the Integration Server installation can install it for you. The Integration Server Installation wizard installs the base WebSphere Application Server product without these features:

- IBM HTTP Server
- Web server plug-ins
- Performance and analysis tools

If you want one or more of the features, cancel the Integration Server installation and issue the **/mnt/cdrom/WAS/install** command, where **mnt/cdrom** is the mount point for the product CD-ROM and **WAS** is the directory for installing the base WebSphere Application Server product.

If you already have an unfederated base node installed, but select an Integration Server feature that requires a base product feature that you have not installed, the Integration Server installation installs the feature on the unfederated base node. The following table describes which base features are required when you select an Integration Server feature.

Table 19. Integration Server features and unfederated base product feature dependencies

If you select these features:	These base product features are also installed:
<b>Embedded Messaging</b>	
Sub-features:	Server and Client
Client Only	
Message-driven Bean Samples (These Samples are the MDBSamples application, which is for the server and not for the client.)	



Table 19. Integration Server features and unfederated base product feature dependencies (continued)

If you select these features:		These base product features are also installed:
<b>Business Rule Beans</b>		WebSphere Application Server
		Admin Scripting
Sub-features: Business Rule Beans Sample		Administrative Console
		Application Server Samples
<b>Event Infrastructure Technical Preview</b>		
<b>Extended Messaging</b>		WebSphere Application Server
		Application Server Samples
Sub-features: Extended Messaging Sample		Embedded Messaging
		Messaging-driven Bean Samples
<b>Dynamic Query</b>		WebSphere Application Server
		Application Server Samples
Sub-features: Dynamic Query Sample		Application Server
		Application Assembly Tool Discontinued as of V5.1.
<b>Additional Integration Server Extensions</b>		Administrative Console
		Application Server Samples
Sub-features: Additional Integration Server Extensions Samples		Application Server Samples
<b>Scheduler and Asynchronous Beans</b>		Application Server
		Application Server Samples
Sub-features: Scheduler and Asynchronous Beans Samples		Application Server
<b>Process Choreographer</b>		Admin Scripting
		Administrative Console
Sub-features: Process Choreographer Samples		Application Server Samples
		Embedded Messaging
Configure a sample business process container		
<b>CORBA C++ SDK (Deprecated)</b>		
Sub-features: Interface Repository Support (Requires DB2)		
CORBA C++ SDK Samples		Application Server Samples
<b>Javadocs</b>		

These Integration Server features are always hidden and deactivated on a federated base node:

- Samples
- Embedded messaging

If the federated base node does not have the administrative console feature and the administrative scripting features, these additional features are hidden and deactivated:

- Business Rule Beans
- Process choreographer

To install any of these deactivated features, you must unfederate the base node, install the Integration Server product again, select the features you require, and add the node to the cell again. Federated nodes must be unfederated before adding base product features to avoid conflicts while the deployment manager owns the configuration of the base node.

You do not have to unfederate a federated base node to add Integration Server features that appear in the list of available features.

You can run the uninstaller program to remove all of the installed features.

32. Specify a destination directory and click **Next** to continue. Deleting the default target location and leaving an installation directory field empty stops you from continuing the installation process. The Installation wizard does not proceed when you click **Next**. Enter the required target directory to proceed to the next panel. Non-ASCII special characters are not supported in the name of the installation directory. Spaces are also not supported in the name of the installation directory.

The installer program for WebSphere Business Integration Server Foundation checks twice for required temporary space. The program checks once at the beginning of the installation before it copies a Java 2 SDK to the temporary directory to support the Installation wizard Java process. Later, the program checks for enough space to install the cumulative fix to either the base product or the Network Deployment product. If not enough space is available, cancel the installation, allocate the approximately 500 MB of temporary space that is required on most platforms, and reinstall. The actual space required depends on the operating system and the features that you are installing.

The installer program does not let you install the base product during an umbrella installation if sufficient space is not available to apply the cumulative fix. However, suppose the installer program installs the base product and then runs into an error during the installation of the cumulative fix because of an insufficient amount of temporary space. In such a case, cancel the installation, allocate enough temporary space to install the cumulative fix, and restart the installation. The installer program picks up the installation where it left off, installing the cumulative fix to the base product, which you can select at the beginning of the installation.

If you have problems accessing the administrative console after installation, check the `installAdminConsole.log` file for a failure indication. Clean up the `/tmp` space and reinstall the administrative console using the `wsadmin` scripting facility.

If you must increase the `/tmp` allocation on a Linux or UNIX-based platform, stop the installation program, increase the allocation, and restart the installation.

If you select the embedded messaging feature and prerequisites are missing, the Installation wizard displays the `mq_prereq.log` error log and takes you back to the Installation type panel. Choose **Custom** installation and clear the embedded messaging feature to continue. The `mq_prereq.log` file is in the system temp directory.

33. Specify node information and click **Next**. Specify the node name and host name. Although the wizard inserts the machine name (of the installation platform) as the node name, you can specify any unique name. The node name is an arbitrary WebSphere Application Server-specific name that must be unique within a cell.

The host name is the network name for the physical machine on which the node is installed. The host name must resolve to a physical network node on the server. When multiple network cards exist in the server, the host name or IP address must resolve to one of the network cards. Remote WebSphere Application Server nodes use the host name to connect to and to communicate with this node. Selecting a host name that other machines can reach within your network is extremely important. Do not use the generic `localhost` identifier for this value.

If you define coexisting nodes on the same computer with unique IP addresses, define each IP address in the `/etc/hosts` file or in a domain name server (DNS) look-up table. WebSphere Application Server configuration files do not provide domain name resolution for multiple IP addresses on a machine with a single network address.

The value that you specify for the host name is used as the value of the `hostName` property in WebSphere Application Server configuration documents. Specify the host name value in one of the following formats:

- Fully qualified domain name servers (DNS) host name string, such as `xmachine.manhattan.ibm.com`
- The default short DNS host name string, such as `xmachine`
- Numeric IP address, such as `127.1.255.3`

The fully qualified DNS host name has the advantage of being totally unambiguous and also flexible. You have the flexibility of changing the actual IP address for the host system without having to change the WebSphere Application Server configuration. This value for host name is particularly useful if you plan to change the IP address frequently when using Dynamic Host Configuration Protocol (DHCP) to assign IP addresses. A format disadvantage is being dependent on DNS. If DNS is not available, then connectivity is compromised.

The short host name is also dynamically resolvable. A short name format has the added ability of being redefined in the local hosts file so that the system can run WebSphere Application Server even when disconnected from the network. Define the short name to 127.0.0.1 (local loopback) in the hosts file to run disconnected. A format disadvantage is being dependent on DNS for remote access. If DNS is not available, then connectivity is compromised.

A numeric IP address has the advantage of not requiring name resolution through DNS. A remote node can connect to the node you name with a numeric IP address without DNS being available. A format disadvantage is that the numeric IP address is fixed. You must change the setting of the `hostName` property in WebSphere Application Server configuration documents whenever you change the machine IP address. Therefore, do not use a numeric IP address if you use DHCP, or if you change IP addresses regularly. Another format disadvantage is that you cannot use the node if the host is disconnected from the network.

34. Configure the sample business process container, if you selected it and click **Next** to continue. Specify values for the following fields:

**User ID to authenticate with the embedded messaging queue manager**

This field is the JMS user ID who authenticates the connection to the JMS provider. This user ID must have administration rights for the messaging service.

The JMS user ID must be less than or equal to 12 characters.

You can create the user ID later and add the user to the `mqm` user group. Or specify the root user as the value for the field:

`root`

**Password**

Type the password for the user you specified as the JMS user ID in the first field.

**Confirmation password**

Repeat the password for the user you specified as the JMS user ID in the first field.

**Security role for the business process system administrator**

This field is the security role mapping. Specify the user or group from the domain user registry that is mapped onto the role of Business Process Administrator. The value to use depends on the local settings. For example, you can specify that the Administrator group is to perform the security role on some systems.

The user registry can be the local operating system, Lightweight Directory Access Protocol (LDAP), or custom registry. The user or group specified must already exist in the user registry being used.

35. Review the summary information and click **Next** to install the product code or **Back** to change your specifications. When the installation is complete, the wizard displays the `install_root\logs\mq_install.log` installation log if you selected the embedded messaging feature and errors occur with its installation.
36. Review the `mq_install.log` installation log if it appears. Click **Next** to continue. The wizard displays the Registration panel.
37. Click **Next** to register the product, or clear the check box and click **Next** to register at a later time. The Registration panel is in English when the machine locale uses a double byte character set (DBCS) language.

You can register the product now by using the link on this panel or later, by using the Web address in the `install_root/prt/readme_prt.txt` file. The Web address in the file is encoded for your locale. A

known problem for some locales corrupts the Web address so that it is similar to the following example. (The Web address is all one line in the file. The following example shows the address on two lines for clarity.)

```
http%3A%2F%2Fwww.ibm.com%2Fsoftware%2Fwebprt%2Fregister%2Fprodreg.nsf%  
2Fcontact%3F0penForm%26lang%3DENUS%26pid%3D45P8842%26q2%3DWindows+2000
```

Use one of the following Web addresses if your *install\_root/prt/readme\_prt.txt* file is corrupt:

- <http://www.ibm.com/software/webprt/register/prodreg.nsf/contact?OpenForm&>
- <https://www6.software.ibm.com/reg/prt/prt-r>

The Installation wizard starts the First Steps tool.

If you are migrating a federated node as you install, close the First Steps tool. Migrated federated nodes have configuration differences that prevent you from using the First Steps tool.

38. Verify the success of the installer program by examining the Exit summary panel and the *install\_root/logs/WAS.WBISF.install.log* file.

If you performed an umbrella installation of the base product or if you installed new base product features, also examine the *install\_root/logs/log.txt* file. ISMP records a success message in the *WAS.WBISF.install.log* file: "INSTFIN: The installation is complete." The logs are the only source of status information for a silent installation.

Look for severe errors that the installer records in the *WAS.WBISF.install.log* file in the installation root directory to verify that no file system or other unusual errors occurred during installation.

If the *log.txt* file and the *WAS.WBISF.install.log* file do not contain a record of any problems but problems exist, verify or troubleshoot the installation, as described in Troubleshooting the installation.

39. Click **Finish** to close the Installation wizard.

40. Restrict access to the */var/mqm/errors* directory and messaging logging files. After installing the embedded messaging feature, you must restrict access to the */var/mqm* directory and to log files that are needed for embedded messaging, such that only the *mqm* user or members of the *mqm* user group have write access. For detailed information, see Installing WebSphere embedded messaging as the JMS provider.

41. Install WebSphere Application Server 5.1 Cumulative Fix 3.

Always install the latest cumulative fixes as they are released. See Cumulative Fix Strategy for WebSphere Application Server V5.0 and V5.1 for more information.

This collection of fixes for Version 5.1 updates the WebSphere Application Server base product or the Network Deployment product to Version 5.1.0.3. Cumulative Fix 3 includes all of the interim fixes in Cumulative Fix 2 and other fixes that are required for some components.

Cumulative Fix 3 is available at the <http://www-1.ibm.com/support/docview.wss?uid=swg24006675> Web address.

You can find a list of currently recommended fixes at the WebSphere Business Integration Server Foundation V5.1 recommended interim fixes Web site.

42. Tune your system for performance. For best performance on any platform, see "Tuning performance" in the information center.

### Preparing Linux for S/390 for better performance

Linux for S/390 (which refers to the Linux distributions available from Linux distributors that run on IBM eServer zSeries and S/390 systems in 31-bit mode) provides a configuration technique that affects the installation and run time performance of WebSphere Application Server. The technique configures the environment where the Linux image runs to use swap space efficiently. Some performance guidelines recommend running Linux with the VM/ESA or z/VM swap turned off because of VM/ESA or z/VM virtualization of hardware. Virtualization can produce double-swapping situations where VM/ESA or z/VM swaps storage and Linux also swaps storage, which degrades performance.

Excessive swapping affects the performance of the base WebSphere Application Server, which might require 200 MB when all of the Sample applications are loaded. On a system without swap space configured for use, and with a relatively small amount of memory (such as 256 MB), WebSphere

Application Server might encounter problems obtaining enough free memory to work properly, particularly when competing for resources against other applications and products that run in the Linux environment.

The solution is to disable swapping in Linux, but to enable swapping in VM/ESA or z/VM. You can increase performance by letting VM/ESA or z/VM handle the swapping. Double or triple the specification for physical memory for the Linux image. For example, if the physical memory allocation as seen by the Linux image is 256 MB, disable swap in Linux, enable swap in VM/ESA or z/VM, and increase the physical memory specification as seen by Linux to 512 MB or 768 MB. This amount of memory handles any large spikes in application memory usage that might occur.

You can fine tune the amount of physical memory to allocate to each Linux guest operating system. Size the JVM heap size for the application running in the Application Server, add 90 MB to that amount for the Application Server, 20 MB for Linux, and another 10-20% to handle peak usage. This measurement provides better memory management from a VM/ESA or z/VM perspective.

Avoid socket timeout exceptions (SocketTimeoutExceptions) when running WebSphere Business Integration Server Foundation on a Network Deployment node on a Linux for S/390 guest operating system on z/VM or VM/ESA. The exceptions are an indicator that too many processes are running and that the Linux system is being overloaded. If the deployment manager is under a heavy load, 1 GB of memory is required. In addition, move all base nodes to other Linux for S/390 guests to allow the deployment manager to run by itself on the Linux for S/390 system.

See the Linux on IBM eserver zSeries and S/390: ISP/ASP Solutions IBM Redbook and the Performance Analysis for Java Web sites book for more information.

The Installation wizard configures the product. It is not necessary to perform further configuration at this time.

You have now successfully installed WebSphere Business Integration Server Foundation and the features that you selected.

## Uninstalling and reinstalling

See Uninstalling the product for information about uninstalling any WebSphere Application Server product.

If you uninstalled WebSphere Business Integration Server Foundation but left the embedded messaging feature installed, and now you want to reinstall the V5.1 product, see “Reinstalling V5.1 after uninstalling and leaving the embedded messaging feature installed” on page 356.

After uninstalling a WebSphere Application Server product, reinstalling into the same directory without first deleting all directory contents results in invalid XML configurations because of the retention of old files. Uninstall manually to delete all of the files so that you can reinstall with a clean system, as described in Manually uninstalling on Linux.

Symptoms that you might experience if you reinstall without uninstalling manually include:

1. The **versionInfo.sh** command states that WebSphere Business Integration Server Foundation is installed but the product is not installed. Or the report might state that the base product is installed when it is not installed. Or the report might state that Cumulative Fix 2 is installed when it is not.
2. Specific directories might be missing in the installation root directory, such as the *install\_root/ProcessChoreographer* directory or the *install\_root/BRBeans* directory.

If you experience symptoms such as these, uninstall everything manually and reinstall. The installation is successful if you manually uninstall before reinstalling.

## Miscellaneous tips for Linux platforms

Table 20. Installation and migration tips

Operating platform	Tip
Linux platforms	Linux platforms <ul style="list-style-type: none"><li>• Ignoring YAST2 dependency conflicts for embedded messaging packages</li><li>• Avoiding utility hangs and accessing the deployment manager</li><li>• Accessing First Steps items on Linux for S/390 systems</li></ul>
All platforms	All platforms
All Linux and UNIX platforms	All Linux and UNIX-based platforms

## Installing the Integration Server on Solaris platforms

This topic describes how to install WebSphere Business Integration Server Foundation as the root user on the Solaris operating platform. If you back up the product CD-ROM, do so as root. Backup copies made from non-root users do not preserve the correct file attributes and do not work. This topic guides you through preparing for Integration Server, which includes choosing and installing the variety of options and features provided.

If you encounter a problem such as not having enough temporary space or not having the right packages on your system, cancel the installation, make the required changes, and restart the installation.

The installation image for the WebSphere Business Integration Server Foundation product is on two CDs. The installation CDs are platform specific. Each CD label identifies the platform for which it is designed to be used. The CDs for a particular platform should only be inserted and run from a CD drive that is mounted on the platform that is identified on the CD.

When you use an installation method that requires you to swap CDs, it is important that no application or window is accessing the CD. Otherwise, you might not be able to unmount one CD and mount the next one. Any of the following actions can lock a CD:

- Browsing a readme file on the CD with a browser
- Browsing any file on the CD with an editor
- Viewing the *Installation Guide* on the CD with Acrobat Reader
- Opening a command window and changing directories to the CD
- Accessing the CD from a telnet session
- Accessing the CD from any other process

This topic describes installing the Integration Server product, using the installation image on the two product CD-ROMs labeled, **Integration Server**. The Integration Server product package also contains CD-ROMs for installing the WebSphere Application Server Network Deployment product and the base WebSphere Application Server product.

This topic is available in Adobe PDF format, on the product CD-ROMs, and online in an information center that is available from the IBM WebSphere Application Server Web site at <http://publib.boulder.ibm.com/infocenter/ws51help/index.jsp>. When possible, access the most current version of this information by selecting the information center. The information center displays in the language of your machine locale.

The Launchpad tool lets you access the product overview, the `readme.html` file, and installation guides.

If you use the Mozilla browser and you do not have the Netscape browser, some links might not work. The Launchpad attempts to call the Netscape browser in the `/usr/bin/netscape` directory. Try a symbolic link to the Mozilla browser to fix the problem as shown in the following example:

```
ln -sf /usr/bin/mozilla /usr/bin/netscape
```



After using the Launchpad to view product documentation, perform the following procedure. The procedure includes several preliminary steps before actually launching the installer program.

1. Stop all WebSphere Application Server-related Java processes on the machine where you are installing the product.
2. Stop any Web server process such as the IBM HTTP Server, if you are extending the base product.
3. Provide adequate disk space.

The installer program for the WebSphere Business Integration Server Foundation product installs Cumulative Fix 2 (V5.1.0.2) to the base product or to the Network Deployment product that the Integration Server extends. The cumulative fix leaves the service level of each product at the V5.1.0.2 level. If you have applied interim fixes that are not part of the cumulative fix, you must reinstall them. Installing the cumulative fix removes all interim fixes that you might have installed.

After the installation is complete, install Cumulative Fix 3 and any recommended fixes that are described at the WebSphere Business Integration Server Foundation V5.1 recommended interim fixes Web site.

The installer program also installs the *V5.1.0 Cumulative Fix 1 for SDKs* service offering. The cumulative fix updates the Java 2 SDK for Solaris that IBM uses with the WebSphere Business Integration Server Foundation product and other V5.1 WebSphere Application Server products. The new service level is 1.4.2.

The Integration Server, Cumulative Fix 2, and Cumulative Fix 1 for SDKs require the following disk space:

**1730 MB for the /opt/WebSphere/AppServer or the /opt/WebSphere/DeploymentManager directory**

The installation root directory includes either the base product or the Network Deployment product. The installation program extends the installation root directory with WebSphere Business Integration Server Foundation software.

**500MB for the /tmp directory**

The temporary directory is the working directory for the installation program. Some components of the installation process require a specific amount of free space in the /tmp directory.

Although you might see an installation message for an incremental amount of free space that is less than 500 MB, the overall cumulative requirement for free space in the /tmp directory is 500 MB.

For example, if you do not have enough free space to start the installation, a message notifies you that you must have 200 MB of free space in the /tmp directory. The 200 MB of free space is what you must have when you have already installed Cumulative Fix 2 to an existing base product or to an existing Network Deployment product.

The 500 MB of free space is required to install the base product, Cumulative Fix 2, and the Integration Server product in the same *umbrella* installation procedure. An umbrella installation installs the base product as it installs Integration Server software.

Installing Integration Server software on the Network Deployment product also installs Cumulative Fix 2 (V5.1.0.2), which increases the amount of space required over the 200 MB in the message.

Verify that you have 500 MB of free space to avoid problems.

A second message about free space occurs when less than 4 MB of free space remains after starting the installation. The InstallShield for MultiPlatforms (ISMP) program displays a message about using the `-is:tempdir` parameter to identify an alternate temporary space directory.

Ignore any `-is:tempdir` message. The `-is:tempdir` parameter is not supported. Cancel the installation, allocate a total of 500 MB of free space in the /tmp directory, and start the installation again.



## 2230 MB

The total amount of space required for both directories is 2230 MB. A significant amount of the required space is temporarily required during installation and is released after installation. If you have already installed the cumulative fix on either the base product or the Network Deployment product that you are extending, the space requirement is reduced.

The Installation wizard displays required space for individual features on the Feature selection panel. The Installation wizard also warns you if you do not have enough space to install the product and the cumulative fixes.

If you plan to migrate applications and the configuration from a previous version, verify that application objects have available disk space. As a rough guideline, plan for space equal to 110 percent of the size of the application objects:

- **For Version 4.0.x:** The size of enterprise archive (EAR) files
- **For Version 5.0.x:** The size of EAR files

4. Define the user groups and the user needed for the embedded messaging feature.
  - a. If you have not already done so, create the `mqm` and `mqbrkrs` user groups.
  - b. Create the `mqm` user.
  - c. Add the `mqm` and `root` users to the `mqm` group.
  - d. Add the user `root` to the `mqbrkrs` group.

The recommended user ID for running the JMS server process is `root`. If you do run the JMS server process under another user ID, add that user ID to the `mqm` and `mqbrkrs` groups. User IDs longer than 12 characters cannot be used for authentication with the embedded WebSphere JMS provider.

The `mqm` user starts the JMS server for general JMS support and the WebSphere embedded broker for WebSphere Application Server topic connections.

Put the user groups into effect when you next start WebSphere Business Integration Server Foundation. For example, either log off and on again with the process user ID or open a new shell in which to start WebSphere Business Integration Server Foundation.

Use the `id -a` command or the `groups` command to see defined groups for `root`. If `mqm` and `mqbrkrs` are not in the list that is returned, you cannot install the embedded messaging feature:

```
[root@wasdoc2 root]# id -a
uid=0(root) gid=0(root)
  groups=0(root),1(bin),2(daemon),
  3(sys),4(adm),6(disk),10(wheel),500(mqm),501(mqbrkrs)
```

```
[root@wasdoc2 root]# groups
root bin daemon sys adm disk wheel mqm mqbrkrs
```

5. Log in appropriately to pick up the secondary user groups, `mqm` and `mqbrkrs`, for `root`. Use the `ssh` command instead of the `telnet` command to log in. Or run the following command after logging on:  
`su -`
6. Allocate adequate disk space for the embedded messaging feature if you are planning to install the feature. The installation locations for the embedded messaging feature are fixed as shown in the following table, which lists the locations for the base messaging functions and the messaging broker functions for publish/subscribe messaging.

Table 21. Space requirements for the embedded messaging feature on Solaris

Component	Base code	Broker code	Base data	Broker data
Path	/usr/ mqm	/usr/ opt/ wemps	/var/ mqm	/var/ wemps
Server and client subfeature	40 MB	70 MB	20 MB	5 MB
Client subfeature	15 MB	15 MB	15 MB	N/A

7. Prepare to install the embedded messaging feature. The embedded messaging feature is based on the IBM WebSphere MQ product. The feature and the product each provide a Java message service (JMS) function that supports queues for point-to-point messaging and topics for publish and subscribe

messaging. You can install WebSphere Business Integration Server Foundation with the embedded messaging feature with or without the WebSphere MQ product on the same machine. To support both the embedded messaging feature and the WebSphere MQ product on the same machine, the WebSphere MQ product must be at a certain fix level and must have several of its features installed.

If you already have WebSphere MQ installed, you can configure it as the JMS provider. Otherwise, you can install the embedded messaging feature during the installation of the Integration Server or install the WebSphere MQ product or another JMS provider after you install the Integration Server.

Even though you might decide now to install only the embedded messaging feature, you can install the WebSphere MQ product later and use the IBM WebSphere MQ product as the JMS provider instead.

8. Verify that you have upgraded to WebSphere MQ 5.3 with the CSD04 update to install embedded messaging on a machine where you already have WebSphere MQ installed. The WebSphere Business Integration Server Foundation package includes copies of the WebSphere MQ 5.3 and Event Broker installation images, with restricted licensing. Use the MQ CD-ROMs to install the required MQ features or WebSphere MQ 5.3 for use with Integration Server.

Determine if your WebSphere MQ 5.3 installation is at the required level by running the **mqver** utility provided by WebSphere MQ.

The required level as indicated by mqver is shown below:

```
Name:      WebSphere MQ
Version:   530.4 CSD04
...
```

9. Verify that you have installed the required WebSphere MQ 5.3 features to install embedded messaging on a machine where you already have WebSphere MQ installed. Verify that you have installed the following features:
  - When installing the embedded messaging server and client feature, the required MQ features are *Server* and *Java messaging*.
  - When installing the embedded messaging client feature, the required MQ feature is *Java messaging*.

If you attempt to install the embedded messaging feature when WebSphere MQ is already installed, the level of WebSphere MQ must be Version 5.3 with the required MQ features. Otherwise, the installation of the embedded messaging feature fails with prerequisite check errors.

10. Create and mount a journalized file system called `/var/mqm` for your messaging working data. Use a partition strategy with a separate volume for embedded messaging or WebSphere MQ data to isolate system activity from the potentially high volume of messaging work that can build up in the `/var/mqm` directory.
11. Create separate file systems for log data in the `var/mqm/log` directory and error files in the `var/mqm/errors` directory. Store log files on a different physical volume from the embedded messaging queues, which are in the `var/mqm` directory. This ensures data integrity in the case of a hardware failure. If you are creating separate file systems, allow the following minimum free space:

**30 MB** `/var/mqm`

**20 MB** `/var/mqm/log`

**4 MB** `/var/mqm/errors`

The `/var` file system stores all the security logging information for the system and stores the temporary files for e-mail and printing. Therefore, it is critical that you maintain free space in `/var` for these operations. If you do not create a separate file system for messaging data, and `/var` fills up, all security logging stops on the system until free space is available in `/var`. Also, e-mail and printing do not work without some available free space in `/var`.

You have the same options for creating file systems for the embedded messaging feature as you do for WebSphere MQ. For example, if you cannot install the embedded messaging options in the required file system (for example, if it is too small), you can do one of the following *before* installing the Embedded Messaging options:

- Create and mount a new file system for the installation directory.

- Create a new directory anywhere on your machine, and create a symbolic link from the required installation directory to the new directory. For example:

```
mkdir /bigdisk/mqm
ln -s /bigdisk/mqm /usr/mqm
```

12. Set kernel values to support the embedded messaging feature. Several Solaris kernel values are typically too small for the embedded messaging options. Starting the internal JMS server or client with insufficient kernel resources produces a First Failure Support Technology (FFST) file in the `/var/mqm/errors` directory.

Before installing embedded messaging, review the machine configuration:

```
sysdef -i
```

The kernel values are set in the `/etc/system` file, as shown in the following example.

```
set shmsys:shminfo_shmmax = 4294967295
set shmsys:shminfo_shmseg = 1024
set shmsys:shminfo_shmmni = 1024
set semsys:seminfo_semaem = 16384
set semsys:seminfo_semmni = 1024
set semsys:seminfo_semmap = 1026
set semsys:seminfo_semmns = 16384
set semsys:seminfo_semmsl = 100
set semsys:seminfo_semopm = 100
set semsys:seminfo_semmnu = 2048
set semsys:seminfo_semume = 256
set msgsys:msginfo_msgmap = 1026
set msgsys:msginfo_msgmax = 65535
set rlim_fd_cur=1024
```

You can change kernel values by editing the `/etc/system` file then rebooting the operating system. For more information about setting up the Solaris system, see the Solaris System Administration documentation. For example, the *Solaris Tunable Parameters Reference Manual*.

Queue managers are generally independent of each other. Therefore system kernel parameters, for example `shmmni`, `semmni`, `semmns`, and `semmnu` need to allow for the number of queue managers in the system.

13. Verify that prerequisites and corequisites are at the required release levels. Although the Installation wizard checks for prerequisite operating system patches with the `prereqChecker` application, review the prerequisites on the IBM WebSphere Application Server supported hardware, software, and APIs Web site if you have not already done so. Refer to the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

Some operating systems that were not supported at the time that this product was shipped on CD-ROM might now be supported. You might receive a message from the `prereqChecker` program that an operating system is not supported when, in fact, the operating system is supported.

Always consult the IBM WebSphere Application Server supported hardware, software, and APIs Web site to determine whether your operating system is supported when you receive a message from the `prereqChecker` program. The Web site lists all supported operating systems and the operating system fixes and patches that you must install to have a compliant operating system. After confirming that your operating system is supported and that you have installed all necessary patches, you can click **Next** to continue an installation when you receive an error message from the `prereqChecker` program.

14. Verify the system `cp` command when using emacs or other freeware.

If you have emacs or other freeware installed on your Solaris operating platform, verify that the system `cp` command is being used.

- a. Type `which cp` at the command prompt before running the installation program for the WebSphere Business Integration Server Foundation product.
- b. Remove the freeware directory from your `PATH` if the resulting directory output includes freeware. For example, if the output is similar to this `/opt/freeware/bin/cp` message, remove the directory from the `PATH`.
- c. Install the WebSphere Business Integration Server Foundation product.

d. Add the freeware directory back to the PATH.

If you install with a **cp** command that is part of a freeware package, the installation might appear to complete successfully, but the Java 2 SDK that the product installs might have missing files in the *install\_root/java* directory.

Missing files can destroy required symbolic links. If you remove the freeware **cp** command from the PATH, you can install the Integration Server product successfully.

Perform the following step to verify that the Java 2 SDK is working correctly.

15. Verify the Java 2 SDK on the WebSphere Business Integration Server Foundation CD. Perform the following steps to verify that the Java 2 SDK on the product CD-ROM is working correctly.

- a. Change directories to the */sun/WAS/jdk/java/bin* directory on the product CD-ROM. For example:

```
cd /mnt/sun/WAS/jdk/java/bin
```

- b. Verify the Java 2 SDK version. Type the following command:

```
./java -version
```

The command completes successfully with no errors when the Java 2 SDK is intact.

16. Unfederate a base node if you require certain WebSphere Business Integration Server Foundation features.

If you are planning to install WebSphere Business Integration Server Foundation on a federated base node, the installer program does not allow you to install certain features. These Integration Server features are always hidden and deactivated on a federated base node:

- Samples
- Embedded messaging

Unfederate the base node. When you install the Integration Server product you can select any Sample features or the embedded messaging server and client feature. You can refederate the base node after the installation is complete.

A federated base node must have both the administrative console feature and the administrative scripting feature to install the following Integration Server features:

- Business Rule Beans
- Process choreographer

Otherwise the two features are hidden and deactivated when installing Integration Server on a federated base node.

Unfederate the base node. When you install the Integration Server product you can select the Business Rule Beans feature or the process choreographer feature. You can refederate the base node after the installation is complete.

17. Select the Installation wizard method or the silent installation method but do not start the installation yet. The installer program has two interfaces, the Installation wizard and a silent command-line installation.

### Performing the installation with the wizard

You can start the Installation wizard in two ways. The default installation method is to open a command window to a read/write directory, issue the fully qualified command to start the Launchpad tool, and click the **Install the product** option. This option launches the Installation wizard in the language of your machine locale unless no translation is available for your locale, in which case you receive the English version. A short delay occurs before the ISMP wizard displays. You do not need to click the Install the product option more than once to cause the wizard to display. The delay is particularly noticeable on x-windows platforms.

You can also start the Installation wizard using the **# /cdrom/cdrom0/sun/install** command, where */cdrom/cdrom0* is the mount point for the product CD-ROM and *sun* is the platform directory. Start the installation from a read/write location and not from the CD-ROM.

If the Solaris machine is configured to auto mount CDRoms, Solaris automatically mounts the product CD as */cdrom/was\_wbisf\_sun\_cd1*. Close the File explorer window that Solaris automatically opens. Do not run the **launchpad** command or the **install** command using the automatically

generated mount point as in this example of the `/cdrom/was_wbisf_sun_cd1/sun/install` command. Instead, start the installation using this mount point specification:

```
/cdrom/cdrom0/sun/install
```

The WebSphere Business Integration Server Foundation installer program applies a cumulative fix to the V5.1.0.0 base product or V5.1.0.0 Network Deployment product that the Integration Server extends. The cumulative fix leaves the service level of each product at the V5.1.0.2 level. If you have applied interim fixes that are not part of the cumulative fix, you must reinstall them. Installing the cumulative fix removes all interim fixes that you might have installed.

The Launchpad copies certain files to your disk drive to avoid locking the CD during the installation, which requires you to change CDs. Expect a slight delay as you open the Launchpad while it copies the readme files and the installation document to disk.

### Performing a silent installation

You can also perform a silent installation using the `-options setup.response` parameter (or the `-options setup_nd.response` parameter for use with the Network Deployment product) with the command method:

```
fully_qualified_CD_pathname/install  
-options fully_qualified_HDD_pathname/setup.response
```

```
# /cdrom/cdrom0/sun/install -options /tmp/setup.response
```

Start the silent installation with a fully qualified path to the options response file. Otherwise, the Installation wizard starts. Start the silent installation from a read/write location and not from the CD-ROM or another read-only directory.

A silent installation causes the installation program to read your responses from the options response file, instead of from the wizard interface. You must customize the *response files* before installing silently.

After customizing one of the files, you can issue the command to silently install. After issuing the command, the following text displays:

```
# .....  
.InstallShield Wizard
```

```
Initializing InstallShield Wizard...
```

```
Searching for Java(tm) Virtual Machine...
```

The silent installation runs without displaying status to the window. If you copy both CDs to your disk drive, press **Enter** when the installation is complete to return to the command prompt. If you copy disk 2 only to your disk drive and you start the installation by issuing a fully qualified **install** command that refers to disk 1 in the CD drive, you can press **Enter** at any time to return from the background job to the command prompt. For more information, see the description of the asynchronous command line at the end of the next step.

You can change the `-W launchPRTBean.active` option to display the Registration panel to indicate the completion of a silent installation on a local system with a graphical user interface.

To determine the status of the silent installation, review the installation logs in the `install_root/logs` directory or in the `/tmp` directory.

Silent installation is particularly useful if you install the product often.

The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard. Review the description of the `setup.response` file and the `setup_nd.response` file for more information. Comments in each file describe how to customize their options.

18. If you have uninstalled WebSphere Application Server Enterprise Edition Version 4.1, remove any entries from the `/usr/bin/jitk.db` file. Remove any remaining artifacts from an uninstalled Enterprise Edition V4.1 system to prevent the display of the Coexistence panel or the Migration panel during installation.



The Installation wizard for WebSphere Business Integration Server Foundation might display the Migration panel or the Coexistence panel even though you have uninstalled WebSphere Application Server Enterprise Edition Version 4.1. You can prevent the Installation wizard from recognizing a previously deleted version of Enterprise Edition by removing the following entry from the `/usr/bin/jitk.db` file:

```
WebSphere Enterprise Edition Server 4.1
```

Remove other Version 4.x entries for WebSphere Application Server products that are no longer on your system.

19. Select one of the four installation methods for installing from the two-CD installation image. The installation image is on two CD-ROMs. The cumulative fixes are on disk 2. Although four methods exist for installing the product from the two CD-ROMs, the recommended Method 1 begins with the next step in the overall procedure.

The installation CDs are platform specific. Each CD label identifies the platform for which it is designed to be used. The CDs for a particular platform should only be inserted and run from a CD drive that is mounted on the platform that is identified on the CD.

Plan to start the installation from a read/write location and not from the CD or a read-only directory. Issue a command with a fully qualified path name to the install program on the CD. Do not change directories to the CD drive to issue a command that uses a relative, local path.

The following description provides an overview of all four methods.

**Method 1:** This method is recommended when using the Installation wizard to install WebSphere Business Integration Server Foundation. This method of installing does not support silent installations.

- a. Insert disk 1.
- b. Remove disk 1 at the prompt.
- c. Insert disk 2.
- d. Identify the location of disk 2. (Disk 2 includes the `WAS_update` directory.)
- e. Continue the installation.

After the installation wizard reads the cumulative fixes from disk 2, the wizard displays a prompt for disk 1:

- a. Remove disk 2.
- b. Insert disk 1.
- c. Continue the installation.

Verify that no other windows or applications access the CD-ROM drive. If any process accesses the CD-ROM, you might not be able to unmount one disk and mount the next one.

To begin installing with this method, go to the next step in the overall installation.

### Other installation options

The next few steps in the overall procedure assume that you are using the recommended method of installing. However, you have three other options for installing from the two CDs, all of which support both the Installation wizard method of installing and the silent installation method:

- **Method 2:** This method copies Disk 2 to a specific default location on the hard drive and does not require you to switch disks. This method is recommended for installing silently:
  - a. Open a shell window and log on as root. Use the same shell window throughout the installation procedure.
  - b. Insert disk 2 into a CD-ROM drive to automatically mount the drive.
  - c. Close any file explorer window that opens.
  - d. Copy the data from the CD to the `/tmp` directory using parameters to maintain symbolic links as shown in the following example:

```
cp -frp /cdrom/cdrom0/sun/WAS_update /tmp
```
  - e. Remove disk 2 and insert disk 1 to continue the installation. Prompts to switch disks do not occur.

- **Method 3:** Create the *CDROM2* environment variable to identify the location of disk 2. The location of disk 2 can be another CD-ROM mount point or a disk location where you copy the data. The installation proceeds without prompts for either disk. This method of installing also supports silent installations:
  - a. Open a shell window and log on as root. Use the same shell window throughout the installation procedure. The *CDROM2* environment variable is only available to the current shell window.
  - b. Insert disk 2 into the CD-ROM drive labeled *CDROM2*.
  - c. Define the *CDROM2* environment variable with the following commands:
 

```
CDROM2=/cdrom/cdrom2/sun
export CDROM2
```
  - d. Insert disk 1 to continue the installation. Prompts to switch disks do not occur.
- **Method 4:** Copy both CDs to any directory and start the installation from that directory. The installation proceeds without prompting for either disk. This method of installing also supports silent installations:
  - a. Open a shell window and log on as root. Use the same shell window throughout the installation procedure.
  - b. Insert disk 1 into a CD-ROM drive.
  - c. Copy the contents of disk 1 to any directory. The commands in the following example create and use the */tmp/wbisf51* directory:
 

```
cd /tmp
mkdir wbisf51
cp -frp /cdrom/cdrom0/* /tmp/wbisf51
```
  - d. Remove disk 1 and insert disk 2 into the CD-ROM drive.
  - e. Copy the data from the CD to the disk drive directory:
 

```
cp -frp /cdrom/cdrom0/* /tmp/wbisf51
```
  - f. Start the installation with the ***/tmp/wbisf51/sun/launchpad.sh*** command or the ***/tmp/wbisf51/sun/install*** command to continue the installation. Prompts to switch disks do not occur.
  - g. Skip the next three steps in the overall procedure to continue the installation.

### Asynchronous and synchronous command lines

After running the **install** command, the command line returns asynchronously. Because of the need to support a two-CD installation, it is not possible to run the **install** command synchronously for Methods 1, 2, and 3. A synchronous **install** command returns the command line after the installation is complete.

Because you can switch CDs in the middle of the installation, the installation process and its children processes all run as background processes. After running the **install** command, the command line returns immediately. Do not misinterpret this to mean that the installation has finished. Although the command line returns, either the Installation wizard or a silent installation might still be in progress.

Confirm the successful completion of the Installation wizard by viewing the Summary panel. Confirm the successful completion of a silent installation (or the Installation wizard) by examining the *install\_root/logs/WAS.WBISF.install.log* file for the following message:

```
INSTFIN: The installation is complete.
```

Method 4 is the exception to the asynchronous behavior. If you copy both CDs to any directory and start the installation from that directory, the installation proceeds without prompting for either disk. The installer program does support a synchronous command line when installing from a disk drive. The command line returns after the installation is complete.

### Installing with a network file system mount

When installing from a drive mounted on a network file system (NFS), use NFS client and server platforms with identical versions of the operating system and a well-tuned NFS, if possible. For example, when installing on a Solaris Operating Environment 9 machine, the recommended NFS server is also a Solaris 9 machine.



If you must copy CD images for one platform to an NFS disk on another operating system platform, use a command that preserves symbolic links. For example, on an AIX platform use the **cp -hrp** command to copy data from an HP-UX disk and preserve the symbolic links. Without the **-h** option, the **cp** command on an AIX platform attempts to resolve symbolic links when copying an HP-UX disc instead of preserving the links.

Even with the **-h** option, the **cp** command on a Solaris platform does not preserve symbolic links when copying an HP-UX disk. On a Solaris platform, use the **tar -cvf** command to copy data from an HP-UX disk and preserve the symbolic links.

Consult the man page for the copy command on the NFS system to understand how the platform supports copying symbolic links.

Because many NFS incompatibilities can exist among various platforms, do not use a drive mounted on a network file system to install from one operating system platform to another without first verifying that the NFS configuration is robust. For example, if your mounted CD is `/cdrom`, issue the following command to see if you have an NFS problem:

```
unzip -l /cdrom/sun/WAS/setup.jar
```

The proper output from the command lists all the files in the `setup.jar` file without error. If you encounter problems in running the command, verify that your `/etc/exports` file includes the `no_root_squash` option.

See Troubleshooting the installation for more information about symptoms you can experience when installing with a faulty NFS mount. Contact your system administrator for help if you continue to have NFS problems.

### Recovering from a failed installation

If the installation program cannot locate the `WAS_update` directory from disk 2, the installation program fails immediately. The immediate failure leaves the `WAS.WBISF.install.log` file only in the `/tmp` directory. Normally, the installation program creates installation logs in the `install_root/logs/wbisf` directory.

In some instances, such as the one where the `WAS_update` directory does not exist, the installation program fails before it can copy the log files from the system temporary directory to the `/logs` directory. If you cannot find the installation log files in the `install_root/logs/wbisf` directory, look in the system temporary directory. Correct any problems and reinstall.

If you do not copy the `WAS_update` directory correctly from disk 2 to the `/tmp` directory or if you use the `CDROM2` variable incorrectly, error messages might exist in the `was_update_apply.err` file and in the `was_update_apply.out` file in the `install_root/logs/wbisf` directory. Correct any problems and reinstall.

The installer program might prompt for disk 2 if it cannot locate disk 2 in the `/tmp` directory or at the location specified by the `CDROM2` variable. In such a case, insert disk 2 and continue the installation.

If the application of Cumulative Fix 2 fails, check the logs for more information. The solution might be as simple as rerunning the installation after selecting a different installation option:

- Method 1: Using the prompts and switching CDs
- Method 2: Copying the second disk to the `/tmp` directory
- Method 3: Using the `CDROM2` variable to identify the location of disk 2
- Method 4: Copying both CDs to the hard drive and running the installation from the hard drive

Using a second method can be successful after a failed first attempt using a different method.

20. Insert the product CD labeled, *Integration Server Disk 1 of 2* into a CD-ROM drive to automatically mount the drive.

If the Solaris machine is configured to auto mount CDs, Solaris automatically mounts the product CD as the `/cdrom/was_wbisf_sun_cd1` device. Close the File explorer window that Solaris automatically opens so that you can define a correct mount point.

21. Open a shell window. Use the same shell window throughout the installation procedure. Verify that you are in a read/write directory and not the CD-ROM directory or another read-only directory before you start the installation.

22. Start the installation with the `/cdrom/cdrom0/sun/launchpad.sh` command, where `/cdrom/cdrom0` is the mount point for the product CD-ROM and `sun` is the platform directory on the CD. The default installation method is to click **Install the product** on the Launchpad tool to launch the Installation wizard, which is an InstallShield for MultiPlatforms (ISMP) application.

Do not run the **launchpad** command or the **install** command from the automatically generated mount point as the `/cdrom/was_wbisf_sun_cd1/sun/launchpad.sh` command, for example. Instead, start the installation from a read/write directory using the mount point specification in the following command:

```
# /cdrom/cdrom0/sun/install
```

The readme link in the Launchpad is to the `readme.html` file in the CD root directory. The `readme` directory off the root of the CD has more detailed readme files. The *Getting Started* document that contains installation information is in the `docs` directory on the CD. Download the most current version of the *Getting Started* document from the Library Web page.

The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard. Review the description of the `setup.response` file and the `setup_nd.response` file for more information. Comments in each file describe how to customize the options.

23. Click **Next** to continue. The license agreement appears for you to read.
24. Click the radio button beside the **I accept the terms in the license agreement** message if you agree to the license agreement and click **Next** to continue. After you accept the licensing terms, the Installation wizard checks for prerequisites and for previous versions, with which it can either migrate or coexist.

As the WebSphere Business Integration Server Foundation product version changes, its prerequisites and corequisites change. It is probably necessary to update your database, Web server, Software Development Kit (SDK), and other software.

As mentioned in the introduction to this topic, the Integration Server product can install the base WebSphere Application Server product. The base product simplifies migrating product prerequisites, by providing the option to install a complimentary Java 2 SDK on your supported operating system. You can uninstall back-level prerequisites and let the Installation wizard install current versions.

If the wizard finds a previous version of WebSphere Application Server, it prompts you to migrate applications and the configuration from the previous version, or to coexist with it. If it finds more than one previous version, the Installation wizard lists them for you to select which one to migrate.

Use the same cell name when migrating Enterprise V5.0.x on Network Deployment to Integration Server on Network Deployment, V5.1.x. If you use a different cell name, federated nodes cannot successfully migrate to the V5.1.x cell. You can use a different node name, if you prefer, when migrating Enterprise V5.0.x on Network Deployment from V5.0.x to V5.1.x. However, you must use the administrative console after installation, to change the Secure Sockets Layer (SSL) settings that mention the node name.

25. Install the administrative console extensions on the Network Deployment product or the programming model extensions on the base WebSphere Application Server product, when both products are installed on the same machine. If you have both the base WebSphere Application Server product and the Network Deployment product on the same machine, the Installation wizard for the Integration Server product displays a panel for you to select the part of the Integration Server product to install. When no product exists on the machine, the Installation wizard prompts you to identify an installation location for an umbrella installation of the base product, Cumulative Fix 2, Cumulative Fix 1 for SDKs, and the Integration Server.
26. Install additional features or install another instance of the Integration Server product when a previous installation of the same level product exists. When the installer program detects a previous installation at the same product level, a panel appears to let you add features to the existing installation or perform a new installation to another directory. When adding features, previously installed features are checked and grayed out with the term **(Installed)** at the end of the feature name.

You can add Integration Server features to Integration Server on an unfederated base node or to Integration Server on a deployment manager node at any time, by running the Installation wizard again and choosing to add features.

If you are installing WebSphere Business Integration Server Foundation on a federated node, the installer program does not allow you to install certain features. These Integration Server features are always hidden and deactivated on a federated base node:

- Samples
- Embedded messaging

Integration Server features that are not grayed out are available for installation on a federated base node. You do not have to unfederate the base node to add available Integration Server features.

If the federated base node does not have the administrative console feature and the administrative scripting features, these additional Integration Server features are hidden and deactivated:

- Business Rule Beans
- Process choreographer

Federated nodes must be unfederated before adding base product features to avoid conflicts while the deployment manager owns the configuration of the base node. To install any of these deactivated features, you must perform the following procedure.

Use the **backupConfig** command to save the Network Deployment configuration so that you can restore the configuration if necessary. Although you can use the **backupConfig** command to save the configuration, the **restoreConfig** command restores the configuration without any features you add to the base node. However, you can refer to the saved configuration after adding features and adding the base node back to the cell. Refer to the saved configuration as you use the administrative console of the deployment manager to reconfigure the base node.

- Cancel the installation.
- Copy configuration files if you installed the Integration Server product on a federated base node after the base node was federated. If you installed the Integration Server product on an unfederated base node or before the base node was federated, you can skip this step. Copy the following files on the base node from the *install\_root/config/cells/cellname/nodes/nodename/servers/server1/* directory to the *install\_root/config/backup/base/cells/cellname/nodes/nodename/servers/server1/* directory:
  - server-pme.xml
  - server-pme502.xml
  - server-pme51.xml
  - resources-pme.xml
  - resources-pme502.xml

Copy the following files on the base node from the *install\_root/config/cells/cellname/nodes/nodename/* directory to the *install\_root/config/backup/base/cells/cellname/nodes/nodename/* directory:

- resources-pme.xml
  - resources-pme502.xml
- Unfederate a federated base product node with the **removeNode** command. Removing the base node from the cell also removes the configuration for the base node, which resides at the cell level.
  - Use the update installer program to uninstall any interim fixes or fix packs that you installed after installing the Integration Server product.
  - Log off and back on.
  - Launch the Integration Server installation program again.
  - Install the new features that you require instead of installing a new product instance.

Continue the installation by performing the remaining steps in the overall procedure. After completing the installation, plan to perform the following steps:

- Use the update installer program to reinstall any interim fixes or fix packs that are available.

If you are updating a node that you intend to federate, install only fix packs and interim fixes that are installed on the deployment manager node. The deployment manager must be at the highest fix level in the cell.

When attempting to federate a WebSphere Business Integration Server Foundation node into a deployment manager cell that does not have the Integration Server installed, you are prompted to install the Integration Server extensions before proceeding. The WebSphere Business Integration Server Foundation code installs Cumulative Fix 2 (5.1.0.2) for the deployment manager and also installs the Integration Server administrative console extensions.

- b. Rejoin the node to the cell with the **addNode** command or the deployment manager administrative console.

This action synchronizes the master cell configuration with changes that you make to the Application Server configuration during the installation of the new features.

- c. Reconfigure the base node with the Network Deployment administrative console.

Consult the configuration that you saved to determine how to configure the node, if necessary.

27. Choose to migrate applications and the configuration from a previous version, or to coexist with another version, or to do neither, and click **Next** to continue.

All WebSphere Application Server products on a single machine share some of the code in the embedded messaging feature, if installed. The required level of the embedded messaging feature for V5.1 (CSD04) is not the same as for V5.0.0 or V5.0.1. The required level of the embedded messaging feature for V5.1 is the same as for V5.0.2.

If you attempt to install V5.1 on a machine where a version of the embedded messaging feature is at a release level earlier than CSD04, the installer program displays the message log in a panel. The message that you see is similar to one of the messages in the following example:

```
MQSeries or WebSphere MQ server at an earlier release than required to support
embedded messaging is already installed on the system.
Unsupported earlier maintenance level of MQSeries or WebSphere MQ detected.
Unsupported earlier release of MQSeries client or WebSphere MQ client detected.
Unsupported maintenance level of MQSeries client or WebSphere MQ client detected.
Software conflict with MQSeries JMS SupportPac MA88 detected.
```

To correct the problem, perform one of the following actions:

- Upgrade the full MQSeries or WebSphere MQ product to WebSphere MQ at the level that supports embedded messaging for V5.1 (CSD04). Refer to “Installing WebSphere embedded messaging as the JMS provider” on page 169 for more information.
- Uninstall the existing MQSeries or WebSphere MQ product if MQSeries or WebSphere MQ is not required on this system and reinstall the WebSphere Application Server product. Select the embedded messaging feature.

The MQSeries JMS SupportPac MA88 problem is slightly different. Uninstall the MQSeries JMS SupportPac MA88 and reinstall the WebSphere Application Server product, selecting the embedded messaging feature. The function provided by SupportPac MA88 is included in the embedded messaging feature.

You can also upgrade the WebSphere Application Server product to V5.0.2 to avoid any problem with an incorrect level of the embedded messaging feature.

You can perform the procedure for migrating V5.0.0 or V5.0.1 Enterprise with embedded messaging on a base node to Integration Server V5.1.

You can perform the procedure for migrating V5.0.0 or V5.0.1 Enterprise with embedded messaging to V5.1 Integration Server on Network Deployment.

To share embedded messaging in a coexistence environment, the node names for each installation must be unique, so that each installation has a message queue manager that is named uniquely. To migrate V5.0.2 to V5.1, the node names must be identical. Therefore, the queue manager names are also identical, if you are migrating from V5.0.2 to V5.1. To prevent losing the queue manager when you uninstall V5.0.2 (or V5.1), you must create a dummy queue manager before uninstalling one of the WebSphere Application Server versions.

The first rule of migration is to migrate after you install WebSphere Business Integration Server Foundation:

If you are planning to install these products:		Select the migration option while installing this product:	
Base product	Integration Server	Base product	Integration Server
X		X	
X	X		X

The exception to the rule is to migrate V3.5.x to V5.1 during the installation of the base product or the Network Deployment product, before installing the Integration Server product.

If you are planning to install these products:		Select the migration option while installing this product:	
Network Deployment	Integration Server	Network Deployment	Integration Server
X		X	
X	X		X

If you migrate Enterprise Edition V4.x or Enterprise V5.0.x to WebSphere Business Integration Server Foundation, Version 5.1, you cannot select the Sample configuration for the process choreographer feature. Migrating the process choreographer feature is not compatible with installing the Sample configuration feature because there can be only one Sample configuration. If you migrate the previous configuration, you cannot install another configuration. Clear the migration check box to install the Sample configuration feature.

Migrating Integration Server also migrates the product that Integration Server extends.

When you perform an umbrella installation of the base WebSphere Application Server product, you can choose to migrate applications and the configuration from a previous version, or to coexist with another version of the base WebSphere Application Server product, or to do neither.

You can also perform a silent migration or configure for coexistence during a silent installation. Refer to Installing silently for a description of performing a silent installation, including the options that you can specify.

The migration prompt appears only when the Installation wizard detects a previous version. The coexistence prompt appears when the Installation wizard detects any other installation, including another Version 5 installation.

If you choose to coexist, the wizard displays a Port selection panel, where you can specify port assignments that do not conflict with existing ports. For example, you can change the HTTP transport port for coexistence, from 9081 (one more than the default Version 5 port number) to 9085 or higher, to avoid potential conflicts with port numbers that previous versions of WebSphere Application Server commonly use.

Use the **netstat -a** command to display all ports in use.

In some cases, such as when installing a non-English version, the Installation wizard might not detect a previous version. You can force the Migration panel or the Coexistence panel to appear, by starting the installation with an option on the **/cdrom/cdrom0/sun/install** command, where **/cdrom/cdrom0** is the mount point for the product CD-ROM and **sun** is the platform directory on the CD-ROM.

For example, use this command:

```
# /cdrom/cdrom0/sun/install
-W showPreviousVersionDetectedPanel.active="true"
```

You can also force the appearance of the Coexistence panel to change conflicting port number assignments using the following command:

```
# /cdrom/cdrom0/sun/install
-W showCoexistencePanel.active="true"
```



If you choose neither the migration option nor the coexistence option, you can run Version 5.1.x and the previous version, but not at the same time. Although it is possible that both versions might coexist without port conflicts, you can ensure that both versions run together by selecting the coexistence option and checking for conflicting port assignments.

The Migration panel lists all previous releases that it can identify. If you highlight a release, the text boxes labeled, "select previous version," show the location of the previous product. Select the product to migrate. If you do not see the previous version that you intend to migrate, click **Select previous version** to enter a location and configuration file name if you are migrating a WebSphere Application Server Advanced Edition Single Server Edition, Version 4.0.x installation.

The field labeled "Configuration file" is valid only for WebSphere Application Server Advanced Edition Single Server Edition, Version 4.0.x. For the other versions of WebSphere Application Server that are supported by migration (Version 3.5 Standard Edition, Version 3.5 Extended Edition, and Version 4.0 Advanced Edition), the `admin.config` file provides the host and port values for the administrative server. If you use a file name other than `admin.config`, issue the commands that call the migration tools instead of migrating while installing. Issuing the commands that call the migration tools is described in Migrating and coexisting.

Migrate V3.5.x to V5.1 during the installation of the base product or the Network Deployment product, before installing the Integration Server product.

You must start the administrative server of some previous versions so that the Installation wizard can export the configuration from the `admin.config` file.

Although you might select migration at this point in the installation process, the actual migration does not begin until after the Version 5 installation is complete. At that time, if the `WASPreUpgrade` tool fails, the Installation wizard does not call the `WASPostUpgrade` tool to complete the migration, but instead displays the `WASPreUpgrade.log` and `WASPostUpgrade.log` log files for you to diagnose the problem. After fixing the problem, such as starting the administrative server of a previous release, you can start the migration again, as described in Migrating and coexisting.

28. Choose a type of installation and click **Next**.

- Choose **Typical install** to install the following features on your system:
  - Embedded messaging server and client
  - Embedded messaging message-driven bean Samples (requires the server and client feature to work)
  - Business rule beans
  - Extended (container-managed) messaging
  - Dynamic query
  - Additional Integration Server extensions
  - Scheduler and asynchronous beans
  - Process choreographer
  - Samples

If you choose a typical installation, skip the next step.

- Choose **Custom install** to select features to install.

After selecting a typical installation, the wizard prompts you to select the directory for the program code. After selecting a custom installation, the wizard displays a list of features.

29. Select features to install and click **Next** to continue, when performing a custom installation. This step is available only when you choose the custom installation type. A description of each feature appears at the bottom of the panel when you roll the cursor over the feature.

Selecting certain features causes the installation of other prerequisite features. The following table shows this feature relationship.

Table 22. Features and feature dependencies

If you select these features:	These Integration Server features are also installed:
<b>Embedded Messaging</b>	

Table 22. Features and feature dependencies (continued)

If you select these features:	These Integration Server features are also installed:	
Sub-features:	Server and Client	
	Client Only	
	Message-driven Bean Samples (for the server and not for the client)	
<p>You can install the MDBSamples application without installing the embedded messaging server and client feature. Perhaps you have already installed the server and client feature. Or perhaps you intend to reconfigure the MDBSamples to use messaging resources that WebSphere MQ software provides.</p> <p>If you install the MDBSamples application and you do not have the server and client feature installed, errors occur.</p> <p>The Application Server starts the MDBSamples application at start up. The MDBSamples application cannot start the required messaging resources in the Java Naming and Directory Interface (JNDI). Because of the lack of required resources, the message-driven beans fail to start, which causes an exception that the Application Server logs.</p> <p>The Application Server is not affected other than being unable to start the MDBSamples application.</p>		
<b>Business Rule Beans</b>		
Sub-features:	Business Rule Beans Sample	
<b>Event Infrastructure Technical Preview</b>		
(Tech preview: For use on a stand-alone base node.)		
<b>Extended Messaging</b>		
Sub-features:	Extended Messaging Sample	Embedded Messaging
<b>Dynamic Query</b>		
Sub-features:	Dynamic Query Sample	
<b>Additional Integration Server Extensions</b>		
Sub-features:	Additional Integration Server Extensions Samples	
<b>Scheduler and Asynchronous Beans</b>		
Sub-features:	Scheduler and Asynchronous Beans Samples	Embedded Messaging
<b>Process Choreographer</b>		
		Additional Integration Server Extensions
Sub-features:	Process Choreographer Sample	Scheduler and Asynchronous Beans
		Additional Integration Server Extensions
		Scheduler and Asynchronous Beans
		Embedded Messaging
	Configure a sample business process container	Additional Integration Server Extensions
		Scheduler and Asynchronous Beans
<b>CORBA C++ SDK (deprecated)</b>		
Sub-features:	Interface Repository Support (Requires DB2)	
	CORBA C++ SDK Samples	
<b>Javadocs</b>		



If you do not have the prerequisite base WebSphere Application Server product installed, the Integration Server installation can install it for you. The Integration Server Installation wizard installs the base WebSphere Application Server product without these features:

- IBM HTTP Server
- Web server plug-ins
- Performance and analysis tools

If you want one or more of the features, cancel the Integration Server installation and issue the **/cdrom/cdrom0/WAS/install** command, where /cdrom/cdrom0 is the mount point for the product CD-ROM and WAS is the directory on the CD-ROM for installing the base WebSphere Application Server product.

If you already have an unfederated base node installed, but select an Integration Server feature that requires a base product feature that you have not installed, the Integration Server installation installs the feature on the unfederated base node. The following table describes which base features are required when you select an Integration Server feature.

Table 23. Integration Server features and unfederated base product feature dependencies

If you select these features:	These base product features are also installed:
<b>Embedded Messaging</b>	
Sub-features:	Server and Client
	Client Only
	Message-driven Bean Samples (These Samples are the MDBSamples application, which is for the server and not for the client.)
<b>Business Rule Beans</b>	
	WebSphere Application Server
	Admin Scripting
	Administrative Console
Sub-features:	Business Rule Beans Sample
<b>Application Server Samples</b>	
<b>Event Infrastructure Technical Preview</b>	
<b>Extended Messaging</b>	
	WebSphere Application Server
	Application Server Samples
Sub-features:	Extended Messaging Sample
	Embedded Messaging
	Messaging-driven Bean Samples
<b>Dynamic Query</b>	
	WebSphere Application Server
Sub-features:	Dynamic Query Sample
	Application Server Samples
<b>Additional Integration Server Extensions</b>	
	Application Server
	Administrative Console
Sub-features:	Additional Integration Server Extensions Samples
	Application Server Samples
<b>Scheduler and Asynchronous Beans</b>	
	Application Server
Sub-features:	Scheduler and Asynchronous Beans Samples
	Application Server Samples
<b>Process Choreographer</b>	
	Application Server
	Admin Scripting
	Administrative Console

Table 23. Integration Server features and unfederated base product feature dependencies (continued)

If you select these features:	These base product features are also installed:
Sub-features:	Process Choreographer Samples
	Application Server Samples
	Configure a sample business process container
	Embedded Messaging
<b>CORBA C++ SDK (Deprecated)</b>	
Sub-features:	Interface Repository Support (Requires DB2)
	CORBA C++ SDK Samples
	Application Server Samples
<b>Javadocs</b>	

These Integration Server features are always hidden and deactivated on a federated base node:

- Samples
- Embedded messaging

If the federated base node does not have the administrative console feature and the administrative scripting features, these additional features are hidden and deactivated:

- Business Rule Beans
- Process choreographer

To install any of these deactivated features, you must unfederate the base node, install the Integration Server product again, select the features you require, and add the node to the cell again. Federated nodes must be unfederated before adding base product features to avoid conflicts while the deployment manager owns the configuration of the base node.

You do not have to unfederate a federated base node to add Integration Server features that appear in the list of available features.

You can run the uninstaller program to remove all of the installed features.

30. Specify a destination directory and click **Next** to continue. Deleting the default target location and leaving an installation directory field empty stops you from continuing the installation process. The Installation wizard does not proceed when you click **Next**. Enter the required target directory to proceed to the next panel. Non-ASCII special characters are not supported in the name of the installation directory. Spaces are also not supported in the name of the installation directory.

The installer program for WebSphere Business Integration Server Foundation checks twice for required temporary space. The program checks once at the beginning of the installation before it copies a Java 2 SDK to the temporary directory to support the Installation wizard Java process. Later, the program checks for enough space to install Cumulative Fix 2 and the Cumulative Fix 1 for SDKs.

If not enough space is available, cancel the installation, allocate the approximately 500 MB of temporary space that is required, and reinstall. The actual space required depends on the features that you are installing.

The installer program does not let you install the base product during an umbrella installation if sufficient space is not available to apply Cumulative Fix 2 and Cumulative Fix 1 for SDKs.

Suppose the installer program installs the base product and then runs into an error during the installation of the cumulative fix because of an insufficient amount of temporary space. In such a case, cancel the installation, allocate enough temporary space to install the cumulative fix, and restart the installation. The installer program picks up the installation where it left off, installing the cumulative fix to the base product, which you can select at the beginning of the installation.

If you have problems accessing the administrative console after installation, check the `installAdminConsole.log` file for a failure indication. Clean up the `/tmp` space and reinstall the administrative console using the `wsadmin` scripting facility.

If you must increase the `/tmp` allocation, stop the installation program, increase the allocation, and restart the installation.

If you select the embedded messaging feature and prerequisites are missing, the Installation wizard displays the `mq_prereq.log` error log and takes you back to the Installation type panel. Choose **Custom** installation and clear the embedded messaging feature to continue. The `mq_prereq.log` file is in the system temp directory.

31. Specify node information and click **Next**.

Specify the node name and host name. Although the wizard inserts the machine name (of the installation platform) as the node name, you can specify any unique name. The node name is an arbitrary WebSphere Application Server-specific name that must be unique within a cell.

The host name is the network name for the physical machine on which the node is installed. The host name must resolve to a physical network node on the server. When multiple network cards exist in the server, the host name or IP address must resolve to one of the network cards. Remote WebSphere Application Server nodes use the host name to connect to and to communicate with this node. Selecting a host name that other machines can reach within your network is extremely important. Do not use the generic `localhost` identifier for this value.

If you define coexisting nodes on the same computer with unique IP addresses, define each IP address in the `/etc/hosts` file or in a domain name server (DNS) look-up table. WebSphere Application Server configuration files do not provide domain name resolution for multiple IP addresses on a machine with a single network address.

The value that you specify for the host name is used as the value of the `hostName` property in WebSphere Application Server configuration documents. Specify the host name value in one of the following formats:

- Fully qualified domain name servers (DNS) host name string, such as `xmachine.manhattan.ibm.com`
- The default short DNS host name string, such as `xmachine`
- Numeric IP address, such as `127.1.255.3`

The fully qualified DNS host name has the advantage of being totally unambiguous and also flexible. You have the flexibility of changing the actual IP address for the host system without having to change the WebSphere Application Server configuration. This value for host name is particularly useful if you plan to change the IP address frequently when using Dynamic Host Configuration Protocol (DHCP) to assign IP addresses. A format disadvantage is being dependent on DNS. If DNS is not available, then connectivity is compromised.

The short host name is also dynamically resolvable. A short name format has the added ability of being redefined in the local hosts file so that the system can run WebSphere Application Server even when disconnected from the network. Define the short name to `127.0.0.1` (local loopback) in the hosts file to run disconnected. A format disadvantage is being dependent on DNS for remote access. If DNS is not available, then connectivity is compromised.

A numeric IP address has the advantage of not requiring name resolution through DNS. A remote node can connect to the node you name with a numeric IP address without DNS being available. A format disadvantage is that the numeric IP address is fixed. You must change the setting of the `hostName` property in WebSphere Application Server configuration documents whenever you change the machine IP address. Therefore, do not use a numeric IP address if you use DHCP, or if you change IP addresses regularly. Another format disadvantage is that you cannot use the node if the host is disconnected from the network.

32. Configure the sample business process container, if you selected it and click **Next** to continue. Specify values for the following fields:

**User ID to authenticate with the embedded messaging queue manager**

This field is the JMS user ID who authenticates the connection to the JMS provider. This user ID must have administration rights for the messaging service.

The JMS user ID must be less than or equal to 12 characters.

You can create the user ID later and add the user to the `mqm` user group. Or specify the root user as the value for the field:

`root`

## Password

Type the password for the user you specified as the JMS user ID in the first field.

## Confirmation password

Repeat the password for the user you specified as the JMS user ID in the first field.

## Security role for the business process system administrator

This field is the security role mapping. Specify the user or group from the domain user registry that is mapped onto the role of Business Process Administrator. The value to use depends on the local settings. For example, you can specify that the Administrator group is to perform the security role on some systems.

The user registry can be the local operating system, Lightweight Directory Access Protocol (LDAP), or custom registry. The user or group specified must already exist in the user registry being used.

33. Review the summary information and click **Next** to install the product code or **Back** to change your specifications. When the installation is complete, the wizard displays the `install_root\logs\mq_install.log` installation log if you selected the embedded messaging feature and errors occur with its installation.
34. Review the `mq_install.log` installation log if it displays. Click **Next** to continue. The wizard displays the Registration panel.
35. Click **Next** to register the product, or clear the check box and click **Next** to register at a later time. The Registration panel is in English when the machine locale uses a double byte character set (DBCS) language.

You can register the product now by using the link on this panel or later, by using the Web address in the `install_root/prt/readme_prt.txt` file. The Web address in the file is encoded for your locale. A known problem for some locales corrupts the Web address so that it is similar to the following example. (The Web address is all one line in the file. The following example shows the address on two lines for clarity.)

```
http%3A%2F%2Fwww.ibm.com%2Fsoftware%2Fwebprt%2Fregister%2Fprodreg.nsf%  
2Fcontact%3F0penForm%261ang%3DENU%26pid%3D45P8842%26q2%3DWindows+2000
```

Use one of the following Web addresses if your `install_root/prt/readme_prt.txt` file is corrupt:

- <http://www.ibm.com/software/webprt/register/prodreg.nsf/contact?OpenForm&>
- <https://www6.software.ibm.com/reg/prt/prt-r>

The Installation wizard starts the First Steps tool.

If you are migrating a federated node as you install, close the First Steps tool. Migrated federated nodes have configuration differences that prevent you from using the First Steps tool.

36. Verify the success of the installer program by examining the Exit summary panel and the `install_root/logs/WAS.WBISF.install.log` file.

If you performed an umbrella installation of the base product or if you installed new base product features, also examine the `install_root/logs/log.txt` file. ISMP records a success message in the `WAS.WBISF.install.log` file: "INSTFIN: The installation is complete." The logs are the only source of status information for a silent installation.

Look for severe errors that the installer records in the `WAS.WBISF.install.log` file in the installation root directory to verify that no file system or other unusual errors occurred during installation.

If the `log.txt` file and the `WAS.WBISF.install.log` file do not contain a record of any problems but problems exist, verify or troubleshoot the installation, as described in Troubleshooting the installation.

37. Click **Finish** to close the Installation wizard.
38. Close the terminal window that remains open after the installation finishes. When installing WebSphere Application Server from the product CD onto a Solaris system, the ISMP installation wizard launches a terminal window, which remains open after the installation is complete. This window contains the following text:

```
InstallShield Wizard
Initializing InstallShield Wizard...

Searching for Java(tm) Virtual Machine...
.....
```

Close the window after the installation completes.

39. Restrict access to the `/var/mqm/errors` directory and messaging logging files. After installing the embedded messaging feature, you must restrict access to the `/var/mqm` directory and to log files that are needed for embedded messaging, such that only the `mqm` user or members of the `mqm` user group have write access. For detailed information, see *Installing WebSphere embedded messaging as the JMS provider*.
40. Install WebSphere Application Server 5.1 Cumulative Fix 3.  
Always install the latest cumulative fixes as they are released. See *Cumulative Fix Strategy for WebSphere Application Server V5.0 and V5.1* for more information.  
This collection of fixes for Version 5.1 updates the WebSphere Application Server base product or the Network Deployment product to Version 5.1.0.3. Cumulative Fix 3 includes all of the interim fixes in Cumulative Fix 2 and other fixes that are required for some components.  
Cumulative Fix 3 is available at the <http://www-1.ibm.com/support/docview.wss?uid=swg24006675> Web address.  
You can find a list of currently recommended fixes at the *WebSphere Business Integration Server Foundation V5.1 recommended interim fixes* Web site.
41. Tune your system for performance. For best performance on any platform, see "Tuning performance" in the information center.

The Installation wizard configures the product. It is not necessary to perform further configuration at this time.

You have now successfully installed WebSphere Business Integration Server Foundation and the features that you selected.

### Uninstalling and reinstalling

See *Uninstalling the product* for information about uninstalling any WebSphere Application Server product.

### Reinstalling a V5.1 instance on a Solaris platform after uninstalling and leaving the embedded messaging feature installed

If you uninstall a V5.1 instance but leave the embedded messaging feature because of other WebSphere Application Server instances, clean up the `/var/sadm/pkg` directory before reinstalling V5.1.

If you uninstall all WebSphere Application Server products on the machine and are now reinstalling, follow the procedure in "Manually uninstalling on Solaris platforms" on page 347 instead of the following procedure.

You must perform this procedure before you can reinstall the product into the same installation root directory on Solaris platforms. Otherwise you must reinstall the product into another directory and you might have a problem reinstalling the embedded messaging feature.

Assume that V5.0.x Enterprise exists in `/opt/WebSphere/AppServer50` with the embedded messaging server and client feature. You then install V5.1 WebSphere Business Integration Server Foundation to the following directory, `/opt/WebSphere/AppServer51`, but later you uninstall Integration Server and the base product and leave the embedded messaging feature installed. And now you decide to reinstall V5.1 WebSphere Business Integration Server Foundation and the base product in an umbrella installation.

1. Make the `/var/backupForWAS51Reinstall` backup directory.

2. Change directories to /var/sadm/pkg, and type `ls -lt | grep WSBA51` to find packages that contain the base WebSphere Application Server.

The directory for Network Deployment is WSNA51.

3. If the WSBA51 directory exists, change directories to the WSBA51 directory and read the pkginfo file in the /var/sadm/pkg/WSBA51 directory.

Find the installation location for V5.1. If the location is the same installation location as the V5.1 product you uninstalled, move the /var/sadm/pkg/WSBA51 folder to /var/backupForWAS51Reinstall.

The following example shows how to display the pkginfo file:

```
# pwd
/var/sadm/pkg/WSBA51
# ls -lt
total 6
-rw-r--r--  1 root    other      591 Oct 27 15:46 pkginfo
drwxr-xr-x  2 root    other      512 Oct 27 15:46 install
drwxr-xr-x  2 root    other      512 Oct 27 15:46 save
# cat pkginfo
# VPD created by InstallShield MultiPlatform Edition
# Mon Oct 27 15:46:34 EST 2003
ARCH=sparc
BASEDIR=/opt/WebSphere/AppServer51
CATEGORY=application
CLASSES=none
DESC=
ISJE_INSTALL_STATUS=3
ISJE_IS_ACTIVE=true
ISJE_IS_PUBLICLY_SHAREABLE=false
ISJE_NAME=IBM WebSphere Application Server
ISJE_PARENTS=WSBA51:5.1.0.0.DSP=:1
ISJE_PRODUCT_NUMBER=5.1.0.0
ISJE_REQUIRED_COUNT=0
ISJE_SOURCES=
ISJE_UID=WSBA51
ISJE_UNINSTALLER="uninst" "uninstall.jar" "uninstall.dat" ""
ISJE_VPD_VERSION=4.5
ISJE_WEB=
NAME=WebSphere Application Server
PKG=WSBA51
PKGINST=WSBA51
VENDOR=
VERSION=5.1.0.0.DSP=
```

When two instances of V5.1 WebSphere Application Server exist, for example, with one installed and one uninstalled, two files exist in the /var/sadm/pkg directory. One is the /var/sadm/pkg/WSBA51 file; the other is the /var/sadm/pkg/WSBA51.2 file. For example:

```
# ls -lt | grep WSBA51
drwxr-xr-x  4 root    other      512 Oct 27 18:52 WSBA51.2
drwxr-xr-x  4 root    other      512 Oct 27 15:46 WSBA51
drwxr-xr-x  3 root    other      512 Oct 21 13:32 WSBA51
```

4. Verify that you are moving the correct file to the backup directory.  
You can do this by examining the pkginfo files. Do not touch entries for other WebSphere Application Server products that might be present on the platform, such as WS entries for existing WebSphere Application Server V5.0.x.
5. Run the `ls -lt | grep WSBM` command to get all of the embedded messaging packages.

For example:

```
#
# ls -lt | grep WSBM
drwxr-xr-x  4 root    other      512 Oct 27 18:52 WSBMQ1AA.2
drwxr-xr-x  4 root    other      512 Oct 27 18:52 WSBMQ2AA.2
drwxr-xr-x  4 root    other      512 Oct 27 18:52 WSBMS4AA.2
drwxr-xr-x  4 root    other      512 Oct 27 18:52 WSBMS6AA.2
drwxr-xr-x  4 root    other      512 Oct 27 18:52 WSBMQAA.2
```



```

drwxr-xr-x  4 root    other    512 Oct 27 15:46 WSBMS4AA
drwxr-xr-x  4 root    other    512 Oct 27 15:46 WSBMS6AA
drwxr-xr-x  4 root    other    512 Oct 27 15:46 WSBMQ1AA
drwxr-xr-x  4 root    other    512 Oct 27 15:46 WSBMQ2AA
drwxr-xr-x  4 root    other    512 Oct 27 15:46 WSBMQ3AA
drwxr-xr-x  4 root    other    512 Oct 27 15:46 WSBMQAA
drwxr-xr-x  4 root    other    512 Oct 27 15:46 WSBMSAA

```

6. Identify entries that are related to the V5.1 product that you uninstalled.

Examine the pkginfo file for each entry. In the previous example, ".2" entries relate to the product you uninstalled, which was originally in the /opt/WebSphere/AppServer51 directory. Use a command to move all the ".2" entries into the backup directory. For example, run the following command from the /var/sadm/pkg/ directory:

```
mv WSBM*.2 /var/backupForWAS51Reinstall
```

For V5.1 of Network Deployment, all related embedded messaging entries start with WSNM. Run the following command to show the Network Deployment entries:

```
ls -lt | grep WSNM
```

For V5.1 of WebSphere Business Integration Server Foundation, all related embedded messaging entries are related to the base product or to the Network Deployment product. No embedded messaging entries start with WSEM.

7. Rename /opt/WebSphere/AppServer51 to /opt/WebSphere/AppServer51\_bk before reinstalling V5.1.

## Miscellaneous tips for Solaris platforms

Table 24. Installation and migration tips

Operating platform	Tip
Solaris platforms	Solaris operating environment <ul style="list-style-type: none"> <li>• Using the <b>unzip</b> function, not the <b>jar</b> command, to decompress downloaded files</li> <li>• Configuring the converter.properties file to use EUC-JP (Japanese) encoding</li> <li>• Configuring the Domino Server plug-in</li> <li>• Avoiding problems starting application servers in zh_TW.EUC locale on Solaris</li> </ul>
All platforms	All platforms
All Linux and UNIX platforms	All Linux and UNIX-based platforms

## Installing the Integration Server on Windows platforms

This topic describes how to install WebSphere Business Integration Server Foundation from a user ID that belongs to the administrator group. Some steps of the installation procedure on a Windows platform require the user to belong to the administrator group and have the following advanced user rights, *Act as part of the operating system* and *Log on as a service*. This topic guides you through preparing for Integration Server, which includes choosing and installing the variety of options and features provided.

If you encounter a problem such as not having enough disk space, cancel the installation, make the required changes, and restart the installation.

The installation image for the WebSphere Business Integration Server Foundation product is on two CDs. The installation CDs are platform specific. Each CD label identifies the platform for which it is designed to be used. The CDs for a particular platform should only be inserted and run from a CD drive that is mounted on the platform that is identified on the CD.

When you use an installation method that requires you to swap CDs, it is important that no application or window is accessing the CD. Otherwise, you might not be able to unmount one CD and mount the next one. Any of the following actions can lock a CD:

- Browsing a readme file on the CD with a browser
- Browsing any file on the CD with an editor

- Viewing the *Installation Guide* on the CD with Acrobat Reader
- Opening a command window and changing directories to the CD
- Accessing the CD from a telnet session
- Accessing the CD from any other process

This topic describes installing the Integration Server product, using the installation image on the two product CD-ROMs labeled, **Integration Server**. The Integration Server product package also contains CD-ROMs for installing the WebSphere Application Server Network Deployment product and the base WebSphere Application Server product.

This topic is available in Adobe PDF format, on the product CD-ROMs, and online in an information center that is available from the IBM WebSphere Application Server Web site at <http://publib.boulder.ibm.com/infocenter/ws51help/index.jsp>. When possible, access the most current version of this information by selecting the information center. The information center displays in the language of your machine locale.

The Launchpad tool lets you access the product overview, the `readme.html` file, and installation guides.

After using the Launchpad to view product documentation, perform the following procedure. The procedure includes several preliminary steps before actually launching the installer program.

1. Stop all WebSphere Application Server-related Java processes on the machine where you are installing the product.
2. Stop any Web server process such as the IBM HTTP Server, if you are extending the base product.
3. Stop all instances of the `process_spawner.exe` program on a Windows system before installing. The installation of Cumulative Fix 2 might fail if the `process_spawner.exe` file is running. The problem happens when you install Cumulative Fix 2 on the base WebSphere Application Server product using the Installation wizard or the silent installation method. See "Troubleshooting the installation" on page 250 for more information.
4. Provide adequate disk space.

The WebSphere Business Integration Server Foundation installer program installs Cumulative Fix 2 to the V5.1.0 base product or to the V5.1.0 Network Deployment product that the Integration Server extends. The cumulative fix pack leaves the service level of each product at the V5.1.0.2 level. If you have applied interim fixes that are not part of the cumulative fix pack, you must reinstall them. Installing the cumulative fix pack removes all interim fixes that you might have installed.

After the installation is complete, install Cumulative Fix 3 and any recommended fixes that are described at the WebSphere Business Integration Server Foundation V5.1 recommended interim fixes Web site.

The installer program also installs a cumulative fix from the *V5.1.0 Cumulative Fix 1 for SDKs service*. The cumulative fix updates the IBM Developer Kit for Windows, Java Technology Edition software that IBM uses with the WebSphere Business Integration Server Foundation product and other V5.1 WebSphere Application Server products. The new service level is 1.4.1 SR1B.

The Integration Server, Cumulative Fix 2, and Cumulative Fix 1 require the following disk space:

If you do not have enough free space in the system `%TEMP%` directory, you see a message prompting you to add more space. Cancel the installation, create a total of 2200 MB of free space on the disk, which includes a total of 400 MB of free space in the system `%TEMP%` directory, and start the installation again.

#### **1800 MB for the disk with the installation root directory**

The installation root directory includes either the base product or the Network Deployment product. The installation program extends the installation root directory with WebSphere Business Integration Server Foundation software.

#### **400 MB for the disk with `%TEMP%` directory**

The system temporary directory is the working directory for the installation program. Some

components of the installation process require a specific amount of free space on the disk with the directory defined by the %TEMP% environment variable.

Although you might see an installation message for an incremental amount of free space that is less than 400 MB, the overall cumulative requirement for free space on the disk with the %TEMP% directory is 400 MB.

For example, if you do not have enough free space to start the installation, a message notifies you that you must have 100 MB of free space on the disk with the %TEMP% directory. The 100 MB of free space is what you must have when you have already installed Cumulative Fix 2 to an existing base product or to the Network Deployment product.

The 400 MB of free space is required to install the base product, Cumulative Fix 2, and the Integration Server product in the same *umbrella* installation procedure. An umbrella installation installs the base product as it installs Integration Server software.

Installing Integration Server software on the Network Deployment product also installs Cumulative Fix 2 (V5.1.0.2), which increases the amount of space required over the 100 MB in the first message that you might see. Verify that you have 400 MB of free space on the disk with the %TEMP% directory to avoid problems.

## 2200 MB

The total amount of space required for both directories is 2200 MB. A significant amount of the required space is temporarily required during installation and is released after installation. If you have already installed the cumulative fix pack on either the base product or the Network Deployment product that you are extending, the space requirement is reduced.

The Installation wizard displays required space for individual features on the Feature selection panel. The Installation wizard also warns you if you do not have enough space to install the product and the cumulative fixes.

If you plan to migrate applications and the configuration from a previous version, verify that application objects have available disk space. As a rough guideline, plan for space equal to 110 percent of the size of the application objects:

- **For Version 4.0.x:** The size of enterprise archive (EAR) files
- **For Version 5.0.x:** The size of EAR files

5. Allocate adequate disk space for the embedded messaging feature if you are planning to install the feature. You can specify the file system into which the embedded messaging feature is installed. The following table shows default locations and free space requirements for the base messaging functions and the messaging broker functions for publish/subscribe messaging.

Table 25. Space requirements for the embedded messaging feature on Windows platforms

Component	Base messaging	Messaging broker
Installation directory	C:\Program Files\IBM\WebSphere MQ	C:\Program Files\IBM\WebSphere MQ\WEMPS
Server and client subfeature	70 MB	45 MB
Client subfeature	15 MB	N/A

If you are using the Installation wizard to install IBM WebSphere Application Server, you can specify an installation location for the embedded messaging feature during either a Full or Custom installation. You can also specify an installation location for the embedded messaging feature when installing silently.

6. Prepare to install the embedded messaging feature. The embedded messaging feature is based on the IBM WebSphere MQ product. The feature and the product each provide a Java message service (JMS) function that supports queues for point-to-point messaging and topics for publish and subscribe messaging. You can install WebSphere Business Integration Server Foundation with the embedded messaging feature with or without the WebSphere MQ product on the same machine. To support both

the embedded messaging feature and the WebSphere MQ product on the same machine, the WebSphere MQ product must be at a certain fix level and must have several of its features installed. If you already have WebSphere MQ installed, you can configure it as the JMS provider. Otherwise, you can install the embedded messaging feature during the installation of the Integration Server or install the WebSphere MQ product or another JMS provider after you install the Integration Server. Even though you might decide now to install only the embedded messaging feature, you can install the WebSphere MQ product later and use the IBM WebSphere MQ product as the JMS provider instead.

7. Verify that you have upgraded to WebSphere MQ 5.3 with the CSD04 update to install embedded messaging on a machine where you already have WebSphere MQ installed. The WebSphere Business Integration Server Foundation package includes copies of the WebSphere MQ 5.3 and Event Broker installation images, with restricted licensing. Use the MQ CD-ROMs to install the required MQ features or WebSphere MQ 5.3 for use with Integration Server.

Determine if your WebSphere MQ 5.3 installation is at the required level by running the **mqver** utility provided by WebSphere MQ.

The required level as indicated by mqver is shown below:

```
Name:      WebSphere MQ
Version:   530.4 CSD04
...
```

8. Verify that you have installed the required WebSphere MQ 5.3 features to install embedded messaging on a machine where you already have WebSphere MQ installed. Verify that you have installed the following features:
  - When installing the embedded messaging server and client feature, the required MQ features are *Server* and *Java messaging*.
  - When installing the embedded messaging client feature, the required MQ feature is *Java messaging*.

If you attempt to install the embedded messaging feature when WebSphere MQ is already installed, the level of WebSphere MQ must be Version 5.3 with the required MQ features. Otherwise, the installation of the embedded messaging feature fails with prerequisite check errors.

9. Verify that prerequisites and corequisites are at the required release levels. Although the Installation wizard checks for prerequisite operating system patches with the prereqChecker application, review the prerequisites on the IBM WebSphere Application Server supported hardware, software, and APIs Web site if you have not already done so. Refer to the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

Some operating systems that were not supported at the time that this product was shipped on CD-ROM might now be supported. You might receive a message from the prereqChecker program that an operating system is not supported when, in fact, the operating system is supported.

Always consult the IBM WebSphere Application Server supported hardware, software, and APIs Web site to determine whether your operating system is supported when you receive a message from the prereqChecker program. The Web site lists all supported operating systems and the operating system fixes and patches that you must install to have a compliant operating system. After confirming that your operating system is supported and that you have installed all necessary patches, you can click **Next** to continue an installation when you receive an error message from the prereqChecker program.

10. Install the required msvcp60.dll file for Windows 2000 Server platforms. The embedded messaging feature requires a DLL file on Windows 2000 Server platforms. The DLL file is already installed on Windows 2000 Advanced Server and other Windows platforms that are supported. If you see a message similar to the following example, download the msvcp60.dll file:

```
wempsdeletebroker.exe - Unable To Locate DLL
The dynamic link library MSVCP60.dll could
not be found in the specified path...
```

The prereq checker in the installer program does not check for this DLL file on the Windows 2000 Server platform. If you select the Windows 2000 Support Tools during Windows 2000 Server installation, the installation program for Windows 2000 Server installs the DLL file in the C:\Program

Files\Support Tools directory. The DLL file is installed during the installation of Windows 2000 Advanced Server in the C:\WINNT\system32 directory.

You can download the DLL file from the Microsoft Web site.

11. Lower the Internet Explorer security level from High to Medium to view the Product overviews from the WebSphere Application Server Installation LaunchPad on Windows 2003 machines.

You might see a blank page when trying to view Product overviews from the WebSphere Application Server Installation LaunchPad on Windows 2003 machines. Internet Explorer is set with High security level on the Internet Zone. Use the following procedure to lower the Internet zone security level to Medium:

- a. Right-click the Internet Explorer icon on the desktop.
- b. Click **Properties > Security > Internet Zone**.
- c. In the **Security level for this zone** area, move the slider from **High** to **Medium**.
- d. Click **OK** to save the change.

12. Verify the Java 2 SDK on the WebSphere Business Integration Server Foundation CD. Perform the following steps to verify that the Java 2 SDK on the product CD-ROM is working correctly.

- a. Change directories to the \win\WAS\jdk\java\bin directory on the product CD-ROM. Type the following command:

```
cd CD_Drive_D:\win\WAS\jdk\java\bin
```

- b. Verify the Java 2 SDK version. Type the following command:

```
.\java -version
```

The command completes successfully with no errors when the Java 2 SDK is intact.

13. Unfederate a base node if you require certain WebSphere Business Integration Server Foundation features.

If you are planning to install WebSphere Business Integration Server Foundation on a federated base node, the installer program does not allow you to install certain features. These Integration Server features are always hidden and deactivated on a federated base node:

- Samples
- Embedded messaging

Unfederate the base node. When you install the Integration Server product you can select any Sample features or the embedded messaging server and client feature. You can refederate the base node after the installation is complete.

A federated base node must have both the administrative console feature and the administrative scripting feature to install the following Integration Server features:

- Business Rule Beans
- Process choreographer

Otherwise the two features are hidden and deactivated when installing Integration Server on a federated base node.

Unfederate the base node. When you install the Integration Server product you can select the Business Rule Beans feature or the process choreographer feature. You can refederate the base node after the installation is complete.

14. Select the Installation wizard method or the silent installation method but do not start the installation yet. The installer program has two interfaces, the Installation wizard and a silent command-line installation.

#### **Performing the installation with the wizard**

You can start the Installation wizard in two ways. The default installation method is to open a command window to a read/write directory, issue the fully qualified command to start the Launchpad tool, and click the **Install the product** option. This option launches the Installation wizard in the language of your machine locale unless there is no translation for your locale, in which case you receive the English version. A short delay occurs before the ISMP wizard displays. You do not need to click the Install the product option more than once to cause the wizard to display.



You can also start the Installation wizard using the **C:\> D:\win\install.bat** command, where the D: drive is your CD-ROM drive and win is the platform directory. Start the installation from a read/write location and not from the CD-ROM.

The WebSphere Business Integration Server Foundation installer program applies a cumulative fix pack to the V5.1.0.0 base product or V5.1.0.0 Network Deployment product that the Integration Server extends. The cumulative fix pack leaves the service level of each product at the V5.1.0.2 level. If you have applied interim fixes that are not part of the cumulative fix pack, you must reinstall them. Installing the cumulative fix pack removes all interim fixes that you might have installed.

The Launchpad copies certain files to your disk drive to avoid locking the CD during the installation, which requires you to change CDs. Expect a slight delay as you open the Launchpad while it copies the readme files and the installation document to disk.

The following example shows a fully qualified call to the installer program:

```
> fully_qualified_CD_pathname\install.bat
```

```
C:\> D:\win\install
```

### Performing a silent installation

You can also perform a silent installation using the `-options C:\fully_qualified_path\setup.response` parameter (or the `-options C:\fully_qualified_path\setup_nd.response` parameter for use with the Network Deployment product) with the command method:

```
C:\> fully_qualified_CD_pathname\install
      -options fully_qualified_HDD_pathname\setup.response
```

```
C:\> D:\win\install -options \temp\setup.response
```

Start the silent installation with a fully qualified path to the options response file. Otherwise, the Installation wizard starts. Start the silent installation from a read/write location and not from the CD-ROM or another read-only directory.

A silent installation causes the installation program to read your responses from the options response file, instead of from the wizard interface. You must customize the *response files* before installing silently.

After customizing one of the files, you can issue the command to silently install. After issuing the command, the following text displays:

```
# .....
.InstallShield Wizard
```

```
Initializing InstallShield Wizard...
```

```
Searching for Java(tm) Virtual Machine...
```

The silent installation runs without displaying status to the window. If you copy both CDs to your disk drive, press **Enter** when the installation is complete to return to the command prompt. If you copy disk 2 only to your disk drive and you start the installation by issuing a fully qualified **install** command that refers to disk 1 in the CD drive, you can press **Enter** at any time to return from the background job to the command prompt. For more information, see the description of the asynchronous command line at the end of the next step.

You can change the `-W launchPRTBean.active` option to display the Registration panel to indicate the completion of a silent installation on a local system with a graphical user interface.

To determine the status of the silent installation, review the installation logs in the `install_root\logs` directory or in the system `%TEMP%` directory.

Silent installation is particularly useful if you install the product often.

The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard. Review the description of the `setup.response` file and the `setup_nd.response` file for more information. Comments in each file describe how to customize their options.



15. Select one of the four installation methods for installing from the two-CD installation image. The installation image is on two CD-ROMs. The cumulative fixes are on disk 2. Although four methods exist for installing the product from the two CD-ROMs, the recommended Method 1 begins with the next step in the overall procedure.

Plan to start the installation from a read/write location and not from the CD or a read-only directory. Issue a command with a fully qualified path name to the install program on the CD. Do not change directories to the CD drive to issue a command that uses a relative, local path.

The following description provides an overview of all four methods.

**Method 1:** This method is recommended when using the Installation wizard to install WebSphere Business Integration Server Foundation. This method of installing does not support silent installations.

- a. Insert disk 1.
- b. Remove disk 1 at the prompt.
- c. Insert disk 2.
- d. Identify the location of disk 2 (which includes the WAS\_update directory).
- e. Continue the installation.

After the installation wizard reads the cumulative fix pack from disk 2, the wizard displays a prompt for disk 1:

- a. Remove disk 2.
- b. Insert disk 1.
- c. Continue the installation.

This method of installing does not support silent installations. To begin installing with this method, go to the next step in the overall installation.

#### Other installation options

The next few steps in the overall procedure assume that you are using the recommended method of installing. However, you have three other options for installing from the two CDs, all of which support both the Installation wizard method of installing and the silent installation method:

- **Method 2:** This method copies Disk 2 to a specific default location on the hard drive and does not require you to switch disks. This method is recommended for installing silently:
  - a. Log on as administrator.
  - b. Open a DOS window or DOS prompt to determine where the system temporary disk is located. Issue the following command to identify the location:

```
echo %TEMP%
```
  - c. Insert Disk 2.
  - d. Use Windows Explorer to copy and paste the win\WAS\_update directory on disk 2 to the %TEMP% location. Or use the following command from a DOS prompt. Copy the data using parameters to maintain symbolic links as shown in the following example:

```
XCOPY /E /Q /Y /I D:\win\WAS_update "%TEMP%\WAS_update"
```
  - e. Remove Disk 2 and insert Disk 1 as described in the next step to continue the installation. Prompts to switch disks do not occur.
- **Method 3:** Create the *CDROM2* environment variable to identify the location of disk 2. The location of disk 2 can be another CD-ROM mount point or a disk location where you copy the data. This method is similar to the first method. The installation proceeds without prompts for either disk. This method of installing also supports silent installations:
  - a. Log on as the administrator user.
  - b. Insert disk 2 into a second CD-ROM drive. This procedure assumes that the first CD-ROM drive is the D:\ drive and that the second CD-ROM drive is the E:\ drive.
  - c. Two ways are available for setting the variable:
    - Open a DOS window and type the following commands to set a variable that applies to the DOS window only:

```
set CDROM2=E:\win
echo %CDROM2%
```

Issue the **launchpad.bat** command or the **install.bat** command from this window.

- Use Windows menus and panels to set a persistent variable:
  - 1) Right click **My Computer**.
  - 2) Click **Properties > Advanced tab > Environment Variables**.
  - 3) Click **New** under system variables.
  - 4) Type **CDROM2** in the variable name field.
  - 5) Type **E:\win** to define the location of disk 2 as the value for the CDROM2 variable.

d. Insert disk 1 to continue the installation. Prompts to switch disks do not occur.

- **Method 4:** Copy both CDs to any directory and start the installation from that directory. The installation proceeds without prompting for either disk. This method of installing also supports silent installations:

- a. Log on as administrator.
- b. Create the C:\wbisf51 directory on the hard disk.
- c. Insert disk 1.
- d. Copy all directories on disk 1 to the C:\wbisf51 directory either with the XCOPY command or by selecting menus and window options. Open a DOS prompt to use the command method. For example, use the commands in the following example to create and use the C:\wbisf51 directory:

```
cd C:\
md wbisf51
XCOPY /E /Q /Y /I "D:" "C:\wbisf51\"
```

Perform the following procedure to copy the CD-ROM to your disk drive using menu options:

- 1) Right click in Windows Explorer while viewing the C:\ drive.
  - 2) Click **New > Folder** to create the folder.
  - 3) Name the new folder **wbisf51**.
  - 4) Select and copy the entire contents of disk 1 in the CD-ROM drive.
  - 5) Paste the contents of disk 1 to the C:\wbisf51 directory on the hard disk.
- e. Remove disk 1 and insert disk 2.
- f. Copy the win directory on disk 2 to the C:\wbisf51 directory either with the XCOPY command or by selecting menus and window options. To use the command method, open a DOS window and type:

```
XCOPY /E /Q /Y /I "D:" "C:\wbisf51\"
```

Perform the following procedure to copy the CD-ROM to your disk drive using menu options:

- 1) Select and copy the entire contents of disk 2.
  - 2) Paste the contents of disk 2 to the C:\wbisf51 directory on the hard disk.
- g. Click **yes** to override any warnings about existing directories and files.
- h. Run the Launchpad program with the **C:\wbisf51\win\launchpad.bat** command or run the installer program directly with the **C:\wbisf51\win\install.bat** command.
- i. Skip the next three steps to continue the installation.

### **Asynchronous and synchronous command lines**

After running the **install** command, the command line returns asynchronously. Because of the need to support a two-CD installation, it is not possible to run the **install** command synchronously for Methods 1, 2, 3, and 4. A synchronous **install** command returns the command line after the installation is complete.

Because you can switch CDs in the middle of the installation, the installation process and its children processes all run as background processes. After running the **install** command, the command line

returns immediately. Do not misinterpret this to mean that the installation has finished. Although the command line returns, either the Installation wizard or a silent installation might still be in progress. Confirm the successful completion of the Installation wizard by viewing the Summary panel. Confirm the successful completion of a silent installation (or the Installation wizard) by examining the `install_root\logs\wbisf\WAS.WBISF.install.log` file for the following message:

```
INSTFIN: The installation is complete.
```

### Recovering from a failed installation

If the installation program cannot locate the `WAS_update` directory from disk 2, the installation program fails immediately. The immediate failure leaves the `WAS.WBISF.install.log` file only in the system `%TEMP%` directory. Normally, the installation program creates installation logs in the `install_root\logs\wbisf` directory.

In some instances, such as the one where the `WAS_update` directory does not exist, the installation program fails before it can copy the log files from the system temporary directory to the `\logs` directory. If you cannot find the installation log files in the `install_root\logs\wbisf` directory, look in the system temporary directory. Correct any problems and reinstall.

If you do not copy the `WAS_update` directory correctly from disk 2 to the system `%TEMP%` directory or if you use the `CDROM2` variable incorrectly, error messages might exist in the `was_update_apply.err` file and in the `was_update_apply.out` file in the `install_root\logs\wbisf` directory. Correct any problems and reinstall.

The installer program might prompt for disk 2 if it cannot locate disk 2 in the system `%TEMP%` directory or at the location specified by the `CDROM2` variable. In such a case, insert disk 2 and continue the installation.

If the application of Cumulative Fix 2 fails, check the logs for more information. The solution might be as simple as rerunning the installation after selecting a different installation option:

- Method 1: Using the prompts and switching CDs
- Method 2: Copying the second disk to the system `%TEMP%` directory
- Method 3: Using the `CDROM2` variable to identify the location of disk 2
- Method 4: Copying both CDs to the hard drive and running the installation from the hard drive

Using a second method can be successful after a failed first attempt using a different method.

16. Insert the product CD-ROM labeled, *Integration Server Disk 1 of 2* into the CD-ROM drive.
17. Open a DOS window. Use the same DOS window throughout the installation procedure. Verify that you are in a read/write directory and not the CD-ROM directory or another read-only directory before you start the installation.
18. Start the installation with the `D:\win\launchpad.bat` command, where the D: drive is your CD-ROM drive and `win` is the platform directory on the CD-ROM. You can also start the installation from a read/write directory using the `D:\win\install.bat` command:

```
C:\> D:\win\install
```

The `readme` link in the Launchpad is to the `readme.html` file in the CD root directory. The `readme` directory off the root of the CD has a more detailed `readme` file. The *Getting Started* document that contains installation information is in the `docs` directory on the CD. You can download the current version of the *Getting Started* document from the Library Web page.

The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard. Review the description of the `setup.response` file and the `setup_nd.response` file for more information. Comments in each file describe how to customize the options.

19. Click **Next** to continue. The license agreement appears for you to read.
20. Click the radio button beside the **I accept the terms in the license agreement** message if you agree to the license agreement and click **Next** to continue. After you accept the licensing terms, the Installation wizard checks for prerequisites and for previous versions, with which it can either migrate or coexist.

As the WebSphere Business Integration Server Foundation product version changes, its prerequisites and corequisites change. It is probably necessary to update your database, Web server, Software Development Kit (SDK), and other software.

As mentioned in the introduction to this topic, the Integration Server product can install the base WebSphere Application Server product. The base product simplifies migrating product prerequisites, by providing the option to install a complimentary Java 2 SDK on your supported operating system. You can uninstall back-level prerequisites and let the Installation wizard install current versions.

If the wizard finds a previous version of WebSphere Application Server, it prompts you to migrate applications and the configuration from the previous version, or to coexist with it. If it finds more than one previous version, the Installation wizard lists them for you to select which one to migrate. As of V5.1, the Installation wizard also lists WebSphere Application Server - Express as a candidate for automatic migration, when detected.

Use the same cell name when migrating Network Deployment from V5.0.x to V5.1.x. If you use a different cell name, federated nodes cannot successfully migrate to the Network Deployment V5.1.x cell.

You can use a different node name, if you prefer, when migrating Network Deployment from V5.0.x to V5.1.x. However, you must use the administrative console after installation, to change the Secure Sockets Layer (SSL) settings that mention the node name.

21. Install the administrative console extensions on the Network Deployment product or the programming model extensions on the base WebSphere Application Server product, when both products are installed on the same machine. If you have both the base WebSphere Application Server product and the Network Deployment product on the same machine, the Installation wizard for the Integration Server product displays a panel for you to select the part of the Integration Server product to install. When no product exists on the machine, the Installation wizard prompts you to identify an installation location for an umbrella installation of the base product, the cumulative fix pack, the service pack upgrade, and the Integration Server.
22. Install additional features or install another instance of the Integration Server product when a previous installation of the same level product exists. When the installer program detects a previous installation at the same product level, a panel appears to let you add features to the existing installation or perform a new installation to another directory. When adding features, previously installed features are checked and grayed out with the term **(Installed)** at the end of the feature name.

You can add Integration Server features to Integration Server on an unfederated base node or to Integration Server on a deployment manager node at any time, by running the Installation wizard again and choosing to add features.

If you are installing WebSphere Business Integration Server Foundation on a federated node, the installer program does not allow you to install certain features. These Integration Server features are always hidden and deactivated on a federated base node:

- Samples
- Embedded messaging

Integration Server features that are not grayed out are available for installation on a federated base node. You do not have to unfederate the base node to add available Integration Server features.

If the federated base node does not have the administrative console feature and the administrative scripting features, these additional Integration Server features are hidden and deactivated:

- Business Rule Beans
- Process choreographer

Federated nodes must be unfederated before adding base product features to avoid conflicts while the deployment manager owns the configuration of the base node. To install any of these deactivated features, you must perform the following procedure.

Use the **backupConfig** command to save the Network Deployment configuration so that you can restore the configuration if necessary. Although you can use the **backupConfig** command to save the configuration, the **restoreConfig** command restores the configuration without any features you add to the base node. However, you can refer to the saved configuration after adding features and adding

the base node back to the cell. Refer to the saved configuration as you use the administrative console of the deployment manager to reconfigure the base node.

- a. Cancel the installation.
- b. Copy configuration files if you installed the Integration Server product on a federated base node after the base node was federated. If you installed the Integration Server product on an unfederated base node or before the base node was federated, you can skip this step. Copy the following files on the base node from the *install\_root\config\cells\cellname\nodes\nodename\servers\server1\* directory into the *install\_root\config\backup\base\cells\cellname\nodes\nodename\servers\server1\* directory:

- server-pme.xml
- server-pme502.xml
- server-pme51.xml
- resources-pme.xml
- resources-pme502.xml

Copy the following files on the base node from the *install\_root\config\cells\cellname\nodes\nodename\* directory into the *install\_root\config\backup\base\cells\cellname\nodes\nodename\* directory:

- resources-pme.xml
- resources-pme502.xml

- c. Unfederate a federated base product node with the **removeNode** command. Removing the base node from the cell also removes the configuration for the base node, which resides at the cell level.
- d. Use the update installer program to uninstall any interim fixes or fix packs that you installed after installing the Integration Server product.
- e. Log off and back on.
- f. Launch the Integration Server installation program again.
- g. Install the new features that you require instead of installing a new product instance.

Continue the installation by performing the remaining steps in the overall procedure. After completing the installation, plan to perform the following steps:

- a. Use the update installer program to reinstall any interim fixes or fix packs that are available.  
If you are updating a node that you intend to federate, install only fix packs and interim fixes that are installed on the deployment manager node. The deployment manager must be at the highest fix level in the cell.

When attempting to federate a WebSphere Business Integration Server Foundation node into a deployment manager cell that does not have the Integration Server installed, you are prompted to install the Integration Server extensions before proceeding. The WebSphere Business Integration Server Foundation code installs Cumulative Fix 2 (5.1.0.2) for the deployment manager and also installs the Integration Server administrative console extensions.

- b. Rejoin the node to the cell with the **addNode** command or the deployment manager administrative console.  
This action synchronizes the master cell configuration with changes that you make to the Application Server configuration during the installation of the new features.
- c. Reconfigure the base node with the Network Deployment administrative console.

Consult the configuration that you saved to determine how to configure the node, if necessary.

23. Choose to migrate applications and the configuration from a previous version, or to coexist with another version, or to do neither, and click **Next** to continue.

All WebSphere Application Server products on a single machine share some of the code in the embedded messaging feature, if installed. The required level of the embedded messaging feature for

V5.1 (CSD04) is not the same as for V5.0.0 or V5.0.1. The required level of the embedded messaging feature for V5.1 is the same as for V5.0.2.

If you attempt to install V5.1 on a machine where a version of the embedded messaging feature is at a release level earlier than CSD04, the installer program displays the message log in a panel. The message that you see is similar to one of the messages in the following example:

MQSeries or WebSphere MQ server at an earlier release than required to support embedded messaging is already installed on the system.

Unsupported earlier maintenance level of MQSeries or WebSphere MQ detected.

Unsupported earlier release of MQSeries client or WebSphere MQ client detected.

Unsupported maintenance level of MQSeries client or WebSphere MQ client detected.

Software conflict with MQSeries JMS SupportPac MA88 detected.

To correct the problem, perform one of the following actions:

- Upgrade the full MQSeries or WebSphere MQ product to WebSphere MQ at the level that supports embedded messaging for V5.1 (CSD04). Refer to “Installing WebSphere embedded messaging as the JMS provider” on page 169 for more information.
- Uninstall the existing MQSeries or WebSphere MQ product if MQSeries or WebSphere MQ is not required on this system and reinstall the WebSphere Application Server product. Select the embedded messaging feature.

The MQSeries JMS SupportPac MA88 problem is slightly different. Uninstall the MQSeries JMS SupportPac MA88 and reinstall the WebSphere Application Server product, selecting the embedded messaging feature. The function provided by SupportPac MA88 is included in the embedded messaging feature.

After installing the product, reboot the system before installing again.

You can also upgrade the WebSphere Application Server product to V5.0.2 to avoid any problem with an incorrect level of the embedded messaging feature.

You can perform the procedure for migrating V5.0.0 or V5.0.1 Enterprise with embedded messaging on a base node to Integration Server V5.1.

You can perform the procedure for migrating V5.0.0 or V5.0.1 Enterprise with embedded messaging to V5.1 Integration Server on Network Deployment.

To share embedded messaging in a coexistence environment, the node names for each installation must be unique, so that each installation has a message queue manager that is named uniquely. To migrate V5.0.2 to V5.1, the node names must be identical. Therefore, the queue manager names are also identical, if you are migrating from V5.0.2 to V5.1. To prevent losing the queue manager when you uninstall V5.0.2 (or V5.1), you must create a dummy queue manager before uninstalling one of the WebSphere Application Server versions.

The first rule of migration is to migrate after you install WebSphere Business Integration Server Foundation:

If you are planning to install these products:		Select the migration option while installing this product:	
Base product	Integration Server	Base product	Integration Server
X		X	
X	X		X

The exception to the rule is to migrate V3.5.x to V5.1 during the installation of the base product or the Network Deployment product, before installing the Integration Server product.



If you are planning to install these products:		Select the migration option while installing this product:	
Network Deployment	Integration Server	Network Deployment	Integration Server
X		X	
X	X		X

If you migrate Enterprise Edition V4.x or Enterprise V5.0.x to WebSphere Business Integration Server Foundation, Version 5.1, you cannot select the Sample configuration for the process choreographer feature. Migrating the process choreographer feature is not compatible with installing the Sample configuration feature because there can be only one Sample configuration. If you migrate the previous configuration, you cannot install another configuration. Clear the migration check box to install the Sample configuration feature.

Migrating Integration Server also migrates the product that Integration Server extends.

When you perform an umbrella installation of the base WebSphere Application Server product, you can choose to migrate applications and the configuration from a previous version, or to coexist with another version of the base WebSphere Application Server product, or to do neither.

You can also perform a silent migration or configure for coexistence during a silent installation. Refer to Installing silently for a description of performing a silent installation, including the options that you can specify.

The migration prompt appears only when the Installation wizard detects a previous version. The coexistence prompt appears when the Installation wizard detects any other installation, including another Version 5 installation.

If you choose to coexist, the wizard displays a Port selection panel, where you can specify port assignments that do not conflict with existing ports. For example, you can change the HTTP transport port for coexistence, from 9081 (one more than the default Version 5 port number) to 9085 or higher, to avoid potential conflicts with port numbers that previous versions of WebSphere Application Server commonly use.

Use the **netstat -a** command to display all ports in use.

In some cases, such as when installing a non-English version, the Installation wizard might not detect a previous version. You can force the Migration panel or the Coexistence panel to appear, by starting the installation with an option on the **D:\win\install.bat** command, where the D: drive is your CD-ROM drive and win is the platform directory on the CD-ROM.

For example, use this command:

```
D:\win\install
-W showPreviousVersionDetectedPanel.active="true"
```

You can also force the appearance of the Coexistence panel to change conflicting port number assignments using this command:

```
D:\win\install
-W showCoexistencePanel.active="true"
```

If you choose neither the migration option nor the coexistence option, you can run Version 5.1.x and the previous version, but not at the same time. Although it is possible that both versions might coexist without port conflicts, you can ensure that both versions run together by selecting the coexistence option and checking for conflicting port assignments.

The Migration panel lists all previous releases that it can identify. If you highlight a release, the text boxes labeled, "select previous version," show the location of the previous product. Select the product to migrate. If you do not see the previous version that you intend to migrate, click **Select previous version** to enter a location and configuration file name if you are migrating a WebSphere Application Server Advanced Edition Single Server Edition, Version 4.0.x installation.

The field labeled "Configuration file" is valid only for WebSphere Application Server Advanced Edition Single Server Edition, Version 4.0.x. For the other versions of WebSphere Application Server that are supported by migration (Version 3.5 Standard Edition, Version 3.5 Extended Edition, and Version 4.0 Advanced Edition), the `admin.config` file provides the host and port values for the administrative

server. If you use a file name other than `admin.config`, issue the commands that call the migration tools instead of migrating while installing. Issuing the commands that call the migration tools is described in *Migrating and coexisting*.

Migrate V3.5.x to V5.1 during the installation of the base product or the Network Deployment product, before installing the Integration Server product.

You must start the administrative server of some previous versions so that the Installation wizard can export the configuration from the `admin.config` file.

Although you might select migration at this point in the installation process, the actual migration does not begin until after the Version 5 installation is complete. At that time, if the `WASPreUpgrade` tool fails, the Installation wizard does not call the `WASPostUpgrade` tool to complete the migration, but instead displays the `WASPreUpgrade.log` and `WASPostUpgrade.log` log files for you to diagnose the problem. After fixing the problem, such as starting the administrative server of a previous release, you can start the migration again, as described in *Migrating and coexisting*.

24. Choose a type of installation and click **Next**.

- Choose **Typical install** to install the following features on your system:
  - Embedded messaging server and client
  - Embedded messaging message-driven bean Samples (requires the server and client feature to work)
  - Business rule beans
  - Extended (container-managed) messaging
  - Dynamic query
  - Additional Integration Server extensions
  - Scheduler and asynchronous beans
  - Process choreographer
  - Samples

If you choose a typical installation, skip the next step.

- Choose **Custom install** to select features to install.

After selecting a typical installation, the wizard prompts you to select the directory for the program code. After selecting a custom installation, the wizard displays a list of features.

25. Select features to install and click **Next** to continue, when performing a custom installation. This step is available only when you choose the custom installation type. A description of each feature appears at the bottom of the panel when you roll the cursor over the feature.

Selecting certain features causes the installation of other prerequisite features. The following table shows this feature relationship.

*Table 26. Features and feature dependencies*

If you select these features:	These Integration Server features are also installed:
	<b>Embedded Messaging</b>
Sub-features:	Server and Client
	Client Only
	Message-driven Bean Samples (for the server and not for the client)

Table 26. Features and feature dependencies (continued)

If you select these features:	These Integration Server features are also installed:	
<p>You can install the MDBSamples application without installing the embedded messaging server and client feature. Perhaps you have already installed the server and client feature. Or perhaps you intend to reconfigure the MDBSamples to use messaging resources that WebSphere MQ software provides.</p> <p>In any case, if you install the MDBSamples application and do not have the server and client feature installed, errors occur. The Application Server starts the MDBSamples application at start up. The MDBSamples application cannot start the required messaging resources in the Java Naming and Directory Interface (JNDI).</p> <p>Because of the lack of required resources, the message-driven beans fail to start, which causes an exception that the Application Server logs. The Application Server is not affected other than being unable to start the MDBSamples application.</p>		
<b>Business Rule Beans</b>		
Sub-features:	Business Rule Beans Sample	
<b>Event Infrastructure Technical Preview</b>		
(Tech preview: For use on a stand-alone base node.)		
<b>Extended Messaging</b>		
Sub-features:	Extended Messaging Sample	Embedded Messaging
<b>Dynamic Query</b>		
Sub-features:	Dynamic Query Sample	
<b>Additional Integration Server Extensions</b>		
Sub-features:	Additional Integration Server Extensions Samples	
<b>Scheduler and Asynchronous Beans</b>		
Sub-features:	Scheduler and Asynchronous Beans Samples	Embedded Messaging
<b>Process Choreographer</b>		
Sub-features:	Additional Integration Server Extensions	
	Scheduler and Asynchronous Beans	
	Process Choreographer Sample	Additional Integration Server Extensions
	Scheduler and Asynchronous Beans	
	Embedded Messaging	
	Configure a sample business process container	Additional Integration Server Extensions
	Scheduler and Asynchronous Beans	
<b>CORBA C++ SDK (deprecated)</b>		
Sub-features:	Interface Repository Support (Requires DB2)	
	CORBA C++ SDK Samples	
<b>Javadocs</b>		

If you do not have the prerequisite base WebSphere Application Server product installed, the Integration Server installation can install it for you. The Integration Server Installation wizard installs the base WebSphere Application Server product without these features:

- IBM HTTP Server
- Web server plug-ins

- Performance and analysis tools

If you want one or more of the features, cancel the Integration Server installation and issue the **D:\WAS\install** command, where D: is the mount point for the product CD-ROM and WAS is the directory on the CD-ROM for installing the base WebSphere Application Server product.

If you already have an unfederated base node installed, but select an Integration Server feature that requires a base product feature that you have not installed, the Integration Server installation installs the feature on the unfederated base node. The following table describes which base features are required when you select an Integration Server feature.

Table 27. Integration Server features and unfederated base product feature dependencies

If you select these features:	These base product features are also installed:
<b>Embedded Messaging</b>	
Sub-features:	Server and Client
	Client Only
	Message-driven Bean Samples (These Samples are the MDBSamples application, which is for the server and not for the client.)
<b>Business Rule Beans</b>	
	WebSphere Application Server
	Admin Scripting
	Administrative Console
Sub-features:	Business Rule Beans Sample
<b>Application Server Samples</b>	
<b>Event Infrastructure Technical Preview</b>	
<b>Extended Messaging</b>	
	WebSphere Application Server
	Application Server Samples
Sub-features:	Extended Messaging Sample
	Embedded Messaging
	Messaging-driven Bean Samples
<b>Dynamic Query</b>	
	WebSphere Application Server
Sub-features:	Dynamic Query Sample
	Application Server Samples
	Application Server
<b>Additional Integration Server Extensions</b>	
	Application Assembly Tool Discontinued as of V5.1.
	Administrative Console
Sub-features:	Additional Integration Server Extensions Samples
<b>Application Server Samples</b>	
<b>Scheduler and Asynchronous Beans</b>	
	Application Server
Sub-features:	Scheduler and Asynchronous Beans Samples
	Application Server Samples
<b>Process Choreographer</b>	
	Application Server
	Admin Scripting
	Administrative Console
Sub-features:	Process Choreographer Samples
	Application Server Samples
	Configure a sample business process container
	Embedded Messaging

Table 27. Integration Server features and unfederated base product feature dependencies (continued)

If you select these features:	These base product features are also installed:	
<b>CORBA C++ SDK (Deprecated)</b>		
Sub-features:	Interface Repository Support (Requires DB2)	
	CORBA C++ SDK Samples	Application Server Samples
<b>Javadocs</b>		

These Integration Server features are always hidden and deactivated on a federated base node:

- Samples
- Embedded messaging

If the federated base node does not have the administrative console feature and the administrative scripting features, these additional features are hidden and deactivated:

- Business Rule Beans
- Process choreographer

To install any of these deactivated features, you must unfederate the base node, install the Integration Server product again, select the features you require, and add the node to the cell again. Federated nodes must be unfederated before adding base product features to avoid conflicts while the deployment manager owns the configuration of the base node.

You do not have to unfederate a federated base node to add Integration Server features that appear in the list of available features.

You can run the uninstaller program to remove any of the installed features.

26. Specify a destination directory. Click **Next** to continue. The default installation path is *drive:\Program Files\IBM\WebSphere MQ\*. You can specify a different directory during installation. There is an advantage for downloading and installing interim fixes and fix packs when the installation root directory does not contain spaces, which the Program Files directory does.

Deleting the default target location and leaving an installation directory field empty stops you from continuing the installation process. The Installation wizard does not proceed when you click **Next**. Enter the required target directory to proceed to the next panel. Non-ASCII special characters are not supported in the name of the installation directory.

The installer program for WebSphere Business Integration Server Foundation checks twice for required temporary space. The program checks once at the beginning of the installation before it copies a Java 2 SDK to the temporary directory to support the Installation wizard Java process. Later, the program checks for enough space to install the cumulative fix pack to either the base product or the Network Deployment product. If not enough space is available, cancel the installation, allocate the approximately 400 MB of temporary space that is required, and reinstall.

The installer program does not let you install the base product during an umbrella installation if sufficient space is not available to apply the cumulative fix pack. However, suppose the installer program installs the base product and then runs into an error during the installation of the cumulative fix pack because of an insufficient amount of temporary space. In such a case, cancel the installation, allocate enough temporary space to install the cumulative fix pack, and restart the installation. The installer program picks up the installation where it left off, installing the cumulative fix pack to the base product, which you can select at the beginning of the installation.

If you have problems accessing the administrative console after installation, check the `installAdminConsole.log` file for a failure indication. Correct any problems and reinstall the administrative console using the `wsadmin` scripting facility.

If you select the embedded messaging feature and prerequisites are missing, the Installation wizard displays the `mq_prereq.log` error log and takes you back to the Installation type panel. Choose **Custom** installation and clear the embedded messaging feature to continue. The `mq_prereq.log` file is in the system temp directory.

27. Specify whether to run the base Application Server as a Windows service if you are performing an umbrella installation of the base product.
28. Specify node information and click **Next**. Specify the node name and host name. Although the wizard inserts the machine name (of the installation platform) as the node name, you can specify any unique name. The node name is an arbitrary WebSphere Application Server-specific name that must be unique within a cell.

The host name is the network name for the physical machine on which the node is installed. The host name must resolve to a physical network node on the server. When multiple network cards exist in the server, the host name or IP address must resolve to one of the network cards. Remote WebSphere Application Server nodes use the host name to connect to and to communicate with this node. Selecting a host name that other machines can reach within your network is extremely important. Do not use the generic localhost identifier for this value.

If you define coexisting nodes on the same computer with unique IP addresses, define each IP address in the `hosts` file or in a domain name server (DNS) look-up table. WebSphere Application Server configuration files do not provide domain name resolution for multiple IP addresses on a machine with a single network address.

The value that you specify for the host name is used as the value of the `hostName` property in WebSphere Application Server configuration documents. Specify the host name value in one of the following formats:

- Fully qualified domain name servers (DNS) host name string, such as `xmachine.manhattan.ibm.com`
- The default short DNS host name string, such as `xmachine`
- Numeric IP address, such as `127.1.255.3`

The fully qualified DNS host name has the advantage of being totally unambiguous and also flexible. You have the flexibility of changing the actual IP address for the host system without having to change the WebSphere Application Server configuration. This value for host name is particularly useful if you plan to change the IP address frequently when using Dynamic Host Configuration Protocol (DHCP) to assign IP addresses. A format disadvantage is being dependent on DNS. If DNS is not available, then connectivity is compromised.

The short host name is also dynamically resolvable. A short name format has the added ability of being redefined in the local `hosts` file so that the system can run WebSphere Application Server even when disconnected from the network. Define the short name to `127.0.0.1` (local loopback) in the `hosts` file to run disconnected. A format disadvantage is being dependent on DNS for remote access. If DNS is not available, then connectivity is compromised.

A numeric IP address has the advantage of not requiring name resolution through DNS. A remote node can connect to the node you name with a numeric IP address without DNS being available. A format disadvantage is that the numeric IP address is fixed. You must change the setting of the `hostName` property in WebSphere Application Server configuration documents whenever you change the machine IP address. Therefore, do not use a numeric IP address if you use DHCP, or if you change IP addresses regularly. Another format disadvantage is that you cannot use the node if the host is disconnected from the network.

29. Configure the sample business process container, if you selected it and click **Next** to continue. Specify values for the following fields:

**User ID to authenticate with the embedded messaging queue manager**

This field is the JMS user ID who authenticates the connection to the JMS provider. This user ID must have administration rights for the messaging service.

You can create the user ID later as a member of the Administrators group. The JMS user ID must be less than or equal to 12 characters. For example, the default Windows user ID, Administrator, is not valid for use as the JMS user ID for the embedded messaging feature because the ID contains 13 characters. Use `mqm` as the user ID.

**Password**

Type the password for the user you specified as the JMS user ID in the first field.



### Confirmation password

Repeat the password for the user you specified as the JMS user ID in the first field.

### Security role for the business process system administrator

This field is the security role mapping. Specify the user or group from the domain user registry that is mapped onto the role of Business Process Administrator. The value to use depends on the local settings. For example, you can specify that the Administrators group is to perform the security role.

The user registry can be the local operating system, Lightweight Directory Access Protocol (LDAP), or custom registry. The user or group specified must already exist in the user registry being used.

30. Review the summary information and click **Next** to install the product code or **Back** to change your specifications. When the installation is complete, the wizard displays the *install\_root\logs\mq\_install.log* installation log if you selected the embedded messaging feature and errors occur with its installation.
31. Review the *mq\_install.log* installation log if it appears. Click **Next** to continue. The wizard displays the Registration panel.
32. Click **Next** to register the product, or clear the check box and click **Next** to register at a later time. The Registration panel is in English when the machine locale uses a double byte character set (DBCS) language.

You can register the product now by using the link on this panel or later, by using the Web address in the *install\_root\prt\readme\_prt.txt* file. The Web address in the file is encoded for your locale. A known problem for some locales corrupts the Web address so that it is similar to the following example. (The Web address is all one line in the file. The following example shows the address on two lines for clarity.)

```
http%3A%2F%2Fwww.ibm.com%2Fsoftware%2Fwebprt%2Fregister%2Fprodreg.nsf%  
2Fcontact%3FOpenForm%26lang%3DENUS%26pid%3D45P8842%26q%3DWindows+2000
```

Use one of the following Web addresses if your *install\_root\prt\readme\_prt.txt* file is corrupt:

- <http://www.ibm.com/software/webprt/register/prodreg.nsf/contact?OpenForm&>
- <https://www6.software.ibm.com/reg/prt/prt-r>

The Installation wizard starts the First Steps tool.

If you are migrating a federated node as you install, close the First Steps tool. Migrated federated nodes have configuration differences that prevent you from using the First Steps tool.

33. Verify the success of the installer program by examining the Exit summary panel and the *install\_root\logs\wbisf\WAS.WBISF.install.log* file.

If you performed an umbrella installation of the base product or if you installed new base product features, also examine the *install\_root\logs\log.txt* file. ISMP records a success message in the *WAS.WBISF.install.log* file: "INSTFIN: The installation is complete." The logs are the only source of status information for a silent installation.

Look for severe errors that the installer records in the *WAS.WBISF.install.log* file in the installation root directory to verify that no file system or other unusual errors occurred during installation.

If the *log.txt* file and the *WAS.WBISF.install.log* file do not contain a record of any problems but problems exist, verify or troubleshoot the installation, as described in Troubleshooting the installation.

34. Click **Finish** to close the Installation wizard.
35. Install WebSphere Application Server 5.1 Cumulative Fix 3.

Always install the latest cumulative fixes as they are released. See Cumulative Fix Strategy for WebSphere Application Server V5.0 and V5.1 for more information.

This collection of fixes for Version 5.1 updates the WebSphere Application Server base product or the Network Deployment product to Version 5.1.0.3. Cumulative Fix 3 includes all of the interim fixes in Cumulative Fix 2 and other fixes that are required for some components.

Cumulative Fix 3 is available at the <http://www-1.ibm.com/support/docview.wss?uid=swg24006675> Web address.

You can find a list of currently recommended fixes at the WebSphere Business Integration Server Foundation V5.1 recommended interim fixes Web site.

36. Tune your system for performance. For best performance on any platform, see "Tuning performance" in the information center.

The Installation wizard configures the product. It is not necessary to perform further configuration at this time.

You have now successfully installed WebSphere Business Integration Server Foundation and the features that you selected.

## Uninstalling and reinstalling

See Uninstalling the product for information about uninstalling any WebSphere Application Server product.

If you uninstalled WebSphere Business Integration Server Foundation but left the embedded messaging feature installed, and now you want to reinstall the V5.1 product, see "Reinstalling V5.1 after uninstalling and leaving the embedded messaging feature installed" on page 356.

After uninstalling a WebSphere Application Server product, reinstalling into the same directory without first deleting all directory contents results in invalid XML configurations because of the retention of old files. Uninstall manually to delete all of the files so that you can reinstall with a clean system, as described in Manually uninstalling on Windows.

Symptoms that you might experience if you reinstall without uninstalling manually include:

1. The **versionInfo** command states that WebSphere Business Integration Server Foundation is installed but the product is not installed. Or the report might state that the base product is installed when it is not installed. Or the report might state that Cumulative Fix 2 is installed when it is not.
2. Specific directories might be missing in the installation root directory, such as the *install\_root*\ProcessChoreographer directory or the *install\_root*\BRBeans directory.

If you experience symptoms such as these, uninstall everything manually and reinstall. The installation is successful if you manually uninstall before reinstalling.

## Miscellaneous tips for Windows platforms

Table 28. Installation and migration tips

Operating platform	Tip
Windows platforms	Windows platforms <ul style="list-style-type: none"><li>• Viewing accurate migration messages</li><li>• Decompressing a WebSphere Application Server elmage that you download</li><li>• Editing or removing the <i>vpd.properties</i> file</li><li>• Preparing for Adaptive Fast Path Architecture (AFPA) driver availability when migrating from IBM HTTP Server Version 1.3.19.x, or earlier</li><li>• Ignoring an incorrect ImagePath entry in the registry after changing the document root</li><li>• Avoiding a user ID with spaces when installing the WebSphere Application Server as a Windows service</li><li>• Changing the display settings from high-contrast black to high-contrast white to view panels with hypertext links</li></ul>
All platforms	All platforms

## Installing and configuring a JMS provider

This topic describes the different ways that you can implement a JMS provider for use with WebSphere Application Server.

For IBM WebSphere Application Server to support bean-managed messaging, you need to install and configure one or more JMS providers that conform to the JMS specification version 1.0.2. To use message-driven beans the JMS provider must support the Application Server Facility (ASF) function defined within that specification.

You can install and use the Embedded Messaging Server option of WebSphere Application Server, install WebSphere MQ as the JMS provider, or install another “generic” JMS provider. If you install both embedded messaging and WebSphere MQ as JMS providers, for example, WebSphere applications can use JMS resources provided by both the embedded WebSphere JMS provider and the WebSphere MQ JMS provider.

WebSphere Application Server provides default JMS support with its Embedded Messaging Server component. This function is installed with WebSphere Application Server, administered through the administrative console and managed as part of the WebSphere Application Server runtime. This function is only accessible from WebSphere Application Server Web, EJB and client containers, and is not interoperable with WebSphere MQ. If access is required to heterogeneous non-JMS applications, WebSphere MQ clustering, or other WebSphere MQ functions, you should install WebSphere Application Server without the Embedded Messaging Server component, and should install WebSphere MQ instead as the JMS provider. You are recommended to install and use the WebSphere Application Server Embedded Messaging Client for communication with the WebSphere MQ queue manager.

To provide the supported levels of messaging, you should apply the latest service for WebSphere Application Server and WebSphere MQ while a production application is in Quality-Assurance or Product-Validation Test.

For more information about WebSphere Application Server messaging scenarios, and the relationship between embedded messaging and WebSphere MQ, see the following articles:

- WebSphere Application Server solutions White paper: Selecting the most appropriate JMS provider for your applications (<ftp://ftp.software.ibm.com/software/websphere/resourcefinder/2318-00.pdf>). This white paper describes the different Java Message Service (JMS) options that are available from IBM for WebSphere Application Server applications. It compares the messaging technology built into WebSphere Application Server, Version 5 with IBM WebSphere MQ, IBM WebSphere Business Integration Event Broker and IBM WebSphere Business Integration Message Broker.
- JMS Topologies and Configurations with WebSphere Application Server and WebSphere Studio Version 5 ([http://www7b.boulder.ibm.com/wsdd/library/techarticles/0310\\_barca/barca.html](http://www7b.boulder.ibm.com/wsdd/library/techarticles/0310_barca/barca.html)). This technical article helps you understand configuration options within WebSphere Application Server for Java Message Service (JMS) applications, including using embedded messaging and WebSphere MQ (formerly MQSeries). It covers setting up your development environment to support various JMS scenarios, development and runtime topologies, and scripting and security.

You can install and configure a JMS provider in one or more of the following ways:

- Installing WebSphere embedded messaging as the JMS provider.

### Note:

- WebSphere embedded messaging as the JMS provider supports both queues (for point-to-point messaging) and topics (for publish/subscribe messaging).
- You can install IBM WebSphere Application Server with embedded messaging on the same host as an existing WebSphere MQ installation, which must be at a supported level of MQ features.
- You can install IBM WebSphere Application Server with embedded messaging then later install WebSphere MQ for use as a JMS provider.

- After installing WebSphere MQ and WebSphere Application Server on the same host, you should service WebSphere MQ independently of the WebSphere Application Server fix packs. This approach helps to avoid potential failures if you later decide to uninstall WebSphere Application Server fix packs.
- Installing WebSphere MQ as the JMS provider.

**Note:**

- You can install WebSphere MQ before IBM WebSphere Application Server. If you then want to install embedded messaging, you must ensure that the WebSphere MQ installation is at a supported level of MQ features.
- If you do not want to use the embedded WebSphere JMS provider, you can install IBM WebSphere Application Server without the **Embedded Messaging Server** option. You are recommended to install and use the WebSphere Application Server **Embedded Messaging Client**.
- You can install WebSphere MQ for use as a JMS provider on top of WebSphere Application Server embedded messaging; this results in a single JMS installation.
  - For point-to-point messaging WebSphere applications can continue to use WebSphere queue resources (through the embedded messaging JMS provider) or WebSphere MQ queue resources that you define to IBM WebSphere Application Server.
  - For publish/subscribe messaging, WebSphere applications can continue to use WebSphere topic resources (through the embedded messaging JMS provider) or WebSphere MQ topic resources that you define to IBM WebSphere Application Server, and which are provided by a Publish/Subscribe broker installed in addition to the base WebSphere MQ.
 

The preferred solution for publish/subscribe messaging with WebSphere MQ as the JMS provider is a full broker such as WebSphere MQ Event Broker. Failing this, you can install the MAOC SupportPac with WebSphere MQ.
- If you install WebSphere MQ as the JMS provider, you can use the WebSphere administrative console to administer the WebSphere MQ JMS provider resources, such as queue connection factories. However, you cannot administer MQ security, which is administered through WebSphere MQ.
- You can change from using WebSphere embedded messaging to WebSphere MQ as the JMS provider for WebSphere enterprise applications, as described in "Moving from the embedded WebSphere JMS provider to WebSphere MQ" in the information center.

For more information about scenarios and considerations for using WebSphere MQ with IBM WebSphere Application Server, see the White Papers and Red books provided by WebSphere MQ; for example, through the WebSphere MQ library Web page at <http://www-3.ibm.com/software/ts/mqseries/library/>

- Installing another JMS provider, which must conform to the JMS specification and, to use message-driven beans, support the ASF function. If you want to use a JMS provider other than the embedded WebSphere JMS provider or a WebSphere MQ JMS provider, you should complete the following steps:
  1. Installing and configuring the JMS provider and its resources by using the tools and information provided with the JMS provider.
  2. Defining the JMS provider to WebSphere Application Server as a generic JMS provider.

**Note:** You cannot use the WebSphere administrative console to administer the JMS provider or its resources.

To install a JMS provider for IBM WebSphere Application Server, consider the following scenarios:

**A new IBM WebSphere Application Server server machine, hostA.**

This scenario starts with adding embedded messaging as the JMS provider, then optionally adding WebSphere MQ as an alternative JMS provider. Each stage summarizes the messaging functions that can be added.

1. Installing embedded messaging as the only JMS provider.

You want to be able to run WebSphere applications that use the WebSphere JMS resources for both point-to-point and publish/subscribe messaging.

- a. Install IBM WebSphere Application Server with the **Embedded Messaging Server** and **Embedded Messaging Client** options.
  - b. Use the administrative console to configure WebSphere JMS resources; for example, WebSphere Queue Connection Factories and WebSphere Topic Connection Factories.
  - c. On any client machines that are to use the WebSphere JMS resources, install IBM WebSphere Application Server with the **Embedded Messaging Client** option.
2. Adding WebSphere MQ as an alternative JMS provider for point-to-point messaging.
- Besides the point-to-point and publish/subscribe messaging that uses the embedded WebSphere JMS resources (from the preceding step), you want to use WebSphere MQ Queue resources for point-to-point messaging.
- a. Install WebSphere MQ 5.3 with the required features. For more information about installing WebSphere MQ, see the WebSphere MQ Quick Beginnings book for your machine's platform. When installing WebSphere MQ, perform the following actions:
    - 1) When asked if you want to remove or modify the version of WebSphere MQ currently installed, choose to remove the Server. (The WebSphere MQ install program recognizes the installed WebSphere embedded messaging as an installed version of WebSphere MQ.)
    - 2) Select the option to keep existing queue managers.
    - 3) Proceed with the installation of the full WebSphere MQ Server by running the install program again, after the old WebSphere MQ server (the Embedded Messaging Server) has been removed.
    - 4) Do not install the WebSphere MQ Client. Use the WebSphere Application Server **Embedded Messaging Client** that was installed with WebSphere embedded messaging.
  - b. Use the administrative console to configure WebSphere MQ Queue Connection Factories and WebSphere MQ Queue Destinations.
3. Adding WebSphere MQ Event Broker for alternative publish/subscribe messaging.
- For publish/subscribe messaging, you want to be able to run WebSphere applications that use the WebSphere MQ Topic resources or the embedded WebSphere Topic resources (such as those configured in preceding steps).
- a. Install WebSphere MQ Event Broker. For more information about installing WebSphere MQ Event Broker, see the WebSphere MQ Event Broker Installation Guide for your machine's platform.
  - b. Use the administrative console to configure WebSphere MQ Topic Connection Factories and WebSphere MQ Topic Destinations.

**An existing WebSphere MQ 5.2 server and broker machine, hostA, where you want to install embedded messaging as the JMS provider.**

1. Upgrade to WebSphere MQ 5.3 with the required features. For more information about upgrading to WebSphere MQ 5.3, see "Migrating from an earlier version" in the WebSphere MQ Quick Beginnings book for your machine's platform.
2. To continue using publish/subscribe messaging, upgrade to a supported broker such as WebSphere MQ Event Broker.
3. Install IBM WebSphere Application Server with the **Embedded Messaging Server** and **Embedded Messaging Client** options.
4. Use the administrative console to configure WebSphere JMS resources; for example, WebSphere Queue Connection Factories and WebSphere Topic Connection Factories.
5. If you want WebSphere applications to use the WebSphere MQ resources, use the administrative console to configure WebSphere MQ JMS resources; for example, WebSphere MQ Queue Connection Factories and WebSphere MQ Destinations.
6. On any client machines that are to use the WebSphere JMS resources, install IBM WebSphere Application Server with the **Embedded Messaging Client** option.

You can run WebSphere applications that use both the WebSphere JMS resources and WebSphere MQ JMS resources for messaging.



**An existing WebSphere MQ server machine, hostA, where you want to use WebSphere MQ as the only JMS provider.**

1. For point-to-point messaging, ensure that you have installed WebSphere MQ 5.3 with required features. For publish/subscribe messaging, ensure that you have also installed a supported broker such as WebSphere MQ Event Broker. For more information about installing WebSphere MQ 5.3 and Event Broker, see the WebSphere MQ Quick Beginnings book and WebSphere MQ Event Broker Installation Guide for your machine's platform.
2. Install IBM WebSphere Application Server without any of the **Embedded Messaging Server** and **Embedded Messaging Client** options.
3. Use the administrative console to configure WebSphere MQ JMS resources; for example, WebSphere MQ Queue Connection Factories and WebSphere MQ Topic Connection Factories.
4. On any client machines that are to use the WebSphere JMS resources, install IBM WebSphere Application Server with the **Embedded Messaging Client** option.

You can run WebSphere applications that use the WebSphere MQ JMS resources for point-to-point or (with a supported broker installed) publish/subscribe messaging.

## Installing WebSphere MQ as the JMS provider

Use this task to install and configure WebSphere MQ with support for the Java Message Service (JMS) for use with the WebSphere Application Server.

**(UNIX platforms only)** Before you install WebSphere MQ, create and mount a journalized file system called `/var/mqm` for your messaging working data. Use a partition strategy with a separate volume for the WebSphere MQ data. This means that other system activity is not affected if a large amount of messaging work builds up in `/var/mqm`. You can also create separate file systems for your log data (`var/mqm/log`) and error files (`var/mqm/errors`). You should store log files on a different physical volume from the messaging queues (`var/mqm`). This ensures data integrity in the case of a hardware failure. If you are creating separate file systems, allow a minimum of 30 MB of storage for `/var/mqm`, 20 MB of storage for `/var/mqm/log`, and 4 MB of storage for `/var/mqm/errors`.

- The `/var` file system is used to store all the security logging information for the system, and is used to store the temporary files for email and printing. Therefore, it is critical that you maintain free space in `/var` for these operations. If you do not create a separate file system for messaging data, and `/var` fills up, all security logging will be stopped on the system until some free space is available in `/var`. Also, email and printing will no longer be possible until some free space is available in `/var`.
- It is not recommended to install WebSphere Studio Application Developer and WebSphere Application Server on the same machine when using WebSphere MQ.
- For more information the security logging issue, see "Security and WebSphere MQ" in the information center.
- For more information about creating file systems for WebSphere MQ, and WebSphere MQ space requirements for `/var` file systems, see the section "Preparing for Installation: Creating WebSphere MQ file systems" in the appropriate WebSphere MQ *Quick Beginnings* book.
- For other installation prerequisites, see the appropriate WebSphere MQ *Quick Beginnings* book, as follows:
  - *WebSphere MQ for Windows, V5.3 Quick Beginnings*, GC34-6073
  - *WebSphere MQ for AIX, V5.3 Quick Beginnings*, GC34-6076
  - *WebSphere MQ for Solaris, V5.3 Quick Beginnings*, GC34-6075
  - *WebSphere MQ for HP-UX, V5.3 Quick Beginnings*, GC34-6077
  - *WebSphere MQ for Linux for Intel and Linux for zSeries, V5.3 Quick Beginnings*, GC34-6078

You can get these books from the WebSphere MQ messaging platform-specific books Web page at <http://www-3.ibm.com/software/ts/mqseries/library/manualsa/manuals/platspecific.html>

To install and configure WebSphere MQ (MQSeries) for use as a JMS provider to IBM WebSphere Application Server, complete the following steps:

1. Install WebSphere MQ 5.3, with the required MQ features, as described in the installation instructions provided with WebSphere MQ.



If you are installing WebSphere MQ on top of WebSphere Application Server embedded messaging, perform the following actions when installing WebSphere MQ:

- a. When asked if you want to remove or modify the version of WebSphere MQ currently installed, choose to remove the Server. (The WebSphere MQ install program recognizes the installed WebSphere embedded messaging as an installed version of WebSphere MQ.)
- b. Select the option to keep existing queue managers.
- c. Proceed with the installation of the full WebSphere MQ Server by running the install program again, after the old WebSphere MQ server (the Embedded Messaging Server) has been removed.
- d. Do not install the WebSphere MQ Client. Use the WebSphere Application Server **Embedded Messaging Client** that was installed with WebSphere embedded messaging.

**Note:** The WBI Server Foundation package includes copies of the WebSphere MQ 5.3 and Event Broker installation packages, with restricted licensing for use with WBI Server Foundation. (WebSphere MQ Event Broker is not available for Linux.) For more information about the usage restrictions for the WebSphere MQ 5.3 and Event Broker installation packages, see the WBI Server Foundation licensing information.

If you want to use the original WebSphere MQ 5.3 release, ensure that you install the CSD03 update.

If you want to use WebSphere MQ 5.3 on the same machine as WebSphere Application Server embedded messaging, ensure that you install the following MQ features:

- For a WebSphere Application Server **Embedded Messaging Server** installation, the required MQ features are “Server” and “Java Messaging”.
- For a WebSphere Application Server **Embedded Messaging Client** installation, the only required MQ feature is “Java Messaging”.

You can use the WebSphere MQ 5.3 installation package provided with WBI Server Foundation to install the required MQ features into an existing WebSphere MQ 5.3 or to install a new WebSphere MQ 5.3 with the required MQ features for use with WBI Server Foundation subject to the licensing conditions.

For information about installing WebSphere MQ 5.3, or migrating to WebSphere MQ 5.3 from an earlier release, see the appropriate WebSphere MQ *Quick Beginnings* book, as listed above.

2. If you want to use WebSphere MQ - Publish/Subscribe support, you need to provide a Publish/Subscribe broker.

For example, you can do this by using either WebSphere MQ Event Broker or WebSphere MQ Integrator (formerly MQSeries Integrator). For more information about these products, see the following Web sites:

- WebSphere MQ Event Broker Web site at <http://www-4.ibm.com/software/ts/mqseries/platforms/#eventb>
- WebSphere MQ Integrator Web site at <http://www-4.ibm.com/software/ts/mqseries/platforms/#integrator>

3. Follow the WebSphere MQ 5.3 instructions for verifying your installation setup.
4. For AIX, see the WebSphere MQ 5.3 readme.txt for additional steps.
5. If you want to install IBM WebSphere Application Server on the same host as WebSphere MQ, and have not yet done so, install IBM WebSphere Application Server. If you do not want to use the embedded WebSphere JMS provider, you can install WebSphere MQ then install WebSphere Application Server without the **Embedded Messaging Server** option. You are recommended to install and use the WebSphere Application Server **Embedded Messaging Client**.
6. Set the MQJMS\_LIB\_ROOT environment variable to the directory where WebSphereMQJavaLib is installed. IBM WebSphere Application Server uses the MQJMS\_LIB\_ROOT to locate the WebSphere MQ libraries for the WebSphere MQ JMS Provider.

This task has installed WebSphere MQ for use as the JMS provider with WebSphere Application Server.

You can configure JMS resources to be provided by WebSphere MQ, by using the WebSphere administrative console to define WebSphere MQ resources.

**(UNIX platforms only)** Restrict access to the messaging errors directories and logging files, by using the following commands. This is part of the procedure to secure the directories and log files needed for WebSphere MQ, as described in "Securing messaging directories and log files" in the information center.

1. For the /var/mqm/errors directory:

```
chmod 3777 /var/mqm/errors
chown mqm:mqm /var/mqm/errors

touch /var/mqm/errors/AMQERR01.LOG
chown mqm:mqm /var/mqm/errors/AMQERR01.LOG
chmod 666 /var/mqm/errors/AMQERR01.LOG
```

```
touch /var/mqm/errors/AMQERR02.LOG
chown mqm:mqm /var/mqm/errors/AMQERR02.LOG
chmod 666 /var/mqm/errors/AMQERR02.LOG
```

```
touch /var/mqm/errors/AMQERR03.LOG
chown mqm:mqm /var/mqm/errors/AMQERR03.LOG
chmod 666 /var/mqm/errors/AMQERR03.LOG
```

2. For the /var/mqm/qmgrs/@SYSTEM/errors directory:

```
chmod 3777 /var/mqm/qmgrs/@SYSTEM/errors
chown mqm:mqm /var/mqm/qmgrs/@SYSTEM/errors
```

```
touch /var/mqm/qmgrs/@SYSTEM/errors/AMQERR01.LOG
chown mqm:mqm /var/mqm/qmgrs/@SYSTEM/errors/AMQERR01.LOG
chmod 666 /var/mqm/qmgrs/@SYSTEM/errors/AMQERR01.LOG
```

```
touch /var/mqm/qmgrs/@SYSTEM/errors/AMQERR02.LOG
chown mqm:mqm /var/mqm/qmgrs/@SYSTEM/errors/AMQERR02.LOG
chmod 666 /var/mqm/qmgrs/@SYSTEM/errors/AMQERR02.LOG
```

```
touch /var/mqm/qmgrs/@SYSTEM/errors/AMQERR03.LOG
chown mqm:mqm /var/mqm/qmgrs/@SYSTEM/errors/AMQERR03.LOG
chmod 666 /var/mqm/qmgrs/@SYSTEM/errors/AMQERR03.LOG
```

After installing WebSphere MQ and WebSphere Application Server on the same host, you should service WebSphere MQ independently of the WebSphere Application Server fix packs. This approach helps to avoid potential failures if you later decide to uninstall WebSphere Application Server fix packs.

## Defining a generic JMS provider

Use this task to define a new JMS provider to WebSphere Application Server, for use instead of the embedded WebSphere JMS provider or a WebSphere MQ JMS provider.

Before starting this task, you should have installed and configured the JMS provider and its resources by using the tools and information provided with the JMS provider.

To define a new generic JMS provider to WebSphere Application Server, use the administrative console to complete the following steps:

1. In the navigation pane, expand **Resources-> Generic JMS Providers** This displays the existing generic JMS providers in the content pane.
2. To define a new generic JMS provider, click **New** in the content pane. Otherwise, to change the definition of an existing JMS provider, click the JMS provider. This displays the properties used to define the JMS provider in the content pane.
3. Specify appropriate properties for the JMS provider.
4. Click **OK**.
5. To save your configuration, click **Save** on the task bar of the Administrative console window.
6. To have the changed configuration take effect, stop then restart the application server.

## Installing WebSphere embedded messaging as the JMS provider

Use this task to install the Embedded Messaging options of IBM WebSphere Application Server for use as the JMS provider.

Before you install the embedded messaging options of IBM WebSphere Application Server, you must complete the following steps:

1. If you want to install embedded messaging on a machine where you already have WebSphere MQ installed, you must ensure that you have upgraded to WebSphere MQ 5.3 with the required MQ features:

- a. If you have the original WebSphere MQ 5.3 release installed, ensure that you have applied the CSD04 update.

To determine if your WebSphere MQ 5.3 installation is at the required level, run the **mqver** utility provided by WebSphere MQ. The required level as indicated by mqver is shown below:

```
Name:      WebSphere MQ
Version:   530.4 CSD04
...
```

For more information about CSD04 and other WebSphere MQ product support, see the WebSphere MQ support page for your platform.

- b. Ensure that you have installed the following WebSphere MQ features:
  - For a WebSphere Application Server **Embedded Messaging Server** installation, the required MQ features are “Server” and “Java Messaging”.
  - For a WebSphere Application Server **Embedded Messaging Client** installation, the only required MQ feature is “Java Messaging”.

If you have not installed WebSphere MQ 5.3 with the required MQ features, then installation of IBM WebSphere Application Server Embedded Messaging options fails with prerequisite check errors.

The WBI Server Foundation package includes copies of the WebSphere MQ 5.3 and Event Broker installation packages, with restricted licensing. (WebSphere MQ Event Broker is not available for Linux.) You can use the provided packages to install the required MQ features or WebSphere MQ 5.3 for use with WBI Server Foundation.

For information about installing WebSphere MQ 5.3, or migrating to WebSphere MQ 5.3 from an earlier release, see the appropriate WebSphere MQ *Quick Beginnings* book, as follows:

- *WebSphere MQ for Windows, V5.3 Quick Beginnings*, GC34-6073
- *WebSphere MQ for AIX, V5.3 Quick Beginnings*, GC34-6076
- *WebSphere MQ for Solaris, V5.3 Quick Beginnings*, GC34-6075
- *WebSphere MQ for HP-UX, V5.3 Quick Beginnings*, GC34-6077
- *WebSphere MQ for Linux for Intel and Linux for zSeries, V5.3 Quick Beginnings*, GC34-6078

You can get these books from the WebSphere MQ messaging platform-specific books Web page at <http://www-3.ibm.com/software/ts/mqseries/library/manualsa/manuals/platspecific.html>

2. Ensure that there is enough space in the file systems where you want to install the Embedded Messaging options and store associated messaging data. On UNIX platforms, you also need to create the required file systems before installing the embedded messaging feature.
  - **(Windows only)** You can specify the file system into which the Embedded Messaging options are installed. The following table lists the default locations for the base messaging functions and the messaging broker functions (for publish/subscribe messaging). The table also provides figures for the file system sizes on which you can base your own calculations.

Table 29. Installation directory and space needed for embedded messaging - Windows platform

	Base messaging	Messaging broker
<b>Installation directory</b>	C:\Program Files\IBM\WebSphere MQ	C:\Program Files\IBM\WebSphere MQ\WEMPS
<b>Typical space needed</b>	70 MB (server) or 15 MB (client)	45 MB (server)

If you are using the Installation wizard to install IBM WebSphere Application Server, you can specify an install location for the Embedded Messaging options during either a Full or Custom install. If you want to use a silent install for IBM WebSphere Application Server, you can specify an install location for the Embedded Messaging options when you tailor the options response file before issuing the command to install silently. For more information about performing a silent installation (including editing the options response file), see *Installing silently*.

- **(UNIX platforms only)** The file system into which the Embedded Messaging options are installed is fixed. The following table lists the default locations for the base messaging functions and the messaging broker functions (for publish/subscribe messaging). The table also provides figures for the file system sizes on which you can base your own calculations.

Table 30. Installation directory and space needed for embedded messaging - UNIX platforms

	Base code	Broker code	Base data	Broker data
	/usr/mqm	/usr/opt/wemps	/var/mqm	/var/wemps
<b>AIX</b>	40MB (server) or 15MB (client)	80MB (server) or 15MB (client)	8MB (server) or 5MB (client)	5MB (server)
	/opt/mqm	/opt/wemps	/var/mqm	/var/wemps
<b>Linux/Intel</b>	40MB (server) or 15MB (client)	100MB (server) or 15MB (client)	8MB (server) or 5MB (client)	5MB (server)
<b>HP-UX</b>	40MB (server) or 15MB (client)	105MB (server) or 15MB (client)	8MB (server) or 5MB (client)	5MB (server)
<b>Solaris</b>	40MB (server) or 15MB (client)	70MB (server) or 15MB (client)	20MB (server) or 15MB (client)	5MB (server)

Before you install WebSphere embedded messaging, create and mount a journalized file system called /var/mqm for your messaging working data. Use a partition strategy with a separate volume for the WebSphere MQ data. This means that other system activity is not affected if a large amount of messaging work builds up in /var/mqm. You can also create separate file systems for your log data (var/mqm/log) and error files (var/mqm/errors). Store log files on a different physical volume from the Embedded Messaging queues (var/mqm). This ensures data integrity in the case of a hardware failure. If you are creating separate file systems, allow a minimum of 30 MB of storage for /var/mqm, 20 MB of storage for /var/mqm/log, and 4 MB of storage for /var/mqm/errors.

**Note:** The /var file system is used to store all the security logging information for the system, and is used to store the temporary files for email and printing. Therefore, it is critical that you maintain free space in /var for these operations. If you do not create a separate file system for messaging data, and /var fills up, all security logging will be stopped on the system until some free space is available in /var. Also, email and printing will no longer be possible until some free space is available in /var.

You have the same options for creating file systems for Embedded Messaging as you do for WebSphere MQ. For example:

- If you cannot install the Embedded Messaging options in the required file system (for example, if it is too small), you can do one of the following *before* installing the Embedded Messaging options:
  - Create and mount a new file system for the installation directory.
  - Create a new directory anywhere on your machine, and create a symbolic link from the required installation directory to the new directory. For example, on AIX:

```
mkdir /bigdisk/mqm
ln -s /bigdisk/mqm /usr/mqm
```

### 3. Define the operating system groups and users needed for embedded messaging:

- **(UNIX platforms only)**
  - a. If you have not already done so, create the groups **mqm** and **mqbrkrs**.
  - b. Add the users **mqm** and **root** to the **mqm** group.
  - c. Add the user **root** to the **mqbrkrs** group.

## Notes

### Note:

- 1) You are recommended to run the JMS server process under the root user ID. If you run the JMS server process under another user ID, add that user ID to the **mqm** and **mqbrkrs** groups

For more information about running servers under a non-root user ID, see "Running an Application Server with a non-root user ID and the nodeagent as root" in the information center.

- 2) User IDs longer than 12 characters cannot be used for authentication with the embedded WebSphere JMS provider.

- **(Windows only)** Define the process user ID with these authorizations:

- Assign the user ID to the Administrator group.
- Give the user ID the advanced user right, Act as part of the operating system.
- Give the user ID the advanced user right, Log on as a service.

User IDs longer than 12 characters cannot be used for authentication with the embedded WebSphere JMS provider. For example, the default Windows NT user ID, Administrator, is not valid for use with embedded WebSphere messaging, because it contains 13 characters.

The IBM WebSphere Application Server installation wizard GUI grants your Windows user ID the advanced user rights, if the user ID belongs to the Administrator group. The silent installation does not. If you create a new user ID on a Windows platform to perform the silent installation, you must restart the system to activate the proper authorizations for the user ID, and to perform a successful silent installation.

This user ID, the WebSphere Application Server process user ID, is used to start the JMS server (for general JMS support) and the WebSphere Embedded Broker (for WebSphere topic connections).

Ensure that these operating system security settings are used when you next start IBM WebSphere Application Server; for example, either log off and then on again with the process user ID, or open a new shell in which to start IBM WebSphere Application Server.

You have the same options for creating user IDs and groups for Embedded Messaging as you do for WebSphere MQ. For more information about creating user IDs and groups for WebSphere MQ, see the section "Preparing for Installation: Setting up the user ID and group" in the appropriate WebSphere MQ *Quick Beginnings* book, as listed above.

4. **(Solaris only)** Several Solaris kernel values are typically too small for the Embedded Messaging options. Starting the internal JMS server or client with insufficient kernel resources produces a First Failure Support Technology (FFST) file in the `/var/mqm/errors` directory.

Before installing Embedded Messaging, review the machine's configuration. To do this type the following command:

```
sysdef -i
```

The kernel values are set in the `/etc/system` file, as shown in the following example.

```
set shmsys:shminfo_shmmax = 4294967295
set shmsys:shminfo_shmseg = 1024
set shmsys:shminfo_shmmni = 1024
set semsys:seminfo_semaem = 16384
set semsys:seminfo_semni = 1024
set semsys:seminfo_semmap = 1026
set semsys:seminfo_semms = 16384
set semsys:seminfo_semmsl = 100
set semsys:seminfo_semopm = 100
set semsys:seminfo_semnu = 2048
set semsys:seminfo_semume = 256
set msgsys:msginfo_msgmap = 1026
set msgsys:msginfo_msgmax = 65535
set rlim_fd_cur=1024
```



You can change kernel values by editing the `/etc/system` file then rebooting the operating system. For more information about setting up the Solaris system, see the Solaris System Administration documentation; for example, the *Solaris Tunable Parameters Reference Manual*.

**Note:** Queue managers are generally independent of each other. Therefore system kernel parameters, for example `shmmni`, `semmni`, `semmns`, and `semmnu` need to allow for the number of queue managers in the system.

5. **(HP-UX only)** Several HP-UX kernel values are typically too small for the Embedded Messaging options. Starting the internal JMS server or client with insufficient kernel resources produces a First Failure Support Technology (FFST) file in the `/var/mqm/errors` directory.

Before installing Embedded Messaging, review the machine's configuration and, if needed, set appropriate HP-UX kernel settings.

You should set new values for the following messaging-related kernel parameters (along with the base set of kernel parameters required by IBM WebSphere Application Server):

Parameter	Value
<code>sema</code>	1
<code>semaem</code>	16384
<code>semmns</code>	16384
<code>semvmx</code>	32767
<code>shmem</code>	1

This table lists only those messaging-related kernel parameters that either are extra to the base set or need values that are greater than given in the base set.

For information about how to review and set the base set of kernel parameters for IBM WebSphere Application Server, see the item "Configure HP-UX kernel settings before installing" in Platform-specific tips for installing and migrating (HP-UX platforms).

**Note:** Queue managers are generally independent of each other. Therefore system kernel parameters, for example `shmmni`, `semmni`, `semmns`, and `semmnu` need to allow for the number of queue managers in the system.

To install the Embedded Messaging options of WebSphere Application Server for use as the WebSphere JMS provider, complete the following steps:

1. Login with the WebSphere Application Server process user ID (defined as part of the prerequisites)

**Note: (UNIX platforms only)** Login as root.

2. On a machine where you want to host queues or topics, install IBM WebSphere Application Server with the **Embedded Messaging Server** option. If you also want application servers on the host to run messaging applications, install the **Embedded Messaging Client** option.

Both options are selected by default.

3. On a machine where you want application servers to run messaging applications that use a JMS provider on another host, install IBM WebSphere Application Server with the **Embedded Messaging Client** option.

This task has installed WebSphere Application Server with its embedded messaging as the JMS provider.

You can configure JMS resources to be provided by embedded messaging, by using the WebSphere administrative console to define WebSphere JMS resources.

**(UNIX platforms only)** Restrict access to the messaging errors directories and logging files; for example, by using the following commands:



1. For the /var/mqm/errors directory:

```
chmod 3777 /var/mqm/errors
chown mqm:mqm /var/mqm/errors

touch /var/mqm/errors/AMQERR01.LOG
chown mqm:mqm /var/mqm/errors/AMQERR01.LOG
chmod 666 /var/mqm/errors/AMQERR01.LOG

touch /var/mqm/errors/AMQERR02.LOG
chown mqm:mqm /var/mqm/errors/AMQERR02.LOG
chmod 666 /var/mqm/errors/AMQERR02.LOG

touch /var/mqm/errors/AMQERR03.LOG
chown mqm:mqm /var/mqm/errors/AMQERR03.LOG
chmod 666 /var/mqm/errors/AMQERR03.LOG
```

2. For the /var/mqm/qmgrs/@SYSTEM/errors directory:

```
chmod 3777 /var/mqm/qmgrs/@SYSTEM/errors
chown mqm:mqm /var/mqm/qmgrs/@SYSTEM/errors

touch /var/mqm/qmgrs/@SYSTEM/errors/AMQERR01.LOG
chown mqm:mqm /var/mqm/qmgrs/@SYSTEM/errors/AMQERR01.LOG
chmod 666 /var/mqm/qmgrs/@SYSTEM/errors/AMQERR01.LOG

touch /var/mqm/qmgrs/@SYSTEM/errors/AMQERR02.LOG
chown mqm:mqm /var/mqm/qmgrs/@SYSTEM/errors/AMQERR02.LOG
chmod 666 /var/mqm/qmgrs/@SYSTEM/errors/AMQERR02.LOG

touch /var/mqm/qmgrs/@SYSTEM/errors/AMQERR03.LOG
chown mqm:mqm /var/mqm/qmgrs/@SYSTEM/errors/AMQERR03.LOG
chmod 666 /var/mqm/qmgrs/@SYSTEM/errors/AMQERR03.LOG
```

This is part of the procedure to secure the directories and log files needed for WebSphere embedded messaging, as described in "Securing messaging directories and log files" in the information center.

If you have installed the Embedded Messaging Server option on top of WebSphere MQ, the MQ command **setmqcap** is set to use parameter 0 instead of -1, which results in:

- Issuing a license-unit message to the MQ console window whenever a queue manager starts
- Writing a message to the MQ error log

To prevent this, after you have completed the installation of IBM WebSphere Application Server, issue the **setmqcap -1** command from a command line.

After installing WebSphere MQ and WebSphere Application Server on the same host, you should service WebSphere MQ independently of the WebSphere Application Server fix packs. This approach helps to avoid potential failures if you later decide to uninstall WebSphere Application Server fix packs.

## Platform-specific tips for installing and migrating

This topic is a collection of platform-specific tips that can help you install and migrate the base WebSphere Application Server product, the Network Deployment product, and the WebSphere Business Integration Server Foundation product.

If you encounter a problem such as not having enough disk space or temporary space or not having the right packages on your Linux or UNIX-based system, cancel the installation, make the required changes, and restart the installation.

For information related to installing the embedded messaging feature, refer to Tips for installing the embedded messaging feature.

The following sections contain applicable tips:

- All platforms
- All Linux and UNIX-based platforms
- AIX platforms
- HP-UX platforms
- Linux platforms
- Solaris Operating Environment
- Windows platforms

## All platforms

### Summary of tips that apply to all platforms

- Running servers in different code pages within a single cell is not supported
- Ignoring certain java.io.IOException errors when installing only the CORBA C++ SDK feature with or without interface repository support
- Updating all of the cluster members to the same service level
- Avoiding non-ASCII special characters or double-byte character set (DBCS) characters in the name of the installation directory
- Verifying the SDK that WebSphere Application Server products install
- Avoiding the use of a V5.0.x deployment manager after migrating to V5.1
- Migrating from embedded messaging to WebSphere MQ requires setting the MQ\_INSTALL\_ROOT variable to the location of the installation root of WebSphere MQ
- Installing WebSphere Application Server products in order on the same machine, when installing the embedded messaging component
- Recovering from configuration errors when the deployment manager was not running during migration.
- Installing all of the Web server plug-ins during the initial installation
- Recovering from an InvalidExecutableException error while starting the jmsserver process
- Restarting the server after a configuration change
- Updating ports for coexistence requires a WebSphere Application Server installation
- Manually uninstalling all of the beta products before installing WebSphere Application Server Version 5.1
- Installing from a directory with a name beginning with the word disk fails
- Accessing migration tools in the migration subdirectory on the WebSphere Application Server, Version 5.1 CD-ROM
- Avoiding license files with bad characters in certain languages
- Updating the XMLConfig utility on WebSphere Version 4.0 Advanced Edition before migration
- Planning to not use the launchClient command on the WebSphere Application Server Network Deployment product
- Ignoring a validation error that might appear after configuring the sample business process container
- Installing Integration Server, V5.1 to extend the deployment manager does not install the Javadoc
- Installing interim fixes for the IBM HTTP Server feature and the embedded messaging feature
- Uninstalling interim fixes for the IBM HTTP Server feature and the embedded messaging (WebSphere MQ) feature before installing fix pack updates to the features
- Applying interim fixes and fix packs to the embedded messaging feature
- Installing the WebSphere Application Server product on top of WebSphere MQ
- Editing the port number when choosing the coexistence option during installation
- Avoiding using the installation verification test on node names that contain double-byte characters
- Avoiding the use of hot keys in the Installation wizard
- Downloading a refreshed PDF from the WebSphere Application Server Library page, or refer to the information in the information center
- Logging in appropriately to pick up secondary user groups for root
- Retaining the embedded messaging feature when uninstalling an instance that does not have the feature installed
- Installing WebSphere Business Integration Server Foundation also installs the V5.1.0 Cumulative Fix for SDKs
- Installing WebSphere Application Server 5.1 Cumulative Fix 2
- Installing WebSphere Application Server 5.1 Cumulative Fix 3
- Verifying that no files exist in the install\_root/classes directory during installation

- Installing the Integration Server installs programming model extensions, Cumulative Fix 2, and the V5.1.0 Cumulative Fix for SDKs
- Using the correct installation CDs for each platform.
- Recovering from a failed installation
- Uninstalling and reinstalling the WebSphere Business Integration Server, Version 5.1 product
- Removing an Enterprise node from the cell before uninstalling the Enterprise product
- Avoiding the underscore (\_) character in machine names
- Avoiding the installation of the server and client feature or the client feature more than once
- Locating more information about the embedded messaging feature or WebSphere MQ
- Installing the embedded messaging server feature if WebSphere MQ Version 5.3 is already installed
- Logging off and back on, or rebooting a Windows machine, after uninstalling the embedded messaging feature
- Planning to not use terminal services with the embedded messaging feature
- Avoiding a coexistence problem between embedded messaging, IBM WebSphere Studio Application Developer Integration Edition, and IBM WebSphere Application Server
- Using a version of Internet Explorer other than Version 6.0 to view the IBM HTTP Administration server
- Avoiding a core that is caused by an incompatibility between functions in various C or C++ run-time libraries
- Hiding one copy of the OpenSSL module so that Apache Web server can start
- Defining the name of the WebSEAL HTTP server in lower case
- Bringing up the IKEYMAN administrative console with the Conversational Monitoring System option for IBM HTTP server 1.3.28 and IBM HTTP Server 2.0.47
- Enabling cryptographic hardware
- Using the WebSphere MQ client instead of the embedded messaging client feature

### Tips that apply to all platforms

- **Running servers in different code pages within a single cell is not supported.**

Both the IBM WebSphere Application Server Network Deployment node and the IBM WebSphere Application Server nodes must be on the same code page.

- **Ignoring certain java.io.IOException errors when installing only the CORBA C++ SDK feature, with or without interface repository support.**

You can ignore the following entries in the WAS.WBISF.install.log file when installing WebSphere Business Integration Server Foundation while selecting only the deprecated CORBA C++ SDK feature:

```
(Jan 22, 2004 6:40:01 PM),
  Setup.product.install, com.ibm.ws.install.actions.PluginProcessorAction,
  err, INST0009E: Could not execute command (generic error). Stack Trace follows.
(Jan 22, 2004 6:40:01 PM),
  Setup.product.install, com.ibm.ws.install.actions.PluginProcessorAction,
  err, java.io.IOException: CreateProcess:
  "C:\Program Files\WebSphere\AppServer\_uninst\launcher.exe"
  C:\DOCUME~1\ADMINI~1\LOCALS~1\Temp\PMEinstPlugCmd.bat
  "C:\Program Files\WebSphere\AppServer\bin\PluginProcessor.bat"
  -restore error=3
STACK_TRACE: 10
  java.io.IOException: CreateProcess:
  "C:\Program Files\WebSphere\AppServer\_uninst\launcher.exe"
  C:\DOCUME~1\ADMINI~1\LOCALS~1\Temp\PMEinstPlugCmd.bat
  "C:\Program Files\WebSphere\AppServer\bin\PluginProcessor.bat" -restore error=3
  at java.lang.Win32Process.create(Native Method)
  at java.lang.Win32Process.<init>(Win32Process.java:97)
  at java.lang.Runtime.execInternal(Native Method)
  at java.lang.Runtime.exec(Runtime.java:601)
  at java.lang.Runtime.exec(Runtime.java:523)
  at java.lang.Runtime.exec(Runtime.java:489)
  at com.ibm.ws.install.actions.PluginProcessorAction.execute(
  PluginProcessorAction.java:188)
  at com.installshield.wizard.RunnableWizardBeanContext.run(
  RunnableWizardBeanContext.java:21)
```

```

(Jan 22, 2004 6:41:36 PM),
  Setup.product.install, com.ibm.ws.install.actions.ExecWizardActionFromDirectory,
  msg1, Executing Command:
  "H:\eex51x-a0352.02\ws\code\image.pme\build\images\disk1\util\launcher.exe"
  "C:\Program Files\WebSphere\AppServer\bin\EARExpander.bat"
  -ear adminconsole.ear -operationDir
  "C:\Program Files\WebSphere\AppServer\installedApps\peart\adminconsole.ear"
  -operation collapse
(Jan 22, 2004 6:41:41 PM),
  Setup.product.install, com.ibm.ws.install.actions.ExecWizardActionFromDirectory,
  msg1, Executing Command:
  "C:\Program Files\WebSphere\AppServer\_uninstWBISF\launcher.exe"
  "C:\Program Files\WebSphere\AppServer\bin/wsadmin.bat"
  -lang javascript -f
  "C:\Program Files\WebSphere\AppServer\_uninstWBISF\startAdminConsole.js"
(Jan 22, 2004 6:41:47 PM),
  Setup.product.install, com.ibm.ws.install.actions.WsAdminWizAction,
  msg1, wsadmin command:"C:\Program Files\WebSphere\AppServer\_uninst\launcher.exe"
  C:\DOCUME~1\ADMINI~1\LOCALS~1\Temp\PMEinstAppCmd.bat
  "C:\Program Files\WebSphere\AppServer\bin/wsadmin.bat"
  -conntype NONE -f
  "C:\Program Files\WebSphere\AppServer\logs\wbisf\WBISFinstallApps.jacl"
(Jan 22, 2004 6:41:47 PM),
  Setup.product.install, com.ibm.ws.install.actions.WsAdminWizAction,
  err, INST0009E: Could not execute command (generic error). Stack Trace follows.
(Jan 22, 2004 6:41:47 PM),
  Setup.product.install, com.ibm.ws.install.actions.WsAdminWizAction,
  err, java.io.IOException: CreateProcess:
  "C:\Program Files\WebSphere\AppServer\_uninst\launcher.exe"
  C:\DOCUME~1\ADMINI~1\LOCALS~1\Temp\PMEinstAppCmd.bat
  "C:\Program Files\WebSphere\AppServer\bin/wsadmin.bat"
  -conntype NONE -f
  "C:\Program Files\WebSphere\AppServer\logs\wbisf\WBISFinstallApps.jacl"
  error=3
STACK TRACE: 10
  java.io.IOException: CreateProcess:
  "C:\Program Files\WebSphere\AppServer\_uninst\launcher.exe"
  C:\DOCUME~1\ADMINI~1\LOCALS~1\Temp\PMEinstAppCmd.bat
  "C:\Program Files\WebSphere\AppServer\bin/wsadmin.bat"
  -conntype NONE -f
  "C:\Program Files\WebSphere\AppServer\logs\wbisf\WBISFinstallApps.jacl"
  error=3 at java.lang.Win32Process.create(Native Method)
  at java.lang.Win32Process.<init>(Win32Process.java:97)
  at java.lang.Runtime.execInternal(Native Method)
  at java.lang.Runtime.exec(Runtime.java:601)
  at java.lang.Runtime.exec(Runtime.java:523)
  at java.lang.Runtime.exec(Runtime.java:489)
  at com.ibm.ws.install.actions.WsAdminWizAction.execute(
    WsAdminWizAction.java:183)
  at com.installshield.wizard.RunnableWizardBeanContext.run(
    RunnableWizardBeanContext.java:21)

(Jan 22, 2004 6:42:21 PM),
  Setup.product.install, com.ibm.ws.install.actions.LogMessageAction, msg1,
  Move baseResponse file from temp to logs directory.
(Jan 22, 2004 6:42:21 PM),
  Setup.product.install, com.ibm.ws.install.actions.LogMessageAction, msg1,
  Move baseInstallSummary file from temp to logs directory.
(Jan 22, 2004 6:42:23 PM),
  Setup.product.install, com.ibm.ws.install.actions.LogSummaryAction, msg1,

```

The Summary Panel has the following message:  
The InstallShield Wizard has successfully installed  
IBM WebSphere Business Integration Server Foundation.  
Choose Finish to exit the wizard.

(Jan 22, 2004 6:42:23 PM),  
Setup.product.install, com.ibm.ws.install.actions.LogMessageAction,  
msg1, INSTFIN: The installation is complete.

The error entries also occur when you install the CORBA C++ SDK feature with its interface repository support subfeature.

- **Updating all of the cluster members to the same service level**

Apply the same interim fixes and fix packs to all of the WebSphere Application Server nodes in a cluster. When all of the cluster members are not at the same service level, the following exception can occur:

```
DRSCacheApp    E DRSW0008E:  
Exception is: com.ibm.disthub.impl.jms.JMSWrappedException:  
{-1361012295|unknown|java.io.OptionalDataException|}
```

This error can cause memory replication to not function properly.

- **Avoiding special non-ASCII characters or double byte character set (DBCS) characters in the name of the installation directory.**

Do not use non-ASCII special characters or double-byte characters in the directory name. This problem is a known limitation.

- **Verifying the Java 2 SDK that WebSphere Application Server products install.**

Verify that the CD-ROM that you are using is a good copy, by verifying the Java 2 SDK on the CD-ROM.

To verify that the Java 2 SDK on the product CD-ROM is working correctly:

1. Change directories to the /WAS/jdk/java/bin directory in the operating system root directory on the product CD-ROM.

For example, on an IBM AIX platform:

```
cd /mnt/aix/WAS/jdk/java/bin
```

On a Windows platform, type the following command:

```
cd CD-ROMDrive:\win\WAS\jdk\java\bin
```

2. Verify the Java 2 SDK version.

On a Linux or UNIX-based platform, type the following command:

```
./java -version
```

On a Windows platform, type the following command:

```
.\java -version
```

The command completes successfully with no errors when the Java 2 SDK is intact.

- **Avoiding the use of a V5.0.x deployment manager after migrating to V5.1.**

After a deployment manager configuration has been migrated to Version 5.1.x, avoid using the Version 5.0.x deployment manager node. Using the V5.0.x node results in an inconsistent configuration and creates an unsupported environment. Use the Version 5.1.x deployment manager node to manage all of the the federated nodes in that cell.

If you inadvertently start the Version 5.0.x deployment manager node, the deployment manager attempts to manage the same cell as the Version 5.1.x deployment manager, but with an older version of the configuration. Any changes made through the Version 5.1.x deployment manager can disappear after the nodes synchronize with the Version 5.0.x deployment manager. This problem can cause major disruptions to the operation of your cell.

It is advisable to disable the Version 5.0.x deployment manager node. Be sure to perform a backup of the configuration using the **backupConfig** command before proceeding. You can disable the Version 5.0.x deployment manager node in a number of ways. The recommended approach is renaming the config directory to something else.

- **Migrating from embedded messaging to WebSphere MQ requires setting the MQ\_INSTALL\_ROOT variable to the location of the installation root of WebSphere MQ.**

When installing V5.1.x with the WebSphere MQ product as the JMS provider, you must use the administrative console to set the `MQ_INSTALL_ROOT` variable to the proper path. The installation program does not set the path when you use the WebSphere MQ product. Although WebSphere MQ is a supported JMS provider, migrating from V5.0.x with embedded messaging does not reset the variable, which still points to the installation root of the V5.0.x embedded messaging code.

Use the administrative console to set the `MQ_INSTALL_ROOT` to the installation root of the WebSphere MQ product.

1. Click **Environment > Manage WebSphere Variables > MQ\_INSTALL\_ROOT**.
2. Type the fully qualified file path for the installation root of the WebSphere MQ product in the Value field.
3. Click **Apply > Save > Save** to apply and save your changes.

- **Installing WebSphere Application Server products in order on the same machine, when installing the embedded messaging component.**

When installing the embedded messaging feature of the WebSphere Application Server product and the Network Deployment product on the same machine, install the WebSphere Application Server product first. Then install the Network Deployment product. Otherwise, embedded messaging installation can fail, or can install with errors.

- **Recovering from configuration errors when the deployment manager was not running during migration.**

During migration of federated nodes, the V5.1 deployment manager must be running for the migration tools to:

- Update the configuration for each federated node
- Request full synchronization

If the V5.1 deployment manager is not running, failures can occur. You can correct the failures by starting the V5.1 deployment manager, running the **updateVariables.jacl** command in the `/migration-specific-backup/variables_files` directory that the migration tools create, and performing a full synchronization for the cell.

Use the following procedure to correct the problem:

1. Start the deployment manager with the `startManager` command.
2. Update the `variables.xml` files:

```
>cd /websphere/appserver/bin
>wsadmin -f ../../websphereBackup/variables_files/updateVariables.jacl
```
3. Use the administrative console or the scripting facilities of the deployment manager to perform a full synchronization for the node.

For example, you can use the `syncNode.sh` or `syncNode.bat` script to synchronize the node.

- **Installing all of the Web server plug-ins during the initial installation.**

You must select all of the plug-ins that you require during the initial installation of the WebSphere Application Server product to automatically control the configuration of the Web servers. If the installer program configures the Web servers, the uninstaller program can remove the configuration from each Web server when you uninstall WebSphere Application Server. If you install the product again to add features, any Web server plug-ins that you select get configured but the uninstaller program is already configured. The uninstaller program does not remove the configuration from each additional Web server whose plug-in that you selected during the second installation.

Install a new instance of the WebSphere Application Server to create an uninstaller program that can remove the configuration from all of the Web servers whose plug-ins that you select. Or you can remove the configuration manually.

- **Recovering from an `InvalidExecutableException` error while starting the `jmsserver` process**

You might get an exception while starting the `jmsserver` process when you install Network Deployment first and then install the base WebSphere Application Server product and its embedded messaging feature on the same node. The error message is recorded in the `install_root/logs/jmsserver/SystemOut.log` file:



```
[9/5/02 14:35:37:818 EDT] 36349b90 JMSService
E MSGS0001E: Starting the Server failed with exception: com.ibm.ws.process.exception.
InvalidExecutableException: Error creating new process.
002: No such file or directory
```

In addition, although the `mq_install.log` file might appear to contain no errors, the `createMQ.nodeName_jmsserver.log` file can contain I/O exceptions. These exceptions result from a corrupted installation of the embedded messaging feature caused by installing the Network Deployment product before the base WebSphere Application Server product. The workaround is to uninstall both products, reinstall the base WebSphere Application Server product, and then reinstall the Network Deployment product.

- **Restarting the server after a configuration change.**

If you make any changes to the configuration, restart the server as noted in the messages section of the administrative console.

- **Updating ports for coexistence requires installing WebSphere Application Server.**

Port updates for coexistence require the installation of WebSphere Application Server. This requirement affects port updates for IBM HTTP Server coexistence. Port updates do not occur if only the IBM HTTP Server is installed. In this case, manually update the `httpd.conf` file. Verify that the ports that you use are available. For example, use the `netstat -a` command to see ports that are being used.

- **Manually uninstalling all of the beta products before installing WebSphere Application Server V5.1.**

You might experience problems if portions of the beta product remain.

To make sure that you get a clean uninstall, follow these steps:

1. Uninstall the beta version of WebSphere Application Server.

Refer to Uninstalling WebSphere Application Server for more information.

2. Confirm that WebSphere MQ and WebSphere embedded messaging Publish and Subscribe (WEMPS) are uninstalled.

If not, uninstall them by using the Windows Add/Remove programs tool or Smitty/installp, whichever is appropriate. Refer to Uninstalling WebSphere Application Server for more information about manually uninstalling on specific platforms.

3. Remove all of the directory trees from the earlier installations of WebSphere Application Server products.

If the stand-alone WebSphere MQ Version 5.3 is installed, remove the WEMPS directory only. Do not uninstall or remove other WebSphere MQ Version 5.3 items.

- **Installing from a directory with a name beginning with the word disk fails.**

Installing WebSphere Application Server Version 5 from a folder that begins with the word `disk` results in an error. Provide another name for the folder.

- **Accessing migration tools in the migration subdirectory on the WebSphere Application Server, Version 5.1 CD-ROM.**

A migration subdirectory on the installation image on the CD-ROM contains the WASPreUpgrade migration tool. The WASPreUpgrade migration tool is intended for scenarios where you might save the currently installed configuration before installing the Version 5.1 product. One example of this situation is where you must upgrade the operating system as part of the Version 5.1 installation. You can migrate the earlier version, copy the migrated files in the backup directory to another system, update the operating system, restore the migrated files in their backup directory, install Version 5.1, and complete the migration.

You can also use the migration directory on the CD-ROM to back up a Version 5.1 configuration in the event of an operating system upgrade. After the upgrade, you can restore the Version 5.1 configuration using the WASPostUpgrade tool.

- **Avoiding license files with bad characters in certain languages.**

Use the graphical installation interface to avoid this problem.

- **Updating the XMLConfig utility on WebSphere Application Server Advanced Edition, Version 4.0 before migration.**

The migration tools use the XMLConfig utility to export the configuration of V4.0 Advanced Edition. You can install any of the following fixes:

- PQ52555 - XMLConfig does not export clone property configuration
- PQ55064 - XMLConfig does not export Enter JavaBeans (EJB) to data source level mappings
- PQ58038 - Performing an XMLConfig export produces an extra CRLF
- PQ62103 - XMLConfig full export fails with a NullPointerException error in a multinode environment
- PQ62471 - Security AdminRoles are not getting exported during the XML export
- PQ63815 - The "=" symbol is not a valid character for the value string in the XMLConfig file

- **Planning to not use the launchClient command on the WebSphere Application Server Network Deployment product.**

The **launchClient** command works on a base WebSphere Application Server node and on a WebSphere Business Integration Server Foundation node, where the Integration Server product extends the base product. The WebSphere Application Server client program does not work on a Network Deployment node.

- **Ignoring a validation error that might appear after configuring the sample business process container.**

A validation error might appear when you click **Configure a Sample Business Process container** during the Enterprise installation and configuration process and issue the following command:

```
wsadmin $AdminConfig validate
```

The following error might appear:

```
WASX7195I: Severity 1; line 0; target
"WebSphere:_WebSphere_Config_Data_Display_Name=BPEDataSourceCloudscape_CF,
_WebSphere_Config_Data_Type=CMPCConnectorFactory,_WebSphere_Config_Data_Id=
cells/t23/nodes/t23/servers/server1:resources.xml#CMPCConnectorFactory_BPE_1";
CHKW3155E: The alias BPEAuthDataAliasCloudscape to the JAASAuthData entry,
specified for J2CConnectionFactory {2}, matches no configured JAASAuthData
entries in security.xml.
```

You can ignore the error because IBM Cloudscape does not require a user ID or password.

- **Installing Integration Server, V5.1 to extend the deployment manager does not install the Javadoc.**

When you install the Integration Server, V5.1 on top of the deployment manager from Network Deployment, V5.1, the Javadoc for the Integration Server is missing.

To work around this problem, see the IBM WebSphere Application Server Support Web site.

- **Installing interim fixes for the IBM HTTP Server feature and the embedded messaging feature.**

Three different sites contain service for WebSphere Application Server products and features:

- Download interim fixes for the IBM HTTP Server feature from the IBM Support site for IBM HTTP Server. The readme file that is bundled with the interim fix describes how to install the interim fix. You do not use the update installer program for the WebSphere Application Server (also known as the updateInstaller program or the Update Installation wizard) to install interim fixes for the IBM HTTP Server feature.
- Download interim fixes for the embedded messaging feature from the WebSphere MQ Service download site. Download the readme file for a description of how to install the interim fix. You do not use the update installer for the WebSphere Application Server to install interim fixes for the embedded messaging feature.
- Download any interim fixes, cumulative fixes, and fix packs for the WebSphere Application Server family of products from the IBM Support site for WebSphere Application Server. Cumulative fixes and fix packs do include service for the IBM HTTP Server feature and for the embedded messaging feature. Interim fixes for a WebSphere Application Server product do not include service for the IBM HTTP Server feature or the embedded messaging feature. The readme file that is bundled with the

WebSphere Application Server interim fix, the cumulative fix, or the fix pack describes how to use the update installer program for WebSphere Application Server products to install the interim fix, the cumulative fix, or the fix pack.

Installing a cumulative fix or a fix pack removes all of the interim fixes for serviceable components, except for interim fixes for the IBM HTTP Server feature or the embedded messaging feature. You must remove those manually as described in the following tip.

- **Uninstalling interim fixes for the IBM HTTP Server feature and the embedded messaging (WebSphere MQ) feature before installing cumulative fixes and fix packs to the features**

If you have installed interim fixes for the IBM HTTP Server feature from the IBM Support site for IBM HTTP Server, or if you have installed interim fixes for the embedded messaging feature from the WebSphere MQ Service download site, the update installer program cannot uninstall interim fixes for these feature components before installing a cumulative fix or a fix pack that might include service for the features. The update installer program does uninstall interim fixes for all of the other components. If the interim fixes for the IBM HTTP Server feature and the embedded messaging feature are not uninstalled for some reason, installing a cumulative fix or a fix pack to the IBM HTTP Server feature or to the embedded messaging feature might fail, or the updated features might fail when you begin using them.

If you reinstall all of the interim fixes for either feature that are more current than the cumulative fix or the fix pack, there is no problem.

You can also choose to have the update installer skip applying cumulative fix or fix pack updates to IBM HTTP Server or embedded messaging if you do not require the updates. You can skip these updates and still apply updates to the rest of the product.

- **Applying interim fixes and fix packs to the embedded messaging feature.**

The IBM WebSphere MQ product can coexist with the embedded messaging feature, if they are at compatible service levels. Always apply any outstanding corrective service to the stand-alone WebSphere MQ product, before installing an interim fix (from the WebSphere MQ Support site) or installing a cumulative fix or a fix pack (from the WebSphere Application Server Support site) that might include a service update for the embedded messaging feature.

In each of the following cases, use the readme file associated with the interim fix or with the cumulative fix or the fix pack to install the service. Do not use the update installer program (also known as the updateInstaller program or the Update installation wizard) to install interim fixes for the embedded messaging feature. Download interim fixes for the embedded messaging feature from the WebSphere MQ Service download site.

For example:

- If you have the embedded messaging server and client feature and do not have WebSphere MQ, do not attempt to apply a corrective service diskette (CSD) for WebSphere MQ. Instead, go to the WebSphere MQ Service download site and download the *WebSphere Embedded Messaging interim fixes for WebSphere Application Server V5.1*.

Upgrading the embedded messaging CSD level by applying a WebSphere MQ CSD is supported only for customers with a full WebSphere MQ license.

- If you have the embedded messaging client feature and a stand-alone WebSphere MQ product, apply any outstanding corrective service to the WebSphere MQ product before installing the interim fix (from the WebSphere MQ Support site) for the embedded messaging client feature or installing a fix pack (from the WebSphere Application Server Support site) for the product that includes service for the embedded messaging client feature.
- If you have the embedded messaging client feature and the stand-alone WebSphere MQ product is already at the latest corrective service level, install the interim fix (from the WebSphere MQ Support site) for the embedded messaging client feature or install a fix pack (from the WebSphere Application Server Support site) for the product that includes service for the embedded messaging client feature.

- **Installing the WebSphere Application Server product on top of WebSphere MQ.**

When planning to install a WebSphere Application Server, Version 5 release on a machine that already has a copy of WebSphere MQ V5.3 installed on it, you are recommended to complete the following steps:

1. Ensure that all the WebSphere MQ features required by the WebSphere Application Server embedded messaging are installed:
  - on UNIX:
    - for WebSphere Application Server Network Deployment or Client: Java Messaging
    - for WebSphere Application Server (base): Runtime, Base (or SDK), Server, Client, Java Messaging and All Message Catalogs
  - on Windows:
    - for WebSphere Application Server ND or Client: Java Messaging
    - for WebSphere Application Server (base): Server and Java Messaging
2. Ensure that WebSphere MQ v5.3 is upgraded to the appropriate prerequisite CSD level:
  - CSD1 for WebSphere Application Server V5.0
  - CSD3 for WebSphere Application Server V5.0.1
  - CSD4 for WebSphere Application Server V5.0.2 and later, including V5.1

3. Install the WebSphere Application Server V5 GM release.

4. Install any appropriate WebSphere Application Server fix packs.

After the initial installation of WebSphere MQ and WebSphere Application Server, you should service WebSphere MQ independently of the WebSphere Application Server fix packs. For example, download and apply the WebSphere MQ V5.3 CSD4 before upgrading your WebSphere Application Server to V5.0.2 or before installing V5.1. This approach helps to avoid failures in uninstalling WebSphere Application Server fix packs.

- **Editing port numbers that First Steps uses after selecting the coexistence option during installation.**

Change First Steps port numbers for Samples and the administrative console to match the port numbers in a coexistence scenario.

If you choose the coexistence option during installation, edit the Samples address to make it comply with the new port value for the HTTP transport port. Manually edit the port number when First Steps attempts to open the page. Change the port to match the coexistence port number for the HTTP transport port. The following example shows how to change the address to the default coexistence port number for the HTTP transport port:

```
http://localhost:9085/WSsamples
```

Edit the administrative console address when First Steps attempts to open the administrative console Web address. Change the port to match the coexistence port number for the administrative console port. The following example shows how to change the address to the default coexistence port number for the administrative console port:

```
http://localhost:9091/admin
```

- **Avoiding using the installation verification test on node names that contain double-byte characters.**

The installation verification test is not supported on node names that contain double-byte characters. See “Troubleshooting the installation” on page 250 for more information.

- **Avoiding the use of hot keys while using the Installation wizard.**

The Installation wizard does not support hot keys.

Hot keys do not work for any languages on any operating system platforms. For example, on the **Cancel Confirmation** panel, you cannot type **Alt - Y** or **Alt - N** to say Yes or No to cancel the installation.

- **Downloading a refreshed PDF from the WebSphere Application Server Library page, or refer to the information in the information center.**

The Getting Started PDF on the product CD-ROM is back level. The information in the information center is more current. This is particularly true for the information related to migrating or uninstalling a migrated or coexisting node that uses the embedded messaging feature.

Download a refreshed PDF from the WebSphere Application Server Library page, or refer to the information in the information center before migrating, uninstalling a node after migration, or uninstalling a coexisting node that has the embedded messaging feature installed.

- **Logging in appropriately to pick up secondary user groups for root**

When the root user on all platforms (except Windows platforms) does not belong to the mqbrkrs and mqm user groups, errors occur when installing the embedded messaging feature.

On many systems, such as SuSe Linux, if you telnet and issue the **id** command or the **groups** command, you cannot see the groups mqm or mqbrkrs even though they might exist. Solve this problem in one of two ways:

- Use the **ssh** command to log in
- Issue the **su** - command

After using one of the commands, verify the required groups with the **id** command or the **groups** command.

In a normal root login, issue the **su** command. For a real root login, issue the **su** - command.

Display settings for a normal root login are automatic. For a real root login, you must set your display environment properly to successfully view the GUI installation wizard. Otherwise, you see a message about Preparing Java(tm) Virtual Machine... and seven rows of dots, but no installation GUI and no further messages. Refer to the documentation for your platform to determine proper display settings.

See “Troubleshooting the installation” on page 250 for a description of the error messages that you might receive if you have not picked up the required secondary groups for root.

- **Retaining the embedded messaging feature when uninstalling an instance that does not have the feature installed.**

The wizard prompts you to uninstall the embedded messaging feature, if the feature is installed. To obey licensing rules, always remove the embedded messaging feature unless other product instances share the code.

This panel can appear whenever the embedded messaging feature is installed on the node and not just when you are uninstalling an instance that has the feature installed. For example, assume that you install the embedded messaging feature when you install the base product. Assume that you install a second instance of the base product, but do not install the embedded messaging feature with the product. If you uninstall the second instance, the Installation wizard displays the prompt to uninstall the embedded messaging feature.

- **Installing WebSphere Business Integration Server Foundation also installs the V5.1.0 Cumulative Fix for SDKs.**

The V5.1.0 Cumulative Fix for SDKs contains service for the IBM SDK and the Sun Java 2 SDK on Solaris and HP-UX platforms that is used by WebSphere Application Server products. The V5.1.0 Cumulative Fix for SDKs is for all Version 5.1 WebSphere Application Server products.

See the download page for the cumulative fix at Web address <http://www-1.ibm.com/support/docview.wss?uid=swg24006682> for more information.

- **Installing WebSphere Business Integration Server Foundation also installs the WebSphere Application Server 5.1 Cumulative Fix 2, which is only available on the product CD.**

This collection of fixes for Version 5.1 updates the WebSphere Application Server base product or the Network Deployment product to Version 5.1.0.2.

This cumulative fix includes service for both the base product and the Network Deployment product. When you install WebSphere Business Integration Server Foundation, the installation program installs Cumulative Fix 2 to the product that the Integration Server is extending.

If you uninstall WebSphere Business Integration Server Foundation, Cumulative Fix 2 is still installed on the base product or the Network Deployment product.

- **Installing WebSphere Application Server 5.1 Cumulative Fix 3.**

This collection of fixes for Version 5.1 updates the WebSphere Application Server base product or the Network Deployment product to Version 5.1.0.3. Cumulative Fix 3 includes all of the interim fixes in Cumulative Fix 2. Cumulative Fix 3 is available at the <http://www-1.ibm.com/support/docview.wss?uid=swg24006675> Web address.

Always install the latest cumulative fixes as they are released. See Cumulative Fix Strategy for WebSphere Application Server V5.0 and V5.1 for more information.



- **Verifying that no files exist in the `install_root/classes` directory during installation.**

The `install_root/classes` directory is reserved for testing and debugging fixes when customers call IBM Support. Having files in the directory during installation can cause various problems depending on the fix left in the directory. Verify that no files exist in the `install_root/classes` directory.

When IBM Support queues work for you and provides you test or debug fixes, you put the fixes in the `install_root/classes` directory. By default, the `install_root/classes` directory is picked up first in the WebSphere Application Server class path to let it override other classes.

This directory lets you verify or debug a fix. After accepting the test fix or finishing with the debugging of the debug fix, delete the fix from the `install_root/classes` directory to return the system to a working state. If you do not remove such fixes from the `install_root/classes` directory, you can experience errors.

- **Installing the Integration Server installs programming model extensions, Cumulative Fix 2, and the V5.1.0 Cumulative Fix for SDKs.**

WebSphere Business Integration Server Foundation installs Cumulative Fix 2 (5.1.0.2) for the Deployment Manager and the base product. Installing the Integration Server also installs the programming model extensions (PME) on the base product and the administrative console extensions on the Network Deployment product.

When attempting to federate a base node that is extended by the Integration Server product into the deployment manager cell, you are prompted to install the programming model extensions before proceeding.

- **Using the correct installation CDs for each platform.**

The installation CDs are platform specific. Each CD label identifies the platform for which it is designed to be used. The CDs for a particular platform should only be inserted and run from a CD drive that is mounted on the platform that is identified on the CD.

Installing with a network file system mount:

When installing from a drive mounted on a network file system (NFS), use NFS client and server platforms with identical versions of the operating system and a well-tuned NFS, if possible. For example, if installing on an xSeries (i386) RHEL3 machine, the recommended NFS server is also an xSeries (i386) RHEL3 machine.

If you are forced to use a cross-platform NFS mount, such as when installing from CD on a Linux for S/390 system, mount the drive with the `-o tcp` option if the option is available. For example:

```
mount -o tcp mycdrom.hostname:/media/cdrom /mnt
```

Refer to the man pages for the **mount** command to see if the `tcp` option is available. Using a CD drive or a disk drive mounted with the default mount option (`udp`) is known to cause errors on some versions of Linux. Red Hat Enterprise Linux 3.0 UL1 on zLinux platforms is particularly sensitive to this problem, but the recommendation applies to all Linux platforms.

If you must copy CD images for one platform to an NFS disk on another operating system platform, use a command that preserves symbolic links. For example, on an AIX platform use the **cp -hrp** command to copy data from an HP-UX disk and preserve the symbolic links. Without the `-h` option, the `cp` command on an AIX platform attempts to resolve symbolic links when copying an HP-UX disc instead of preserving the links.

Even with the `-h` option, the **cp** command on a Solaris platform does not preserve symbolic links when copying an HP-UX disc. On a Solaris platform, use the **tar -cvf** command to copy data from an HP-UX disk and preserve the symbolic links.

Consult the man page for the copy command on the NFS system to understand how the platform supports copying symbolic links.

Because many NFS incompatibilities can exist among various platforms, do not use a drive mounted on a network file system to install from one operating system platform to another without first verifying that the NFS configuration is robust. For example, if your mounted CD is `/mnt`, issue the following command on a Linux for S/390 system to see if you have an NFS problem:

```
unzip -l /mnt/linuxs390/WAS/setup.jar
```



The proper output from the command lists all the files in the setup.jar file without error. If you encounter problems in running the command, verify that your /etc/exports file includes the no\_root\_squash option.

See <http://www.redhat.com/docs/manuals/enterprise/RHEL-3-Manual/sysadmin-guide/s1-nfs-mount.html> for more information about the -o tcp option.

See Troubleshooting the installation for more information about possible symptoms when installing with a faulty NFS mount. Contact your system administrator for help if you continue to have NFS problems.

- **Recovering from a failed installation.**

If the installation program cannot locate the WAS\_update directory from disk 2, the installation program fails immediately. The immediate failure leaves the WAS.WBISF.install.log file only in the /tmp directory (or in the system %TEMP% directory on Windows platforms). Normally, the installation program creates installation logs in the *install\_root/logs/wbisf* directory.

In some instances, such as the one where the WAS\_update directory does not exist, the installation program fails before it can copy the log files from the system temporary directory to the /logs directory. If you cannot find the installation log files in the *install\_root/logs/wbisf* directory, look in the system temporary directory. Correct any problems and reinstall.

If you do not copy the WAS\_update directory correctly from disk 2 to the /tmp directory (or to the system %TEMP% directory on Windows platforms) or if you use the *CDROM2* variable incorrectly, error messages might exist in the was\_update\_apply.err file and in the was\_update\_apply.out file in the *install\_root/logs/wbisf* directory. Correct any problems and reinstall.

The installer program might prompt for disk 2 if it cannot locate disk 2 in the /tmp directory (or in the system %TEMP% directory on Windows platforms) or at the location specified by the *CDROM2* variable. In such a case, insert disk 2 and continue the installation.

If the application of Cumulative Fix 2 fails, check the logs for more information.

The solution might be as simple as rerunning the installation after selecting a different installation option:

- Method 1: Using the prompts and switching CDs
- Method 2: Copying the second disk to the /tmp directory (or to the system %TEMP% directory on Windows platforms)
- Method 3: Using the *CDROM2* variable to identify the location of disk 2
- Method 4: Copying both CDs to the hard drive and running the installation from the hard drive

Using a second method can be successful after a failed first attempt using a different method.

- **Uninstalling and reinstalling the WebSphere Business Integration Server, Version 5.1 product**

See Uninstalling the product for information about uninstalling or the WebSphere Business Integration Server, Version 5.1 product any WebSphere Application Server product.

If you uninstalled WebSphere Business Integration Server, Version 5.1 product but left the embedded messaging feature installed, and now you want to reinstall the V5.1 product, see Reinstalling V5.1 after uninstalling and leaving the embedded messaging feature installed.

After uninstalling a WebSphere Application Server product, reinstalling into the same directory without first deleting all directory contents results in invalid XML configurations because of the retention of old files.

Uninstall manually to delete all of the files so that you can reinstall with a clean system:

- Manually uninstalling on AIX platforms
- Manually uninstalling on HP-UX platforms
- Manually uninstalling on Linux platforms
- Manually uninstalling on Solaris platforms
- Manually uninstalling on Windows platforms

Symptoms that you might experience if you reinstall without uninstalling manually include:

1. The **versionInfo.sh** command states that WebSphere Business Integration Server Foundation is installed but the product is not installed. Or the report might state that the base product is installed when it is not installed. Or the report might state that Cumulative Fix 2 is installed when it is not.
2. Specific directories might be missing in the installation root directory, such as the *install\_root/ProcessChoreographer* directory or the *install\_root/BRBeans* directory.

If you experience symptoms such as these, uninstall everything manually and reinstall. The installation is successful if you manually uninstall before reinstalling.

- **Removing an Enterprise node from the cell before uninstalling the Enterprise product.**

After uninstalling the Enterprise product and restarting the server, the following errors might occur:

- Enterprise resources fail to bind.
- The **addNode** command fails.

If you uninstall the Enterprise product from one of the base nodes in a cell, you must remove the node from the cell prior to uninstalling the Enterprise product. If you do not remove the node first, the cell manager might push the Enterprise configuration back to the node and cause errors when you try to start the application server of the node. If this occurs, you must uninstall and reinstall the IBM WebSphere Application Server.

WebSphere Business Integration Server Foundation automatically unfederates a base node from the cell before it uninstalls from the base node.

- **Avoiding the underscore ( \_ ) character in machine names.**

Internet standards dictate that domain names conform to the host name requirements described in Internet Official Protocol Standards RFC 952 and RFC 1123. Domain names must contain only letters (upper or lower case) and digits. Domain names can also contain dash characters ( - ) as long as the dashes are not on the ends of the name. Underscore characters ( \_ ) are not supported in the host name.

If you have installed WebSphere Application Server on a machine with an underscore character in the machine name, access the machine with its IP address or the localhost designator until you rename the machine.

- **Avoiding the installation of the server and client feature or the client feature more than once.**

Although you might install the base product in combination with the Network Deployment product or the Integration Server product, installing the server and client subfeature or the client subfeature more than once is not necessary.

If you plan to install the base and Network Deployment products, or the base and the Integration Server products on a single Windows machine, install the base product embedded messaging subfeatures instead of the Network Deployment client feature, or instead of the Integration Server server and client subfeature. Using the base product features avoids a potential problem caused by a problem in the Microsoft Software Installer utility.

- **Locating more information about the embedded messaging feature or WebSphere MQ.**

For more information about the actions to take before installing the embedded messaging feature, refer to Installing the WebSphere Application Server embedded messaging feature as the JMS provider. For more information about installing JMS providers, refer to Installing and configuring a JMS provider.

For information about installing the WebSphere MQ Version 5.3 product, or migrating to WebSphere MQ Version 5.3 from an earlier release, refer to the appropriate WebSphere MQ *Quick Beginnings* book:

- *WebSphere MQ for Windows, V5.3 Quick Beginnings*, GC34-6073
- *WebSphere MQ for AIX, V5.3 Quick Beginnings*, GC34-6076
- *WebSphere MQ for Solaris, V5.3 Quick Beginnings*, GC34-6075
- *WebSphere MQ for Linux for iSeries and Linux for zSeries, V5.3 Quick Beginnings*, GC34-6078

These books are available at the WebSphere MQ messaging platform-specific books Web page.

- **Installing the embedded messaging server feature if WebSphere MQ Version 5.3 is already installed.**

You have a choice if WebSphere MQ Version 5.3 is already installed:

- You can install only the embedded messaging client feature on a machine that already has WebSphere MQ Version 5.3.

To use WebSphere MQ Version 5.3 as the JMS provider, install the IBM WebSphere Application Server product or the Enterprise product with only the embedded messaging client feature. The Network Deployment product has only the embedded messaging client feature. Installing and using the WebSphere Application Server embedded messaging client feature is recommended with either the server feature or the full WebSphere MQ Version 5.3 product.

WebSphere Application Server messaging applications can use the WebSphere MQ Version 5.3 product as the JMS provider. Using the client feature, however, requires that you install the WebSphere MQ Version 5.3 Java messaging feature.

- You can install the embedded messaging server and client features on a machine that already has WebSphere MQ Version 5.3.

To install the embedded messaging server feature when WebSphere MQ Version 5.3 is already installed, upgrade WebSphere MQ Version 5.3:

- Apply the CSD04 update to the original WebSphere MQ Version 5.3 release if you are running V5.0.2 or V5.1 of WebSphere Application Server.
- Install the WebSphere MQ Version 5.3 features, server and Java messaging, which the WebSphere Application Server embedded messaging server feature requires.

If you install WebSphere MQ Version 5.3 without the required features, the installation of either embedded messaging feature of IBM WebSphere Application Server is unsuccessful because of prerequisite check errors. The Enterprise package includes installation images of the WebSphere MQ Version 5.3 product and the WebSphere MQ Event Broker product, with restricted licensing. You can use the products to install the required WebSphere MQ Version 5.3 features or to install the refresh release of WebSphere MQ Version 5.3 for use with the Enterprise product.

- **Logging off and back on, or rebooting a Windows machine, after uninstalling the embedded messaging feature.**

If you uninstall the embedded messaging feature, log off and back on, or reboot a Windows machine before reinstalling.

- **Planning to not use terminal services with the embedded messaging feature.**

Terminal services is not supported as a valid installation scenario when installing WebSphere Application Server and the embedded messaging feature.

- **Avoiding a coexistence problem between embedded messaging, IBM WebSphere Studio Application Developer Integration Edition, and IBM WebSphere Application Server.**

The IBM WebSphere Studio Application Developer Integration Edition and IBM WebSphere Application Server both include an option to install embedded messaging. The embedded messaging option in these two products is incompatible.

To avoid this problem, do not install embedded messaging for both products on the same machine.

- **Using a version of Internet Explorer other than Version 6.0 to view the IBM HTTP Administration server.**

Forms Proxy Settings and Proxy Cache do not behave correctly When using Internet Explorer Version 6.0 to view the IBM HTTP Administration server, the Forms Proxy Settings and Proxy Cache do not behave correctly. If you select the radio buttons that display editable fields, the fields do not display.

To work around this problem, use another version of the browser.

- **Avoiding a core that is caused by an incompatibility between functions in various C or C++ run-time libraries.**

Depending on the order that the libraries are loaded, a core can occur or IBM HTTP Server fails to initialize. This problem is seen on various Red Hat Intel versions, and SuSE SLES and Red Hat on S/390 platforms.

The GSKit libraries used by the IKEYMAN utility and the IBM HTTP Server SSL module require the C++ library `libstdc++-libc6.1-1.so.2` file on the Intel platform and the `libstdc++-libc6.1-2.so.3` file on the OS/390 platform. If the libraries do not exist, the IKEYMAN utility might provide only limited functionality

and the IBM HTTP Server SSL fails to initialize. If another version of this library, or another library with a common function, loaded first, it might result in the use of an incompatible library routine.

If you encounter this problem, set the environment variable `LD_PRELOAD` to the following values before starting IBM HTTP Server or IKEYMAN:

- Intel: export `LD_PRELOAD=/usr/lib/libstdc++-libc6.1-1.so.2`
- OS/390: export `LD_PRELOAD=/usr/lib/libstdc++-libc6.1-2.so.3`

This change forces the library to load first when the application starts.

- **Hiding one copy of the OpenSSL module so that Apache Web server can start.**

Apache Web server fails to start when using the `mod_ssl` plug-in module and issuing the following command:

```
apachectl startssl
```

A problem exists with a single process that has two copies of the OpenSSL modules.

Hide the Global Security Kit (GSKit) copy of the OpenSSL modules by renaming the `opt/ibm/gsk7/icc` directory to `opt/ibm/gsk7/icc_save`.

- **Defining the name of the WebSEAL HTTP server in lower case.**

When defining your WebSEAL HTTP Server in the administrative console, you must define the name of the WebSEAL HTTP Server all in lower case.

To define the name of the WebSEAL server name, click **LTPA > Trust Association > Interceptors > com.ibm.ws.security.web.WebSealTrustAssociationInterceptor > Custom Properties > com.ibm.websphere.security.webseal.hostnames**.

- **Bringing up the IKEYMAN administrative console with the Conversational Monitoring System option for IBM HTTP server 1.3.28 and IBM HTTP Server 2.0.47**

- You cannot bring up IKEYMAN.
- IKEYMAN does not have the Conversational Monitoring System (CMS) database option to choose from when creating a key database for IBM HTTP Server.

IKEYMAN is changed in Global Security Kit (GSKit) 7 to integrate IKEYMAN for Java Secure Socket Extension (JSSE) that is Java-based and GSKit that is C++-based. IKEYMAN is a tool used to manage digital certificates. You can now use the same IKEYMAN for WebSphere Application Server and IBM HTTP Server. For example, creating a Java Key Store (JKS) or a CMS key database from the same panel within IKEYMAN.

A key database enables a client application to connect to those servers that have digital certificates signed by those certificate authorities (CAs). You must perform extra steps to use the same IKEYMAN with the CMS option in addition to the JKS option. The CMS option is needed when you set up IBM HTTP Server for Secure Sockets Layer (SSL) transactions.

Set the `JAVA_HOME` variable to the location of the IBM Software Development Kit on the machine. If you are using WebSphere Application Server, set the `JAVA_HOME` variable to the Java Runtime Environment (JRE) that is shipped with WebSphere Application Server.

For example:

- On the Linux platform: Export the `JAVA_HOME=/opt/WebSphere/AppServer/java` variable.
- On the UNIX platform: Run the `<IHS install root>/bin/iskeyman`, or `<WAS_HOME>/bin/iskeyman.sh` command, from a command prompt to bring up the IKEYMAN administrative console.
- On the Windows platform: To bring up IKEYMAN, click **Start > Programs > IBM HTTP Server 1.3.28 (or IBM HTTP Server 2.0.47) > Start Key Management Utility**, or run `<WAS_HOME>/bin/iskeyman.bat` at a command prompt.

If you cannot bring up IKEYMAN after the previous steps, perform the following steps:

1. Set the `JAVA_HOME` variable to the home of the IBM Software Development Kit for the Java platform located on your machine. If you are using WebSphere Application Server, you should set the `JAVA_HOME` variable to the JRE that is shipped with WebSphere Application Server.
2. If you are not using the JRE that comes with WebSphere Application Server, and the `gskikm.jar` file exists in your `JAVA_HOME` directory, rename and move the `$JAVA_HOME/jre/lib/ext/gskikm.jar`

file to a directory that is not visible to the IBM Software Development Kit class path, external directory, and the bootstrap class path. For example, on the Linux platform: `mv $JAVA_HOME/jre/lib/ext/gskikm.jar/gskfiles/gskikm.jar.org`.

3. Ensure that the `java.security` file has the following providers:

You can find the `java.security` file in the security directory path. For example, the full path to the file on the Windows platform is `C:\Program Files\IBM\Java141\jre\lib\security\java.security`.

```
security.provider.2=com.ibm.crypto.provider.IBMJCE
security.provider.3=com.ibm.spi.IBMCMSProvider
```

If you try to use cryptographic hardware with IBM HTTP Server, ensure that the file contains the following lines in the order that is shown here:

```
security.provider.1=com.ibm.spi.IBMCMSProvider
security.provider.2=com.ibm.crypto.provider.IBMJCE
security.provider.3=com.ibm.jsse.IBMJSSEProvider
security.provider.4=com.ibm.crypto.pkcs11.provider.IBMPKCS11
```

If you are not using an IBM Software Development Kit or if the IBM Software Development Kit files in the `lib\ext` directory are older than the ones that come with the GSKit, you have to copy all the Java archive (JAR) files from the `ibm\gsk7\classes\jre\lib\ext` directory to the `Java141\jre\lib\ext` directory.

– On the UNIX platform:

To bring up IKEYMAN, run the `<IHS install root>/bin/ikeyman`, or `<WAS_HOME>/bin/ikeyman.sh` command, from a command prompt.

– On the Windows platform:

To bring up IKEYMAN, click **Start > Programs > IBM HTTP Server 1.3.28** (or **IBM HTTP Server 2.0.47**) > **Start Key Management Utility**, or run `WAS_HOME/bin/ikeyman.bat` at a command prompt.

• **Enabling cryptographic hardware**

The cryptographic token is no longer a separate item on the IKEYMAN GUI menu. It is treated as one of the key store types. You can specify the PKCS11 module name by specifying the property of `DEFAULT_CRYPTOGRAPHIC_MODULE` in the `ikmuser.properties` file as before. However, IKEYMAN no longer tries to load the dynamic link lists (DLL) or Library (LIB) at startup time to decide whether to support the cryptographic token. The value of the `DEFAULT_CRYPTOGRAPHIC_MODULE` property is used only for the default value shown on the GUI.

When you open the Cryptographic Token, IKEYMAN first retrieves the value of the `DEFAULT_CRYPTOGRAPHIC_MODULE` property in the `ikmuser.properties` file and pre-fill the value in the **File Name** and **Location** fields in the **Key Database File > Open dialog box of IKEYMAN** GUI. You can modify the value in the **File Name** and **Location** fields or click the **Browse** button.

Once the specified DLL or LIB is loaded successfully, you can use IKEYMAN. After opening a cryptographic token successfully, IKEYMAN displays the certificates stored in the cryptographic token.

• **Using the WebSphere MQ client instead of the embedded messaging client feature.**

Use the client from the full WebSphere MQ installation and do not use the embedded messaging client feature. It is not necessary to install the embedded messaging client feature. Both clients are the same, except that the embedded messaging client has a licensing restriction that prohibits it from communicating with queue managers outside of the WebSphere Application Server environment.

## All Linux and UNIX-based platforms

### Summary of tips that apply to all Linux and UNIX-based platforms

- Preparing a Linux or UNIX operating platform for the embedded messaging feature
- Installing to fixed locations on Linux and UNIX-based operating systems
- Defining the prerequisite Linux or UNIX operating system groups, `mqm` and `mqbrkrs`
- Adding `mqm` and `mqbrkrs` groups before installing the embedded messaging feature
- Creating and mounting the required journalized file system, `/var/mqm`, before installing WebSphere Application Server
- Restricting access to the `var/mqm/errors` directory and to the messaging logging files



- Removing a remaining artifact from an uninstalled Enterprise Edition V4.1 system to prevent the Coexistence panel or the Migration panel from appearing
- Verifying the system **cp** command when using emacs or other freeware
- Ignoring the desktop icon messages from InstallShield for Multiplatforms (ISMP) during installation
- Avoiding setting WebSphere Application Server environment variables in the user profile or in the system profile
- Avoiding spaces in the name of the installation directory on Linux and UNIX platforms
- Moving all of the core dump files from the `var/sadm/pkg` directory
- Starting the `jmsserver` process before running some Samples on UNIX platforms
- Changing the `NLSPATH` statement in the `setupCorbaClient.sh` file
- Changing the permissions of certain files to open the rule browser
- Migrating when the SDK that ships with the product is not available
- A delay occurs before the Installation wizard displays its first panel
- Manually entering Launchpad Web addresses to launch the links directly from your browser.
- Using the `tcp` option to mount CD drives or disk drives in a network file system mount if the option is available
- Preserving symbolic links when copying product CDs to network file server disks
- Avoiding `java.lang.NullPointerException` errors while installing the Integration Server

### Tips that apply to all Linux and UNIX-based platforms

- **Preparing a Linux or UNIX operating platform for the embedded messaging feature.**

Perform this step only if you are installing the Java Message Service (JMS) provider for WebSphere Application Server on a Linux or UNIX-based operating system. You must install the embedded messaging feature to use the JMS provider that WebSphere Application Server provides.

If you are installing the embedded messaging feature, you must create two operating system groups as described in “Installing WebSphere embedded messaging as the JMS provider” on page 169.

The Solaris Operating Environment and HP-UX also require that you increase kernel settings as described in “Installing WebSphere embedded messaging as the JMS provider” on page 169.

For an index of platform-specific information about using the embedded messaging feature, see “Tips for installing the embedded messaging feature” on page 222.

- **Installing to fixed locations on Linux and UNIX-based operating systems**

On Linux and UNIX-based operating systems, the embedded messaging feature installs to fixed locations that you cannot override. The default locations are:

- Linux platforms: `/var/mqm`, `/var/wemps`, `/opt/mqm`, `/opt/wemps`
- AIX platforms: `/usr/opt/mqm`, `/usr/opt/wemps`, `/var/mqm`
- Solaris platforms: `/var/mqm`, `/var/wemps`, and `/usr`

The Installing WebSphere embedded messaging as the JMS provider topic describes directory locations in detail.

- **Defining the prerequisite Linux or UNIX operating system groups, `mqm` and `mqbrkrs`**

Before you install the embedded messaging component on UNIX or Linux platforms, you must define the operating system groups `mqm` and `mqbrkrs`, and the user IDs needed for WebSphere embedded messaging. For detailed information, see Installing WebSphere embedded messaging as the JMS provider.

- **Creating and mounting the required journalized file system, `/var/mqm`, before installing WebSphere Application Server**

On UNIX platforms, use a partition strategy with a separate volume for the messaging data. A separate partition prevents other system activity from being affected when a large amount of messaging work builds up in the `/var/mqm` directory.

The `/var` file system is used to store all of the security logging information for the system, and is used to store the temporary files for e-mail and printing. Therefore, it is critical that you maintain free space in the `/var` directory for these operations. If you do not create a separate file system for messaging data, and the `/var` directory fills up, all of the security logging, e-mail, and printing is stopped on the system until some free space is available in the `/var` directory.



- **Restricting access to the /var/mqm/errors directory and messaging logging files**

After installing WebSphere embedded messaging, you must restrict access to the /var/mqm directories and to the log files needed for WebSphere embedded messaging, such that only the mqm user ID or members of the mqm user group have write access. For detailed information, see Installing WebSphere embedded messaging as the JMS provider and Securing messaging directories and log files.

- **Removing a remaining artifact from an uninstalled Enterprise Edition V4.1 system to prevent the Coexistence panel or the Migration panel from appearing**

The Installation wizard for WebSphere Business Integration Server Foundation might display the Coexistence panel or the Migration panel even though you have uninstalled the Enterprise Edition Version 4.1 product.

You can prevent the Installation wizard from recognizing a previously deleted version of the Enterprise Edition product by removing the following entry from the /usr/bin/jitk.db file:

```
WebSphere Enterprise Edition Server 4.1
```

If other Version 4.x entries exist for WebSphere Application Server products, and the products are no longer on your system, remove those entries also.

- **Verifying the system cp command when using emacs or other freeware.**

If you have emacs or other freeware installed on your Linux or UNIX-based system, verify that the system **cp** command is being used.

1. Type which cp at the command prompt before running the installation program for a WebSphere Application Server product.
2. Remove the freeware directory from your PATH if the resulting directory output includes freeware. For example if the output shows /opt/freeware/bin/cp, remove the directory from the PATH.
3. Install the WebSphere Application Server product.
4. Add the freeware directory back to the PATH.

If you install with a **cp** command that is part of a freeware package, the installation completes but the Java 2 SDK that the WebSphere Application Server product installs, which is *install\_root/java*, can have missing files. Some required symbolic links can be destroyed. If you remove the freeware cp command from the PATH, you can install the WebSphere Application Server product successfully.

To verify that the Java 2 SDK that WebSphere Application Server installs is working correctly:

1. Go to *install\_root/java/bin*.
2. Type *./java -version*.

The command completes successfully with no errors when the Java 2 SDK is intact.

- **Ignoring the desktop icon messages from InstallShield for Multiplatforms (ISMP) during installation.**

You can ignore any messages in the log.txt file about not being able to create a desktop icon on Linux and UNIX-based platforms.

For instance, ignore messages that are similar to the following example when installing Network Deployment:

```
Setup.product.install,
  com.installshield.product.actions.DesktopIcon,
  msg1, Unable to find platform specific desktop icon information.
  Could not create desktop icon "Start the deployment manager"
Setup.product.install,
  com.installshield.product.service.product.PureJavaProductServiceImpl,
  msg1, installing Desktop Icon (StopCellMgrIconBean)
Setup.product.install,
  com.installshield.product.actions.DesktopIcon,
  msg1, Unable to find platform specific desktop icon information.
  Could not create desktop icon "Stop the deployment manager"
Setup.product.install,
  com.installshield.product.service.product.PureJavaProductServiceImpl,
  msg1, installing Desktop Icon (AdminConsoleIconBean)
Setup.product.install,
```

```

    com.installshield.product.actions.DesktopIcon,
    msg1, Unable to find platform specific desktop icon information.
    Could not create desktop icon "Administrative Console"
Setup.product.install,
    com.installshield.product.service.product.PureJavaProductServiceImpl,
    msg1, installing Desktop Icon (LogAnalyzerIconBean)
Setup.product.install,
    com.installshield.product.actions.DesktopIcon,
    msg1, Unable to find platform specific desktop icon information.
    Could not create desktop icon "Log Analyzer"

```

- **Avoiding setting WebSphere Application Server environment variables in the user or system profile.**

WebSphere Application Server products use environment variables to control many dynamic settings, such as the path to the product in the \$WAS\_HOME variable, the path to the /logs directory in \$LOG\_ROOT, or the path to the IBM Development Kit in \$JAVA\_HOME. Avoid setting these variables in the system profile or in user profiles. You might have a setting in a profile that overrides the proper setting. If you reset variables that the products use to function, you can produce unpredictable results, or even failure. To view WebSphere Application Server environment variables, open the administrative console and click **Environment > Manage WebSphere Variables**. Scroll down to see the variables. You can also click **Next** and **Previous** to see other pages of variables. Click a variable to see more information, including its description. Other variable settings are described on other administrative console pages.

- **Avoiding spaces in the name of the installation directory on Linux and UNIX platforms.**

Do not use spaces in the installation directory name. Spaces in directory names are not supported on Linux and UNIX.

- **Moving all of the core dump files from the var/sadm/pkg directory.**

The InstallShield for MultiPlatforms (ISMP) Installation wizard iterates through all of the directories in the /var/sadm/pkg directory, assuming that each entry that the wizard finds is a directory. The wizard tries to open the pkginfo file within the directory. The ISMP wizard fails when it cannot find an entry under the core file. Remove the core file from the directory to avoid the problem.

- **Starting the JMS server before running some Samples on UNIX platforms.**

To run Samples that use JMS APIs, you must manually start the JMS server (jmsserver) before running the samples on UNIX platforms.

To start the jmsserver process, complete the following steps:

1. Open the administrative console: <http://localhost:9090/admin>.
2. Click **Servers > Application Servers > server1 > Server Components > JMS Servers**.
3. Change the Initial State from **STOP** to **START**.
4. Save the configuration and log out of the administrative console.
5. Stop and restart the Application Server from the command line. For example,

```
stopServer.sh server1 followed by startServer.sh server1
```

- **Changing the NLSPATH statement in the setupCorbaClient.sh file.**

After installing the CORBA C++ client, you cannot set up the client because of a syntax error in the NLSPATH line within the setupCorbaClient.sh file.

To correct this error, complete the following steps:

1. Locate the setupCorbaClient.sh file in the /usr/WebSphere/AppClient/bin directory.
2. Find the line beginning with NLSPATH= and change the semicolon to a colon.

- **Changing the permissions of certain files to open the rule browser**

The permissions of the ruleexporter.sh file, the ruleimporter.sh file, and the rulemgmt.sh file in the /opt/WebSphere/DeploymentManager/bin directory are not correct.

When you use the rulemgmt.sh command to open the rule browser, the following error displays:

```

/opt/WebSphere/DeploymentManager/bin/rulemgmt.sh: cannot execute
looked at the files under /opt/WebSphere/DeploymentManager/bin and found
ruleexporter.sh, ruleimporter.sh and rulemgmt.sh are not executable:
-rwxr-xr-x  1 root  other      1621 Nov  9 18:16 restoreConfig.sh

```

```

-rw-rw-rw- 1 root    other    847 Jan 15 12:41 ruleexporter.bat
-rw-rw-rw- 1 root    other    961 Jan 15 12:41 ruleexporter.sh
-rw-rw-rw- 1 root    other    854 Jan 15 12:41 ruleimporter.bat
-rw-rw-rw- 1 root    other    883 Jan 15 12:41 ruleimporter.sh
-rw-rw-rw- 1 root    other   1262 Jan 15 12:41 rulemgmt.bat
-rw-rw-rw- 1 root    other   1445 Jan 15 12:41 rulemgmt.sh
-rwxr-xr-x 1 root    other   5206 Nov  9 18:19 securityProcs.jacl

```

To change the permissions of these files, run either of the following commands:

```

`chmod +x ruleexporter.sh`, `chmod +x ruleimporter.sh`, `chmod +x rulemgmt.sh`
`chmod 755 ruleexporter.sh`, `chmod 755 ruleimporter.sh`, `chmod 755 rulemgmt.sh`

```

- **Migrating when the Java 2 SDK that ships with the product is not available.**

If you upgrade the Java 2 SDK that ships with the WebSphere Application Server product, and you intend to use the migration tools to migrate the configuration of a Version 4.0.x installation to Version 5.0.x, you can work around any Java wrapper errors that you might receive.

For example, if you upgrade to Java 2 SDK 1.3.1\_08 and attempt to migrate V4.0.4 to V5.0.2, you receive a Java wrapper not found error when you issue the following command, which is shown on more than one line for clarity:

```

./WASPreUpgrade.sh
  /tmp/WAS40Backup
  /opt/WebSphere/AppServer
  wassun3
  -traceString " *=all=enabled"
  -traceFile /tmp/PreUpgradeTrace.log

```

The error that you receive is about a Java wrapper not found. Create a soft link to get around the problem:

1. `cd install_root/java/bin/aparc/native_threads`
2. `ln -s java.java_wrapper`

When you call the `.java_wrapper`, the Java 2 SDK assumes that the Java code is called and the migration can continue.

- **A delay occurs before the Installation wizard displays its first panel.**

The default installation method is to open a command window to a read/write directory, issue the fully qualified command to start the Launchpad tool, and click the **Install the product** option. This option launches the Installation wizard, which is an InstallShield for MultiPlatforms (ISMP) application. This action launches the Installation wizard in the language of your machine locale unless no translation exists for your locale, in which case you receive the English version. A short delay occurs before the ISMP wizard displays.

You do not need to click the *Install the product* option more than once to cause the wizard to display the first panel. The delay is particularly noticeable on x-windows platforms.

- **Manually entering Launchpad Web addresses to launch the links directly from your browser.**

There is a known problem with the Launchpad that prevents it from using Netscape to open the documentation links on some operating system platforms.

If you use the Mozilla browser, some Launchpad links do not work. The Launchpad attempts to call the Netscape browser in the `/usr/bin/netscape` directory. Try a symbolic link to the Mozilla browser to fix the problem as shown in the following example:

```
ln -sf /usr/bin/mozilla /usr/bin/netscape
```

You can also launch the following links directly from your browser:

### Product Overview

<http://www.ibm.com/software/webservers/appserv/>

Your security options might prevent redirection, such as to the <http://www-306.ibm.com/software/info1/websphere/index.jsp?tab=products/appserv> Web site. If so, you can

identify the IBM Web site as a trusted site to allow the redirection. For example, on Internet Explorer, add <http://www-306.ibm.com> to the list of Trusted Sites by selecting **Tools > Internet Options > Security (tab) > Trusted Sites**.

### Readme File

`CD-ROM_mount_point/readme/readme_en.html`

### Installation Guide

`CD-ROM_mount_point/docs/InstallGuide_en.PDF`

The *Installation Guide* is in Adobe PDF format. Viewing this document requires you to have Adobe Acrobat Reader, which is a free download from the Adobe Acrobat Web site.

- **Using the tcp option to mount CD drives or disk drives in a network file system mount if the option is available.**

Refer to the man pages for the **mount** command to check if the tcp option is available. Using a CD drive or a disk drive mounted with the default mount option (udp) is known to cause errors on some versions of Linux.

Red Hat Enterprise Linux 3.0 UL1 on zLinux platforms is particularly sensitive to this problem, but the recommendation applies to all Linux platforms. Installing with product CDs that are physically located on an NFS server can fail. Symptoms that occur when installing with disk 1 on an NFS server include:

- An indication that the `/tmp/_wbi_/jdk/java/bin/java` file does not exist after issuing the **launchpad.s** command or the **install** command and the installation fails.
- An indication of copy errors in the `/tmp/wbisf_launcher.log` file:

```
cp: cannot stat `~/mnt/linuxs390/WAS/jdk/java/jre/lib/images':  
  No such file or directory  
cp: cannot stat `~/mnt/linuxs390/WAS/jdk/java/jre/lib/security':  
  No such file or directory  
cp: cannot stat `~/mnt/linuxs390/WAS/jdk/java/lib':  
  No such file or directory
```
- An indication of stale NFS file handle errors when trying to list the files under the NFS-mounted file system:

```
#ls /mnt/linuxs390/WAS/jdk/java/jre/lib  
ls.: :stale NFS file handle
```
- An indication of server-not-responding errors in the `/var/log/messages` file on the NFS client:

```
Mar 15 16:29:59 aushat178 kernel:  
  nfs: server svtnx4 not responding, still trying
```

Symptoms that occur when installing with disk 2 on the NSF server include:

- After clicking **Next** on the Prompt for disk 2 panel, the Installation wizard fails while copying the update installer application with an error that is similar to the following example:

```
Copying cumulative fix and update installer application failed.  
Cumulative fix or interim fixes cannot be applied.  
This installation is terminating.
```
- After the failure of the installation of the cumulative fix, there are missing directories in the `install_root/WAS_update` directory. You can verify missing directories by comparing the directory structure to the directory structure on disk 2.

Before installing with an NFS-mounted CD or hard disk, verify that the NFS is working correctly. For example, if your mounted CD is `/mnt`, issue the following command on zLinux to see if you have an NFS problem:

```
unzip -l /mnt/linuxs390/WAS/setup.jar
```

The proper output from the command lists all the files in the `setup.jar` file without error. If you encounter problems in running the command, verify that your `/etc/exports` file includes the `no_root_squash` option. Also mount the NFS drive with the `-o tcp` option. For example:

```
mount -o tcp mycdrom.hostname:/media/cdrom /mnt
```

See <http://www.redhat.com/docs/manuals/enterprise/RHEL-3-Manual/sysadmin-guide/s1-nfs-mount.html> for more information about the `-o tcp` option.

Contact your system administrator for help if you continue to have NFS problems.

- **Preserving symbolic links when copying product CDs to network file server disks**

When copying a CD for one operating system platform to a network file system (NFS) disk on another type of operating system using the **cp** command, you can encounter errors such as those in the following example:

```
a file is bad
no such file or directory exists
libCSup.2 cannot be accessed
```

The copy error occur when incorrectly copying symbolic link files.

An example of such an error occurs when copying an HP-UX CD image onto an AIX platform with the **cp -frp** command. The default **cp** command behavior on an AIX platform is to resolve the symbolic links by copying the files to which the symbolic links point. Errors occur when a symbolic link resolves to a platform-specific library or file that is not present on the NFS operating system. Use options on the copy command of the NFS system to copy symbolic links instead of resolving them. For example, the **-h** option on the **cp** command of the AIX platform copies symbolic links from the HP-UX CD to the NFS disk on the AIX platform.

Even with the **-h** option, the **cp** command on a Solaris platform does not preserve symbolic links when copying an HP-UX disk. On a Solaris platform, use the **tar -cvf** command to copy data from an HP-UX disk and preserve the symbolic links:

1. Insert disk 2 for HP-UX platforms into the drive on the Solaris system.

2. Close the file explorer window if one opens.

3. Open a command window.

4. Change directories:

```
CD /cdrom/cdrom0
```

5. Issue the following command:

```
tar cvf * /workarea/filename.tar
```

6. Change directories:

```
CD /workarea
```

7. Issue the following command:

```
tar -xvf filename.tar
```

Consult the man page for the copy command on the NFS system to understand how the platform supports copying symbolic links.

- **Avoiding java.lang.NullPointerException errors while installing the Integration Server.**

The installation of WebSphere Business Integration Server Foundation, Version 5.1 can fail with java.lang.NullPointerException errors.

The installation of WebSphere Business Integration Server Foundation, Version 5.1 can fail with the following errors when broken links exist in the file systems:

An error occurred during wizard bean change notification:

```
java.lang.NullPointerException
  at com.ibm.wizard.platform.aix.AixFileUtils.
    getFileSystemData(AixFileUtils.java:388)
  at com.ibm.wizard.platform.aix.AixFileUtils.
    getPartitionDataWithExecs(AixFileUtils.java:172)
  at com.ibm.wizard.platform.aix.AixFileUtils.
    getPartitionData(AixFileUtils.java:104)
  at com.ibm.wizard.platform.aix.AixFileServiceImpl.
    getPartitionNames(AixFileServiceImpl.java:397)
...

```

The installation of the cumulative fix also fails.

To avoid the problem, unmount the file systems with broken links before installing.

## AIX platforms

### Summary of tips that apply to AIX platforms

- Providing adequate disk space for installation
- Unmounting file systems with broken links to avoid java.lang.NullPointerException errors
- Installing the prerequisite xIC.rte 6.0 run-time code on AIX 5.1 or AIX 5.2
- Installing the prerequisite Java130.rte.lib Version 1.3.0 on AIX Version 4.3.3 or AIX Version 5
- Correcting directory permissions on AIX platforms before reinstalling WebSphere Application Server with the embedded messaging feature
- Avoiding corrupt display characters when installing V5.1 on AIX 5.2 in a Simplified Chinese locale
- A core dump might occur when running WebSphere Application Server with DB2 V7.2 FP8 client in AIX 5.2
- Avoiding a segmentation fault problem when installing or uninstalling
- Avoiding a null pointer exception during the interactive installation of the IBM HTTP Server product on AIX platforms.
- Ignoring DBCS messages when you do not require DBCS support. Otherwise, install the necessary patches.
- Using UNIX line-end characters (0x0D0A) to terminate each line of the options response file for silent installation
- Navigating if the scroll bar disappears on the Feature panel of the Installation wizard
- Ignoring error messages that appear in the log.txt installation log
- Avoiding a potential port conflict between the administrative console and the WebSM system management console on AIX 5.1, with maintenance level 2.
- Canceling the installation and updating your operating system before restarting the installation, if you install on an AIX machine and receive a message that a fileset is missing, such as the X11.fnt.ucs.ttf fileset
- Setting up the display environment for a real root login on AIX systems
- Avoiding a DSAPI filter-loading error when the Lotus Domino Server starts
- Uninstalling the Enterprise product might leave extraneous information in the server registries
- Avoiding a null pointer exception during the interactive installation of the IBM HTTP Server on AIX platforms
- Starting IBM HTTP Server 2.0.47 on AIX 5.2 systems
- Using the AIX 5.1 and 5.2 Fast Response Cache Accelerator feature with IBM HTTP Server 2.0.47

### Tips that apply to AIX platforms

- **Providing adequate disk space for AIX platforms.**

WebSphere Business Integration Server Foundation installs Cumulative Fix 2 (V5.1.0.2) to either the base product or the Network Deployment product during installation. The service pack requires more space than the Integration Server requires by itself. Space requirements that appear in the following list include the space required for the cumulative fix.

#### **1750 MB for the /usr/WebSphere/AppServer or the /usr/WebSphere/DeploymentManager directory**

Installation root directory, which includes either the base product or the Network Deployment product and the Integration Server product

#### **500MB for the /tmp directory**

System temporary directory. Temporary space is required to install the base or Network Deployment V5.1.0.2 service pack.

#### **2250 MB**

Total space requirement for both directories. A significant amount of the required space is temporarily required during installation and is released after installation. If you have already installed the cumulative fix pack on either the base product or the Network Deployment product that you are extending, the space requirement is reduced.

Space requirements for the embedded messaging feature are described in the Installing WebSphere embedded messaging as the JMS provider topic.



- **Unmounting file systems with broken links to avoid java.lang.NullPointerException errors.**

Unmount file systems with broken links before installing WebSphere Business Integration Server Foundation on an AIX system. The installation of the cumulative fix pack can fail with the following error when broken links to file systems occur:

An error occurred during wizard bean change notification:

```
java.lang.NullPointerException
  at com.ibm.wizard.platform.aix.AixFileUtils.
    getFileSystemData(AixFileUtils.java:388)
  at com.ibm.wizard.platform.aix.AixFileUtils.
    getPartitionDataWithExecs(AixFileUtils.java:172)
  at com.ibm.wizard.platform.aix.AixFileUtils.
    getPartitionData(AixFileUtils.java:104)
  at com.ibm.wizard.platform.aix.AixFileServiceImpl.
    getPartitionNames(AixFileServiceImpl.java:397)
...

```

Use the **df -k** command to check for broken links to file systems. Look for file systems that list blank values in the *1024-blocks size* column. Columns with a value of "-" (dash) are not a problem. A problem with the /dev/lv00 file system is illustrated in the following example:

```
> df -k
Filesystem      1024-blocks      Free %Used    Iused %Iused Mounted on
/dev/hd4         1048576      447924   58%     2497    1% /
/dev/hd3         4259840     2835816   34%      484    1% /tmp
/proc            -             -         -         -        - /proc
/dev/lv01        2097152     229276   90%     3982    1% /storage
/dev/lv00
/dev/hd2         2097152     458632   79%    42910    9% /usr
iw031864:/cdrom/db2_v72_eee_aix32_sbcs

```

The /proc file system is not a problem. The iw031864:/cdrom/db2\_v72\_eee\_aix32\_sbcs file system is a definite problem. The /dev/lv00 file system is also a likely problem. Use one of the following commands to solve this problem:

```
> umount /cdrom/db2_v72_eee_aix32_sbcs
> umount /cdrom

```

Start the installation again. If the problem continues, unmount any file systems that have blank values, such as the /dev/lv00 file system in the example. If you cannot solve the problem by unmounting file systems with broken links, reboot the machine and start the installation again.

- **Installing x1C.rte 6.0 run-time code, which is a prerequisite of GSKit7 on AIX 5.1 or AIX 5.2.**

You must install the x1C.rte 6.0 run-time code, which is a prerequisite of GSKit7. Download the run-time code as a fix from the AIX Support site.

- **Installing the prerequisite Java130.rte.lib Version 1.3.0 on AIX Version 4.3.3 or AIX Version 5.**

On AIX Version 4.3.3 (not supported by WebSphere Application Server V5.1) and AIX Version 5, you must install Java130.rte.lib Version 1.3.0 to verify that the embedded messaging feature installs correctly. To download a copy of Java 1.3.0:

1. Go to [www.ibm.com/java](http://www.ibm.com/java): Java Technology Zone.
2. Go to the bottom of the page: **Most popular links**.
3. Click **IBM Developer Kit for AIX**.
4. Click **Download**.
5. Click **Java 1.3.0** from the **Java Version** column in the table.
6. (Optional) Register for a user ID and password.

To correct an existing problem:

1. Uninstall the following components, if present:
  - WebSphere Application Server
  - WebSphere MQ (MQSeries)
  - WebSphere MQ (MQSeries) Java classes and classes for WebSphere MQ for the Java Message Service
  - IBM HTTP Server
  - WebSphere Embedded Messaging Publishing and Subscribe Edition

2. Edit the `vpd.properties` file and remove any entry related to WebSphere Application Server. WebSphere Application Server-related entries begin with:
  - **WSB** for the base WebSphere Application Server, V5.0.x product
  - **WSBAA51** for the base WebSphere Application Server, V5.1 product
  - **WSC** for the WebSphere Application Server Application Clients
  - **WSE** for the Enterprise product, V5.0.x
  - **WSN** for the Network Deployment product, V5.0.x
  - **WSNAA51** for the Network Deployment product, V5.1
  - **WSM** for the WebSphere MQ product
3. Reinstall the WebSphere Application Server product.

- **Correcting directory permissions on AIX platforms before reinstalling WebSphere Application Server with the embedded messaging feature**

After manually uninstalling the WebSphere Application Server product and before reinstalling the product with the embedded messaging component, look for the following directory: `/var/mqm/log/WAS_system_name_server_name`. If this directory exists, confirm that the directory is empty and that the user, `mqm`, can open and write to it. If it is not accessible, the embedded messaging installation program throws the following error:

```
AMQ7064: Log path not valid or inaccessible is written in the
        createMQ.system_name_server_name.log file.
```

If this error occurs, the installation of the embedded messaging component fails.

- **Avoiding corrupt display characters when installing V5.1 on AIX 5.2 in a Simplified Chinese locale.**

When using the Installation wizard to install V5.1 in one of the Simplified Chinese locales, set the `LANG` variable to "EUC-CN" to avoid the display of corrupt font characters:

1. Click **Options > Language** from the logon console and select the `EUC_CN` Simplified Chinese locale.  
The logon console changes to Simplified Chinese.

2. Log in as root.

3. Run the **locale** command to verify that you have set the `EUC_CN` locale:

```
bash-2.01# locale

LANG=EUC_CN
LC_COLLATE="EUC_CN"
LC_CTYPE="EUC_CN"
LC_MONETARY="EUC_CN"
LC_NUMERIC="EUC_CN"
LC_TIME="EUC_CN"
LC_MESSAGES="EUC_CN"
LC_ALL=
```

4. Set the `LANG` variable to "EUC\_CN" if the setting is not correct:

```
export LANG=EUC_CN
```

You can now install without corrupt characters.

- **Avoiding a core dump when running WebSphere Application Server with DB2 V7.2 FP8 client in AIX 5.2.**

A core dump might occur when you are running WebSphere Application Server with DB2 V7.2 FP8 client in AIX 5.2 having all of the following configurations:

1. You installed WebSphere Application Server in 64-bit AIX 5.2.
2. You installed 64-bit DB2 V7.2 FP8.
3. You created a 32-bit client instance to connect to the DB2 server.
4. You installed applications that use DB2 data source in WebSphere Application Server.

A java core dumped error displays when you start the WebSphere Application Server. This error is from a known DB2 problem.

To solve this problem, rename the `libdb2lai.a` file on your DB2 client machine as follows:

1. Change to the /usr/lpp/db2\_07\_01/lib directory.
2. Rename the libdb2lai.a file to libdb2lai.a.orig.

- **Avoiding a segmentation fault problem when installing or uninstalling.**

If a core dump causes the desktop to disappear while installing or uninstalling the product and leaves only the log in prompt, run the DBX utility on the resulting core file.

If you see the following output, apply the AIX PTF fix for PMR:82869,004 to solve the problem:

```
dbx /usr/bin/X11/X core
Type 'help' for help.
reading symbolic information ...warning: no source compiled with -g
```

[using memory image in core]

```
Segmentation fault in . at 0x10040aac
0x10040aac (???) 931d0000      stw   r24,0x0(r29)
(dbx) where
SetFontPathElements(??, ??, ??, ??) at 0x10040aac
SetFontPath(??, ??, ??, ??) at 0x10042e58
SetFontPath(??, ??, ??, ??) at 0x10042e80
ProcSetFontPath(??) at 0x10015ce4
DeleteClientFromAnySelections(??) at 0x1001e8a8
```

- **Avoiding a null pointer exception during the interactive installation of the IBM HTTP Server product on AIX platforms.**

When installing IBM HTTP Server using the wizard on an AIX platform, you might receive a null pointer Java error on the installation panels when the installer begins to copy files to your machine. This error is caused by an unstable AIX ODM registry.

To work around this problem:

1. Exit the installer.
2. Issue the following command to see if any remaining registry entries for IBM HTTP Server are present:

```
lslpp -l|grep IHS
```

3. If registry entries for IBM HTTP Server remain, install IBM HTTP Server silently by running the following command:

```
java -jar setup.jar -silent -P ihs.installLocation=the desired installation location
```

**Note:** To remove the installation silently, use the -silent parameter on the uninstall command. For example, run this command from the IBM HTTP Server installation root:

```
java -jar _uninst/uninstall.jar -silent
```

- **Ignoring DBCS messages or installing necessary patches when you do not require DBCS support.**

While installing any WebSphere Application Server product, you might see the following messages on AIX 5.1 and AIX 4.3.3 (not supported by WebSphere Application Server V5.1) until you install the missing filesets.

Operating system patches of particular concern:

```
Fileset X11.fnt.ucs.ttf_KR was not found on the system.
v5.1.0.0 - Font required for Korean character display
```

```
Fileset X11.fnt.ucs.ttf_TW was not found on the system.
v5.1.0.0 - Font required for Taiwanese character display
```

```
Fileset X11.fnt.ucs.ttf_CN was not found on the system.
v5.1.0.0 - Font required for Chinese character display
```

- **Using UNIX line-end characters (0x0D0A) to terminate each line of the options response file for silent installation.**

During a silent installation on AIX machines, the response file passed to the installer program must not contain ASCII line-end characters (0x0D0A). The response file must contain UNIX line-end characters

only. When the options response file contains ASCII line-end characters, the **install** command is unsuccessful and does not log or display an error. To verify the cause of failure, use the Java argument `-Dis.debug=1` on the **install** command. The debug information describes a service exception about invalid characters in the options response file.

- **Navigating if the scroll bar disappears on the Feature panel of the Installation wizard.**

If the scroll bar disappears, use the up and down arrow keys to navigate the features in the Feature panel. Use the tab key to move the focus to the navigation. You can also use the mouse.

- **Ignoring the following error messages that appear in the log.txt installation log.**

You can ignore the following error messages that might appear during installation of the base product in an umbrella installation:

```
WASBase, com.ibm.wizard.platform.aix.AixProductServiceImpl,
    wrn, - WARNING:
Got invalid size of 0 for file:
  /usr/WebSphere/AppServer/
    config/cells/
      BaseApplicationServerCell/
        nodes/
          DefaultNode/
            spi.policy:
WASBase, com.ibm.wizard.platform.aix.AixRegistryServiceImpl,
    wrn, AixRegistryServiceImpl:
Error attempting to modify AIX VPD.
```

- **Avoiding a potential port conflict between the administrative console and the WebSM system management console on AIX 5.1, with maintenance level 2.**

The AIX WebSM system management server listens on port 9090 by default. If you suspect that you have a port conflict, verify it by shutting down WebSphere Application Server. Then issue this command:

```
netstat -an |grep 9090
```

If you get a match, another process is already listening on port 9090. If you want the WebSM server and WebSphere Application Server to coexist, change the WebSphere Application Server administrative console port when installing WebSphere Application Server, or after installation. Although not recommended, you can also disable the WebSM server. To disable the WebSM server, issue this command:

```
/usr/websm/bin/wmsserver -disable
```

The command permanently disables WebSM server startup.

- **Canceling the installation and updating your operating system before restarting the installation, if you install on an AIX machine and receive a message that a fileset is missing, such as the X11.fnt.ucs.ttf fileset.**

Update your operating system if it is missing required filesets. If you receive a message that a fileset is missing, such as the X11.fnt.ucs.ttf fileset, cancel the installation, update the operating system, and restart the installation.

- **Setting up the display environment for a real root login on AIX systems.**

In a normal root login, issue the command `su`. For a real root login, issue the command `su -`.

Display settings for a normal root login are automatic. For a real root login, you must set your display environment properly to successfully view the Installation wizard. Otherwise, you see a message about Preparing Java(tm) Virtual Machine..., and seven rows of dots, but no Installation wizard and no further messages. Refer to the documentation for your AIX platform to determine proper display settings.

- **Avoiding a DSAPI filter-loading error when the Lotus Domino Server starts.**

On a UNIX-based operating system, if you start the Lotus Domino Web server from a non-root user, you are likely to generate a DSAPI filter-loading error:

```
Error loading DSAPI filter.
```

```
Filter not loaded: /usr/WebSphere/AppServer/bin/libdomino5_http.a
```

Manually change the WebSphere Application Server bin directory permissions from 750 to 755 to run Lotus Domino Server as a non-root user and not generate the error. This change does, however, pose a security risk.

You must also change permissions on the WebSphere Application Server logs directory to 777 to let Lotus Domino Server write to the log.

If the Lotus Domino Server is started as root, the problem does not occur.

- **Uninstalling the Enterprise product might leave extraneous information in the server registries.**

While uninstalling the Enterprise product on AIX systems, you encounter the following question: "Do you want to uninstall WebSphere Application Server also"? If you answer "yes", the Application Server is uninstalled. However, this process of uninstalling might not clean up all of the registry entries for the WebSphere Application Server product.

To work around this problem, use the following parameter when you uninstall the Enterprise product:

```
_uninstPME/uninstall -is:javaconsole
```

- **Avoiding a null pointer exception during the interactive installation of the IBM HTTP Server on AIX platforms.**

A null pointer exception is thrown during the interactive installation of IBM HTTP Server on AIX systems

When installing IBM HTTP Server as a standalone installation through the administrative console on the AIX platform, you can receive a null pointer Java error on the installation panels, when the installer begins to copy files to your machine.

This situation is caused by an unstable AIX Object Data Manager (ODM) registry.

To work around this problem:

1. Exit the installer.
2. Issue the `lslpp -l |grep IHS` command to check if there are remaining IBM HTTP Server registry entries that cannot exist.
3. If there are remaining IBM HTTP Server registry entries, do a silent installation of IBM HTTP Server by running the following command:

```
java -jar setup.jar -silent -P ihs.installLocation=<the desired install location>
```

**Note:** To remove the installation silently, add the `-silent` parameter to the regular `uninstall` command from the IBM HTTP Server installation location, for example:

```
java -jar _uninst/uninstall.jar -silent
```

- **Starting IBM HTTP Server 2.0.47 on AIX 5.2 systems.**

A potential IBM HTTP Server 2.0.47 startup failure exists on AIX 5.2 systems when a non-default AIX resolver configuration is used (for example, in `/etc/netsvc.conf`), and the IBM HTTP Server configuration file (for example, `httpd.conf`), uses Listen directives that do not specify an Internet Protocol address. The following example shows error messages issued by IBM HTTP Server:

```
[crit] (78) A remote host did not respond within the timeout period.:
      alloc_listener: failed to set up sockaddr for ::
Syntax error on line 130 of /usr/IBMIHS/conf/httpd.conf
Listen setup failed.
```

This error is caused by a defect in the AIX resolver library.

The defect is fixed by APAR IY40908 for AIX 5.2. The fix is shipped with AIX52B Gold and later.

Alternatively, you can take one of the following actions to solve the problem:

- Use the IPv4-specific Listen directive in the IBM HTTP Server configuration file, for example, "Listen 0.0.0.0:80"
- Do not override the default AIX resolver configuration.
- Change the following line in the `/etc/netsvc.conf` file from:

```
hosts = local = auth , bind
to
hosts = local = auth , bind , local
```

- **Using the AIX 5.1 and 5.2 Fast Response Cache Accelerator feature with IBM HTTP Server 2.0.47.**

IBM HTTP Server 2.0.47 supports the AIX 5.1 and 5.2 Fast Response Cache Architecture (FRCA) feature through the `mod_afpa_cache.so` plug-in module. However, you must install the interim fix IY49388 for AIX 5.2. IBM HTTP Server 1.3.28 does not support the AIX FRCA feature.

## HP-UX platforms

### Summary of tips that apply to HP-UX platforms

- Providing adequate disk space for installation
- Migrating the V5.0.2 Enterprise product during an umbrella installation
- Installing required patches for correct character display of the installation panel on Asian language platforms
- Uninstalling a V5.1 instance on HP-UX platforms before reinstalling the instance
- Mounting the product CD-ROM
- Configuring HP-UX kernel settings before installing WebSphere Application Server
- Migrating or coexisting with an existing WebSphere Application Server node that HP-UX does not recognize
- Avoiding using Netscape 4.79 on HP-UX 11 in Japanese, to avoid problems in viewing the administrative console
- Configuring the `converter.properties` file to use EUC-JP (Japanese) encoding on HP-UX
- Using certificate revocation lists (CRLs) with IBM HTTP Server on HP-UX and Linux for S/390 platforms is not supported at this time
- Ignoring certain error messages when installing WebSphere Application Server with embedded messaging from the CD-ROM

### Tips that apply to HP-UX platforms

- **Providing adequate disk space for HP-UX platforms.**

WebSphere Business Integration Server Foundation installs Cumulative Fix 2 (V5.1.0.2) to either the base product or the Network Deployment product during installation. The service pack requires more space than the Integration Server requires by itself. Space requirements that appear in the following list include the space required for the cumulative fix.

#### **1650 MB for the `/opt/WebSphere/AppServer` or the `/opt/WebSphere/DeploymentManager` directory**

The installation root directory includes either the base product or the Network Deployment product. The installation program extends the installation root directory with WebSphere Business Integration Server Foundation software.

#### **500 MB for the `/tmp` directory**

The temporary directory is the working directory for the installation program. Some components of the installation process require a specific amount of free space in the `/tmp` directory.

Although you might see an installation message for an incremental amount of free space that is less than 500 MB, the overall cumulative requirement for free space in the `/tmp` directory is 500 MB.

For example, if you do not have enough free space to start the installation, a message notifies you that you must have 200 MB of free space in the `/tmp` directory. The 200 MB of free space is what you must have when you have already installed Cumulative Fix 2 to an existing base product or to an existing Network Deployment product.

The 500 MB of free space is required to install the base product, Cumulative Fix 2, and the Integration Server product in the same *umbrella* installation procedure. An umbrella installation installs the base product as it installs Integration Server software.

Installing Integration Server software on the Network Deployment product also installs Cumulative Fix 2 (V5.1.0.2), which increases the amount of space required over the 200 MB in the message.

Verify that you have 500 MB of free space to avoid problems.



A second message about free space occurs when less than 4 MB of free space remains after starting the installation. The InstallShield for MultiPlatforms (ISMP) program displays a message about using the `-is:tempdir` parameter to identify an alternate temporary space directory.

Ignore any `-is:tempdir` message. The `-is:tempdir` parameter is not supported. Cancel the installation, allocate a total of 500 MB of free space in the `/tmp` directory, and start the installation again.

### 2150 MB

The total amount of space required for both directories is 2150 MB. A significant amount of the required space is temporarily required during installation and is released after installation. If you have already installed the cumulative fix pack on either the base product or the Network Deployment product that you are extending, the space requirement is reduced.

Space requirements for the embedded messaging feature are described in the Installing WebSphere embedded messaging as the JMS provider topic.

- **Migrating the V5.0.2 Enterprise product during an umbrella installation of the WebSphere Business Integration Server Foundation product.**

Two methods exist for installing Integration Server and migrating the configuration of an existing Enterprise system:

- Install the base WebSphere Application Server V5.1 product and do not select migration. Then install Integration Server to extend the base product and select migration during the Integration Server installation.
- Do not install the base WebSphere Application Server V5.1 product before you install Integration Server. When you install Integration Server, select the umbrella installation of the base product by selecting to install a new instance of the base product on the installation panel that lets you select a product to extend. Select the migration option during the Integration Server installation.

On HP-UX, you must install and migrate using the umbrella installation method. The installShield wizard is not always able to recognize an existing base product installation because of registration problems with the HP-UX native registry. The umbrella installation and migration scenario works and is the preferred migration path for HP-UX platforms.

- **Installing required patches for correct character display of the installation panel on Asian language platforms.**

The installation panel displays garbled characters on Asian language platforms, including Korean, traditional Chinese, Japanese, and simplified Chinese, for the HP-UX 11i operating system.

Verify that the following patches are installed on your HP-UX 11i machine:

Name	Description
B6848BA	Ximian GNOME 1.4 GTK+ Libraries for HP-UX 11.00 and 11i
BUNDLE11i	Required Patch Bundle for HP-UX 11i, February 2001 or later
PHSS_26974 (for 11.0) or PHSS_26973 (for 11i)	Korean TrueType fonts
PHSS_24937 (for 11.0) or PHSS_26977 (for 11i)	Traditional Chinese TrueType fonts
PHSS_26972(for 11.0) or PHSS_26971 (for 11i)	Japanese TrueType fonts
PHSS_26976(for 11.0) or PHSS_24975 (for 11i)	Simplified Chinese TrueType fonts
PHSS_25091(for 11.0) or PHSS_25092 (for 11i)	Common TrueType fonts

You can find these patches at the following URL:

<http://www.hp.com/products1/unix/java/infolibrary/patches.html#1>.

- **Ignoring a prerequisite checker error for a patch when a superset of the patch has been installed.**

If you apply a superset patch that includes a specific patch that the prerequisite checker program requires, you can ignore the message from the installer program and continue the installation. You can always continue the installation whenever you see an error message about a missing prerequisite. You can ignore the messages and continue the installation. Although the list of prerequisite patches that the installer program checks is extensive, the list does not include all of the superset patches.

For example, the installer program checks for patch PHCO\_29109. The HP-UX Web site recommends that you install a superset patch, PHCO\_29960, instead of PHCO\_29109. After installing the patch and rebooting the machine, reinstalling the base WebSphere Application Server results in the same message about the missing PHCO\_29109 prerequisite. You can ignore the error because you know that you have installed a superset patch.

- **Uninstalling a V5.1 instance on HP-UX platforms before reinstalling the instance.**

If you uninstall a V5.1 instance, but leave the embedded messaging feature installed because of other WebSphere Application Server instances on the machine, rename the /opt/WebSphere/AppServer51 directory so that HP-UX cannot locate the earlier installation that is still registered. Reinstall into a directory other than the /opt/WebSphere/AppServer51 directory or the renamed directory. Use a new directory name for reinstalling the V5.1 instance.

If you uninstall every WebSphere Application Server product on the machine and are now reinstalling, follow the procedure in “Manually uninstalling on HP-UX platforms” on page 340 instead.

For example, assume that V5.0.2 exists in the /opt/WebSphere/AppServer502 directory with the embedded messaging server and client feature. You then install V5.1 to the /opt/WebSphere/AppServer51 directory, but later you uninstall the product with the **uninstall** command and select to leave the embedded messaging feature installed. And now you decide to reinstall V5.1.

Rename the /opt/WebSphere/AppServer51 directory to the /opt/WebSphere/AppServer51\_bk directory before reinstalling V5.1 into the /opt/WebSphere/AppServer51New directory.

This step is required before you can reinstall the product onto the same system. To correct the registry entries and uninstall all of the WebSphere Application Server products on the machine, follow the procedure in “Manually uninstalling on HP-UX platforms” on page 340 instead.

- **Configuring HP-UX kernel settings before installing.**

To set kernel parameters, perform the following steps:

1. Log into the host machine with superuser (root) privileges.
2. Determine the physical memory to avoid setting certain kernel parameters above the physical capacity:
  - a. Start the HP-UX System Administration Manager (SAM) utility.
  - b. Click **Performance Monitors > System Properties > Memory**.
  - c. Note the value for Physical Memory and click **OK**.
  - d. Exit from the SAM utility.
3. Set the maxfiles and maxfiles\_lim parameters to at least 4096. (The following table recommends 8000 and 8196, respectively. You must first edit the /usr/conf/master.d/core-hpux file, to allow the SAM utility to set values greater than 2048:
  - a. Open the file /usr/conf/master.d/core-hpux in a text editor.
  - b. Change the line, \*range maxfiles<=2048 to \*range maxfiles<=60000
  - c. Change the line, \*range maxfiles\_lim<=2048 to \*range maxfiles\_lim<=60000
  - d. Save and close the file. Old values might be stored in the /var/sam/boot.config file. Force the SAM utility to create a new boot.config file:
    - 1) Move the existing version of the /var/sam/boot.config file to another location, such as the /tmp directory.
    - 2) Start the SAM utility.
    - 3) Click **Kernel Configuration > Configurable Parameters**. When the Kernel Configuration window opens, a new boot.config file exists.

Alternatively, rebuild the boot.config file with the following command:

```
# /usr/sam/sbin/getkinfo -b
```

4. Set new kernel parameter values:
  - a. Start the SAM utility.
  - b. Click **Kernel Configuration > Configurable Parameters**.
  - c. For each of the parameters in the following table, perform this procedure:
    - 1) Highlight the parameter to change.
    - 2) Click **Actions > Modify Configurable Parameter**.
    - 3) Type the new value in the **Formula/Value** field.
    - 4) Click **OK**.

Some kernel values for WebSphere Application Server with the embedded messaging feature are higher than those shown in the following table. See the Installing WebSphere embedded messaging as the JMS provider topic for more information.

Some kernel values for WebSphere Application Server IBM DB2 on the same machine, are higher than those shown in the following table.

- Recommended HP-UX kernel configuration parameters for DB2 Version 8
- Recommended HP-UX kernel configuration parameters for DB2 V7

Typical kernel settings for running WebSphere Application Server appear in the following table:

Parameter	Value
dbc_max_pct	25
maxdsiz	805306358
maxdsiz	2048000000 (when the base and Network Deployment products are on one machine)
maxfiles_lim	8196 (Change this setting before changing the maxfiles setting.)
maxfiles	8000
maxssiz	8388608
maxswapchunks	8192
max_thread_proc	3000
maxuprc	512
maxusers	512
msgmap	2048
msgmax	65535
msgmax	131070 (when the base and Network Deployment products are on one machine)
msgmnb	65535
msgmnb	131070 (when the base and Network Deployment products are on one machine)
msgmni	50
msgseg	32767
msgssz	32
msgtql	2046
nfile	58145
nflocks	3000
ninode	60000
nkthread	7219
nproc	4116
npty	2024
nstrpty	1024

Parameter	Value
nstrtel	60
sema	1 (with embedded messaging)
semaem	16384 (with embedded messaging)
semmap	514
semmni	2048
semmns	16384 (with embedded messaging)
semmnu	1024
semume	200
semvmx	32767 (with embedded messaging)
shmmax	2147483647
shmem	1 (with embedded messaging)
shmmni	1024
shmseg	1024
STRMSGSZ	65535

5. click **Actions > Process New Kernel**.

6. Click **Yes** on the information window to confirm your decision to restart the machine.

Follow on-screen instructions to restart your machine and to enable the new settings.

7. If you plan to redirect displays to non-HP machines, do the following steps before running the WebSphere Application Server Installation wizard:

a. Issue the following command to obtain information on all of the public locales accessible to your application:

```
# locale -a
```

b. Choose a value for your system from the output that is displayed and set the LANG environment variable to this value. Here is an example command that sets the value of LANG to en\_US.iso88591

```
# export LANG=en_US.iso8859
```

- **Migrating or coexisting with an existing WebSphere Application Server node that HP-UX does not recognize.**

In some cases, the InstallShield for MultiPlatforms (ISMP) program does not detect a previously installed version of WebSphere Application Serve because of a failure to read the registry keys on HP-UX.

You can force the Migration panel or the Coexistence panel to display, by starting the installation with an option on the **install.bat** or **install** command. For example, use this command:

```
./install -W showPreviousVersionDetectedPanel.active="true"
```

You can also force the appearance of the Coexistence panel to change conflicting port number assignments. For example, force the Coexistence panel to appear using this command:

```
./install -W showCoexistencePanel.active="true"
```

On either panel, identify the location of the existing product instance that is not being recognized.

- **Avoiding using Netscape 4.79 on HP-UX 11 in Japanese, to avoid problems in viewing the administrative console.**

It is possible that you cannot view the menu or areas of the console that scroll. Only certain portions of the administrative console are visible. You cannot scale the administrative console.

The workaround for the problem is to use another supported browser or another browser and operating system platform. You can also open the menu frame in a separate window, to avoid the problem.

- **Configuring the converter.properties file to use EUC-JP (Japanese) encoding on HP-UX.**

The `install_root/java/jre/lib/i18n.jar` file on HP-UX platforms does not have the converters for Cp33722C, but does have the converter for Cp33722. To use EUC-JP encoding on HP-UX platforms, change the `EUC-JP=Cp33722C` entry in the `converter.properties` file to `EUC-JP=Cp33722` or `EUC-JP=EUC_JP`.

- **Using certificate revocation lists (CRLs) with IBM HTTP Server on HP-UX and Linux for S/390 platforms is not supported at this time.**

Certificate revocation lists are not supported for IBM HTTP Server on HP-UX and Linux for S/390 platforms.

- **Ignoring certain error messages when installing WebSphere Application Server with embedded messaging from the CD-ROM.**

The following warning messages are issued despite successful installation. You might see the following messages in the `mq_install.log` file when installing WebSphere Application Server with embedded messaging from the CD-ROM:

```
MQSERIES.MQM-CL-HPUX: A test command parameter is not valid." and "*"
"hostname:/cdrom/hpux/messaging/images": Cannot open the
  logfile on this target or source. Possibly the media is
  read-only or there is a permission problem."
```

You can ignore the warning messages. The problem does not affect the successful installation of WebSphere Application Server with embedded messaging.

## Linux platforms

### Summary of tips that apply to Linux platforms

- Providing adequate disk space for installation
- Providing prerequisites for Red Hat Enterprise Linux V3.0
- Upgrading Red Hat Enterprise Linux V3.0 to service level 1 (update 1)
- Preparing Linux for S/390 for better performance
- Changing the locale encoding to English to install WebSphere Application Server on SuSE SLES 8.0 for Power platforms
- Japanese not recommended on Red Hat Enterprise Linux (RHEL) Advanced Server Version 2.1
- Ignoring YAST2 dependency conflicts for embedded messaging packages
- Preparing the SuSE Linux Enterprise Server 8.0 - Powered by UnitedLinux 1.0 platform for WebSphere Application Server installation
- Configuring Apache 1.3 to run on SuSE Linux Enterprise Server 8.0
- Correct font problems on SuSE Linux Enterprise Server 8.0 in Simplified Chinese and Traditional Chinese locales
- Avoiding the certificate revocation list (CRL) function, which is not supported for IBM HTTP Server on Linux for S/390
- Using the `ikeycmd` command line interface for `ikeyman` from IBM HTTP Server on Linux for S/390
- Avoiding utility hangs and accessing the deployment manager
- Installing the IBM Development Kit that supports CORBA C++ on Red Hat Linux Advanced Server version 2.1 requires an additional C++ run-time environment on iSeries platforms
- Using the GNOME desktop on Red Hat Linux Advanced Server V2.1 in the Korean locale
- Upgrading Red Hat Enterprise Linux V3.0 to service level 1 (update 1)
- Changing the Chinese locale on a Red Hat Enterprise Linux 3.0 platform from `zh_CN.gb18030` to `zh_CN.gbk`
- Accessing First Steps items on Linux for S/390 systems
- Using certificate revocation lists (CRLs) with IBM HTTP Server HP-UX and Linux for S/390 platforms is not supported at this time
- Editing the `keyman` script to bring up `IKEYMAN` for IBM HTTP Server 1.3.28 shipped with WebSphere Application Server
- Ignoring messages from the prerequisites checker when your operating system is at the level specified by the WebSphere Application Server supported hardware, software, and APIs Web site
- Using the LinuxThreads threading mode instead of the Native POSIX Threading Library (NPTL)

- Avoiding an error occurs when starting the Launchpad program for WebSphere Application Server clients, Version 5.1 using the Konqueror file in the K Desktop Environment on SuSE Linux Enterprise Server (SLES)
- Avoiding a segmentation fault on RHEL V3.0 Update 1.

### Tips that apply to Linux platforms

- **Providing adequate disk space on Linux platforms.**

WebSphere Business Integration Server Foundation installs Cumulative Fix 2 (V5.1.0.2) to either the base product or the Network Deployment product during installation. The service pack requires more space than the Integration Server requires by itself. Space requirements that appear in the following list include the space required for the cumulative fix.

**1750 MB for the /opt/WebSphere/AppServer or the /opt/WebSphere/DeploymentManager directory**

Installation root directory, which includes either the base or the Network Deployment product and the Integration Server product

**500MB for the /tmp directory**

System temporary directory. Temporary space is required to install the base or Network Deployment V5.1.0.2 service pack.

**2250 MB**

Total space requirement for both directories. A significant amount of the required space is temporarily required during installation and is released after installation. If you have already installed the service pack on either the base product or the Network Deployment product that you are extending, the space requirement is reduced.

Space requirements for the embedded messaging feature are described in Installing WebSphere embedded messaging as the JMS provider.

- **Providing prerequisites for Red Hat Enterprise Linux V3.0**

A known limitation in the prerequisites checker program prevents correctly examining prerequisite packages on Linux platforms. If you plan to install WebSphere Application Server Version 5.1.x products on a Red Hat Enterprise Linux 3.0 system, install the following prerequisite packages on the RHEL 3.0 system.

You must install the following packages on Red Hat Enterprise Linux V3.0 for xSeries platforms:

- compat-gcc-7.3-2.96.122
- compat-libstdc++-7.3-2.96.122
- compat-libstdc++-devel-7.3-2.96.122
- compat-glibc-7.x-2.2.4.32.5
- compat-gcc-c++-7.3-2.96.122
- compat-db-4.0.14-5
- rpm-build-4.2.1-4.2

The following package is required for Red Hat Enterprise Linux V3.0 for pSeries platforms:  
rpm-build-4.2.1-4.2.

You must install the following packages on Red Hat Enterprise Linux V3.0 for S/390 (z/OS and S/390 in 31-bit mode) platforms:

- compat-db-4.0.14-5
- compat-pwdb-0.62-3
- compat-libstdc++-7.2-2.95.3.77
- rpm-build-4.2.1-4.2

You can install a later release of any of these packages.

- **Upgrading Red Hat Enterprise Linux V3.0 to service level 1 (update 1).**

Upgrade RHEL 3.0 to service level 1 by downloading and installing the service updates from Red Hat.



If you do not upgrade to service level 1, certain national language issues in the released version of GLIBC included in Red Hat Enterprise Linux V3 might cause Java virtual machine (JVM) failures due to segmentation faults. These failures can occur during installation when the locale is set to anything other than an English locale.

The prerequisites checker program for the base V5.1.0.0 product does not recognize Red Hat Enterprise Linux 3.0 as a supported operating system. If you receive a message from the prerequisites checker program that RHEL 3.0 is an unsupported operating system, ignore the message and continue the installation if you installed all prerequisite packages from the previous step and downloaded and installed the service level 1 update.

- **Preparing Linux for S/390 for better performance**

Linux for S/390 (which refers to the Linux distributions available from Linux distributors that run on IBM eServer zSeries and S/390 systems in 31-bit mode) provides a configuration technique that affects the installation and run time performance of WebSphere Application Server. The technique configures the environment where the Linux image runs to use swap space efficiently. Some performance guidelines recommend running Linux with the VM/ESA or z/VM swap turned off because of VM/ESA or z/VM virtualization of hardware. Virtualization can produce double-swapping situations where VM/ESA or z/VM swaps storage and Linux also swaps storage, which degrades performance.

Excessive swapping affects the performance of WebSphere Application Server, which might require 200 MB when all of the Sample applications are loaded. On a system without swap space configured for use, and with a relatively small amount of memory (such as 256 MB), WebSphere Application Server might encounter problems obtaining enough free memory to work properly, particularly when competing for resources against other applications and products that run in the Linux environment.

The solution is to disable swapping in Linux, but to enable swapping in VM/ESA or z/VM. You can increase performance by letting VM/ESA or z/VM handle the swapping. Double or triple the specification for physical memory for the Linux image. For example, if the physical memory allocation as seen by the Linux image is 256 MB, disable swap in Linux, enable swap in VM/ESA or z/VM, and increase the physical memory specification as seen by Linux to 512 MB or 768 MB. This amount of memory handles any large spikes in application memory usage that might occur.

You can fine tune the amount of physical memory to allocate to each Linux guest operating system. Size the JVM heap size for the application running in the Application Server, add 90 MB to that amount for the Application Server, 20 MB for Linux, and another 10-20% to handle peak usage. This measurement provides better memory management from a VM/ESA or z/VM perspective.

Avoid socket timeout exceptions (SocketTimeoutExceptions) when running WebSphere Business Integration Server Foundation on a Network Deployment node on a Linux for S/390 guest operating system on z/VM or VM/ESA. The exceptions are an indicator that too many processes are running and that the Linux system is being overloaded. If the deployment manager is under a heavy load, 1 GB of memory is required. In addition, move all base nodes to other Linux for S/390 guests to allow the deployment manager to run by itself on the Linux for S/390 system.

See the Linux on IBM eserver zSeries and S/390: ISP/ASP Solutions IBM Redbook and the Performance Analysis for Java Web sites book for more information.

- **Changing the locale encoding to English to install WebSphere Application Server on SuSE 8.0 SLES for Power platforms.**

The WebSphere Application Server installation program is corrupted when you start the installation on SuSE Linux Enterprise Server (SLES) 8.0 for a Power platform in a double-byte character set (DBCS) language. The double-byte character set languages display the characters incorrectly. The single-byte character set (SBCS) languages display the characters correctly.

The reason for this problem is either missing fonts on the system, incorrectly called fonts, or incorrectly displayed fonts.

Change the locale encoding to English to properly install WebSphere Application Server on SuSE SLES 8.0 for Power. To change the locale, open a terminal or window and complete the following steps:

1. Type `export LC_ALL=C` and press **Enter**.
2. Type `export LANG=C` and press **Enter**.

3. To verify that the locale is properly set to English, type `locale` to see that all variables are set to C.
- **Japanese not recommended on Red Hat Enterprise Linux (RHEL) Advanced Server Version 2.1.**  
The Red Hat Advanced Server Version 2.1 GUI language selection menu displays two selections for Japanese:

- Japanese (eucJP)
- Japanese (SJIS)

Click **Japanese (eucJP)** to install and run the IBM WebSphere Application Server in a Japanese environment. Do not use Japanese (SJIS).

See the Red Hat Japanese Web site at <http://www.jp.redhat.com/support/7.2/sla/rh72faq.html> for more information.

- **Ignoring YAST2 dependency conflicts for embedded messaging packages**

The YAST2 utility on SuSE Linux Enterprise Server 8.0 has a known problem reporting dependency conflicts. If you use the utility, you can ignore the Dependency conflict panel that reports conflicting packages for the embedded messaging feature. Two examples from such a report might appear like this:

```
MQSeriesClient
MQSeriesClient-U486878
```

```
MQSeriesJava
MQSeriesJava-U486878
```

Many packages, such as the embedded messaging packages in the WebSphere Application Server products, specify a conflict to control incompatible package levels. In this case, the conflict identifies a WebSphere MQ-related package level that is less than 5.3.0. YAST2 seems to be misinterpreting the specification and flagging a conflict for WebSphere MQ packages that are less than *or equal to* 5.3.0.

- **Preparing the SuSE Linux Enterprise Server 8.0 - Powered by UnitedLinux 1.0 operating platform for WebSphere Application Server installation.**

1. Install SP2 for the UnitedLinux 1.0 operating platform to let you use the WebSphere Application Server LaunchPad.

It is your responsibility to install this service pack. No definitive way is available for the `prereqChecker` function of the installer to detect service pack versions on UnitedLinux. Kernel `uname`/versions between 8.0 and 8.0.2 are identical. `signature RPM` exists for denoting a service pack installation.

2. Use the IBM Developer Kit that WebSphere Application Server provides to support the Java 2 SDK on the SuSE SLES 8.0 operating system to avoid potential problems when uninstalling an interim fix or a fix pack. To use the IBM Developer Kit, remove the `java2-jre-1.3.1-524` and `java2-1.3.1-524` RPMs from the machine before installing WebSphere Application Server.

- **Configuring Apache 1.3 to run on SuSE Linux Enterprise Server 8.0.**

Using the following directive in an otherwise unmodified `httpd.conf` file can result in an error:

```
LoadModule app_server_http_module /opt/WebSphere/AppServer/bin/mod_app_server_http.so
```

The error is indicated by a message similar to the following example:

```
[warn] Loaded DSO /opt/WebSphere/AppServer/bin/mod_app_server_http.so uses
plain Apache 1.3 API, this module might crash under EAPI!
(please recompile it with -DEAPI)
[notice] Apache/1.3.26 (Linux/SuSE) mod_python/2.7.8 Python/2.2.1
PHP/4.2.2 mod_perl/1.27 configured -- resuming normal operations
[notice] suEXEC mechanism enabled (wrapper: /usr/sbin/suexec)
[notice] Accept mutex: sysvsem (Default: sysvsem)
[notice] child pid 3383 exit signal Segmentation fault (11)
```

1. Edit the `/etc/sysconfig/apache` file and change the value of the following parameters from **yes** to **no** to remove PHP and Python from the Web server:

- `HTTPD_SEC_MOD_PYTHON`
- `HTTPD_SEC_MOD_PHP`

2. Run the `SuSEconfig` utility to enable your changes.

Do not attempt to use the EAPI module with the version of Apache 1.3 that ships with SuSE Linux Enterprise Server 8.0. An error in this version of Apache prevents using the EAPI module. Obtain an updated version of Apache 1.3 from SuSE, or download an updated version of Apache 1.3 from another source to use the EAPI plug-in module.

Edit the `/etc/sysconfig/apache` file if you download a new version, remove PHP and Python from the Web server, and run the `SuSEconfig` utility.

- **Correct font problems on SuSE Linux Enterprise Server 8.0 in Simplified Chinese and Traditional Chinese locales.**

On the Linux for Power platform that SuSE Linux Enterprise Server 8.0 provides, there is a font problem caused by a missing package. There is no `ttf-hanyi` package installed during the normal product installation of the SuSE 8.0 operating system. This causes the Installation wizard for WebSphere Application Server products to display garbled characters on the Simplified Chinese locale and the Traditional Chinese locale.

Copy the `ttf-hanyi-2021016-0.noarch.rpm` package on the SuSE 8.0 for i386 CD-ROM to the Power PC system. Install the package on the Power PC machine and reboot the machine to solve the problem.

- **Avoiding the certificate revocation list (CRL) function, which is not supported for IBM HTTP Server on Linux for S/390.**

Do not use the certificate revocation list (CRL) function on Linux for S/390 at this time.

- **Using the `ikeycmd` command line interface for `ikeyman` from IBM HTTP Server on Linux for S/390.**

You might see a Java core dump after running an `ikeyman` command function, such as creating the stash file. This error occurs on both RedHat and SuSE releases as the result of a conflict in library routines caused by the default loading sequence.

To work around this problem, set the `LD_PRELOAD` environment variable before running the following command:

```
LD_PRELOAD=/usr/lib/libstdc++-libc6.1-2.so.3
```

This command loads the library first when the application is started. Setting this environment variable is also necessary to support Secure Sockets Layer (SSL) on Linux for S/390.

- **Migrating from WebSphere Application Server, Version 3.5 on Linux platforms.**

The error can occur when the migration tools cannot find the `JAVA_HOME`. The `WASPreUpgrade` command reports the error while backing up the WebSphere Application Server V3.5 environment. The error appears in the `WASPreUpgrade` log as:

```
MIGR0257E:Environment variable JAVA_HOME was not set is generated
```

To work around the problem:

1. Create a directory link to one of the following directories:

- `$WAS_HOME/IBMJavaLink`
- `/opt/IBMJava2-122`
- `$WAS_HOME/IBMJava2-122`

`WAS_HOME` is the WebSphere Application Server 3.5 `WAS_HOME`.

2. Run the `WASPreUpgrade` command again, followed by the `WASPostUpgrade` command, to migrate the environment correctly to WebSphere Application Server, Version 5.

- **Avoiding utility hangs and accessing the deployment manager.**

The default Red Hat installation creates an association between the host name of the machine and the loopback address, 127.0.0.1. In addition, the `/etc/nsswitch.conf` file is set up to use the `/etc/hosts` file before trying to look up the server using a name server (DNS). This loopback processing can hang utilities that start and stop a server, such as the `startServer` command, the `stopManager` command, and others, even though the server might successfully start or stop.

The stop can also cause failures when adding nodes on a Linux deployment manager. If you have trouble synchronizing new nodes with the Linux deployment manager during `addNode` processing,

ensure that the host name is defined properly. The default configuration has local host defined in the `/etc/hosts` file. The default `/etc/nsswitch.conf` looks only at the host file and not the DNS server. To correct this problem, remove the 127.0.0.1 mapping to localhost in the `/etc/hosts` file or edit the name service configuration (`/etc/nsswitch.conf`) file to resolve the proper host name by using the name server.

For example, remove the 127.0.0.1 mapping from the `/etc/hosts` file, which might look like the following example:

```
# IP Address      name of machine
n.n.n.n          hostname.domain.com  hostname
127.0.0.1        localhost
```

Otherwise, change the `etc/nsswitch.conf` file to search DNS before searching the hosts file.

For example, `hosts : dns files`

- **Installing the IBM Development Kit that supports CORBA C++ on Red Hat Linux Advanced Server Version 2.1 requires an additional C++ run-time environment on iSeries platforms.**

This release note applies to Red Hat Linux Advanced Server 2.1 on iSeries platforms only.

If you install the CORBA C++ Development Kit on Red Hat Linux Advanced Server version 2.1, you might find some incompatibility issues with the GNU Compiler (GCC) C++ run-time support library. IBM uses the GCC Version 2.95.3 C++ run-time support library rather than the GCC provided with the Red Hat Linux Advanced Server Version 2.1.

To work around this incompatibility issue, download the GCC Version 2.95.3, build it, and use the C++ run-time support library it provides. After building GCC Version 2.95.3, place the C++ run-time support library in the WebSphere `/lib` directory. The process of obtaining and installing this additional run-time environment follows:

1. FTP to `ftp.gnu.org`.
2. Type `cd gnu/gcc/gcc-2.95.3/`
3. Download the `gcc-everything-2.95.3.tar.gz` file.
4. Create a build directory such as the `/gcc-2.95.3-build` directory. In the remaining steps, this directory is referred to as the *gcc-buildtree* directory.
5. Type `cd gcc-buildtree`
6. Extract the GCC source code by running the following command:

```
tar -xzf location-of-gcc-tar-file/gcc-everything-2.95.3.tar.gz
```

7. Type `cd gcc-buildtree/gcc-2.95.3`
8. Issue the following command to configure the GCC source code in preparation for building:

```
./configure --prefix /compiler/gcc-2.95.3/ -enable-shared="libstdc++,libgcc"
```

**Note:** The `--prefix` option specifies that the compiler installs into the `/compiler/gcc-2.95.3` directory. You can choose another location.

9. Type `make` to compile the GCC. The compile process might take several minutes to complete as it depending on the speed of your computer.
10. Type `make install` to install the compiler in the location specified previously using the **--prefix** option.
11. Run the following command to copy the C++ run-time support library to the WebSphere `/lib` directory:

```
cp /compiler/gcc-2.95.3/lib/libstdc++-libc6.2-2.so.3 install_root/lib
```

- **Using the GNOME desktop on Red Hat Linux Advanced Server V2.1 for i386 Update3 in the Korean locale.**

You cannot start the deployment manager on a Network Deployment system when Korean characters are in the cell name. This is true in the Korean locale when running the KDE desktop on a Red Hat Linux Advanced Server V2.1 for i386 Update3 system.

This problem is caused by the default system desktop being set to "KDE", which means that file `/etc/sysconfig/desktop` has the value `desktop="KDE"`.

Run the following command on your RedHat 2.1 system to change the default system desktop to GNOME:

```
#echo "DESKTOP=\"GNOME\"" >/etc/sysconfig/desktop
```

Restart your system to solve the problem.

- **Upgrading Red Hat Enterprise Linux V3.0 to service level 1 (update 1).**

Upgrade RHEL 3.0 to service level 1 by downloading and installing the service updates from Red Hat.

If you do not upgrade to service level 1, certain national language issues in the released version of GLIBC included in Red Hat Enterprise Linux V3 might cause Java virtual machine (JVM) failures due to segmentation faults. These failures can occur during installation when the locale is set to anything other than an English locale.

- **Changing the Chinese locale on a Red Hat Enterprise Linux 3.0 platform from zh\_CN.gb18030 to zh\_CN.gbk.**

A known problem with RHEL V3 before installing service level 1 (update 1) is that one of the Chinese locales and its codepage, `zh_CN.gb18030`, causes the Installation wizard to render several input fields uneditable. Change the locale and its codepage to `zh_CN.gbk` to allow the Installation wizard to work correctly.

- **Accessing First Steps items on Linux for S/390 systems.**

When you select the following features from the First Steps panel, the Web browser window does not open:

- WebSphere information center
- Register the Product
- Samples Gallery
- Administrative Console

To access these features:

1. Open a Web browser window on another machine.
2. Type the browser Web address that displays in the First Steps status window into the address field of the Web browser.
3. Press **Enter** to open the page in the Web browser.

- **Editing the keyman script to bring up IKEYMAN for IBM HTTP Server 1.3.28 shipped with WebSphere Application Server**

Editing the `keyman` script to bring up IKEYMAN for the IBM HTTP Server 1.3.28 shipped with WebSphere Application Server

You cannot bring up IKEYMAN by typing the `keyman` script under the `IHS_HOME/bin` directory for IBM HTTP Server 1.3.28 shipped with WebSphere Application Server, Version 5.1 on the Linux PowerPC 64 bit platform. The following error is thrown:

```
Line 139: /usr/local/ibm/gsk7_gcc295/bin/gsk7ibm_gcc295: No such file or directory
```

To work around this problem, perform the following steps:

1. Use WebSphere Application Server IKEYMAN to create the CMS keystore. You can invoke the WebSphere Application Server IKEYMAN from the `WAS_HOME/bin` directory.
2. Edit the IBM HTTP Server `keyman` script: remove 2 references of "gcc295" from next to the last line.

- **Ignoring messages from the prerequisites checker when your operating system is at the level specified by the WebSphere Application Server supported hardware, software, and APIs Web site.**

The installation prerequisites checker checks for prerequisites that might have changed since the release of the product CD.

The prerequisites checker for the installation program is fixed at the time the product CDs are created. It is possible that more operating system patches are required since the time the product CDs were



created. It is also possible that new versions of operating systems are supported even though the prerequisites checker identifies the new operating system level as unsupported.

Always consult the IBM WebSphere Application Server supported hardware, software, and APIs Web site to determine whether your operating system is supported when you receive a message from the prerequisites checker program during installation.

The Web site lists all supported operating systems and the operating system fixes and patches that you must install to have a compliant operating system. After confirming that your operating system is supported and that you have installed all the necessary patches, you can click **Next** to continue an installation when you receive an error message from the prereqChecker program.

- **Using the LinuxThreads threading mode instead of the Native POSIX Threading Library (NPTL).**

WebSphere Application Server, Version 5.1.0 products run under the LinuxThreads threading mode because of program dependencies on specific behavior within the LinuxThreads mode. Do not use the NPTL mode. The WAS 5.1.0 run time automatically sets up LinuxThreads.

If you set LD\_ASSUME\_KERNEL=2.4.19 or LD\_ASSUME\_KERNEL=2.2.5 to switch to LinuxThreads outside the context of WebSphere Application Server, set the RPM\_FORCE\_NPTL=1 environment variable.

Unusual behavior occurs with Red Hat Package Manager (RPM) when running under LinuxThreads on Red Hat Enterprise Linux, Version 3.0. Corruption of the RPM database can occur. Setting the environment variable forces the RPM program to always run under NPTL threading and protects the RPM database from corruption.

Set the value in the environment using the following command:

```
export RPM_FORCE_NPTL=1
```

- **Avoiding an error occurs when starting the Launchpad program for WebSphere Application Server clients, Version 5.1 using the Konqueror file in the K Desktop Environment on SuSE Linux Enterprise Server (SLES).**

When starting the Launchpad program for WebSphere Application Server clients, Version 5.1 using the Konqueror file manager in the K Desktop Environment (KDE) on Linux systems, a "Couldn't find the program launchpad.sh" error occurs.

Because the **launchpad.sh** command uses a relative path to locate the Java program, you should run the **launchpad.sh** command from the directory where the **launchpad.sh** command is located for the client program. When using the Konqueror file manager to issue the **launchpad.sh** command, the current directory is your home directory. Therefore, the **launchpad.sh** command cannot work.

Do not use the Konqueror file manager to issue the **launchpad.sh** command for the client. Open a Konsole session in the KDE, change the current directory to where the **launchpad.sh** command is located, and run the **launchpad.sh** command.

- **Avoiding a segmentation fault on RHEL V3.0 Update 1.**

An "A suitable JVM could not be found" message is displayed when installing WebSphere Business Integration Server Foundation on Red Hat Enterprise Linux 3 U1.

When installing from an operator console attached to the server (not telnet), the "A suitable JVM could not be found" message displays and the installation fails with a segmentation fault.

You might have previously installed, logged off, logged back on, and are running the installation again on the operator console attached to the server.

This is a known limitation of Red Hat Enterprise Linux V3.0 that causes a segmentation fault when calling the JVM.

Test if the JVM is failing by running the following command:

```
/mnt/cdrom/platform/linuxi386/jdk/java/jre/bin/java -version
```

If you receive a "Segmentation Fault" message, reboot your machine or press **Ctrl-X** to reinstall. Rebooting the machine resolves the problem.



## Solaris Operating Environment

### Summary of tips that apply to Solaris platforms

- Providing adequate space for Solaris platforms
- Uninstalling a V5.1 instance on a Solaris platform before reinstalling the instance
- Using the **unzip** function, not the **jar** command, to decompress downloaded files
- Closing the terminal window that remains open after the installation finishes
- Configuring the `converter.properties` file to use EUC-JP (Japanese) encoding
- Configuring the Domino Server plug-in
- Avoiding problems starting application servers in `zh_TW.EUC` locale on Solaris
- Using the correct mount point for the product CD

### Tips that apply to Solaris platforms

- **Providing adequate disk space for Solaris platforms.**

WebSphere Business Integration Server Foundation installs Cumulative Fix 2 (V5.1.0.2) to either the base product or the Network Deployment product during installation. The service pack requires more space than the Integration Server requires by itself. Space requirements that appear in the following list include the space required for the cumulative fix pack.

#### **1730 MB for the /opt/WebSphere/AppServer or the /opt/WebSphere/DeploymentManager directory**

The installation root directory includes either the base product or the Network Deployment product. The installation program extends the installation root directory with WebSphere Business Integration Server Foundation software.

#### **500MB for the /tmp directory**

The temporary directory is the working directory for the installation program. Some components of the installation process require a specific amount of free space in the `/tmp` directory.

Although you might see an installation message for an incremental amount of free space that is less than 500 MB, the overall cumulative requirement for free space in the `/tmp` directory is 500 MB.

For example, if you do not have enough free space to start the installation, a message notifies you that you must have 200 MB of free space in the `/tmp` directory. The 200 MB of free space is what you must have when you have already installed Cumulative Fix 2 to an existing base product or to an existing Network Deployment product.

The 500 MB of free space is required to install the base product, Cumulative Fix 2, and the Integration Server product in the same *umbrella* installation procedure. An umbrella installation installs the base product as it installs Integration Server software.

Installing Integration Server software on the Network Deployment product also installs Cumulative Fix 2 (V5.1.0.2), which increases the amount of space required over the 200 MB in the message.

Verify that you have 500 MB of free space to avoid problems.

A second message about free space occurs when less than 4 MB of free space remains after starting the installation. The InstallShield for MultiPlatforms (ISMP) program displays a message about using the `-is:tempdir` parameter to identify an alternate temporary space directory.

Ignore any `-is:tempdir` message. The `-is:tempdir` parameter is not supported. Cancel the installation, allocate a total of 500 MB of free space in the `/tmp` directory, and start the installation again.

#### **2230 MB**

The total amount of space required for both directories is 2230 MB. A significant amount of the required space is temporarily required during installation and is released after installation. If you have already installed the cumulative fix pack on either the base product or the Network Deployment product that you are extending, the space requirement is reduced.

Space requirements for the embedded messaging feature are described in Installing WebSphere embedded messaging as the messaging provider.

- **Uninstalling a V5.1 instance on a Solaris platform before reinstalling the instance.**

If you uninstall a V5.1 instance but leave the embedded messaging feature because of other WebSphere Application Server instances, clean up the `/var/sadm/pkg` directory before reinstalling V5.1.

If you uninstall all of the WebSphere Application Server products on the machine and are now reinstalling, follow the procedure in “Manually uninstalling on Solaris platforms” on page 347 instead of this procedure.

You must perform this procedure before you can reinstall the product into the same installation root directory on Solaris platforms. Otherwise, you must reinstall the product into another directory and you might have a problem reinstalling the embedded messaging feature.

Assume that V5.0.x exists in `/opt/WebSphere/AppServer50` with the embedded messaging server and client feature. You then install V5.1 to the following directory, `/opt/WebSphere/AppServer51`, but later you uninstall the product and leave the embedded messaging feature installed. And now you decide to reinstall V5.1.

1. Make the `/var/backupForWAS51Reinstall` backup directory.
2. Change directories to `/var/sadm/pkg`, and type `ls -lt | grep WSBA51` to find packages that contain the base WebSphere Application Server.

The directory for Network Deployment is `WSNAA51`.

3. If the `WSBA51` directory exists, change directories to the `WSBA51` directory and read the `pkginfo` file in the `/var/sadm/pkg/WSBA51` directory.

Find the installation location for V5.1. If the location is the same installation location as the V5.1 product that you uninstalled, move the `/var/sadm/pkg/WSBA51` folder to the `/var/backupForWAS51Reinstall` directory.

The following example shows how to display the `pkginfo` file:

```
# pwd
/var/sadm/pkg/WSBA51
# ls -lt
total 6
-rw-r--r--  1 root    other      591 Oct 27 15:46 pkginfo
drwxr-xr-x  2 root    other      512 Oct 27 15:46 install
drwxr-xr-x  2 root    other      512 Oct 27 15:46 save
# cat pkginfo
# VPD created by InstallShield MultiPlatform Edition
# Mon Oct 27 15:46:34 EST 2003
ARCH=sparc
BASEDIR=/opt/WebSphere/AppServer51
CATEGORY=application
CLASSES=none
DESC=
ISJE_INSTALL_STATUS=3
ISJE_IS_ACTIVE=true
ISJE_IS_PUBLICLY_SHAREABLE=false
ISJE_NAME=IBM WebSphere Application Server
ISJE_PARENTS=WSBA51:5.1.0.0.DSP=:1
ISJE_PRODUCT_NUMBER=5.1.0.0
ISJE_REQUIRED_COUNT=0
ISJE_SOURCES=
ISJE_UID=WSBA51
ISJE_UNINSTALLER="_uninst" "uninstall.jar" "uninstall.dat" ""
ISJE_VPD_VERSION=4.5
ISJE_WEB=
NAME=WebSphere Application Server
PKG=WSBA51
PKGINST=WSBA51
VENDOR=
VERSION=5.1.0.0.DSP=
```

When two instances of V5.1 WebSphere Application Server exist, such as with one instance installed and one instance uninstalled, for example, two files exist in the `/var/sadm/pkg` directory. One is the `/var/sadm/pkg/WSBAA51` file, the other is the `/var/sadm/pkg/WSBAA51.2` file. For example:

```
# ls -lt | grep WSBAA
drwxr-xr-x 4 root other 512 Oct 27 18:52 WSBAA51.2
drwxr-xr-x 4 root other 512 Oct 27 15:46 WSBAA51
drwxr-xr-x 3 root other 512 Oct 21 13:32 WSBAA
```

4. Verify that you are moving the correct file to the backup directory.

Examine the `pkginfo` files. Do not touch entries for other WebSphere Application Server products that might be present on the platform, such as `WS` entries for existing WebSphere Application Server V5.0.x.

5. Run the `ls -lt | grep WSBM` command to get all of the embedded messaging packages.

For example:

```
#
# ls -lt | grep WSBM
drwxr-xr-x 4 root other 512 Oct 27 18:52 WSBMQ1AA.2
drwxr-xr-x 4 root other 512 Oct 27 18:52 WSBMQ2AA.2
drwxr-xr-x 4 root other 512 Oct 27 18:52 WSBMS4AA.2
drwxr-xr-x 4 root other 512 Oct 27 18:52 WSBMS6AA.2
drwxr-xr-x 4 root other 512 Oct 27 18:52 WSBMQAA.2
drwxr-xr-x 4 root other 512 Oct 27 15:46 WSBMS4AA
drwxr-xr-x 4 root other 512 Oct 27 15:46 WSBMS6AA
drwxr-xr-x 4 root other 512 Oct 27 15:46 WSBMQ1AA
drwxr-xr-x 4 root other 512 Oct 27 15:46 WSBMQ2AA
drwxr-xr-x 4 root other 512 Oct 27 15:46 WSBMQ3AA
drwxr-xr-x 4 root other 512 Oct 27 15:46 WSBMQAA
drwxr-xr-x 4 root other 512 Oct 27 15:46 WSBMSAA
```

6. Identify entries that are related to the V5.1 product that you uninstalled.

Examine the `pkginfo` file for each entry. In the previous example, `".2"` entries relate to the product that you uninstalled, which was originally in the `/opt/WebSphere/AppServer51` directory. Use a command to move all of the `".2"` entries into the backup directory. For example, run the following command from the `/var/sadm/pkg/` directory:

```
mv WSBM*.2 /var/backupForWAS51Reinstall
```

For V5.1 of Network Deployment, all of the related embedded messaging entries start with `WSNM`. Run the following command to show the Network Deployment entries:

```
ls -lt | grep WSNM
```

7. Rename `/opt/WebSphere/AppServer51` to `/opt/WebSphere/AppServer51_bk` before reinstalling V5.1.

- **Using the `unzip` function, not the `jar` command, to uncompress downloaded files.**

To uncompress downloaded installation files for the Solaris operating system, use the `unzip` function and not the `jar` command. Using the `jar` function sets file permissions incorrectly, which causes the installation to fail.

- **Closing the terminal window that remains open after the installation finishes.**

When installing WebSphere Application Server from the product CD onto a Solaris system, the ISMP Installation wizard launches a terminal window, which remains open after the installation is complete. This window contains the following text:

```
InstallShield Wizard
Initializing InstallShield Wizard...

Searching for Java(tm) Virtual Machine...
.....
```

Close the window after the installation completes.

- **Configuring the `converter.properties` file to use EUC-JP (Japanese) encoding.**

The `install_root/java/jre/lib/i18n.jar` file on Solaris platforms does not have the converters for Cp33722C, but does have the converter for Cp33722. To use EUC-JP encoding on Solaris platforms, change the `EUC-JP=Cp33722C` entry in the `converter.properties` file to `EUC-JP=Cp33722` or `EUC-JP=EUC_JP`.

- **Configuring the Domino Server plug-in.**

During installation, a `dsapi_stderr.txt` file is created in the `logs` directory and you can get the following error messages:

```
lotus.notes.NotesException: Could not load dll for system name SUNOS
    at lotus.notes.NotesThread.load(NotesThread.java:210)
    at lotus.notes.NotesThread.<clinit>(NotesThread.java:24)
java.lang.UnsatisfiedLinkError: NnotesInitThread
    at lotus.notes.NotesThread.NnotesInitThread(Native Method)
    at lotus.notes.NotesThread.initThread(NotesThread.java:99)
    at lotus.notes.NotesThread.run(NotesThread.java:133)
```

You can configure the IBM WebSphere Application Server or Domino Server plug-in manually using the Domino Server Web administration tool. The workarounds include:

1. Start the Domino Server.
2. Enter the Web address for the Domino Server Web Administration site using a browser. For example, `http://hostname/names.nsf`. Enter the administrator user name and password.
3. Double-click **Server-Servers**.
4. Double-click **WebServer** to configure.
5. Double-click **Edit Server**.
6. Double-click **Internet Protocol**.
7. Add the IBM WebSphere Application Server DSAPI plug-in to the **DSAPI** field. For example, `/opt/WebSphere/AppServer/bin/libdomino5_http.so`  
If DSAPI filter files are already specified, use a space to delimit the WebSphere Application Server plug-in file.
8. Double-click **Save and Close**.
9. Restart the Domino Server.

- **Avoiding problems starting application servers in the zh\_TW.EUC locale on Solaris platforms.**

If you use the embedded JMS provider in WebSphere Application Server products or WebSphere MQ as the JMS provider on Solaris, do not set the `LANG` and `LC_ALL` variables to `zh_TW.EUC` (Traditional Chinese locale) to avoid problems when starting application servers. Set the `LANG` and `LC_ALL` variables to `zh_TW` instead of `zh_TW.EUC`.

- **Using the correct mount point for the product CD.**

If the Solaris Volume Manager (`vold`) is running, Solaris automatically mounts the product CD as the `/cdrom/was_wbisf_sun_cd1` device.

Do not run the `launchpad.sh` command or the `install` command from the automatically generated mount point. For example, do not run the `/cdrom/was_wbisf_sun_cd1/sun/install` command.

1. Close the File explorer window that Solaris automatically opens so that you can define a correct mount point.
2. Open a shell window and use the window throughout the installation.
3. Verify that you are in a read/write directory and not the CD-ROM directory or another read-only directory before you start the installation.
4. Start the installation using the mount point specification in the following command:

```
# /cdrom/cdrom0/sun/1launchpad.sh
```

## Windows platforms

### Summary of tips that apply to Windows platforms

- Providing adequate space for installation
- Providing the required `msvcp60.dll` file for Windows 2000 Server

- Planning for the default installation path
- Viewing accurate migration messages
- Decompressing a WebSphere Application Server image that you download
- Editing or removing the `vpd.properties` file
- Preparing for Adaptive Fast Path Architecture (AFPA) driver availability when migrating from IBM HTTP Server Version 1.3.19.x, or earlier
- Rebooting the machine after uninstalling the embedded messaging feature
- Ignoring an incorrect `ImagePath` entry in the registry after changing the document root
- Avoiding a user ID with spaces when installing the WebSphere Application Server as a Windows service
- Changing the display settings from high-contrast black to high-contrast white to view panels with hypertext links
- Avoiding using the default service names created by the installer because they are common
- Uninstalling WebSphere Embedded Messaging Publish and Subscribe Edition on Windows 2003 Server
- Lowering the Internet Explorer security level from High to Medium to view the Product overviews from the Launchpad on Windows 2003 machines
- Stopping all instances of the `process_spawner.exe` program before installing Cumulative Fix 2
- Expecting a delay before the Installation wizard displays its first panel
- Running the installation program asynchronously
- Avoiding the use of the Add or Remove Programs utility

### Tips that apply to Windows platforms

- **Providing adequate disk space for installation.**

WebSphere Business Integration Server Foundation installs Cumulative Fix 2 (V5.1.0.2) to either the base product or the Network Deployment product during installation. The service pack requires more space than the Integration Server requires by itself. Space requirements that appear in the following list include the space required for the cumulative fix pack.

#### 1800 MB

Installation root directory, which includes either the base or the Network Deployment product and the Integration Server product

#### 400 MB

Temporary system free space. Temporary space is required to install the base or Network Deployment V5.1.0.2 service pack.

#### 2200 MB

Total space requirement. A significant amount of the required space is temporarily required during installation and is released after installation. If you have already installed the cumulative fix pack on either the base product or the Network Deployment product that you are extending, the space requirement is reduced.

- **Providing the required `msvc60.dll` file for Windows 2000 Server platforms.**

The embedded messaging feature requires a DLL file on Windows 2000 Server platforms. The DLL file is already installed on Windows 2000 Advanced Server and other Windows platforms that are supported. If you see a message similar to the following example, download the `msvc60.dll` file:

```
wempsdeletebroker.exe - Unable To Locate DLL
The dynamic link library MSVCP60.dll could
not be found in the specified path...
```

The prereq checker in the installer program does not check for this DLL file on the Windows 2000 Server platform. If you select the Windows 2000 Support Tools during Windows 2000 Server installation, the installation program for Windows 2000 Server installs the DLL file in the `C:\Program Files\Support Tools` directory. The DLL file is installed during the installation of Windows 2000 Advanced Server in the `C:\WINNT\system32` directory.

You can download the DLL file from the Microsoft Web site.

- **Planning for the default installation path**

On Windows platforms, the default installation path is *drive:\Program Files\IBM\WebSphere MQ\*. You can specify a different directory during installation. On Linux and UNIX-based platforms, the path is fixed.

- **Viewing accurate migration messages.**

When migration is running during installation, the information displayed in the pre-migration and post-migration processing might display corrupted national characters. Use the PreUpgrade and PostUpgrade logs in the *backup/logs* directory, where *backup* is the backup directory specified during installation.

- **Decompressing a WebSphere Application Server image that you download.**

If you are using the downloadable archive file to install the WebSphere Application Server product, the PKWARE pkunzip utility might not decompress the download image correctly. Use another utility (such as WinZip) to unzip the image.

- **Editing or removing the vpd.properties file.**

Installing WebSphere Application Server on some international computers might result in an installation failure or in font problems. Use the following procedure to work around this problem:

1. Locate the vpd.properties file in the operating system installation directory.

For example, C:\WINDOWS or C:\WINNT on a Windows system.

2. Remove all of the lines containing one of these strings:

- WSE
- WSN
- WSB
- WSM

Do not delete or rename the vpd.properties file because the InstallShield for MultiPlatforms (ISMP) program uses it for other products that it installs. If you are sure that no other entries exist in the file, you can delete the file.

- **Preparing for Adaptive Fast Path Architecture (AFPA) driver availability when migrating from IBM HTTP Server Version 1.3.19.x, or earlier.**

The AFPA driver controls the fast response cache accelerator function, which is also known as the *cache accelerator*. The version of IBM HTTP Server installed with WebSphere Application Server shares the AFPA driver with any coexisting IBM HTTP Server. Uninstalling a coexisting Version 1.3.19.x (or earlier) IBM HTTP Server also uninstalls the common AFPA driver.

When configured to use an AFPA driver that is no longer present, the cache accelerator does not provide a response improvement. IBM HTTP Server generates errors as it starts. For example:

```
[error] (9) Bad file descriptor: Afpa Device Driver open failed.
```

You can either restore the driver or disable the cache accelerator configuration. Restore the driver by reinstalling the later version of IBM HTTP Server after you uninstall the earlier version. To verify that the AFPA driver is installed and working, see if it is listed in device manager under Non-Plug and Play Drivers. Select the Show hidden devices option in the device manager view on Windows 2000 or later platforms.

You can disable AFPA by commenting out the following directives in the httpd.conf configuration file:

```
AfpaEnable  
AfpaCache on  
AfpaLogFile "C:\Program Files\IBM HTTP Server\log\afpalog" V-ECLF
```

- **Rebooting the machine after uninstalling the embedded messaging feature.**

If you uninstall the embedded messaging feature on a Windows machine, you must reboot the machine before reinstalling.

- **Avoiding a user ID with spaces when installing the WebSphere Application Server as a Windows service.**



When installing the WebSphere Application Server as a Windows service, do not use a user ID that contains spaces. A user ID with spaces cannot be validated. The user is not allowed to proceed with the installation. To work around this problem, install with a user ID that does not contain spaces, or do not choose to install services.

- **Changing the display settings from high-contrast black to high-contrast white to view panels with hypertext links.**

For Installation wizard panels that contain hypertext links, a display setting of "high-contrast black" causes some of the text to display in the same color (black) as the background color. This makes the text impossible to display. Change your settings to "high-contrast white" to see all of the text in every Installation wizard panel.

- **Avoiding using the default service names created by the installer because they are common**

Unable to use the default service names created by the installer because they are common

In a same version coexistence scenario for IBM HTTP Server Version 1.3.28 or Version 2.0.47 on a Windows platform, you are unable to use the default service names created by the installer because they are common.

To work around this problem, perform the following steps:

1. Install the first copy of IBM HTTP Server, either by itself or with IBM WebSphere Application Server.
2. Customize the service names for the first install by running the following commands from the first install location:

```
apache -k install -n "IHS 1.3.28(1)"
        apache -k install -f conf\admin.conf -n "IHS 1.3.28 Administration (1)"
```

3. Edit the `AdminAlias` directive in the `<installLocation 1>\conf\admin.conf` file to point to the new service name, for example "IHS 1.3.28(1)".
4. Remove the default service names installed by the first installation by running:

```
apache -k uninstall -n "IBM HTTP Server 1.3.28"
        apache -k uninstall -n "IBM HTTP Administration 1.3.28"
```

5. Install the second copy of IBM HTTP Server, either by itself or with IBM WebSphere Application Server. The default service names correspond to the second installation.

The custom service names previously mentioned must be unique on your system and are not required to be those exact strings.

- **Uninstalling WebSphere Embedded Messaging Publish and Subscribe Edition on Windows 2003 Server.**

After using the Add or Remove Programs utility on Windows 2003 Server to uninstall WebSphere Application Server, the entry for WebSphere Embedded Messaging Publish and Subscribe Edition persists. Using the Add or Remove Programs utility to remove WebSphere Embedded Messaging Publish and Subscribe Edition generates a Fatal Error during installation message.

As a work around, manually remove the WEMPS entry in the Windows 2003 Server registry. See "Manually uninstalling on Windows platforms" on page 352 for more information about manually uninstalling messaging components.

- **Lowering the Internet Explorer security level from High to Medium to view the Product overviews from the Launchpad on Windows 2003 machines.**

You might see a blank page when trying to view Product overviews from the WebSphere Launchpad on Windows 2003 machines. The default security level setting for the Internet Zone on Internet Explorer is High. Use the following techniques to lower the Internet zone security level to Medium:

1. Right-click the Internet Explorer icon on the desktop.
2. Click **Properties > Security > Internet Zone**.
3. In the **Security level for this zone** area, move the slider from **High** to **Medium**.
4. Click **OK** to save the change.

- **Stopping all instances of the `process_spawner.exe` program before installing Cumulative Fix 2.**

The installation of Cumulative Fix 2 might fail if an instance of the `process_spawner.exe` file is running. Stop the process manually, if any processes are running, and restart the installation. To stop the process, run the Task Manager program, search for the process, and stop any running instances of the `process_spawner.exe` program.

See `tins_trouble.dita#tins_trouble/194703.RN` for more information.

- **Expecting a delay before the Installation wizard displays its first panel**

The default installation method is to open a command window to a read/write directory, issue the fully qualified command to start the Launchpad tool, and click the **Install the product** option. This option launches the Installation wizard, which is an InstallShield for MultiPlatforms (ISMP) application. This action launches the Installation wizard in the language of your machine locale unless no translation exists for your locale, in which case you receive the English version. A short delay occurs before the ISMP wizard displays.

You do not need to click the Install the product option more than once to cause the wizard to display.

- **Running the installation program asynchronously.**

After running the `install` command, the command line returns asynchronously. Because of the need to support a two-CD installation, it is not possible to run the `install` command synchronously for Methods 1, 2, and 3, and Method 4 on a Windows platform. A synchronous **install** command returns the command line after the installation is complete.

Because you can switch CDs in the middle of the installation, the installation process and its children processes all run as background processes. After running the **install** command, the command line returns immediately. Do not misinterpret this to mean that the installation has finished. Although the command line returns, either the Installation wizard or a silent installation might still be in progress. Confirm successful completion with the Installation wizard by viewing the Summary panel. Confirm the successful completion of a silent installation (or the Installation wizard) by examining the `install_root/logs/WAS.WBISF.install.log` file for the following message:

```
INSTFIN: The installation is complete.
```

One exception to the asynchronous behavior occurs on Linux and UNIX platforms when using Method 4. If you copy both CDs to any directory and start the installation from that directory, the installation proceeds without prompting for either disk. The installer program does support a synchronous command line when installing from a disk drive. The command line returns after the installation is complete.

- **Avoiding the use of the Add or Remove Programs utility.**

Do not use the Add or Remove Programs utility on Windows platforms to uninstall WebSphere Business Integration Server Foundation. Do not use the Add or Remove Programs utility on Windows platforms to uninstall WebSphere Business Integration Server Foundation. Change directories to the `install_root/_uninstWBISF` directory and issue the **uninstall** command.

## Tips for installing the embedded messaging feature

When installing IBM WebSphere Application Server, you can install the embedded messaging feature (which is selected by default) to use as the Java Message Service (JMS) provider. To install the embedded messaging feature successfully, you must complete several other actions first as described in the installation procedure. You must consider whether you also want to use WebSphere MQ on the same host. On Linux and UNIX-based platforms, you must define the groups and the user required to support the embedded messaging feature.

You can either complete the required actions before installing the WebSphere Application Server product, or deselect the embedded messaging feature, which installs the WebSphere Application Server product without embedded messaging.

If you already have WebSphere MQ installed, you can configure it as the JMS provider. Otherwise, you can install the embedded messaging feature, the WebSphere MQ product, or another JMS provider later, after you install the WebSphere Application Server product.

The WebSphere Application Server embedded messaging feature provides a JMS provider that supports both queues (for point-to-point messaging) and topics (for publish and subscribe messaging). You can install the WebSphere Application Server with the embedded messaging feature on the same host with the WebSphere MQ product. To support this combination, several WebSphere MQ product features must be at a certain level.

After installing the WebSphere Application Server product with the embedded messaging feature, you can install the WebSphere MQ product and use it as the JMS provider instead.

This topic provides an index to tips for installing and migrating the embedded messaging feature that are described in “Platform-specific tips for installing and migrating” on page 173.

### **Tips for all platforms**

- Migrating from embedded messaging to WebSphere MQ requires setting the MQ\_INSTALL\_ROOT variable to the location of the installation root of WebSphere MQ
- Installing WebSphere Application Server products in order on the same machine, when installing the embedded messaging component
- Recovering from an InvalidExecutableException while starting jmsserver
- Applying fixes and fix packs to the embedded messaging feature
- Providing adequate space for installation
- Avoiding the installation of the server and client feature or the client feature more than once
- Installing the embedded messaging server feature if WebSphere MQ Version 5.3 is already installed
- Logging off and back on, or rebooting a Windows machine, after uninstalling the embedded messaging feature
- Planning not to use terminal services with the embedded messaging feature
- Avoiding a coexistence problem between embedded messaging, IBM WebSphere Studio Application Developer Integration Edition, and IBM WebSphere Application Server
- Locating more information about the embedded messaging feature or WebSphere MQ

### **Tips for all Linux and UNIX platforms**

- Preparing a Linux or UNIX operating platform for the embedded messaging feature
- Defining the prerequisite Linux or UNIX operating system groups, mqm and mqbrkrs
- Installing to fixed locations on UNIX-based operating systems
- Creating and mounting the required journalized file system, /var/mqm, before installing WebSphere Application Server
- Restricting access to the /var/mqm/errors directory and messaging logging files

### **Tips for AIX platforms**

- Installing the prerequisite Java130.rte.lib Version 1.3.0 on AIX Version 4.3.3 or AIX Version 5
- Correcting directory permissions on AIX platforms before reinstalling WebSphere Application Server with the embedded messaging feature

### **Tips for Linux platforms**

- Ignoring YAST2 dependency conflicts for embedded messaging packages

### **Tips for Windows platforms**

- Providing the required msvc60.d11 file for Windows 2000 Server
- Planning for the default installation path

## Using the Launchpad to start the installation

Use the Launchpad to access a product overview, to access the readme file, to access the installation guide, and to install the product.

### 1. Start the Launchpad.

The Launchpad program is in the *operating\_system\_platform* directory on the product CD.

You can start the Launchpad manually using a fully qualified command instead of changing directories to the CD-ROM and running the command locally from the platform directory:

- Mount the CD-ROM drive on Linux or UNIX-based platforms, if necessary. This procedure varies per platform. Consult the installation procedure for your platform for instructions on mounting CD-ROM drives. Open a shell window and issue a fully qualified **launchpad.sh** command to start the Launchpad. On Windows platforms, issue a fully qualified **launchpad.bat** command to start the Launchpad. Issue a fully qualified **LaunchPad.sh** command to start the Launchpad for the **Application Clients** CD-ROM.

The Launchpad opens in the language of the machine locale setting. The appearance of the Launchpad is the same for the base product and the Network Deployment product. You can access the Installation Guide to see which product it describes installing if you lose track of the product to which the panel applies.

### 2. Use the Launchpad to access the product overview, the readme file, and installation guides.

### 3. Click **Install the product** to launch the installation wizard.

You can use the Launchpad to start the installation and to access information through a browser.

If you use the Mozilla browser on a Linux or UNIX system and you do not have the Netscape browser, some links might not work because the Launchpad attempts to call the Netscape browser in the `/usr/bin/netscape` directory. Try a symbolic link to the Mozilla browser to fix the problem as shown in the following example:

```
ln -sf /usr/bin/mozilla /usr/bin/netscape
```

If you still cannot use the Launchpad panel, you can launch the following links directly from your browser:

#### Button Link

#### Product Overview

<http://www.ibm.com/software/webservers/appserv/>

It is possible that your security options might prevent redirection, such as to the <http://www-306.ibm.com/software/info1/websphere/index.jsp?tab=products/appserv> Web site. If so, you can identify the IBM Web site as a trusted site to allow the redirection. For example, on Internet Explorer, add <http://www-306.ibm.com> to the list of Trusted Sites by selecting **Tools > Internet Options > Security (tab) > Trusted Sites**.

#### Readme File

*CD-ROM mount point/readme/readme\_en.html*

#### Installation Guide

*CD-ROM\_mount\_point/docs/InstallGuide\_en.PDF*

The *Installation Guide* is in Adobe PDF format. Viewing this document requires you to have Adobe Acrobat Reader, which is a free download from the Adobe Acrobat Web site.

#### Install the product

*CDROM\_mount\_point/platform\_directory/install* on Linux and UNIX-based platforms.

*CDROM\_drive:\platform\_directory\install.bat* on Windows platforms.

Return to Installing the product to continue.

## Installing silently

This topic describes how to perform a silent installation of the product as the root user on a Linux or UNIX-based operating system, or from a user ID that belongs to the Administrator group on a Windows platform.

Use this procedure to perform a silent installation of the WebSphere Business Integration Server Foundation product.

A silent installation uses the installation program to install the product. However, instead of displaying a wizard interface, the silent installation causes the installation program to read all of your responses from a file that you must customize.

1. Verify that the user ID has sufficient authority to perform the task.

Install silently as root on a Linux or UNIX-based platform, or as a user that belongs to the administrator group on a Windows platform. Some steps for installing silently on a Windows platform require the administrator group user to have the following advanced user rights:

- *Act as part of the operating system*
- *Log on as a service*

The installation wizard grants your Windows user ID the advanced user rights, if the user ID belongs to the administrator group. The silent installation does not grant these rights. If you create a new user ID on a Windows platform to perform the silent installation, you must restart the system to activate the proper authorizations for the user ID, before you can perform a successful silent installation.

Table 31. Installation tip

Operating platform	Tip
Windows platforms	A Windows user ID with spaces cannot be validated for installing services.

If you attempt a silent installation of services or the embedded messaging feature without the required authorizations, the installation might fail while attempting to write to a `WAS.WBISF.install.log` file that it has not opened yet. Or, you might see messages in the `WAS.WBISF.install.log` file that are similar to the following messages:

```
(Jan 30, 2003 12:04:32 PM), Setup.product.install,
com.ibm.ws.install.conditions.PCWebSphereCheckCondition, msg1,
higherVersionFoundPasses: false
(Jan 30, 2003 12:04:32 PM), Setup.product.install,
com.ibm.ws.install.conditions.PCWebSphereCheckCondition, msg1,
defaultEvalResult: false
(Jan 30, 2003 12:04:32 PM), Setup.product.install,
com.ibm.ws.install.conditions.PCWebSphereCheckCondition, msg1,
checkOnlyCurrentVersion: true
(Jan 30, 2003 12:04:34 PM), Setup.product.install,
com.ibm.ws.install.conditions.PCWebSphereCheckCondition, msg1,
higherVersionFoundPasses: false
(Jan 30, 2003 12:04:34 PM), Setup.product.install,
com.ibm.ws.install.conditions.PCWebSphereCheckCondition, msg1,
defaultEvalResult: false
(Jan 30, 2003 12:04:34 PM), Setup.product.install,
com.ibm.ws.install.conditions.PCWebSphereCheckCondition, msg1,
checkOnlyCurrentVersion: false
(Jan 30, 2003 12:04:41 PM), Setup.product.install,
com.ibm.ws.install.actions.LogMessageAction, msg1, INST0058E:
The install failed or did not complete due to one or more errors.
```

2. Copy the response file as `myoptionsfile` to your disk drive and customize it.

There are three types of silent installation:

- Extending an existing installation of the base WebSphere Application Server product
- Extending an existing installation of the Network Deployment product
- Installing and extending the base WebSphere Application Server product

Copy the `setup.response` file to install the Integration Server product on a machine to extend an existing base WebSphere Application Server product, or to install and extend the base product.

Copy the `setup_nd.response` file to install the Integration Server product on a machine that already has the Network Deployment product.

3. Issue one of these commands to use your custom response file:

#### Windows platforms

```
"fully_qualified_CD_drive_D:\win\install"  
-options"fully_qualified_disk_drive_C:_WAS\myoptionsfile
```

The `WAS.WBISF.install.log` file is in the `install_root\logs` directory.

#### Linux and UNIX-based platforms

```
fully_qualified_mnt_cdrom/install -options  
fully_qualified_disk_drive_/tmp/WAS/myoptionsfile
```

The `WAS.WBISF.install.log` file is in the `install_root/logs` directory.

You can find the sample options response file in the `operating-system platform` directory on the product CD.

4. Reboot your machine in response to the prompt that might appear on Windows platforms.

If you install the embedded messaging feature, `-P mqSeriesBean.active="true"`, certain conditions, such as a locked file, might require you to reboot. You have the option of rebooting immediately, after which the installation program resumes the installation at the point it left off. You can also defer rebooting to a convenient time, such as after the overall installation is complete.

You can install silently using the response file. If you are doing an umbrella installation of the base WebSphere Application Server product, examine the `install_root/logs/log.txt` file for a line similar to this:  
MessageAction, msg1, The WebSphere 5.1 install is complete.

This message is an indicator that you have successfully installed the base product. Examine the `WAS.WBISF.install.log` file for a line similar to this:

```
"INSTFIN: The installation is complete."
```

This is an indicator that you have successfully installed the Integration Server product.

Return to Installing the product to continue.

## Customizing Integration Server option response files

This topic describes how to customize the response files for silently installing the WebSphere Business Integration Server Foundation product from a command line without the Installation wizard. Install as the root user on a Linux or UNIX-based platform, or as a user that belongs to the administrator group on a Windows platform. Some steps of the silent installation procedure on a Windows platform require that the administrator group user to have the advanced user rights *Act as part of the operating system* and *Log on as a service*.

Before using the `/mnt/cdrom/linuxi386/install -options /tmp/myoptionsfile` command, for example, to invoke a silent installation, you must customize the response file to add your selections.

Customize the options response file precisely to enable the silent installation program to read the option values that the file contains. The options response file is for silent installation only. The file does not affect the default values for similar options that appear in the Installation wizard.

1. Locate the sample options response file in the `operating-system platform` directory on the product CD.

There are two files for Integration Server installation:



- Use the `setup.response` file when installing the Integration Server on the same machine as the base WebSphere Application Server product, whether or not you perform an umbrella installation to install the base product.
- Use the `setup_nd.response` file when installing the Integration Server on the same machine with the Network Deployment product.
- Use both files if you install the Integration Server on a machine that already has both the base product and the Network Deployment product. Use the files as you install the Integration Server twice, once to install the extensions that work with the base product, and once to install the administrative extensions for the Network Deployment product.

Each options response file is located in the *operating-system platform* directory on the product CD-ROM.

2. Copy an options response file to customize it. For example, copy the `setup_nd.response` file on the product CD as *myoptionsfile* on your disk drive. Customize the options to define how to extend the Network Deployment product.
3. Edit the copy of the file in your flat file editor of choice, on the target operating system. Read the directions within the response file to choose appropriate values. Prepare for a silent installation on an AIX platform by using UNIX line-end characters (0x0D0A) to terminate each line of the options response file, as described in Platform-specific tips for installing and migrating.
4. Search for and verify that the `-silent` option is present in the file and that it is uncommented. The `-silent` option enables silent installation.  
This option is present in the file as it ships from IBM. Without this option, the file has no use. The options response file is for silent installation only. The file does not affect the default values that appear in the Installation wizard.
5. Include custom option responses that reflect parameters for your system.  
Read the directions within the response file to choose appropriate values.
6. Save the file.

You can customize the response file to prepare for running a silent installation.

### Examples of using options files to install Integration Server

Edit the version of each file that ships with the version of the Integration Server that you are installing.

You must use fully qualified path names for the CD-ROM with the installation image and for the customized options file on your hard drive. You might have to change CD-ROMs as you are installing.

You cannot run the installer program locally from the CD-ROM because you might have to switch CD-ROMs during the installation.

### Example of using an options file to install Integration Server on a base WebSphere Application Server node

Use the following examples to install Integration Server on a base WebSphere Application Server node silently.

#### Linux and UNIX-based platforms:

```
fully_qualified_CD_pathname/install
  -options fully_qualified_HDD_pathname/setup.response

/mnt/cdrom/linuxi386/install -options /tmp/myoptionsfile
```

#### Windows platforms:

```
fully_qualified_CD_pathname\install
  -options fully_qualified_HDD_pathname\setup.response

d:\win\install -options c:\temp\myoptionsfile.txt
```

### Example of using an options file to install Integration Server on a deployment manager node

Use the following examples to install Integration Server on a deployment manager node silently.

#### Linux and UNIX-based platforms:

```
fully_qualified_CD_pathname/install
  -options fully_qualified_HDD_pathname/setup_nd.response

/mnt/cdrom/linuxi386/install -options /tmp/myoptionsfile
```

#### Windows platforms:

```
fully_qualified_CD_pathname\install
  -options fully_qualified_HDD_pathname\setup_nd.response

d:\win\install -options c:\temp\myoptionsfile.txt
```

Return to Installing the product to continue.

## setup.response

This topic describes the response file for installing the WebSphere Business Integration Server Foundation product to extend the base WebSphere Application Server product silently.

Install silently as the root user on a Linux or UNIX-based platform, or as a user that belongs to the administrator group on a Windows platform. Some steps of the silent installation procedure on a Windows platform require the administrator group user to have the advanced user rights *Act as part of the operating system* and *Log on as a service*.

Silent installation reads all of the installation choices from an options response file.

There are two types of installation for the Integration Server product, so there are two separate options response files.

The `setup_nd.response` file is for extending the Network Deployment product. This `setup.response` file is for extending the base product. You must customize an options response file before you can use it to perform a silent installation. An options response file has nothing to do with the Installation wizard and the default values that appear on the wizard panels.

### Location

This sample options response file, `setup.response`, is on the product CD in the *operating-system platform* directory. Copy the file to a hard disk to customize it.

### Usage notes

- This file is not a read-only file.
- Edit this file directly with your flat file editor of choice, such as WordPad on a Windows platform.
- This file is not updated by any product components.
- The file must exist to perform a silent installation of the Integration Server product on top of an existing installation of the base WebSphere Application Server product, or to install the Integration Server product and the base product at the same time in an umbrella installation.
- When installing silently, the installation program does not display a wizard but instead, reads this file to determine installation option values.

- You can change the `-W launchPRTBean.active` option to display the Registration panel for a confirmation of completeness on a local system with a graphical user interface.
- Review the installation logs in the `install_root/logs` directory or in the `/tmp` directory (the system `%TEMP%` directory on a Windows platform) to verify the status of the installation.

### Example of setup.response, for use with the base WebSphere Application Server product

The following example is similar to the file that ships with the Integration Server.

```
# *****
# Usage:
# Windows:
#   fully_qualified_CD_pathname\install
#   -options fully_qualified_HDD_pathname\setup.response
#   ie: d:\win\install -options c:\temp\setup.response
#
# Other Platforms:
#   fully_qualified_CD_pathname/install
#   -options fully_qualified_HDD_pathname/setup.response
#   ie: /mnt/cdrom/linuxi386/install -options /tmp/setup.response
#
# Note: the install program cannot be run locally from the CDRom as you
# may need to switch CDs during the install.
# *****
#
# Note: To install WebSphere Business Integration Server Foundation v5.1
# on an existing WebSphere Application Server Network Deployment v5.1
# please use the file setup_nd.response
#
# =====
# Please follow the comments to use the response file and understand
# the various options. You must carefully complete or change the various
# values. If the values are not completed properly, the install may be
# unsuccessful.
#
# NOTE: This file is for silent install only.
#
# IMPORTANT: ALL VALUES MUST BE ENCLOSED IN DOUBLE QUOTES ( " " ).
# -----
# =====
# Install Option:
#
# Please specify whether you want to install WebSphere Business Integration
# Server Foundation v5.1 on an existing WebSphere Application Server v5.1 or you
# want to install it to a new location.
#
# Value          Comment
# *****
# PMEONWAS       To Install on an existing WebSphere
#                Application Server v5.1
#
# NEWLOCATION     To install in a new location. This will also
#                install the required WebSphere Application
#                Server v5.1 features for you.
# -----

-W pmeInstallLocation.installOption="PMEONWAS"

# =====
# Install Location:
#
# If you selected -W pmeInstallLocation.installOption="PMEONWAS"
# then specify the install location of the WebSphere Application
# Server v5.1 here.
# If you selected -W pmeInstallLocation.installOption="NEWLOCATION"
# specify the destination directory for the WebSphere Business Integration
```

```

# Server Foundation v5.1 installation.
#
# You will need to change this for UNIX platforms. As an example for
# AIX, the value may be "/usr/WebSphere/AppServer"
# -----

-P EEX_WASPME.installLocation="C:\Program Files\WebSphere\AppServer"

# =====
#
# If you have selected -W pmeInstallLocation.installOption="NEWLOCATION",
# then please edit the following fields.
# -----

# Please enter a node name and hostname for this installation.
# nodeName: The node name is used for administration, and must be
#           unique within its group of nodes (cell). You must replace
#           the "DefaultNode" with the node name that you want the
#           default node to be.
# hostName: The hostname is the DNS name or IP address for this computer.
#           You must replace "127.0.0.1" to a resolveable hostname or
#           IP address for your machine.
#
# Warning: If you are migrating now or plan to do so after installation,
# enter the same node name as the previous version.
# -----

-W nodeNameBean.nodeName="DefaultNode"
-W nodeNameBean.hostName="127.0.0.1"

# If you would like to run IBM WebSphere Application Server v5.1
# as a windows service (on windows platforms only), set the
# following field to "true".
# This field will be ignored on Unix systems.
# -----

-W serviceSettingsWizardBean.wasChoice="true"

# If you chose to run IBM WebSphere Application Server v5.1 as a
# windows service, then you must specify the User Name and Password
# which are required to install the Services.
# The current user must be admin or must have admin authority to
# install a Service. Also the username which is given here must
# have "Log On as a Service " authority for the service to run properly.
#
# userName: Replace YOUR_USER_NAME with your username.
# password: Replace YOUR_PASSWORD with your valid password.
# -----

-W serviceSettingsWizardBean.userName="YOUR_USER_NAME"
-W serviceSettingsWizardBean.password="YOUR_PASSWORD"

# =====
# WebSphere Application Server v5.1, Embedded Messaging feature:
#
# The WebSphere Business Integration Server Foundation v5.1 installer can install
# the Embedded Messaging from the WebSphere Application Server v5.1 for you.
#
# installLocation: For Windows Platform only, uncomment the installLocation
#                  line, and specify the location you want MQ to be installed.
#                  The directory may not be configured by the user for UNIX
#                  platforms as it is predetermined.

```

```

# IMPORTANT NOTE: If you do not want to install Embedded Messaging, please
# ensure all of the following MQ or EMS options are set to "false". But if
# any of the selected Integration Server feature requires Embedded Messaging,
# then Embedded Messaging will be installed regardless of its setting.
#
# The "Embedded Messaging Server and Client" (EEX_BaseEMS) and the
# "Embedded Messaging Client Only" (EEX_BaseEMC) are mutually exclusive.
# You can install either "Server and Client" or "Client Only", but not both.
#
# If you select "Server and Client" feature, please ensure msvcp60.dll file
# is installed.
# -----

# Embedded Messaging
-P EEX_BaseMQ.active="true"

# Install location for Windows platforms
# -P EEX_BaseMQ.installLocation=
# "C:\Program Files\IBM\WebSphere MQ"

# Embedded Messaging Server and Client
-P EEX_BaseEMS.active="true"

# Embedded Messaging Client Only
-P EEX_BaseEMC.active="false"

# Embedded Messaging Samples
-P EEX_BaseEMSamp.active="true"

# =====
# WebSphere Business Integration Server Foundation v5.1 features:
#
# Features marked "true" will be installed.
# Features marked "false" will not be installed.
# -----

# If you would like to install Business Rule Beans,
# set the following value to "true"

-P EEX_BRB.active="true"

# If you would like to install the samples for
# Business Rule Beans, set the following value to
# "true"

-P BRBSamples.active="true"

# If you would like to install Event Infrastructure
# (Technical Preview),
# set the following value to "true"

-P EEX_CEI.active="false"

# If you would like to install Extended Messaging,
# set the following value to "true"

-P EEX_CMMFeature.active="true"

# If you would like to install the samples for
# Extended Messaging, set the following value to
# "true"

-P EMSamples.active="true"

```

```

# If you would like to install Dynamic Query, set
# the following value to "true"

-P EEX_DQ.active="true"

# If you would like to install the samples for
# Dynamic Query, set the following value to "true"

-P DQSamples.active="true"

# If you would like to install WorkArea Service,
# Internationalization Service, Activity Sessions,
# Application Profile, and Activity Service, set
# the following value to "true"

-P EEX_OS.active="true"

# If you would like to install the samples for
# WorkArea Service, Internationalization Service,
# Activity Sessions, Application Profile, and
# Activity Service, set the following value to
# "true"

-P EEX_OSSamples.active="true"

# If you would like to install Scheduler and
# Asynchronous Beans, set the following value to
# "true"

-P EEX_SCHED.active="true"

# If you would like to install the samples for
# Scheduler and Asynchronous Beans, set the
# following value to "true"

-P SchedulerAsyncBeansSamples.active="true"

# If you would like to install Process Choreographer,
# set the following value to "true"
#
# DEPENDENCIES (if this feature is selected then
# the dependencies below must also be selected)
# Scheduler and Async Beans:
# EEX_SCHED.active="true"
# Other Services:
# EEX_OS.active="true"

-P EEX_PCFeature.active="true"

# If you would like to install the samples for Process
# Choreographer, set the following value to "true"

-P EEX_PCSamplesFeature.active="true"

# If you would like to create a sample Business
# Process container configuration, set the following
# value to "true"

-P CreateSimpleWorkflowConfiguration.active="false"

# If you are creating a sample Business Process container
# configuration, the following three values need to be entered
#
# GetUsernameAndPasswordforWorkflowRunAs.RunAsUserName
# is the JMS API User id which is used by the Business Process
# container MDB to process asynchronous API calls. This is only
# required when WebSphere security is enabled

```



```

#
# GetUsernameandPasswordforWorkflowRunAs.RunAsPassword
# GetUsernameandPasswordforWorkflowRunAs.ConfirmationRunAsPassword
# is the password for the JMS API User
# NOTE: the RunAsPassword and the ConfirmationRunAsPassword need to be identical
#
# GetUsernameandPasswordforWorkflowRunAs.FlowAdminRole
# is the Security Role for Business Process System Administrator

-W GetUsernameandPasswordforWorkflowRunAs.RunAsUserName=""
-W GetUsernameandPasswordforWorkflowRunAs.RunAsPassword=""
-W GetUsernameandPasswordforWorkflowRunAs.ConfirmationRunAsPassword=""
-W GetUsernameandPasswordforWorkflowRunAs.FlowAdminRole=""

# If you would like to install the CORBA C++ SDK,
# set the following value to "true"
#
# NOTE: CORBA C++ is currently not supported on the Linux PPC platform.

-P EEX_CORBA.active="false"

# If you would like to install Interface Repository
# Support for the CORBA C++ SDK, set the following
# value to "true".
#
# NOTE:This feature requires DB2.

-P EEX_CORBA_IR.active="false"

# If you would like to install the samples for the
# CORBA C++ SDK, set the following value to "true"

-P CorbaSDKSamples.active="false"

# If you would like NOT to install the javadoc,
# set the following value to "false"

-P EEX_JAVADOC.active="true"

# =====
# Migration:
#
# NOTE: You must uncomment and modify EVERY property
# in this section for silent migration to work properly.
# -----

# -----
# Uncomment the below line to indicate that you wish to
# migrate the previous version of WebSphere Application
# Server.

# -W PME_PreviousVersionPanel.migrationSelected="true"

# -----
# Direct the installer to operate on a specific previous
# version of WebSphere Application Server by uncommenting
# the next line and entering one of these values:
#
# Value          Edition
# *****      *****
# AE             WAS Advanced Edition (V4.0.x)
# advanced       WAS Advanced Edition (V4.0.x)
# AEs           WAS Advanced Single Server Edition (V4.0.x)
#
# Note: While migrating during WebSphere Business Integration

```

```

# Server Foundation v5.1 install, you must specify the edition
# of the WebSphere Application Server you wish to migrate, here.
#
# Note: For migration from WebSphere Application Server
# Enterprise 5.0.x, this field is not used. So simply
# set PME_PreviousVersionPanel.selectedVersionEdition to "<NONE>"
# -W PME_PreviousVersionPanel.selectedVersionEdition="AEs"

# -----
# Specify the version number of the previous version
# of WebSphere Application Server that you want to migrate
# For example : 5.0.0, 5.0.1, 5.0.2, 4.0, 4.0.1, etc...
#
# Note: While migrating during WebSphere Business Integration
# Server Foundation v5.1 install, you must specify the version
# of the WebSphere Application Server you wish to migrate, here.
#
# -W PME_PreviousVersionPanel.previousVersionSelected="5.0.0"

# -----
# Specify the location where the previous version of
# WebSphere Application Server is installed.
# -W PME_PreviousVersionPanel.selectedVersionInstallLocation=
#     "/opt/WebSphere/AppServer"

# -----
# Specify the path to the configuration file for the previous
# version. Configuration filenames are:
#
# Value                PME_PreviousVersionPanel.selectedVersionEdition
# *****
# admin.config         AE
# admin.config         advanced
# server-cfg           AEs
#
# Note: For migration from WebSphere Application Server
# Enterprise 5.0.x, this field is not used. So simply
# set PME_PreviousVersionPanel.selectedVersionConfigFile
#     to "<NONE>"
# -W PME_PreviousVersionPanel.selectedVersionConfigFile=
#     "/opt/WebSphere/AppServer/config/server-cfg.xml"

# -----
# Specify the directory where migration will backup
# information about the previous version.
# -W PME_MigrationInformationPanel.migrationBackupDir=
#     "/tmp/migrationbackup"

# -----
# Specify the directory where migration logs will be stored.
# -W PME_MigrationInformationPanel.migrationLogfileDir=
#     "/tmp/migrationlogs"

```

```

# =====
# Coexistence:
#
# NOTE: You must uncomment and modify EVERY property
# in this section for silent coexistence to work properly.
#
# -----

# Uncomment the below line to indicate that you wish to
# perform coexistence.

#-W PME_DoCoexistenceSilent.propertyValue="TRUE"

# -----
# The new value for the Bootstrap Port

#-W coexistencePanelBean.bootstrapPort="2810"

# -----
# The new values for the HTTP and HTTPs transports.

#-W coexistencePanelBean.httpTransportPort="9085"
#-W coexistencePanelBean.httpsTransportPort="9444"

# -----
# The new values for the admin console an secure admin
# console ports.

#-W coexistencePanelBean.adminConsolePort="9091"
#-W coexistencePanelBean.secureAdminConsolePort="9044"

# -----
# The new values for the csivServerAuthListener and
# the csivMultiAuthListener ports.
# NOTE: You can usually leave these set to 0

#-W coexistencePanelBean.csivServerAuthListenerAddr="0"
#-W coexistencePanelBean.csivMultiAuthListenerAddr="0"

# -----
# The new value for the sasSSLServerAuth port.

#-W coexistencePanelBean.sasSSLServerAuthAddr="0"

# -----
# The new values for the JMS Server Direct Address,
# JMS Server Security, and JMS Server QueuedAddress ports

#-W coexistencePanelBean.jmsServerDirectAddress="5569"
#-W coexistencePanelBean.jmsServerSecurityPort="5567"
#-W coexistencePanelBean.jmsServerQueuedAddress="5568"

# -----
# The new value for the soap connector address port

#-W coexistencePanelBean.soapConnectorAddress="8881"

# -----

```

```

# The new value for the DRS Client Address port
#-W coexistencePanelBean.drsClientAddress="7874"

# =====
# Optional:
#
# -----

# The below value specifies silent install.
# This value indicates that the install will be silent.

-silent

# -----
# Product Registration Tool
#
# To launch the Product Registration Tool, please change
# the value to "true"

-W launchPRTBean.active="false"

# -----
# First Steps
#
# If you want the First Steps to be displayed at the end
# of an umbrella installation, change the value to "true"

-W firstStepsSequenceBean.active="false"

# =====
# Internal Use Only
#
# These entries are for internal use only. DO NOT EDIT.
# -----

-W EEX_SetupTypePanel.selectedSetupTypeId="custom"
-W coexistencePanelBean.useIhs="false"
-W ProdCheck_PMEInstallLocation.active="false"

```

## setup\_nd.response

This topic describes the response file for installing the WebSphere Business Integration Server Foundation product to extend the Network Deployment product silently. Perform a silent installation as the root user on a Linux or UNIX-based platform, or as a user that belongs to the administrator group on a Windows platform. Some steps of the silent installation procedure on a Windows platform require the administrator group user to have the advanced user rights *Act as part of the operating system* and *Log on as a service*.

Silent installation reads all of the installation choices from an options response file.

There are two types of installation for the Integration Server product, so there are two separate options response files.

This setup\_nd.response file is for extending the Network Deployment product. The setup.response file is for extending the base product. You must customize an options response file before you can use it to perform a silent installation. An options response file has nothing to do with the Installation wizard and the default values that appear on the wizard panels.

## Location

This sample options response file, `setup_nd.response`, is on the product CD in the *operating-system platform* directory. Copy the file to a hard disk to customize it.

## Usage notes

- This file is not a read-only file.
- Edit this file directly with your flat file editor of choice, such as WordPad on a Windows platform.
- This file is not updated by any product components.
- The file must exist to perform a silent installation of the Integration Server product on top of an existing installation of the Network Deployment product. When installing silently, the installation program does not display a wizard but instead, reads this file to determine installation option values.
- You can change the `-W launchPRTBean.active` option to display the Registration panel for a confirmation of completeness on a local system with a graphical user interface.
- Review the installation logs in the *install\_root/logs* directory or in the `/tmp` directory (the system `%TEMP%` directory on a Windows platform) to verify the status of the installation.

## Example of `setup_nd.response` file, for use with the Network Deployment product

The following example is similar to the file that ships with the Integration Server.

```
# *****
# Response file for installing
# WebSphere Business Integration Server Foundation v5.1
# on an existing
# WebSphere Application Server Network Deployment v5.1.
# *****

# *****
# Usage:
# Windows:
# fully_qualified_CD_pathname\install
# -options fully_qualified_HDD_pathname\setup_nd.response
# ie: d:\win\install -options c:\temp\setup_nd.response
#
# Other Platforms:
# fully_qualified_CD_pathname/install
# -options fully_qualified_HDD_pathname/setup_nd.response
# ie: /mnt/cdrom/linuxi386/install -options /tmp/setup_nd.response
#
# Note: the install program cannot be run locally from the CDROM as you
# may need to switch CDs during the install.
# *****

# Note: To install WebSphere Business Integration Server Foundation v5.1
# on an existing WebSphere Application Server v5.1 or in a new location
# please use the response file "setup.response"

# =====
# Please follow the comments to use the response file and understand
# the various options. You must carefully complete or change the various
# values. If the values are not completed properly, the install may be
# unsuccessful.
#
# NOTE: This file is for silent install only.
#
# IMPORTANT: ALL VALUES MUST BE ENCLOSED IN DOUBLE QUOTES ( "" ).
# -----

# =====
# Install Location:
```

```

#
# Please specify the install location of the WebSphere Application
# Server Network Deployment v5.1 here.
# -----

-P EEX_WASPME.installLocation="C:\Program Files\WebSphere\DeploymentManager"

# =====
# Migration:
#
# NOTE: You must uncomment and modify EVERY property
# in this section for silent migration to work properly.
# -----

# -----
# Uncomment the below line to indicate that you wish to
# migrate the previous version of WebSphere Application
# Server.

# -W ND_PreviousVersionPanel.migrationSelected="true"

# -----
# Direct the installer to operate on a specific previous
# version of WebSphere Application Server by uncommenting
# the next line and entering one of these values:
#
# Value          Edition
# *****
# AE             WAS Advanced Edition (V4.0.x)
# advanced      WAS Advanced Edition (V4.0.x)
# AEs           WAS Advanced Single Server Edition (V4.0.x)
#
# Note: While migrating during WebSphere Business Integration
# Server Foundation v5.1 install, you must specify the edition
# of the WebSphere Application Server you wish to migrate, here.
#
# Note: For migration from WebSphere Application Server
# Enterprise 5.0.x, this field is not used. So simply
# set ND_PreviousVersionPanel.selectedVersionEdition to "<NONE>"

# -W ND_PreviousVersionPanel.selectedVersionEdition="AEs"

# -----
# Specify the version number of the previous version
# of WebSphere Application Server that you want to migrate
# For example : 5.0.0, 5.0.1, 5.0.2, 4.0, 4.0.1, etc...
#
# Note: While migrating during WebSphere Business Integration
# Server Foundation v5.1 install, you must specify the version
# of the WebSphere Application Server you wish to migrate, here.
#
# -W ND_PreviousVersionPanel.previousVersionSelected="5.0.0"

# -----
# Specify the location where the previous version of
# WebSphere Application Server is installed.

# -W ND_PreviousVersionPanel.selectedVersionInstallLocation
#      ="/opt/WebSphere/AppServer"

```



```

# -----
# Specify the path to the configuration file for the previous
# version. Configuration filenames are:
#
# Value          ND_PreviousVersionPanel.selectedVersionEdition
# *****
# admin.config   AE
# admin.config   advanced
# server-cfg     AEs
#
# Note: For migration from WebSphere Application Server
# Enterprise 5.0.x, this field is not used. So simply
# set ND_PreviousVersionPanel.selectedVersionConfigFile to "<NONE>"

# -W ND_PreviousVersionPanel.selectedVersionConfigFile=
#     "/opt/WebSphere/AppServer/config/server-cfg.xml"

# -----
# Specify the directory where migration will backup
# information about the previous version.

# -W ND_MigrationInformationPanel.migrationBackupDir="/tmp/migrationbackup"

# -----
# Specify the directory where migration logs will be stored.

# -W ND_MigrationInformationPanel.migrationLogfileDir="/tmp/migrationlogs"

# =====
# Optional:
#
# -----

# The below value specifies silent install. This value indicates that
# the install will be silent.

-silent

# -----
# Product Registration Tool
#
# To launch the Product Registration Tool, please change
# the value to "true"

-W launchPRTBean.active="false"

# =====
# Internal Use Only
#
# These entries are for internal use only. DO NOT EDIT.
# -----

-W pmeInstallLocation.installOption="PMEONWASND"
-W SetBaseInstallLocationBean_GUI.active="false"
-W EEX_SilentInstall.propertyValue="TRUE"
-W EEX_SetupTypePanel.selectedSetupTypeId="custom"
-W GotoFeaturePanel.active="false"
-W BaseInstalledActivatePMESequence.active="false"
-W ProdCheck_PMEInstallLocation.active="false"

```

## Automatically restarting server processes

There are several server processes related to WebSphere Application Server products that the operating system can monitor and automatically restart when the server processes stop abnormally. This task describes how to set up monitored processes.

To set up this function on a Linux and UNIX-based operating system, you must have root authority to edit the `inittab`.

On a Windows operating system, you must belong to the Administrator group and have the user rights *Act as part of the operating system* and *Log on as a service* to define Windows services. The installation wizard grants you the user rights, if your user ID is part of the Administrator group. It displays a message that states that although the advanced user rights are now effective, they do not display as effective until the next time you log on.

You can also add the user rights manually if you are performing a silent installation on a Windows platform. For example, to grant the user rights to your administrator group user ID on a Windows 2000 Server platform:

1. Click **Administrative Tools** in the Control Panel.
2. Click **Local Security Policy**.
3. Click **Local Policies**.
4. Click **User Rights Assignments**.
5. Right click **Act as part of the operating system**.
6. Click **Security**.
7. Click **Add**.
8. Click your user ID.
9. Click **Add**.
10. Click **OK**.
11. Click **OK**.
12. Right click **Log on as a service**.
13. Click **Security**.
14. Click **Add**.
15. Click **OK**.
16. Click **OK**.
17. Reboot your machine to make the settings effective.

Consult your operating system help for more information.

There are several environments where you might use this function of automatically restarting servers. You can restart the **server1** server process in a stand-alone WebSphere Application Server environment, for example. Here is a list of processes you might consider restarting:

- The **server1** process on a stand-alone Application Server
- The **dmgr** process on a deployment manager node
- The **nodeagent** server process on any Application Server node in a deployment manager cell
- The **jmsserver** process on the Application Server node, if the Application Server node has the embedded messaging feature
- The **IBM HTTP Server** process
- The **IBM HTTP Administration** process
- The **WebSphere Embedded Messaging Publish And SubscribeWAS\_node\_name\_jmsserver** process, if the Application Server node has the embedded messaging feature
- The **WebSphere Embedded Messaging Publish And SubscribeWAS\_node\_name\_server1** process, if the Application Server node has the embedded messaging feature

You can create Windows services during installation, using the installation wizard. The wizard lets you create services for these servers:

- The **server1** process in a stand-alone base product environment, defined as a manually started (versus automatic) service
- The **IBM HTTP Server** process and the **IBM HTTP Administration** process, defined as automatically started services when you choose to install the IBM HTTP Server feature during the base product installation
- The **dmgr** process on a deployment manager node, defined as a manually started (versus automatic) service

The installation wizard does not provide a way to create a service for a node agent because the deployment manager instantiates each node agent after installation when you add an Application Server node to the deployment manager cell. For this reason, you must manually create a function that automatically starts a failed nodeagent server process.

You must manually create a shell script that automatically starts any of the processes previously mentioned, on a Linux and UNIX-based operating system. Each Windows service or UNIX shell script controls a single process, such as a stand-alone WebSphere Application Server instance. Multiple stand-alone Application Server processes require multiple Windows service or UNIX scripts, which you can define.

In a Network Deployment environment, the **addNode** or **startNode** command starts a single unmonitored node agent only, the nodeagent process, and does not start all of the processes that you might define on the node. While running, the node agent monitors and restarts Application Server processes on that node, on either a Windows or a Linux and UNIX-based platform. Each Application Server process has MonitoringPolicy configuration settings that the node agent uses when monitoring and restarting the process.

It is recommended that you set up a monitored node agent process manually, either through a Windows service, or through the rc.was example shell script on Linux and UNIX-based platforms. The operating system monitors and automatically restarts the node agent process, nodeagent, if the process terminates abnormally, which means if the process stops without going through a normal shutdown. It is also recommended that you set up the deployment manager server, dmgr, as a monitored process. As mentioned, you can do this during installation on a Windows platform. On a Linux and UNIX-based platform, use the rc.was example shell script to set up the deployment manager dmgr server as a monitored process.

If you do not install the WebSphere Application Server base product or Network Deployment as a Windows service during installation, you can use the **WASService** command in the *install\_root/bin* directory to do so at a later time. You can use the tool to add any WebSphere Application Server process as a Windows service. The operating system can then monitor each server process, and restart the server if it stops.

1. **Use the installation wizard** to set up a Windows service to automatically monitor and restart processes related to the WebSphere Application Server product.
  - Perform the following procedure from the installation wizard for the base WebSphere Application Server product, to select services that the installation wizard can set up:
    - a. Click **Run WebSphere Application Server as a service**.

If you select this option, the installation wizard creates the following service during the installation:

**IBM WebSphere Application Server V5 - server1**

The IBM WebSphere Application Server V5 - server1 service controls the **server1** process in a stand-alone environment.

After you complete and verify the installation, use the Windows NT Services Control panel, or the Windows 2000 (or later) Services panel to change the **IBM WebSphere Application Server V5 - server1** service to an automatic startup type.

- 1) Right click **IBM WebSphere Application Server V5 - server1** and click **Properties**.

2) Click **Automatic** from the **Startup type** list box and click **OK**.

WebSphere Application Server Version 5.1 does not support Windows NT.

- b. Click **Run IBM HTTP Server as a service**.

Select this option on the machine where you are installing the IBM HTTP Server.

If you select this option, the installation wizard creates the following services during the installation:

- **IBM HTTP Server 1.3.2x** (either 1.3.26 or 1.3.28 for V5.1)
- **IBM HTTP Administration 1.3.2x** (either 1.3.26 or 1.3.28)

The installation wizard defines the startup type of these services as **automatic**. It is not necessary that you do so.

- c. Enter your user ID and password and click **Next**.

In a coexistence environment, you can change the default service names to make them unique. In a same version coexistence scenario for IBM HTTP Server 1.3.2x.x or 2.0.x on a Windows platform, you cannot use the default service names created by the installer because they are common.

To work around this problem:

- a. Install the first copy of IBM HTTP Server, either by itself or with WebSphere Application Server and select to install the services.
- b. Customize the service names for the first install by running the following commands from the first install location:

```
apache -k install -n "IHS 1.3.26(1)"
apache -k install -f conf\admin.conf -n "IHS 1.3.26 Administration (1)"
```

If you are installing IBM HTTP Server 1.3.28, use these commands:

```
apache -k install -n "IHS 1.3.28(1)"
apache -k install -f conf\admin.conf -n "IHS 1.3.28 Administration (1)"
```

- c. Edit the `AdminAlias` directive in the `install_location 1\conf\admin.conf` file to point to the new service name, such as **IHS 1.3.26(1)**.
- d. Remove the default service names installed by the first install by running the following commands:

```
apache -k uninstall -n "IBM HTTP Server 1.3.26"
apache -k uninstall -n "IBM HTTP Administration 1.3.26"
```

- e. Install the second copy of IBM HTTP Server, either by itself or with WebSphere Application Server. The default service names will now correspond to the second install.

**Note:** Customized service names must be unique on your system.

- Perform the following procedure from the installation wizard for the Network Deployment product:
  - a. Click **Run WebSphere Application Server Network Deployment as a service**.
  - b. Enter your user ID and password and click **Next**.

The installation wizard creates the following service during the installation:

**IBM WebSphere Application Server V5 - dmgr**

The IBM WebSphere Application Server V5 - dmgr service controls the **dmgr** server process, which is the deployment manager server that administers the cell.

2. **After installing**, use the `WASService.exe` utility in the `install_root\bin` directory to manually define a Windows service for another installation or configuration instance of the base WebSphere Application Server product.
3. **After installing**, use the `WASService.exe` tool to manually define the `nodeagent` server process as a Windows service.  
You can use the same tool to manually define a Windows service for another installation or configuration instance of either the base WebSphere Application Server product or the Network Deployment product.
4. **After installing**, set up a Linux and UNIX-based shell script to automatically monitor and restart the `nodeagent` server or any other related server process.
  - a. Locate the `rc.was` example shell script, which is in the `install_root/bin` directory.

- b. Create a new shell script for each process that the operating system is to monitor and restart.
- c. Edit each shell script according to comments in its header, which provide instructions for identifying a WebSphere Application Server process.
- d. Edit the inittab table of the operating system, to add an entry for each shell script you have created.

Comments in the header of the `rc.was` file show a sample inittab entry line for adding the script.

This inittab entry causes the Linux and UNIX-based system to call each shell script whenever the system initializes. As it runs, each shell script monitors and starts the server process you specified.

Each shell script monitors and restarts an individual WebSphere Application Server process in a stand-alone environment, or a node agent or deployment manager process in an WebSphere Application Server Network Deployment environment.

You can use the **net start** and **net stop** commands to control the IBM HTTP Server services on a Windows system. For more information about these commands, see the Windows help file. Access these commands from the Start menu, clicking **Start > Programs > IBM HTTP Server**.

You can also use the **Start the Server** and **Stop the Server** commands to control the IBM WebSphere Application Server on a Windows system. Access these commands from the Start menu, clicking **Start > Programs > IBM WebSphere > Application Server V5.1**.

You can also use the **Start the Manager** and **Stop the Manager** commands to control the Network Deployment dmgr server on a Windows system. Access these commands from the Start menu, clicking **Start > Programs > IBM WebSphere > Application Server V5.1 > Deployment Manager**.

Processes started by a **startServer** or **startNode** or **startManager** command are not running as monitored processes, regardless of how you have configured them.

For example, you can configure a base Application Server as a WebSphere Application Server monitored process. However, if you start the Application Server instance using the **startServer** command, the operating system does not monitor or restart the Application Server because the operating system did not start the process as a monitored process.

Return to Installing the product to continue.

## WASService command

The **WASService** command line tool lets you add any WebSphere Application Server process as a Windows service.

WebSphere Application Server processes that you could add as Windows services include:

- Any base Application Server, such as the default `server1` process
- The `jmsserver` process that exists on a base Application Server node when you have installed the embedded messaging server feature and the node is part of a deployment manager cell
- The `nodeagent` process on a base Application Server node that is part of a deployment manager cell
- The deployment manager process, `dmgr`, on the Network Deployment node

If the installation wizard creates a Windows service during installation, the uninstaller program removes the Windows service. If you use the **WASService** command to create a service yourself, it is your responsibility to remove the service when it is no longer valid. The uninstaller program does not remove Windows services that you create with the **WASService** command.

## Location of command file

The `WASService.exe` command file is located in the `install_root\bin` directory.

## WASService.exe command syntax for starting an existing service

The command syntax is as follows:

```
WASService.exe [-start] service_name
```

## WASService.exe command syntax for creating a service

The command syntax is as follows:

```
WASService.exe -add service_name  
                -serverName Server  
                [-wasHome install_root]  
                [-configRoot configuration_repository_directory]  
                [-startArgs additional_start_arguments]  
                [-stopArgs additional_stop_arguments]  
                [-userid execution_id -password password]  
                [-logFile service_log_file]  
                [-logRoot server_log_directory]  
                [-userScript path\setupCmdLine.bat]  
                [-restart true | -restart false]
```

## WASService.exe command syntax for deleting a service

The command syntax is as follows:

```
WASService.exe -remove service_name
```

## WASService.exe command syntax for stopping a running service

The command syntax is as follows:

```
WASService.exe -stop service_name
```

## WASService.exe command syntax for retrieving service status

The command syntax is as follows:

```
WASService.exe -status service_name
```

## Parameters

Supported arguments include:

**-add** *service\_name*

Creates a service named *service\_name*.

**-configRoot** *configuration\_repository\_directory*

Optional parameter that identifies the configuration directory of the installation root directory of a WebSphere Application Server product.

**-logFile** *service\_log\_file*

Optional parameter that identifies a log file that the **WASService** command uses to record its activity.

**-logRoot** *server\_log\_directory*

Optional parameter that identifies a wsinstance server log directory that the **WASService** command uses to determine if the server is running.

**-remove** *service\_name*

Deletes the specified service.

**-restart true | false**

Restarts the existing service automatically if the service fails when set to true.



- server** *Server\_name*  
Identifies the server that the service controls.
- start** *service\_name*  
Starts the existing service. The `-start` parameter is the default parameter; you can omit the `-start` parameter and still start the service.
- startArgs** *additional\_start\_arguments*  
Optional parameter that identifies additional parameters.
- status** *service\_name*  
Returns the current status of the service, which includes whether the service is running or stopped.
- stop** *service\_name*  
Stops the specified service.
- stopArgs** *additional\_stop\_arguments*  
Optional parameter that identifies additional parameters.
- userid** *execution\_ID* **-password** *password*  
Optional parameters that identify a privileged user ID and password.
- userScript** *path\setupCmdLine.bat*  
Optional parameter that identifies the `setupCmdLine.bat` command file that the **WASService** command uses to understand wsinstance nodes.
- wasHome** *install\_root*  
Optional parameter that identifies the installation root directory of the WebSphere Application Server product.

### Creating a deployment manager service

This example creates a service called *IBMwas5Service - dmgr* that starts the dmgr process:

```
WASService -add dmgr
            -servername dmgr
            -wasHome "D:\Program Files\WebSphere\DeploymentManager"
            -logfile "D:\Program Files\WebSphere\DeploymentManager\logs\dmgr\startServer.log"
            -logRoot "D:\Program Files\WebSphere\DeploymentManager\logs\dmgr"
            -restart true
```

### Creating a node agent service

This example creates a service called *IBMwas5Service - nodeagent* that starts the nodeagent process:

```
WASService -add nodeagent
            -servername nodeagent
            -wasHome "D:\Program Files\WebSphere\AppServer"
            -logfile "D:\Program Files\WebSphere\AppServer\logs\nodeagent\startServer.log"
            -logRoot "D:\Program Files\WebSphere\AppServer\logs\nodeagent"
            -restart true
```

### Creating an Application Server service

This example creates a service called *IBMwas5Service - server2* that starts an Application Server process:

```
WASService -add server2
            -servername server2
            -wasHome "D:\Program Files\WebSphere\AppServer"
            -logfile "D:\Program Files\WebSphere\AppServer\logs\server2\startServer.log"
            -logRoot "D:\Program Files\WebSphere\AppServer\logs\server2"
            -restart true
```

---

## firststeps command

The **firststeps** command starts the First Steps tool.

First Steps is a post-installation ease-of-use tool for directing WebSphere Application Server elements from one place. Options dynamically appear on the First Steps panel, depending on features you install. With all options present, you can use First Steps to start or stop the Application Server, verify the installation, access the information center, access the administrative console, access the Samples Gallery, or launch the product registration.

First Steps starts automatically at the end of the installation of the base product, during an umbrella installation. If it is not running, start First Steps from the command line:

### Location of the command file

Beginning with V5.1, the location of the `firststeps.sh` or `firststeps.bat` script is:

- On Linux and UNIX-based server platforms: `install_root/firststeps/firststeps.sh`
- On Windows platforms: `install_root\firststeps\firststeps.bat`

### Parameters

No parameters are associated with this command.

### Syntax for the firststeps command on a Linux or UNIX-based platform

The command syntax is as follows:

```
./firststeps.sh
```

### Syntax for the firststeps command on a Windows platform

The command syntax is as follows:

```
firststeps.bat
```

### Usage tips

If this is the first time you have used the First Steps panel since installing the product, click **Verify installation** to make sure that all is well with your installation. The verification process starts the server for you. Do not select the **Start the server** option at the same time that the installation verification test (IVT) is running. There is a known problem if you select the **Start the server** option at the same time that the IVT is running.

After selecting the **Start the server** option, an output screen displays with status messages. The success message informs you that the server is open for business. Then the menu item changes to **Stop the server**.

Do not select any other options from the First Steps panel after selecting the **Start the server** option. There is a known problem that prevents the proper operation of the installation verification test when you select the **Verify Installation** option after selecting the **Start the server** option. Stop the server before verifying the installation.

The installation verification test is not supported on node names that contain double-byte characters. See "Troubleshooting the installation" on page 250 for more information.

The Web administrative console is a configuration editor that runs in a Web browser. The administrative console lets you work with Application Server configuration files encoded in XML. Changes made using the administrative console take effect the next time you start the Application Server. To launch the

administrative console, click **Administrative console**. You can also point your browser to `http://your_host_name:9090/admin` to start the administrative console. Substitute your own host name in the address. As the administrative console opens, it prompts you for a login name. This is not a security item, but merely a tag that allows you to identify configuration changes you make during the session.

From the First Steps menu, click on **Samples gallery** to explore the sample applications. Alternatively you can point your browser directly to `http://DNS_host_name:9090/WSsamples`. This command is case sensitive. Substitute your own host name in the address.

The Samples gallery option displays on the First Steps menu even when no Samples are installed. When there are no Samples, the link is inactive and does not work. You can ignore the option or remove it from the panel. To remove the option from the panel, perform one of the following procedures:

Linux and UNIX-based platforms:

1. Edit the `install_root/firststep/firststep.sh` file.
2. Change `./firststeps` to `./firststeps_no_samp`.

Windows platforms:

1. Edit the `install_root\firststep\firststep.bat` file.
2. Change `.\firststeps` to `.\firststeps_no_samp`.

If the Mozilla browser is your default browser, some of the links on the First Steps panel do not work. If you cannot use the First Steps panel, launch the links directly from your browser.

You can also try a symbolic link to the Mozilla browser to fix the problem as shown in the following example:

```
ln -sf /usr/bin/mozilla /usr/bin/netscape
```

Links on the First Steps panel for the base WebSphere Application Server product:

### Button Link

#### Product Overview

<http://www.ibm.com/software/webservers/appserv/>

It is possible that your security options might prevent redirection, such as to the <http://www-306.ibm.com/software/info1/websphere/index.jsp?tab=products/appserv> Web site. If so, you can identify the IBM Web site as a trusted site to allow the redirection. For example, on Internet Explorer, add <http://www-306.ibm.com> to the list of Trusted Sites by selecting **Tools > Internet Options > Security (tab) > Trusted Sites**.

#### WebSphere information center

<http://publib.boulder.ibm.com/infocenter/ws51help/index.jsp>

#### Samples Gallery

<http://localhost:9080/WSsamples>

Use the HTTP transport port if you changed the port setting during installation.

If you do not install Samples this option does not appear on the First Steps panel.

There is a known problem with this option if you do not install Samples during the initial installation of the base product. If you install Samples later in an incremental installation, such as when installing Samples during the installation of WebSphere Business Integration Server Foundation, the option is not added to the panel. If you install Samples in an incremental installation, use the link in this description to access the Samples.

Change the First Steps port number for the Samples option to match the port number in a coexistence scenario.

If you choose the coexistence option during installation, edit the Samples address to make it comply with the new port value for the HTTP transport port. Manually edit the port number when First Steps attempts to open the page. Change the port to match the coexistence port number for the HTTP transport port. The following example shows how to change the address to the default coexistence port number for the HTTP transport port:

`http://localhost:9085/WSsamples`

### **Administrative Console**

`http://localhost:9090/admin`

Change the First Steps port number for the administrative console option to match the port number in a coexistence scenario.

Edit the administrative console address when First Steps attempts to open the administrative console Web address. Change the port to match the coexistence port number for the administrative console port. The following example shows how to change the address to the default coexistence port number for the administrative console port:

`http://localhost:9091/admin`

Links on the First Steps panel for the Network Deployment product:

### **Button Link**

#### **Product Overview**

`http://www.ibm.com/software/webservers/appserv/`

It is possible that your security options might prevent redirection, such as to the `http://www-306.ibm.com/software/info1/websphere/index.jsp?tab=products/appserv` Web site. If so, you can identify the IBM Web site as a trusted site to allow the redirection. For example, on Internet Explorer, add `http://www-306.ibm.com` to the list of Trusted Sites by selecting **Tools > Internet Options > Security (tab) > Trusted Sites**.

#### **WebSphere information center**

`http://publib.boulder.ibm.com/infocenter/ws51help/index.jsp`

### **Administrative Console**

`http://localhost:9090/admin`

Change the First Steps port number for the administrative console option to match the port number in a coexistence scenario.

Edit the administrative console address when First Steps attempts to open the administrative console Web address. Change the port to match the coexistence port number for the administrative console port. The following example shows how to change the address to the default coexistence port number for the administrative console port:

`http://localhost:9091/admin`

### **Viewing the registration page in English in DBCS locales**

The **Register the product** entry on the First Steps menu displays the default welcome page in English when the machine locale uses a double byte character set (DBCS) language.

---

## **Using the installation verification test**

After installing the base product during an umbrella installation, you are ready to use the installation verification test (IVT).

The IVT program scans product log files for errors and verifies core functionality of the product installation.

1. If you started the administrative server of a previous WebSphere Application Server product from V3.5.x and later, or V4.0.x or later, to let the installation wizard export its configuration and applications to Version 5, stop the server before running the IVT. Otherwise, the Version 5 server might not start due to port conflicts between the two servers.
2. Select **Verify Installation** from the First Steps panel and observe the results in the First Steps status window. A log file for the installation is created and stored in the `logs` directory with the name of `ivt.log`. Do not select any other options from the First Steps panel after selecting **Verify Installation** and while the IVT is running. There is a known problem if you select the **Start the server** option at the same time that the IVT is running.
3. If the First Steps tool is not running, start it from the `/bin/firststeps` directory.
  - On Linux and UNIX-based server platforms: `install_root/firststeps/firststeps.sh`
  - On Windows platforms: `install_root\firststeps\firststeps.bat`

You can also run First Steps from the Start Menu on Windows platforms.

4. You can also start the IVT tool from the `/bin` directory.
  - On Linux and UNIX-based platforms: `./ivt.sh`
  - On Windows platforms: `ivt`

The IVT program starts the server automatically if the server is not running. Once the server initializes, the IVT runs a series of verification tests and reports pass or fail status in a console window. It also logs results to the `install_root/logs/ivt.log` file. As the IVT verifies your system, it reports any errors it detects.

5. After installing IBM WebSphere Business Integration Server Foundation, verify the installation by running the Samples. If you did not install the Samples associated with the extensions you are verifying, rerun the installation and use the **Custom** installation type to add additional Samples. Running the Samples verifies core functionality of the installation.

- a. Start the server using one of these methods.
  - Locate the First Steps tool and select the **Start server** option.
  - Issue the command `install_root/bin/startServer.sh server1` from a command window. Use the `startServer.bat` script on Windows platforms.
- b. Use either of the following methods to run the Samples Gallery:
  - Use the First Steps GUI to run the Samples Gallery.
  - Invoke a browser window to access the following address:  
`http://localhost:9080/WSsamples/en/index.html`

If you change the HTTP transport port during installation, use the changed port number in the address.

- c. Follow the links and instructions on the `http://localhost:9080/WSsamples/en/index.html` page to access Samples of installed extensions.

Running a Sample successfully is an indication that the functionality of the extension is fully operational.

Return to Installing WebSphere Application Server to continue.

## ivt command

The **ivt** command starts the installation verification test (IVT) program.

The IVT program starts the process automatically if the process is not already running. Once the process initializes, the IVT runs a series of verification tests and reports pass or fail status in a console window.

The IVT program scans product log files for errors and verifies core functionality of the product installation.

You can start the IVT program from the command line or from the First Steps menu.

The installation verification test is not supported on node names that contain double-byte characters.

## Location of the command file

The command file is a script. On Linux and UNIX platforms, the command file is named `ivt.sh` in the `install_root/bin` directory. On Windows platforms, the command file is named `ivt.bat` in the `install_root\bin` directory.

## Parameters

No parameters are associated with this command.

## Syntax for the `ivt` command on a Linux or UNIX-based platform

The command syntax is:

```
ivt.sh
```

Issue the command from the `install_root/bin` directory.

## Syntax for the `ivt` command on a Windows platform

The command syntax is:

```
ivt.bat
```

Issue the command from the `install_root\bin` directory.

## Logging

The `ivt` command logs results to the `install_root/logs/ivt.log` file.

---

## Troubleshooting the installation

If you did not receive the *Successful installation* message or the *INSTFIN: The installation is complete.* line in the installation log, use this information to troubleshoot the installation.

1. Install the base product first before installing the Network Deployment product when installing both products on the same machine. Install the base product before installing the Network Deployment product when installing both products on the same machine. The embedded messaging feature is included in the default installation.

Table 32. Installation tip

Operating platform	Tip
All platforms	Installing WebSphere Application Server products in order on the same machine, when installing the embedded messaging component

2. To manage multiple base product Application Servers, install the Network Deployment product. The WebSphere Application Server, Version 5.x product does not provide centralized management of multiple servers. The WebSphere Application Server Network Deployment, Version 5.x product provides this function.  
The deployment manager process (`dmgr`) in the Network Deployment product manages a cell of Application Servers. You can federate a base Application Server into the cell or unfederate it. While federated, the configuration of the base Application Server is managed from the deployment manager.
3. Use the First Steps tool to run the installation verification test (IVT). Select **Verify installation**. Check the `install_root\logs\ivt.log` file for a summary of test results. Correct any errors and retry. The installation wizard automatically starts the First Steps tool at the end of installation.
4. Check the installation log files for errors after installing:



Installing creates the /logs/log.txt file and the /logs/WAS.WBISF.install.log file. Uninstalling creates the *install\_root*/logs/uninstlog.txt file and the *install\_root*/logs/WAS.WBISF.uninst.log file.

The following table shows the installation log locations when installing the application clients for Version 5.1. The location is fixed and might not agree with the installation root location if you specified a location during installation.

Table 33. Installation log locations when installing the WebSphere Application Server Application Clients

Windows system log path name	Linux and UNIX-based operating system log path name
C:\Program Files\WebSphere\AppClient\logs\WAS.Client.install.log	/opt/WebSphere/AppClient/logs/ WAS.Client.install.log

Table 34. Installation log locations when installing WebSphere Business Integration Server Foundation

Component	Installation log path name	
	Windows platforms: <i>install_root</i> \logs	Linux and UNIX-based platforms: <i>install_root</i> /logs/wbisf
Integration Server	log.txt uninstlog.txt WAS.WBISF.uninstall.log WAS.WBISF.install.summary.log WAS.WBISF.install.log	
	When the installation of the Integration Server also installs base product features, the following files are created:  baseInstallSummary.File baseResponse.File	
Administrative console	installAdminConsole.log	

Component	Windows platforms: <i>install_root</i> \logs\wbisf	Linux and UNIX-based platforms: <i>install_root</i> /logs/wbisf
Integration Server	PluginProcessorInst.log WBISFinstallApps.log EARExpanderErr.log EAREExpaxpanderOut.log	
	When an error installing Cumulative Fix 2 occurs, the following files are created:  was_update_apply.err was_update_apply.out	
Component	Windows platforms: %TEMP%	Linux and UNIX-based platforms: /tmp
Integration Server	WAS.WBISF.install.log	
	wbisf_launcher.log (debug information of install script)	
	wbisf_launchpad.log (debug information of launchpad script)	
	wbisf_jvm.log (debug and JVM searching information for ISMP native launcher)	

If the installation program cannot locate the WAS\_update directory from disk 2, the installation program fails immediately. The immediate failure leaves the WAS.WBISF.install.log file only in the /tmp directory (or in the system %TEMP% directory on Windows platforms). Normally, the installation program creates installation logs in the *install\_root/logs* directory. In some instances, such as the one where the WAS\_update directory does not exist, the installation program fails before it can copy the log files from the system temporary directory to the /logs directory. If you cannot find the installation log files in the *install\_root/logs* directory, look in the system temporary directory.

5. See if there are files in the *install\_root/classes* directory. When IBM Support queues work for you and provides you test or debugging fixes, you are supposed to place the fixes in the *install\_root/classes* directory. By default, the *install\_root/classes* directory is picked up first in the WebSphere Application Server class path to let it override other classes.

This directory lets you verify or debug a fix. After accepting the test fix or finishing with the debugging of the debug fix, you are supposed to delete the fix from the *install\_root/classes* directory to return the system to a working state. If you do not remove such fixes from the *install\_root/classes* directory, you can experience errors.

6. Turn on tracing if the installation logs do not contain enough information to determine the cause of the problem.

- Report the stdout and stderr logs to the console window, by adding the `-is:javaconsole` parameter to the **install** command:

- On Linux and UNIX-based platforms:

```
install -is:javaconsole
```

or capture the stream to a file with the following commands:

```
install -is:javaconsole > captureFileName.txt 2>&1
```

- On Windows platforms:

```
install.bat -is:javaconsole
```

or capture the stream to a file with the following commands:

```
install.bat -is:javaconsole > drive:\captureFileName.txt
```

- Capture additional information to a log of your choice with the `-is:log filename` option.
- Turn on additional installation logging by passing the `-W Setup.product.install.logAllEvents="true"` parameter to the **install** command:

- On Linux and UNIX-based platforms:

```
install -W Setup.product.install.logAllEvents="true"
```

- On Windows platforms:

```
install.bat -W Setup.product.install.logAllEvents="true"
```

If you install on an AIX 5.1 system, with maintenance level 2, it is possible that the Web-based system manager, a standard component of AIX systems, already uses port 9090. When starting the server you get information that port 9090 is already in use. To resolve the conflicting port use, change the port assignment for the HTTP\_TRANSPORT\_ADMIN port in the server.xml file. The file path is:

```
usr/websphere/appserver/config/cells  
/cell/nodes/node/servers/server1/server.xml
```

7. Use the First Steps tool or the command line method to start the Application Server. **To start the server from the command line:**

- On Linux and UNIX-based platforms: `install_root/bin/startServer.sh server1`
- On Windows platforms: `install_root\bin\startServer server1`

If you enable security, specify the `-user` and the `-password` parameters of the command.

8. Verify whether the server starts and loads properly, by looking for a running Java process and the *Open for e-business* message in the `SystemOut.log` and `SystemErr.log` files. If no Java process exists or if the message does not appear, examine the same logs for any miscellaneous errors. Correct any errors and retry. You can find the `SystemOut.log` and `SystemErr.log` files in the *install\_root/logs/server1* (Linux and UNIX-based platforms) or *install\_root\logs\server1* (Windows platforms) directory.

9. Use the First Steps tool or the command line method to stop the Application Server, if it is running, and to start the deployment manager. **To stop the server from the command line:**
  - On Linux and UNIX-based platforms: `install_root/bin/stopServer.sh server1`
  - On Windows platforms: `install_root\bin\stopServer server1`

If you enable security, specify the `-user` and the `-password` parameters of the command.

**To start the deployment manager from the command line:**

- On Linux and UNIX-based platforms: `install_root/bin/startManager.sh`
  - On Windows platforms: `install_root\bin\startManager`
10. Verify that the server starts and loads properly by looking for a running Java process and the *Server dmgr open for e-business* message in the `dmgr_stdout.log` and `dmgr_stderr.log` files. If no Java process exists or if the message does not appear, examine the same logs for any miscellaneous errors. Correct any errors and retry.
  11. Refer to the plug-in configuration documentation, if you have installed plug-ins and the Web server does not come up properly.
  12. Start the Snoop servlet.

In a Network Deployment environment, the Snoop servlet is available in the cell only if you included the DefaultApplication when adding the Application Server to the cell. The `-includeapps` option for the **addNode** command migrates the DefaultApplication to the cell. If the application is not present, skip this step.

- a. Start the Application Server.
- b. Start the IBM HTTP Server or the Web server that you are using. Use a command window to change the directory to the IBM HTTP Server installed image, or to the installed image of your Web server. Issue the appropriate command to start the Web server, such as these commands for IBM HTTP Server:

**To start the IBM HTTP Server from the command line:** Access the **apache** and **apachectl** commands in the `IBMHttpServer/bin` directory.

- On Linux and UNIX-based platforms: `./apachectl start`
  - On Windows platforms: `apache`
- c. Point your browser to `http://localhost:9090/snoop` to test the internal HTTP transport provided by the Application Server. Point your browser to `http://localhost/snoop` to test the Web server plug-in.
  - d. Verify that Snoop is running. Either Web address should display the Snoop Servlet - Request/Client Information page.
13. Start the WebSphere Application Server administrative console.
    - a. Start the Application Server.
    - b. Point your browser to `http://localhost:9090/admin`.
    - c. Type any ID and click **OK** at the administrative console window.

The server starts. The administrative console starts. You can access the administrative console through the browser. The administrative console accepts your login.

14. Verify that the Application Server was incorporated into the cell. The command window displays a sequence of messages when you issue the **addNode** command:

```
Begin federation of node xxxx with deployment manager at localhost:8879.
Successfully connected to deployment manager Server: localhost:8879
Creating node agent configuration for node: xxxx
Reading configuration for node agent process: nodeagent
Adding node xxxx configuration to cell: AdvancedDeploymentCell
Performing configuration synchronization between node and cell.
Launching node agent process for node: xxxx
Node agent launched. Waiting for initialization status.
Node agent initialization completed successfully. Process ID is: 3012
Node xxxx has been successfully federated.
```

The last message is an indicator of success. A second Java process is running, which is the `nodeagent` process. The `stdout.log` file and `stderr.log` file in the `node_name` directory contains a Server `node_name` open for e-business message.

15. Resolve any IP address caching problems.

By default, the Java 2 SDK caches the IP address for the domain name service (DNS) naming lookup. After resolving the host name successfully, the IP address stays in the cache. By default, the cache entry remains forever. This default IP caching mechanism can cause problems, as described in the following problem scenarios.

#### **Problem scenario 1**

Suppose the Application Server at `host1.ibm.com` has an initial IP address of `1.2.3.4`. When a client at `host2.ibm.com` conducts a DNS lookup of `host1.ibm.com`, the client stores the `1.2.3.4` address in the cache. Subsequent DNS name lookups return the cached value, `1.2.3.4`. The cached value is not a problem until the `host1.ibm.com` IP address changes, to `5.6.7.8`, for example. The client at `host2.ibm.com` does not retrieve the current IP address, but always retrieves the previous address from the cache. If this scenario occurs, the client cannot reach `host1.ibm.com` unless you stop and restart the client process.

#### **Problem scenario 2**

Suppose the Application Server at `host1.ibm.com` has an initial IP address of `1.2.4.5`. Although the IP address of the application server does not change, a network outage can record an exception code as the IP address in the cache, where it remains until the client is restarted on a working network. For example, if the client at `host2.ibm.com` disconnects from the network because of an unplugged cable, the disconnected lookup of the Application Server at `host1.ibm.com` fails. The failure causes the IBM Developer Kit to put the special exception code entry into the IP address cache. Subsequent DNS name lookups return the exception code, which is `java.net.UnknownHostException`.

#### **IP address caching and WebSphere Application Server process discovery**

If you change the IP address of a federated WebSphere Application Server node, processes running in other nodes cannot contact the changed node until you stop and restart them.

If a deployment manager process starts on a disconnected node, it cannot communicate with cell member processes until you stop and restart the deployment manager process. For example, plugging in an unplugged network cable does not restore proper addresses in the IP cache until the deployment manager process is restarted.

#### **Using the IP address cache setting**

You can always stop and restart a deployment manager process to refresh its IP address cache. However, this process might be expensive or inappropriate.

The `networkaddress.cache.ttl` (public, JDK1.4) and `sun.net.inetaddr.ttl` (private, JDK1.3) parameters control IP caching. The value is an integer that specifies the number of seconds to cache IP addresses. The default value, `-1`, specifies to cache forever. A value of `0` specifies to never cache.

Using a zero value is not recommended for normal operation. If you do not anticipate network outages or changes in IP addresses, use the cache forever setting. The never caching setting introduces the potential for DNS spoofing attacks.

#### **For more information about the Java 2 SDK**

The Java 2 SDK, Standard Edition 1.4 Web site at <http://java.sun.com/j2se/1.4/docs/guide/net/properties.html> describes the private `sun.net.inetaddr.ttl` property, which works in both Java 2 SDK, Standard Edition 1.3 (WebSphere Application Server V5.0.0, V5.0.1, and V5.0.2) and Java 2 SDK, Standard Edition 1.4 (WebSphere Application Server V5.1). The *Networking* section of the Java 2 SDK, Standard Edition 1.4 Web site at <http://java.sun.com/j2se/1.4/jcp/beta/> describes a change in the behavior of the `java.net.URLConnection` class.

16. Use the `tcp` option to mount CD drives or disk drives in a network file system (NFS) mount if the option is available. Refer to the man pages for the `mount` command to see if the `tcp` option is available. Using a CD drive or a disk drive mounted with the default mount option (`udp`) is known to

cause errors on some versions of Linux. Red Hat Enterprise Linux 3.0 UL1 on S/390 platforms is particularly sensitive to this problem, but the recommendation applies to all Linux platforms. Installing with product CDs that are physically located on an NFS server can fail. Symptoms that occur when installing with disk 1 on an NFS server include:

- An indication that the `/tmp/_wbi_/jdk/java/bin/java` file does not exist after issuing the **launchpad.sh** command or the **install** command and the installation fails.
- An indication of copy errors in the `/tmp/wbisf_launcher.log` file:

```
cp: cannot stat `/mnt/linuxs390/WAS/jdk/java/jre/lib/images':  
  No such file or directory  
cp: cannot stat `/mnt/linuxs390/WAS/jdk/java/jre/lib/security':  
  No such file or directory  
cp: cannot stat `/mnt/linuxs390/WAS/jdk/java/lib':  
  No such file or directory
```
- An indication of stale NFS file handle errors when trying to list the files under the NFS-mounted file system:

```
#ls /mnt/linuxs390/WAS/jdk/java/jre/lib  
ls.: :stale NFS file handle
```
- An indication of server-not-responding errors in the `/var/log/messages` file on the NFS client:

```
Mar 15 16:29:59 aushat178 kernel:  
  nfs: server svtnx4 not responding, still trying
```

Symptoms that occur when installing with disk 2 on the NSF server include:

- After clicking **Next** on the Prompt for disk 2 panel, the Installation wizard fails while copying the update installer application with an error that is similar to the following example:

```
Copying cumulative fix and update installer application failed.  
Cumulative fix or interim fixes cannot be applied.  
This installation is terminating.
```
- After the failure of the installation of the cumulative fix, there are missing directories in the `install_root/WAS_update` directory. You can verify missing directories by comparing the directory structure to the directory structure on disk 2.

Before installing with an NFS-mounted CD or hard disk, verify that the NFS is working correctly. For example, if your mounted CD is `/mnt`, issue the following command on zLinux to see if you have an NFS problem:

```
unzip -l /mnt/linuxs390/WAS/setup.jar
```

The proper output from the command lists all the files in the `setup.jar` file without error. If you encounter problems in running the command, verify that your `/etc/exports` file includes the `no_root_squash` option. Also mount the NFS drive with the `-o tcp` option. For example:

```
mount -o tcp mycdrom.hostname:/media/cdrom /mnt
```

See <http://www.redhat.com/docs/manuals/enterprise/RHEL-3-Manual/sysadmin-guide/s1-nfs-mount.html> for more information about the `-o tcp` option.

Contact your system administrator for help if you continue to have NFS problems.

#### 17. Avoid segmentation faults when installing on Red Hat Enterprise Linux 3.0 U1.

If you are installing from an operator console attached to the RHEL 3 U1 machine and you receive a message that is similar to the following message, you might be experiencing a known limitation of RHEL 3 U1:

```
A suitable JVM could not be found
```

Red Hat Enterprise Linux 3.0 causes a segmentation fault when calling the JVM. The problem occurs when you run the installation program, log off of the root user, log back on to root, and run the installation again on the operator console that is attached to the machine (not a telnet session).

The installation fails with a segmentation fault.

This is a known limitation of Red Hat Enterprise Linux V3.0 that causes a segmentation fault when calling the JVM.

Test the JVM to see if it is failing by running the following command:

```
/mnt/cdrom/platform/linuxi386/jdk/java/jre/bin/java -version
```

If you receive a "segmentation fault" message, reboot your machine or press Ctrl-x to reinstall. Rebooting the machine or pressing Ctrl-x resolves the problem.

18. Preserve symbolic links when copying product CDs to network file server (NFS) disks. When copying a CD for one operating system platform to a network file system (NFS) disk on another type of operating system using the `cp` command, you can encounter errors such as those in the following example:

```
a file is bad
no such file or directory exists
libcSup.2 cannot be accessed
```

The copy error occur when incorrectly copying symbolic link files.

An example of such an error occurs when copying an HP-UX CD image onto an AIX platform with the `cp -frp` command. The default `cp` command behavior on AIX is to resolve the symbolic links by copying the files to which the symbolic links point. Errors occur when a symbolic link resolves to a platform-specific library or file that is not present on the NFS operating system.

Use options on the copy command of the NFS system to copy symbolic links instead of resolving them. For example, the `-h` option on the `cp` command of the AIX platform copies symbolic links from the HP-UX CD to the NFS disk on the AIX platform.

Even with the `-h` option, the `cp` command on a Solaris platform does not preserve symbolic links when copying an HP-UX disk. On a Solaris platform, use the `tar -cvf` command to copy data from an HP-UX disk and preserve the symbolic links:

- a. Insert disk 2 for HP-UX platforms into the drive on the Solaris system.
- b. Close the file explorer window if one opens.
- c. Open a command window.
- d. Change directories:  

```
CD /cdrom/cdrom0
```
- e. Issue the following command:  

```
tar cvf * /workarea/filename.tar
```
- f. Change directories:  

```
CD /workarea
```
- g. Issue the following command:  

```
tar -xvf filename.tar
```

Consult the man page for the copy command on the NFS system to understand how the platform supports copying symbolic links.

19. Pick up secondary user groups for root before installing the embedded messaging feature.

On many systems, such as SuSe Linux, if you telnet and issue the `id` command or the `groups` command, you cannot see the groups `mqm` or `mqbrkrs` even though they might exist. Solve this problem in one of two ways:

- Use the `ssh` command to log in
- Issue the `su -` command

After using one of the commands, verify the required groups with the `id` command or the `groups` command.

In a normal root login, issue the `su` command. For a real root login, issue the `su -` command.

Display settings for a normal root login are automatic. For a real root login, you must set your display environment properly to successfully view the GUI installation wizard. Otherwise, you see a message about Preparing Java(™) Virtual Machine... and seven rows of dots, but no installation GUI and no further messages. Refer to the documentation for your platform to determine proper display settings.

If you see the following messages in the `SystemOut.log` file, you have not picked up the required secondary groups for root:



```
[date time CDT] 60cf2faf JMSRegistrati
  A MSGS0601I: WebSphere Embedded Messaging has not been installed
[date time CDT] 60cf2faf JMSEmbeddedPr A MSGS0050I:
  Starting the Queue Manager
[date time CDT] 60cf2faf JMSEmbeddedPr E MSGS0058E:
  Unable to start the JMS Server as WebSphere Embedded Messaging has not been installed
[date time CDT] 60cf2faf JMSService E MSGS0001E:
  Starting the JMS Server failed with exception:
  java.lang.Exception: MSGS0058E:
    Unable to start the JMS Server as
      WebSphere Embedded Messaging has not been installed
```

Also, the following associated messages are added to the mq\_install.log file:

```
wmsetup: date time Checking if user "root" is in group "mqm"
wmsetup: date time
wmsetup: date time ERROR: Group "mqm" exists, id "root" is
  defined to the group but does not
wmsetup: date time have the group in its current set of effective groups.
wmsetup: date time Current group membership is :
wmsetup: date time uid=0(root) gid=0(system) groups=2(bin)
wmsetup: date time You may need to login.
wmsetup: date time
wmsetup: date time ... RC 4 from Check_root
wmsetup: date time ERROR: User "root" not in group "mqm"
wmsetup: date time Check_root mqbrkrs
wmsetup: date time Checking for group "mqbrkrs" ...
wmsetup: date time lsgroup returned "mqbrkrs id=203
  admin=false users=root adms=root registry=files " RC=0
wmsetup: date time Checking if user "root" is in group "mqbrkrs"
wmsetup: date time
wmsetup: date time ERROR: Group "mqbrkrs" exists, id "root" is
  defined to the group but does not
wmsetup: date time have the group in its current set of effective groups.
wmsetup: date time Current group membership is :
wmsetup: date time uid=0(root) gid=0(system) groups=2(bin)
wmsetup: date time You may need to login.
wmsetup: date time
wmsetup: date time ... RC 4 from Check_root
wmsetup: date time ERROR: User "root" not in group "mqbrkrs"
```

20. Stop all instances of the process\_spawner.exe program on a Windows system before installing. The installation of Cumulative Fix 2 might fail if the process\_spawner.exe file is running. The problem happens when you install Cumulative Fix 2 on the base WebSphere Application Server product using the Installation wizard or the silent installation method.

- The Installation wizard fails with a message that is similar to the following message:

```
Installation of WebSphere Application Server V5.1
cumulative fix failed. Look into the log file
for more information. This install is terminating.
```

- The WAS.WBISF.install.log file in the *install\_root*/logs/ directory or in the system %TEMP% directory has a message that is similar to the following example:

```
Installation of cumulative fix pack failed.
Refer to was_update_apply.log under install logs directory for more details.
```

- The was\_update\_apply.out file in the *install\_root*/logs/wbisf directory or in the system %TEMP% directory has a message that is similar to the following example:

```
Task 114; Begin Installing fix pack 'was510_cf2_win', component 'process'.
Quiet Mode: Logging to C:\WebSphere\AppServer\logs\update\
  20040316_054259_was510_cf2_win_process_install.log
Task 114; End Installing fix pack 'was510_cf2_win', component 'process'.
Task 115; Begin Installing fix pack 'was510_cf2_win', component 'process.impl'.
Quiet Mode: Logging to C:\WebSphere\AppServer\logs\update\
  20040316_054300_was510_cf2_win_process_impl_install.log
java.io.FileNotFoundException: C:\WebSphere\AppServer\bin\process_spawner.exe
  (Access is denied)
  at java.io.FileOutputStream.open(Native Method)
```

```
at java.io.FileOutputStream.<init>(FileOutputStream.java(Compiled Code))
at java.io.FileOutputStream.<init>(FileOutputStream.java(Inlined Compiled Code))
at com.ibm.websphere.update.delta.Extractor.transferOut(Extractor.java(Compiled Code))
at com.ibm.websphere.update.delta.Extractor.extractJarEntryFile(Extractor.java:6362)
at com.ibm.websphere.update.delta.Extractor.handleFileEntry(Extractor.java:6175)
at com.ibm.websphere.update.delta.Extractor.handleEntry(Extractor.java:6067)
```

```
...
Task 115; End Installing fix pack 'was510_cf2_win', component 'process.impl'.
Task 116; Begin Completing fix pack 'was510_cf2_win'
```

End of [ "C:\WebSphere\AppServer\WAS\_update\updateSilent.bat" ]

A stray instance of the process\_spawner.exe program can cause the errors. Cumulative Fix 2 needs to update this file but cannot update it if the process is running.

Stop the process manually, if any processes are running, and restart the installation. To stop the process, run the Task Manager program, search for the process, and stop any running instances of the process\_spawner.exe program.

21. Do not use the installation verification test (IVT) from the First Steps program or by running the **ivt.sh** command (or the **ivt.bat** command on a Windows platform) if the node name contains double-byte characters. The installation verification test is not supported on node names that contain double-byte characters. You can receive an error that is similar to the following example:

```
java.lang.reflect.InvocationTargetException
  at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
  at sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:79)
  at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:41)
  at java.lang.reflect.Method.invoke(Method.java:386)
  at com.ibm.ws.bootstrap.WSLauncher.main(WSLauncher.java:94)Caused
    by: java.lang.NumberFormatException: For input string: ""
  at java.lang.NumberFormatException.forInputString(NumberFormatException.java:62)
  at java.lang.Integer.parseInt(Integer.java:469)
  at java.lang.Integer.parseInt(Integer.java:498)
  at com.ibm.websphere.ivt.client.ivtClient.main(Unknown Source)
  ...
```

22. Starting the Launchpad program for WebSphere Application Server clients, Version 5.1 using the Konqueror file in the K Desktop Environment on SuSE Linux Enterprise Server (SLES) causes an error.

When starting the Launchpad program for WebSphere Application Server clients, Version 5.1 using the Konqueror file manager in the K Desktop Environment (KDE) on Linux systems, a "Couldn't find the program launchpad.sh" error occurs.

Because the **launchpad.sh** command uses a relative path to locate the Java program, you should run the **launchpad.sh** command from the directory where the **launchpad.sh** command is located for the client program. When using the Konqueror file manager to issue the **launchpad.sh** command, the current directory is your home directory. Therefore, the **launchpad.sh** command cannot work.

You can troubleshoot the installation.

The Troubleshooting section of the information center contains more detailed debugging and reporting instructions. See Installation component troubleshooting tips for more information about troubleshooting the installation.

For current information available from IBM Support on known problems and their resolution, see the IBM Support page.

IBM Support has documents that can save you time gathering information needed to resolve this problem. Before opening a PMR, see the IBM Support page.

Return to the Installing WebSphere Application Server topic to continue.

---

## Creating multiple Version 5 configuration instances

*Multiple configuration instances*, as it applies to WebSphere Application Server products, is the ability to install the base WebSphere Application Server product or the Network Deployment product once, and to use the **wsinstance** command to create multiple instances of the initial installation, all running on the same machine at the same time.

Subsequent installation of the WebSphere Business Integration Server Foundation product to the initial installation of the WebSphere Application Server or Network Deployment product, installs the Integration Server extensions on the initial installation but does not automatically update existing configuration instances. Any configuration instances that you create after installing Integration Server do have Integration Server extensions.

In contrast to multiple configuration instances is *coexistence*, which refers to multiple *installations* of WebSphere Application Server, running on the same machine at the same time. Both coexistence and multiple configuration instances of the base WebSphere Application Server product imply various combinations of Web server interaction.

You can find a description of coexistence in *Migrating and Coexisting*.

You can install the base WebSphere Application Server product or the Network Deployment product one time and use the **wsinstance** tool in the `install_root\bin\wsinstance` folder to create multiple configuration instances. Each WebSphere Application Server configuration instance is a stand-alone instance with a unique name, and its own set of configuration files and user data folders. Configuration folders include `config`, `etc` and `properties`. User data folders include `installedApps`, `installableApps`, `temp`, `logs`, `tranlog` and `wstemp`. Each instance has the administrative console application to manage the configuration instance. The configuration instance shares all run-time scripts, libraries, the Software Development Kit, and other files with the initial Application Server.

Each configuration instance of the Network Deployment product is a stand-alone deployment manager (dmgr) with its own set of unique configuration files and user data folders for the cell. Configuration folders include `config`, `etc` and `properties`. User data folders include `installedApps`, `installableApps`, `temp`, `logs`, `tranlog` and `wstemp`. The dmgr configuration instance also includes the administrative console and the file transfer applications to manage the configuration instance.

You can configure and operate each configuration instance independently of other instances.

These limitations apply to multiple configuration instances:

- You cannot federate a configuration instance of the base product into a deployment manager cell. A deployment manager cannot manage a configuration instance.
- You cannot use the **Uninstall.exe** or **uninstall** command to remove a configuration instance. You must remove configuration instances with the `-delete` option of the **wsinstance** command, before uninstalling the installation instance.
- You cannot migrate the configuration and applications from an earlier release to a Version 5 configuration instance.

Reasons to use configuration instances include:

- You install the product only once.
- You can have stand-alone environments without the space or procedural constraints of multiple, full product installations. (Configuration instances use a minimal amount of space.)
- You can have a centralized development environment that is easy to maintain, where multiple developers and testers share one machine.
- You can create identical environments, where everyone is developing, testing, or performing in an identical workspace.

One reason to not use configuration instances is that you cannot federate a configuration instance of the base product into a deployment manager cell. A deployment manager cannot manage a configuration instance.

Use the following procedure to create and configure multiple V5 instances:

1. Install the base WebSphere Application Server product. Optionally, you can also install the Network Deployment product.
2. Back up the *install\_root/bin/wsinstance/configdefaults* directory. In certain situations, it might become necessary to restore the following files from the backup to the *install\_root/bin/wsinstance/configdefaults* directory:

- *./security.xml*
- *./nodes/\$NODE\_NAME/resources.xml*
- *./nodes/\$NODE\_NAME/serverindex.xml*
- *./nodes/\$NODE\_NAME/servers/\$SERVER\_NAME/resources.xml*

See the description of a possible error that can occur for more information.

3. Use the **wsinstance** command in the *WAS\_HOME/bin/wsinstance* folder, to create a configuration instance of the server you installed in step 1. Refer to the description of the **wsinstance** command to learn more about the command, and to see examples of use.

You must specify a unique directory path and a unique node name for each configuration instance.

You must also specify unique port numbers for each configuration instance. For example, on a Windows platform, specify ports beginning at 20002, for node shasti, in configuration instance\_root G:\shasti\WebSphere, on the planetjava machine, by issuing this command:

```
wsinstance.bat -name shasti
                -path G:\shasti\WebSphere
                -host planetjava
                -startingPort 20002
                -create
```

This command creates a separate set of configuration and other data files.

4. Install the WebSphere Business Integration Server Foundation product.  
If you install the Integration Server product, the installation wizard displays a list of installed base WebSphere Application Server installation instances in a list box. It also displays a list of installed Network Deployment installation instances. If you select an installation instance that has configuration instances, the Integration Server installation wizard installs Integration Server extensions on the initial installation instance but not on existing configuration instances.

Copy these files to each existing configuration instance to extend them with the Integration Server extensions:

- *server-pme.xml*
- *server-pme502.xml*
- *server-pme51.xml*

Copy the files from the *install\_root/bin/wsinstance/configdefaults/cells/host\_name/nodes/node\_name/servers/server1* directory to each *config\_instance\_install\_root/config/cells/host\_name/nodes/node\_name/servers/server1*.

5. Run the **setupCmdLine.bat** (or **setupCmdLine.sh**) script in the *bin* directory of the *instance\_root* folder to set the WebSphere Application Server environment to the configuration instance.

Or, you can set *WAS\_USER\_SCRIPT* to *instance\_root/bin/setupCmdLine.bat*, which has the same effect as running the **setupCmdLine** command.

On Linux and UNIX-based platforms, **source** the script to the parent shell to inherit the exported variables by running this command:

```
# ./setupCmdLine.sh (there is a space between the period and the slash)
```

Or, you can set *WAS\_USER\_SCRIPT* to *instance\_root/bin/setupCmdLine.sh*, which has the same effect as running the **setupCmdLine** command. For example:

```
# export WAS_USER_SCRIPT=/opt/inst1/bin/setupCmdLine.sh
```

After completing this step, you can start the application server configuration instance with the **startManager** or **startServer** command.

If you are using the embedded messaging feature, and you are logging on as a non-root user on a UNIX-based or Linux platform, you must add the mqm user and the root user to the mqm and mqbrkrs operating system groups, as described in the Installing WebSphere embedded messaging as the JMS provider topic.

You must download and apply any interim fixes for the embedded messaging feature to each configuration instance:

- Download interim fixes for the embedded messaging feature from the WebSphere MQ Service download site. The readme file that is bundled with the interim fix describes how to install the interim fix.
- Download any fix packs for the product from the IBM Support site for WebSphere Application Server. The readme file that is bundled with the fix pack describes how to use the update installer (also known as the updateInstaller program or the update installation wizard) for WebSphere Application Server products to install the fix pack. Installing a fix pack removes all interim fixes. You might have to reinstall interim fixes that are not in the fix pack to bring the embedded messaging feature back to the fix level you require.

#### 6. Associate a Web server with a configuration instance.

If you create multiple configuration instances of the base WebSphere Application Server product, you can configure each instance to either share a Web server with other configuration instances, or to use a separate Web server.

- **Share the Web server**

- a. Generate a `plugin-cfg.xml` configuration file for each application server configuration instance that is to share a Web server.
- b. Manually merge all `plugin-cfg.xml` configuration files into one file of the same name, `plugin-cfg.xml`. Put the file in the default folder for the first configuration instance, such as:  
`instance_root/WebSphere/AppServer/config/cells/plugin-cfg.xml`

If you use the same server name in multiple instances, (for example, suppose there are two `server1` entries), the merged file has duplicate entries that you must address. All requests for either `server1` instance are routed to the last one in the merged list.

To correct the problem, change duplicate server name entries to make them unique in the `PrimaryServers` stanza:

```
<PrimaryServers>
  <Server Name="server1"/>
  <Server Name="server1a"/>
</PrimaryServers>
```

Change each duplicate name in the merged file to match its unique name in the `PrimaryServers` stanza.

Three tips to follow when merging the files are:

- There should be only one instance of the tags `Config` and `Log`.
  - The properties `"keyring"` and `"stashfile"` should use the same location for all application servers in the merged file.
  - Combine all other tags from both files, so long as the tags do not have duplicate names.
- c. Edit the Web server configuration file on the Web server, as described in the *Configuring Web server plug-ins* topic, to point to the `plugin-cfg.xml` file.

Repeat this process to add or remove a configuration instance from the configuration that shares the Web server, or when you regenerate a plug-in configuration file for any configuration instance in the group.

- **Use a separate Web server**

This configuration is simple. Each application server configuration instance uses a different Web server.

- a. Use the Web server documentation to create a new Web server instance for each configuration instance.

For example, to install multiple images of the IBM HTTP Server:

- 1) Use the **InstallIHS** command script in the IHS directory on the product CD to install IBM HTTP Server for a second or later instance.
- 2) Install the multiple installation instance to a new directory.
- 3) Set a unique port for each multiple instance by editing the "port" directive in the `conf/httpd.conf` file in the IBM HTTP Server installation root.
- 4) Download and apply any interim fixes to each multiple instance of the IBM HTTP Server from the IBM Support site for IBM HTTP Server. The readme file that is bundled with the interim fix describes how to install the interim fix.
- 5) Download any fix packs for the product from the IBM Support site for WebSphere Application Server. The readme file that is bundled with the fix pack describes how to use the update installer for WebSphere Application Server products to install the fix pack to each multiple instance of the IBM HTTP Server using the silent interface of the WebSphere Application Server update installer:

```
updateSilent -ihsOnly -install -ihsInstallDir directory
```

Installing a fix pack removes all interim fixes except those installed for the IBM HTTP Server feature (or the embedded messaging feature). The fix pack includes all interim fix changes up to the point of the fix pack. You might have to reinstall interim fixes that are more current than the fix pack to bring the HTTP Server back to the fix level you require.

- 6) Copy the current binary plug-in from the `install_root\bin` directory of the WebSphere Application Server product, to the HTTP Server machine and update the `LoadModule` directive in the `httpd.conf` file accordingly.
  - 7) Copy the `plugin-cfg.xml` file from the `install_root\config\cells` directory of the WebSphere Application Server product, to the HTTP Server machine and update the `WebSpherePluginConfig` directive in the `httpd.conf` file accordingly.
  - b. Modify the Web server configuration file, such as the `httpd.conf` file for IBM HTTP Server, to point to the configuration instance.
    - 1) Specify the location of the WebSphere Application Server plug-in binary program. For example, when you install a plug-in feature, the installation wizard installs the plug-in binary program in the `install_root/bin` folder.
    - 2) Specify the location of the `plugin-cfg.xml` file of the configuration instance. This file is located in the `config/cells` or `config\cells` folder of the configuration instance root location.
7. Federate multiple installation instances into a deployment manager cell.
  8. Create additional servers in a multiple instance or coexistence environment.
  9. Change port assignments in configuration files if you have a node that you cannot start because of port conflicts.

Refer to the description of the **wsinstance** command to learn more about the command, and to see examples of use.

Return to Installing WebSphere Application Server to continue.

## wsinstance command

The **wsinstance** command creates multiple configuration instances of one initial installation of the product.

### Overview

The `wsinstance` script creates multiple configuration instances of either the base WebSphere Application Server or the deployment manager.



Each WebSphere Application Server configuration instance is a stand-alone instance with a unique name and its own set of configuration files and user data folders. Configuration folders include `config`, `etc` and `properties`. User data folders include `installedApps`, `installableApps`, `temp`, `logs`, `tranlog` and `wstemp`. Each configuration instance also has the administrative console application to manage the configuration instance. Each configuration instance shares all run-time scripts, libraries, the Software Development Kit, and other files with the initial Application Server.

Each deployment manager configuration instance is a different cell. You can federate Application Server installation instances into a deployment manager configuration instance.

Each configuration instance of the Network Deployment product is a stand-alone deployment manager (dmgr) with its own set of unique configuration files and user data folders for the cell. Configuration folders include `config`, `etc` and `properties`. User data folders include `installedApps`, `installableApps`, `temp`, `logs`, `tranlog` and `wstemp`. The dmgr configuration instance also includes the administrative console and the file transfer applications, to manage the configuration instance.

### Location of command file

The command file is located in the `install_root/bin/wsinstance` directory. The command file is a script named `wsinstance.sh` for Linux and UNIX-based platforms or `wsinstance.bat` for Windows platforms.

### wsinstance.sh command syntax for Linux and UNIX-based platforms

The command syntax is as follows:

```
wsinstance.sh -name instanceName
              -path instanceLocation
              -host hostName
              [-startingPort startingPort]
              [-readOnly]
              -create|-delete
              [-debug]
```

### wsinstance.sh command syntax for Windows platforms

```
wsinstance.bat -name instanceName
               -path instanceLocation
               -host hostName
               [-startingPort startingPort]
               [-readOnly]
               -create|-delete
               [ -debug]
```

### Parameters

Supported arguments include:

#### **-create|-delete**

A required parameter that specifies whether to create or delete the configuration instance.

#### **-debug**

An optional parameter that turns on the debug function of the Ant utility, which the `wsinstance` tool uses.

#### **-host *hostname***

A required parameter that specifies the host name where you are creating the configuration instance. This should match the host name you specified during installation of the initial product.

#### **-name *instanceName***

A required parameter that specifies the name of the new configuration instance. Use a unique value. The `wsinstance` command uses this name to construct the node name, which is `instanceName_hostname` for the new configuration instance of an Application Server ora deployment

manager. The instance name is also the name of the cell. It is important to have a unique name for each configuration instance, to provide a unique combination of host name and instance name, which together form the WAS\_NODE name for the configuration instance.

The embedded messaging feature requires unique node names. The wsinstance tool cannot prevent reusing node names for configuration instances created from read-only partitions. Embedded messaging is not supported when you reuse a node name for a configuration instance. So use a unique name.

**-path** *instanceLocation*

A required parameter that specifies the file path of the instance. All required folders for the instance are in this directory, which is unique to the configuration instance.

**-readOnly**

An optional parameter. The wsinstance tool can detect whether you are creating an instance from the base WebSphere Application Server or Network Deployment product in a read-only partition.

The wsinstance tool registers a new wsinstance in the `properties/wsinstance.properties` file of the original installation, if write access to the original product is available. If the original installation is in a read-only partition or if you use the `-readOnly` option, the wsinstance tool does not register the wsinstance within the `properties/wsinstance.properties` file of the original installation.

Creating configuration instances from an original installation in a read-only partition has service implications. There is no mechanism in the original installation to identify and update a configuration instance that you create from a read-only partition. Normally, the registration file in the original installation provides the mechanism for updating configuration instances. When you apply a fix pack or an interim fix to the original installation, the update installer also updates the registered configuration instances. However, there is no registration entry for a configuration instance created from a read-only partition, where no entry is made in the registration file.

When you install a fix pack or interim fix to the original installation, you must use the wsinstance tool to delete the configuration instance and recreate it. A configuration instance must be at the same fix level as the product from which you create it. Otherwise, the configuration instance is unsupported.

**-startingPort** *startingPort*

An optional parameter that specifies the starting port number for generating all ports for the configuration instance. If not specified, the wsinstance tool uses default ports, or custom-defined ports from a file that you can create.

## Example of creating an instance on a Linux or UNIX-based platform

To create a configuration instance for user `shasti`:

```
wsinstance.sh -name shasti
               -path ~/shasti/WebSphere
               -host planetaix
               -create
```

On a base WebSphere Application Server product installation, the command creates an Application Server configuration instance named `shasti` in location `~/shasti/WebSphere` with a node name of `shasti_planetaix`. If user `shasti` is to use the embedded messaging feature, you must add the user (`shasti`) to the `mqm` and `mqbrkrs` operating system groups, as described in *Installing WebSphere embedded messaging as the JMS provider*. This is true for any non-root user on a Linux or UNIX-based platform.

On a Network Deployment product installation, the command creates a deployment manager configuration instance named `shasti` in a cell named `shasti` in location `~/shasti/WebSphere` with a node name of `shasti_planetaix`.

## Example of creating an instance on a Windows platform

To create a configuration instance for user `shasti`:

```
wsinstance.bat -name shasti
               -path G:\shasti\WebSphere
               -host planetnt
               -create
```

On a base WebSphere Application Server product installation, the command creates an Application Server configuration instance named `shasti` in location `G:\shasti\WebSphere` with a node name of `shasti_planetnt`.

## Example of a creating an instance in a multiuser environment on a Linux or UNIX platform

Follow these steps to create a configuration instance for user `shasti` in a multiuser environment:

1. Create the configuration instance:

```
wsinstance.sh -name shasti
              -path ~shasti/WebSphere
              -host myhost
              -startingPort 12000
              -create
```

2. Change the owner of the folder:

```
chown -R shasti ~shasti/WebSphere
```

3. As a convenience, add a call to script `~shasti/WebSphere/bin/setupCmdLine.sh` in the profile of user `shasti` to set the environment when user `shasti` logs in.

4. Give these folder permissions to user `shasti`:

```
install_root/bin      --- rx (read and execute)
install_root/java     --- rx
install_root/properties ----r (read)
install_root/deploytool ----r
install_root/config   ----r
install_root/lib      ----r
install_root/classes  ----r
install_root/null     ----r
install_root/samples  ----r
install_root/Web      ----r
```

## Example of deleting a configuration instance

The following command is on more than one line for formatting purposes. Enter the command on one line to delete the configuration instance named `shasti`:

```
wsinstance.sh -name shasti
              -host planetaix
              -delete
```

## Using predefined port numbers

When you use the `wsinstance` tool without the `-startingPort` parameter, the tool attempts to examine a file named with the convention `instanceName_portdef.props` in the `/bin/wsinstance` directory of the installation root directory of the original product. You can create the file by copying the `portdef.props` template file and customizing the port numbers.

## Example of using default port assignments

When a port definition file is not present, the `wsinstance` tool generates a `hostname_instanceName_portdef.props` file in the `/bin/wsinstance` directory of the installation root directory of the original product, using the `portdef.props` template file.

When using the `winstance` tool from a read-only partition, the tool cannot create the `hostname_instanceName_portdef.props` file in a directory of the original product. Therefore, the tool creates the file in the installation root directory of the new instance.

The `winstance` tool adds one (1) to the default port numbers for the base WebSphere Application Server product. If you create two configuration instances using default port assignments, both instances have the same, conflicting port numbers until you change them.

### Incrementing default port numbers from a starting point

The `winstance` tool can assign port numbers based on a starting port value that you give on the command line, using the `-startingPort` parameter. The tool assigns port numbers sequentially from the starting port number value as it creates an `hostname_instanceName_portdef.props` file in the `winstance` subdirectory of the `bin` directory in the `install_root` folder.

In the case of creating an instance from a read-only partition, the resulting `hostname_instanceName_portdef.props` file is in the installation root of the new instance.

For example, a `hostname_instanceName_portdef.props` file created with `-startingPort 20002` would appear similar to this:

```
HTTPS_TRANSPORT_ADMIN=20002
CSIV2_SSL_SERVERAUTH_LISTENER_ADDRESS=20004
HTTP_TRANSPORT_ADMIN=20003
HTTP_TRANSPORT=20005
HTTPS_TRANSPORT=20006
INTERNAL_JMS_SERVER=20007
BOOTSTRAP_ADDRESS=20008
SAS_SSL_SERVERAUTH_LISTENER_ADDRESS=20009
DRS_CLIENT_ADDRESS=20011
SOAP_CONNECTOR_ADDRESS=20010
CSIV2_SSL_MUTUALAUTH_LISTENER_ADDRESS=20012
JMSSERVER_QUEUED_ADDRESS=20013
JMSSERVER_DIRECT_ADDRESS=20014
```

The order of port assignments can be arbitrary. Predicting assignments is not possible.

### Example of startingPort parameter use

The following example of using the `winstance` tool creates the `shasti_portdef.props` file with the content shown in the previous example:

```
winstance.bat -name shasti
              -path G:\shasti\WebSphere
              -host planetnt
              -startingPort 20002
              -create
```

### Setting up and using the configuration instance environment

Most tasks that you perform in a configuration instance are done from one shell or command window after you run the `setupCmdLine.sh` or `setupCmdLine.bat` script in the `/bin` directory of the configuration instance. Such a scenario might be:

1. Create the configuration instance using the `/bin/winstance/winstance.sh` (or `winstance.bat`) script from the original installation.
2. In that command window or in another, change directories to the `/bin` directory of the new configuration instance.
3. Establish a temporary override for the normal WebSphere Application Server environment by running the `setupCmdLine.sh` or `setupCmdLine.bat` script:

```
setupCmdLine.sh
```

4. In the same window, start server1 by changing directories to the `install_root/bin` directory of the original installation and issuing the command. There is no such command in the `/bin` directory of the configuration instance:

```
startServer.sh server1
```

This works because running the `setupCmdLine` script from the configuration instance reconfigures the WebSphere Application Server environment. Reconfiguring the environment lets you issue commands from the `/bin` directory of the original installation as if you were issuing them from the configuration instance. The configuration instance creates a virtual installation that includes the original installation `/bin` directory. The virtual environment lasts until you close the Linux or UNIX shell or the command window in a Windows environment.

Even after you close the shell or command window, the server you started is still running in a spawned process that retains the environment settings.

5. See how the environment has changed. Display all the environment variables. You can see one that points to the `setupCmdLine.sh` or `setupCmdLine.bat` file in the configuration instance. The name of the environment variable is `WAS_USER_SCRIPT`. For example, in a Linux bash shell or in the command window on a Windows platform, type:

```
set
```

6. Notice the changes in the environment. Display all the ports for the machine to see the ports that you set for the configuration instance. For example, in a Linux bash shell or in the command window on a Windows platform, type:

```
netstat -a
```

7. Open a browser window and point it at the port where you defined `HTTP_TRANSPORT_ADMIN` in the `hostname_instanceName_portdef.props` file in the installation root of the new instance. For example, suppose the setting is `HTTP_TRANSPORT_ADMIN=20003`. Open the administrative console for server1 by pointing your browser at:

```
http://hostname_orIP_address:20003/admin/
```

By setting the `WAS_USER_SCRIPT` environment variable to point to itself, the `setupCmdLine` script of the configuration instance overrides the `setupCmdLine` script of the original installation and redirects scripts in the `install_root/bin` directory of the original installation to work on configuration instance objects.

## Backing up required files before installing additional features or before installing the V5.0.x Enterprise product

Creating a new WebSphere Application Server V5.x instance using the `wsinstance` utility can fail with an "adminconsole" already exists error after adding features or installing the V5.0.x Enterprise product. The new instance cannot be administered until the `adminconsole.ear` is successfully deployed, but the `adminconsole.ear` cannot be deployed on the new instance. The text of the problem is similar to the following example:

```
WASX7022E: Problem running command
"$AdminApp install adminconsole.ear
  {-node CELL_INSTANCE
   -configroot /WAS_HOME/config
   -copy.sessionmgr.servername server1
   -appname adminconsole}"
-- exception information: com.ibm.ws.scripting.ScriptingException:

WASX7279E: An application with name "adminconsole" already exists.
  Select a different name.
```

The new instance of the Application Server might start successfully. However, the administrative console cannot start because of an error in the `wsinstance` template files caused by installing additional base features, additional Network Deployment features, or by installing Enterprise.

Use the following procedure to work around the problem:

1. Back up the *install\_root/bin/wsinstance/configdefaults* directory.
2. Use the installation program to add the new features or to install Enterprise.
3. Delete the following directories and their contents:
  - *install\_root/bin/wsinstance/configdefaults/backup*
  - *install\_root/bin/wsinstance/configdefaults/temp*
  - *install\_root/bin/wsinstance/configdefaults/\$CELL\_NAME/applications*
4. Restore the following files from the backup you made to their original locations in the *install\_root/bin/wsinstance/configdefaults* directory:
  - *./security.xml*
  - *./nodes/\$NODE\_NAME/resources.xml*
  - *./nodes/\$NODE\_NAME/serverindex.xml*
  - *./nodes/\$NODE\_NAME/servers/\$SERVER\_NAME/resources.xml*

Do not restore the entire backup you made. Restore only the files mentioned in this step.

*\$CELL\_NAME* refers to the name of the cell defined during the initial product installation.

*\$NODE\_NAME* refers to the name chosen for the node.

*\$SERVER\_NAME* refers to each of the servers present. Perform the procedure on each server.

See the technote [Creating a new V5 instance using the wsinstance command fails with "adminconsole" already exists error](#) for more information.

### Correcting a WASX7022E error

If you did not back up the wsinstance template files before installing additional features or before installing the V5.0.x Enterprise product, you can recover from the resulting WASX7022E error described in the preceding section with the following procedure.

1. Uninstall the product and the Enterprise product (if necessary).
2. Reinstall the product, selecting all features that you intend to use.
3. Back up the *install\_root/bin/wsinstance/configdefaults* directory.
4. Install the Enterprise product if necessary.
5. Delete the following directories and their contents:
  - *install\_root/bin/wsinstance/configdefaults/backup*
  - *install\_root/bin/wsinstance/configdefaults/temp*
  - *install\_root/bin/wsinstance/configdefaults/\$CELL\_NAME/applications*
6. Restore the following files from the backup you made to their original locations in the *install\_root/bin/wsinstance/configdefaults* directory:
  - *./security.xml*
  - *./nodes/\$NODE\_NAME/resources.xml*
  - *./nodes/\$NODE\_NAME/serverindex.xml*
  - *./nodes/\$NODE\_NAME/servers/\$SERVER\_NAME/resources.xml*

Do not restore the entire backup you made. Restore only the files mentioned in this step.

**If you cannot afford to reinstall the product on this system:** Do not use the wsinstance utility on this system. The corrupt templates will not affect functionality of the product other than the wsinstance utility.



## Creating servers in coexistence or multiple instance environments

WebSphere Application Server lets you create multiple servers based on an existing template, or using an existing server as a template. You can generate unique ports for the new server during its creation. Always select the unique port option when creating servers in a coexistence environment of multiple versions, installations or configuration instances, due to the likelihood of conflicting port assignments. Verify port assignments for the newly created server and change them if necessary.

1. Create a server (MyServer, for example) using either the administrative console or wsadmin scripts.
2. Log on to the administrative console.
3. Go to **Servers > Application Servers > MyServer > End Points**.
4. Go into each end point and change the port numbers.
5. Change the HTTP Transport ports.
  - a. Go to **Servers > application servers > MyServer > Web Container > HTTP Transports**.
  - b. Change the HTTP transport port numbers.
  - c. Make a record of the new port numbers.
6. Change the JMS server ports, if you create servers from an application server template that has the embedded messaging feature.
  - a. Go to **Servers > application servers > MyServer > Server Components > JMS Servers > Security Port Endpoint**.
  - b. Change the port numbers.
7. Change the JMS server ports, if you create servers from an application server template that is not federated into a deployment manager cell, but does have the embedded messaging feature.
  - a. Go to **Servers > application servers > MyServer > Server Components > JMS Servers > Security Port Endpoint**.
  - b. Change the port numbers.

To continue, return to one of these topics:

- Installing multiple Version 5 configuration instances
- Setting up Version 5 coexistence

## Changing HTTP transport ports

This topic describes how to change HTTP transports manually by editing configuration files. Use this procedure when a conflicting HTTP transport setting is preventing an application server or deployment manager instance from starting.

Edit the configuration files to resolve conflicting port assignments, as described below.

1. Look for symptoms of port number conflicts. Troubleshooting topics describe symptoms and ways to identify and fix possible port number conflicts.

Among the topics described are these:

  - Administration and Administrative Console troubleshooting tips
  - Client program does not work
  - Debugging WebSphere Application Server applications
  - Errors after enabling SSL, or SSL-related error messages
  - Problems starting or using the wsadmin command
  - Troubleshooting migration problems
  - Web Container troubleshooting tips
  - Web module or application server dies or hangs
  - Web resource (JSP file, servlet, HTML file, image) does not display
2. Edit an application server configuration.
  - a. Open the server.xml configuration file for the server1 application server.

The file path for the server1 configuration, with a node name of **mynode**, is:

*install\_root/config/cells/mynode/nodes/mynode/servers/server1*

- b. Look for transports `xmi:type="applicationserver.webcontainer:HTTPTransport"`.

The administrative console application uses transport ports 9090 and 9043. The Sample applications use transport ports 9080 and 9443. Change the port numbers and save the file. Make a record of the new port numbers.

- c. Open the `virtualhosts.xml` file in the *install\_root/config/cells/mynode* folder.

This file contains alias entries for transport ports defined in the `server.xml` file.

- d. Look for aliases `xmi:id` to change port number assignments for any ports you changed.

3. Edit a deployment manager node configuration.

The deployment manager uses HTTP transport ports for the administrative console application. The default port is 9090.

- a. Open the `server.xml` configuration file for the dmgr deployment manager server.

The file path for the dmgr configuration, with a cell name of **myManager**, and a node name of **mynode**, is:

*install\_root/config/cells/myManager/nodes/mynode/servers/dmgr*

- b. Look for transports `xmi:type="applicationserver.webcontainer:HTTPTransport"`.

The administrative console application uses transport ports 9090 and 9043. Change the port numbers and save the file. Make a record of the new port numbers.

- c. Open the `virtualhosts.xml` file in the *install\_root/config/cells/mynode* folder.

This file contains alias entries for transport ports defined in the `server.xml` file.

- d. Look for aliases `xmi:id` to change port number assignments for any ports you changed.

To continue, return to one of these topics:

- Installing multiple Version 5 configuration instances
- Setting up Version 5 coexistence

---

## Installing interim fixes, cumulative fixes, and fix packs

This topic describes the proper procedure for using the update installer program to install interim fixes, cumulative fixes, and fix packs. The update installer program is also known as the `updateInstaller` program or the Update installation wizard.

The update installer program installs interim fixes, cumulative fixes, and fix packs to WebSphere Application Server products.

Three different Web sites contain interim fixes for WebSphere Application Server products and features. Three sites exist because two of the features of the base product have their own service and support sites.

You cannot install or uninstall interim fixes for either of the two features using the update installer program for WebSphere Application Server. See the following tips for more information:

*Table 35. Installation tip*

Operating platform	Tip
All platforms	<ul style="list-style-type: none"><li>• Installing interim fixes for the IBM HTTP Server feature and the embedded messaging feature</li><li>• Uninstalling interim fixes for the IBM HTTP Server feature and the embedded messaging (WebSphere MQ) feature before installing cumulative fixes and fix packs to the features</li></ul>

You must use the update installer program to install cumulative fixes and fix packs for the two features. The relationship among interim fixes, cumulative fixes, and fix packs is shown in the Cumulative Fix Strategy for WebSphere Application Server V5.0 and V5.1 Web page.

Fix packs are also known as *fixpacks*, *FixPaks* and *program temporary fixes*, or PTFs.

There are two interfaces to the update installer application, a wizard with a graphical interface, and a command-line, silent interface.

This topic describes the proper procedure for installing an interim fix or a fix pack on any or all Application Server products in an entire cell, or installing on a stand-alone product in a WebSphere Business Integration Server Foundation, V5.1 environment, using the update installer application.

To apply an interim fix or fix pack, first set up and configure the environment by downloading the interim fix and the update installer, or downloading the fix pack (which includes the update installer), creating update repositories, and setting the JAVA\_HOME environment variable. Then you can use the update installer to install the interim fix or fix pack, using either its wizard interface, the **updateWizard** command or its silent, command-line interface, the **updateSilent** command.

The update installer application can also uninstall interim fixes, cumulative fixes, and fix packs.

Three requirements govern applying an interim fix or fix pack to a cell, to ensure the continued, smooth interaction of the various WebSphere Application Server products:

- **Requirement 1:** Within a cell, the Network Deployment product must be at the highest fix pack level. For example, you cannot use the **addNode** command to add a V5.1 base WebSphere Application Server node to a V5.0.0 deployment manager cell. Therefore, apply the newer fix pack to the Network Deployment instance before applying the same level fix pack for the base WebSphere Application Server.
- **Requirement 2:** The WebSphere Business Integration Server Foundation product must be at the same interim fix or fix pack level as the product it extends:
  - If the Integration Server product extends a base WebSphere Application Server node, the interim fix or fix pack level of the Integration Server product must be the same as that of the base WebSphere Application Server product.
  - If the Integration Server product extends a deployment manager node, the interim fix or fix pack level of the Integration Server product must be the same as that of the Network Deployment product.
- **Requirement 3:** Temporarily, while installing or removing a WebSphere Business Integration Server Foundation product interim fix or fix pack, the base or Network Deployment product must be at the higher interim fix or fix pack level. For example, install the interim fix or fix pack on the base product, or on the Network Deployment product before installing it on the Integration Server product. Or remove the interim fix or fix pack from the Integration Server product before removing it from the base product or the Network Deployment product.

Verify that the interim fix or fix pack level of each base WebSphere Application Server node within the cell is the same as or lower than that of the deployment manager. No base node within the cell is allowed at a higher level than the deployment manager node. Uninstall an interim fix or fix pack from every base node, if you uninstall the same level interim fix or fix pack from the deployment manager node.

Use the versionInfo command in the install\_root/bin directory to display the exact fix and version level of the product. Do not use the **versionInfo** command while installing an interim fix or fix pack.

You can also use the silent update installer application to:

- View interim fix information
- View fix pack information

Before installing or uninstalling interim fixes, cumulative fixes, and fix packs on a machine, stop all Java processes on the machine that use the IBM Developer Kit that WebSphere Application Server provides to support the Java 2 SDK on your operating system platform, such as the IBM Developer Kit for AIX, Java Technology Edition. Stop all Application Servers, the nodeagent, the deployment manager server, and all servers, such as the jmsserver, that belong to serviceable features. Features with servers include the IBM HTTP Server and the embedded messaging feature.

Stop all Java processes, if necessary. If you do install or uninstall an interim fix or fix pack while a WebSphere Application Server-related Java process runs, IBM does not guarantee that the product can continue to run successfully, or without error.

Refer to the following tip for information about updating cluster members:

*Table 36. Installation tip*

Operating platform	Tip
All platforms	Updating all cluster members to the same service level

This procedure describes a scenario for applying an interim fix or fix pack to an Integration Server-extended base node, an entire Integration Server-extended cell, or to the Integration Server-extended deployment manager and any other Integration Server-extended base node in the cell. Apply the interim fix or fix pack to the Integration Server product when you install the interim fix or fix pack on the base or Network Deployment product. According to the guidelines:

1. Apply an interim fix or fix pack to the deployment manager.
2. Apply an interim fix or fix pack to the Integration Server product that extends the deployment manager.
3. Apply an interim fix or fix pack to zero, one, or more of the base nodes:
  - a. Apply an interim fix or fix pack to the base product on the node.
  - b. Apply an interim fix or fix pack to the Integration Server product that extends the base node.

If you are applying the interim fix or fix pack to the Integration Server product on a stand-alone Application Server, follow step 13, which describes how to update a base node.

The Uninstalling interim fixes, cumulative fixes, and fix packs topic describes how to remove an interim fix or fix pack from an Integration Server-extended base node, from an entire Integration Server-extended cell, or from any part of the cell. According to the guidelines, uninstall the interim fix or fix pack from each base node in a cell, and from the Integration Server product on each base node before you can uninstall the interim fix or fix pack from the deployment manager node, and from the Integration Server product on the deployment manager node.

**Note:** Installing a fix pack uninstalls all interim fixes. If some of the interim fixes that are uninstalled are a later level than the fix pack, their function is not included in the fix pack. Reinstall such interim fixes to bring your system back to the previous interim fix level.

Space requirements vary depending on what you are installing. The size of each download is available on the Support site. After unpacking the ZIP file that you download, delete the ZIP file to gain more free space, if necessary. For a fix pack, have approximately 400 MB of free space in the /tmp directory and another 400 MB in the file system that hosts the WebSphere Application Server image (typically /usr) on a UNIX-based platform, or approximately 800 MB of free space on the disk drive where you are installing on a Windows platform.

Verify that the free space is available before beginning the installation. After unpacking the ZIP file, you can delete the ZIP file to free space if necessary. After it is installed, the fix pack code generally increases the IBM WebSphere Application Server installation and run-time footprints by only a small amount. The space required for unpacking the ZIP file is about the same as the size of the fix pack.

Space is also required for backup files in the `install_root/properties/version/backup` directory. When installing a fix pack the space required is typically about the same as the size of the fix pack, depending on the particular fix pack.

Interim fixes require much less space to install.

1. Stop the nodeagent server process on each base WebSphere Application Server node in the cell with the **stopNode** command.

If you do not have a deployment manager node, skip to step 13.

2. Stop the deployment manager process with the **stopManager** command.

The `dmgr` Java process is the deployment manager process. The **stopManager** command is in the `install_root/bin` directory of each base node.

3. Create a read/write directory for downloading and unzipping the ZIP file. Later, you will also launch the update installer from the directory. Launching the update installer is not supported from a read-only directory, or from a directory with spaces in its name.

For example, create the `/opt/WebSphere/update` directory.

4. Create a `/fixes` directory within the download directory as a repository for interim fixes you are installing.

5. Download the interim fix or fix pack elmage from the Support Web site. Download the update installer application ZIP file to the `/update` directory you created if you are installing an interim fix. Download the current version of the update installer when installing an interim fix. The Support page links to the current installer.

It is not necessary to create a `/fixpacks` repository directory. Unpacking a fix pack creates the `/fixpacks` directory if it does not already exist.

Download an interim fix from the Support page to the `/fixes` directory within the download directory. Download a fix pack ZIP file to the `/update` directory within the download directory. It is not necessary to create a `/fixpacks` repository directory. Unpacking a fix pack creates the `/fixpacks` directory if it does not already exist.

6. Verify that the elmage is owned by root on a Linux or UNIX-based platform.

- a. List the contents of the download directory. For example:

```
# ls -al
drwxr-xr-x  6 root  bin           512 Oct 21 08:50 was5fp2_linux
```

The directory list in the preceding example shows a Fix Pack 2 file that is not owned by root.

- b. Change the ownership of any files not owned by root. You can change the ownership of all files in the download directory.

For example:

```
# chmod -R root:root *
```

7. Extract the contents of the ZIP file into the directory where you downloaded it. Unpack the update installer to the `/update` directory, if you downloaded a current update installer to install an interim fix.

Unpack the interim fix to the `/fixes` directory.

Unpack the fix pack to automatically create the `/fixpacks` directory.

*Table 37. Installation tip*

Operating platform	Tip
Windows platforms	Use another unzip product such as WINZIP, instead of the PKWARE pkunzip utility to unzip the product archive.

8. Set up the Java environment for the update installer.

#### **Setting the JAVA\_HOME environment variable**

**Important:** If the update installer can set the Java environment, this step is unnecessary. Otherwise, this is a required step.

The location of the update, fixes, and fixpacks directories is arbitrary. You can create the directories anywhere so long as you do not use a directory name with one or more spaces.

It is possible that the update installer cannot set the JAVA\_HOME environment variable. If you receive a message that the update installer cannot set JAVA\_HOME, set the environment variable yourself, or issue the appropriate command script from the **bin** directory of the product installation root:

- a. Open a command-line window.
  - b. Change directory to the bin directory of the installation root.
  - c. Issue the command to set JAVA\_HOME. Issue the appropriate command:
    - `. install_root/bin/setupCmdLine.sh` (source the command on UNIX platforms - There is a space between the period and the installation root directory.)
    - `source install_root/bin/setupCmdLine.sh` (source the command on Linux platforms )
    - `install_root\bin\setupCmdLine.bat` (Windows platforms only)
9. Apply the interim fix or fix pack to the deployment manager node.

- a. Use the appropriate command to apply the interim fix or fix pack on the deployment manager node.

Depending on the interface you use to the update installer:

- Refer to the updateWizard command topic for usage information.
- Refer to the **updateSilent** command description of the proper syntax for installing the interim fix or fix pack:
  - Installing interim fixes
  - Installing fix packs

For example, to install the was50\_nd\_fp2\_win fix pack, use this **updateSilent** command:

```
C:\WebSphere\DeploymentManager\update> updateSilent -fixpack
-installDir "C:\Program Files\WebSphere\DeploymentManager"
-skipIHS
-fixpackDir "C:\Program Files\WebSphere\DeploymentManager\update\fixpacks"
-install
-fixpackID was50_nd_fp2_win
```

The command is shown here on more than one line, for clarity.

- b. Apply the same level interim fix or fix pack to the Integration Server product that extends the network deployment node.

After installing the interim fix or fix pack on the deployment manager node, apply the same level interim fix or fix pack to the Integration Server product that extends the network deployment node.

10. Bring the deployment manager node back online with the **startManager** command.

The dmgr Java process is the deployment manager process. The **startManager** command is in the *install\_root/bin* directory of each base node.

11. Verify that the deployment manager node is fully functional and has the interim fix or fix pack applied.

There are several ways to verify the successful application of an interim fix or fix pack:

- Does the interim fix or fix pack appear in the wizard panel that lists applied interim fixes, or the panel that lists applied fix packs? If so, the interim fix or fix pack is installed.
- Does the interim fix or fix pack appear in the wizard panel that lists installable interim fixes, or the panel that lists installable fix packs? If so, the interim fix or fix pack is uninstalled.
- Is there an [interim fixID].efix file or a [fix packID].ptf file in the *install\_root/properties/version/version* directory, or an [interim fixID].efixApplied file, [interim fixID].efixDriver file, [interim fix packID].ptfApplied file, or an [interim fix packID].ptfDriver file in the *install\_root/properties/version/history* directory?



- Do the product version and history reports show the interim fix or fix pack as installed or removed?
  - Does viewing interim fix information and update state show that the interim fix is installed or removed?
  - Does viewing fix pack information and update state show that the fix pack is installed or removed?
12. Restart the node agent of each base node with the **startNode** command.
- Restart the node agent on each base node, to let the node agent continue to communicate with the updated deployment manager node. You can restart all node agents, but you need not restart node agents on base nodes that you intend to update with the interim fix or fix pack. The interim fix or fix pack installation requires you to stop and restart the node agent.
- The **startNode** command is in the *install\_root/bin* directory of each base node.
13. Perform the following steps for each base node to which you intend to apply the interim fix or fix pack:
- a. Stop each base node with the **stopNode** command.
  - b. Stop each server process on the base WebSphere Application Server node with the **stopServer** command.
 

Stop all WebSphere Application Server-related Java processes. On a Windows platform, you can use the task manager to stop Java processes. On a UNIX-based platform, use the **kill** command to stop Java processes.
  - c. Create a download directory, if one does not already exist.
 

For example, create the */usr/websphere/update* directory.
  - d. Download the update installer application ZIP file to the */update* directory, if you are installing an interim fix.
 

Download the current version of the file even though you might have an update installer from a previous interim fix installation. The Support page links to the current installer.
  - e. Extract the contents of the ZIP file to the */update* directory.
  - f. Create the */update/fixes* repository if you are installing an interim fix.
 

It is not necessary to create the */fixpacks* repository directory. Unpacking the fix pack from the update directory creates the */fixpacks* directory, if it does not already exist.
  - g. Download the interim fix or fix pack elmage. Download an interim fix from the Support page to the */update/fixes* directory.
 

Download a fix pack ZIP file to the */update* directory.
  - h. Verify that the elmage is owned by root.
    - 1) List the contents of the download directory.
 

For example:

```
# ls -al
drwxr-xr-x  6 root  bin          512 Oct 21 08:50 was5fp2_linux
```

The directory list in the preceding example shows a Fix Pack 2 file that is not owned by root.
    - 2) Change the ownership of any files not owned by root.
 

You can change the ownership of all files in the download directory. For example:

```
# chmod -R root:root *
```
  - i. Unpack the interim fix or fix pack. Unpack a fix pack to automatically create the */fixpacks* directory.

Table 38. Installation tip

Operating platform	Tip
Windows platforms	Use another unzip product such as WINZIP, instead of the PKWARE pkunzip utility to unzip the product archive.

- j. Set up the Java environment for the update installer. If the update installer can set the Java environment, this step is not necessary. Otherwise, this is a required step.

The location of the update, fixes, and fixpacks directories is arbitrary. You can create the directories anywhere so long as you do not use a directory name with one or more spaces.

It is possible that the update installer cannot set the JAVA\_HOME environment variable. If you receive a message that the update installer cannot set JAVA\_HOME, set the environment variable yourself, or issue the appropriate command script from the /bin directory of the product installation root:

- 1) Open a command-line window.
- 2) Change directory to the bin directory of the installation root.
- 3) Issue the appropriate command to set JAVA\_HOME:
  - `. install_root/bin/setupCmdLine.sh` (source the command on UNIX platforms - There is a space between the period and the installation root directory.)
  - `source install_root/bin/setupCmdLine.sh` (source the command on Linux platforms )
  - `install_root\bin\setupCmdLine.bat` (Windows platforms only)
  - `. install_root/bin/setupClient.sh` (source the command for the Application Server client - There is a space between the period and the installation root directory.)
  - `source install_root/bin/setupClient.sh` (Linux platforms only)
  - `install_root\bin\setupClient.bat` (Windows platforms only)

- k. Apply the interim fix or fix pack to the base node.

Depending on the interface to the update installer:

- Refer to updateWizard command for usage information.
- Refer to the **updateSilent** command description of the proper syntax for installing the interim fix or fix pack:
  - Installing interim fixes
  - Installing fix packs

For example, to install the was50\_fp2\_win fix pack, use this **updateSilent** command:

```
C:\WebSphere\AppServer\update> updateSilent -fixpack
    -installDir "C:\Program Files\WebSphere\AppServer"
    -skipIHS
    -fixpackDir "C:\WebSphere\AppServer\update\fixpacks"
    -install
    -fixpackID was50_fp2_win
```

The command is shown here on more than one line, for clarity.

- l. Install the interim fix or fix pack to the Integration Server product.

After installing the interim fix or fix pack to the base product, apply the same level interim fix or fix pack to the Integration Server product that extends the base node.

- m. Restart each server on the node with the **startServer** command.
- n. Restart the node agent for the base node with the **startNode** command.
- o. Verify that the base node is fully functional and that it has the interim fix or fix pack applied.

There are several ways to verify the successful application of an interim fix or fix pack as described in the earlier step that verifies that the deployment manager node is functional.

14. Specify that file sets on each base node match those on the deployment manager node.

Ensure consistent configuration data across a cell. You can synchronize files on individual nodes or throughout your system. To synchronize files throughout the system, use the deployment manager administrative console page, **System administration > Nodes > check\_each\_node\_name > Full Resynchronization**. You can use the administrative console page, **System Administration > Node Agents > nodeagent > File Synchronization Service**, to specify automatic synchronization every minute until all base node servers are brought online.

15. Verify that all nodes are online and that the cell is functioning correctly.

16. Restore your original file synchronization settings, if you changed them.

The cell is now fully functional. All operations are available and functioning normally.

17. Verify that the elmage is owned by root.

a. List the contents of the download directory. For example:

```
# ls -al
```

```
drwxr-xr-x  6 root  bin          512 Oct 21 08:50 was5fp2_linux
```

The directory list in the preceding example shows a Fix Pack 2 file that is not owned by root.

b. Change the ownership of any files not owned by root. You can change the ownership of all files in the download directory.

For example:

```
# chmod -R root:root *
```

18. Unpack the interim fix or fix pack. Unpacking the fix pack automatically creates the fixpacks directory.

Table 39. Installation tip

Operating platform	Tip
Windows platforms	Use another unzip product such as WINZIP, instead of the PKWARE pkunzip utility to unzip the product archive.

You can successfully install interim fixes, cumulative fixes, and fix packs to Integration Server-extended nodes.

Return to Installing WebSphere Application Server to continue.

## updateSilent command

The **updateSilent** command is the silent, command-line interface to the update installer program of the IBM WebSphere Application Server. You can also use a wizard interface to the update installer program, the **updateWizard** command. The update installer program is also known as the updateInstaller program or the Update installation wizard.

The update installer program installs interim fixes, cumulative fixes, and fix packs to WebSphere Application Server products.

The relationship among interim fixes, cumulative fixes, and fix packs is shown in the Cumulative Fix Strategy for WebSphere Application Server V5.0 and V5.1 Web page.

### Overview

Both the **updateSilent** command and the “updateWizard command” on page 278 call the update installer program to install and uninstall interim fixes, cumulative fixes, and fix packs for WebSphere Application Server products. This topic describes the silent interface to the update installer program and its command-line parameters.

**Stop all Java processes on the machine that use the IBM Software Developer Kit (SDK) that WebSphere Application Server provides:** Before installing or uninstalling interim fixes, cumulative fixes, and fix packs on a machine, stop all Java processes on the machine that use the IBM SDK, Java Technology Edition that WebSphere Application Server provides. WebSphere Application Server processes include:

- Application Server processes
- All servers, such as the IBMHttpServer process, that belong to serviceable features. Features with servers include the IBM HTTP Server and the embedded messaging feature.
- The nodeagent process on a base node when the node is federated into a deployment manager cell
- The dmgr process for the deployment manager server

- The jmsserver on a base node when the node is part of a cell and the embedded messaging server and client feature is installed

Stop all Java processes, if necessary. If you do install or uninstall an interim fix, a cumulative fix, or a fix pack while a WebSphere Application Server-related Java process runs, IBM does not guarantee that the product can continue to run successfully, or without error.

**Remove the WebSphere MQ tray icon if present** On a Windows platform, remove the WebSphere MQ tray icon if it is present. The WebSphere MQ tray icon in the lower right corner indicates that a WebSphere MQ process (**amqmtbrn.exe**) is running. Right click the tray icon and click **Hide** to remove it.

**Do not launch multiple copies of the update installer program at one time** The update installer program cannot be launched concurrently with itself. Performing more than one update at the same time can lead to a failed or faulty installation.

The following descriptions contain reference information about the command. See Installing interim fixes, cumulative fixes, and fix packs for more information about using the command.

#### **Command name**

updateSilent.sh and updateSilent.bat, command-line interface to the installer.jar file.

#### **Related command**

updateWizard.sh and updateWizard.bat, graphical interface to the installer.jar file.

#### **Syntax and panel examples**

##### **Using the updateSilent interface to work with interim fixes**

See updateSilent examples for interim fixes for more information.

##### **Using the updateSilent interface to work with cumulative fixes and fix packs**

See updateSilent examples for cumulative fixes and fix packs for more information.

## **updateWizard command**

The **updateWizard** command is the wizard interface to the IBM WebSphere Application Server update installer program. You can also use a silent, command-line interface to the update installer program, the **updateSilent** command. The update installer program is also known as the updateInstaller program or the Update installation wizard.

The update installer program installs interim fixes, cumulatives fixes, and fix packs to WebSphere Application Server products.

The relationship among interim fixes, cumulative fixes, and fix packs is shown in the Cumulative Fix Strategy for WebSphere Application Server V5.0 and V5.1 Web page.

### **Overview**

Both the **updateWizard** command and the “updateSilent command” on page 277 command call the update installer program to install and uninstall interim fixes, cumulative fixes, and fix packs for WebSphere Application Server products. This topic describes the wizard interface to the update installer command, and gives some information about its panels and fields.

**Stop all Java processes on the machine that use the IBM Software Developer Kit (SDK) that WebSphere Application Server provides:** Before installing or uninstalling interim fixes, cumulative fixes, and fix packs on a machine, stop all Java processes on the machine that use the IBM SDK, Java Technology Edition that WebSphere Application Server provides. WebSphere Application Server processes include:

- Application Server processes
- All servers, such as the IBMHttpServer process, that belong to serviceable features. Features with servers include the IBM HTTP Server and the embedded messaging feature.
- The nodeagent process on a base node when the node is federated into a deployment manager cell

- The dmgr process for the deployment manager server
- The jmsserver on a base node when the node is part of a cell and the embedded messaging server and client feature is installed

Stop all Java processes, if necessary. If you do install or uninstall an interim fix, a cumulative fix, or a fix pack while a WebSphere Application Server-related Java process runs, IBM does not guarantee that the product can continue to run successfully, or without error.

**Remove the WebSphere MQ tray icon if present** On a Windows platform, remove the WebSphere MQ tray icon if it is present. The WebSphere MQ tray icon in the lower right corner indicates that a WebSphere MQ process (**amqmtbrn.exe**) is running. Right click the tray icon and click **Hide** to remove it.

**Do not launch multiple copies of the update installer program at one time** The update installer program cannot be launched concurrently with itself. Performing more than one update at the same time can lead to a failed or faulty installation.

The following descriptions contain reference information about the command. See Installing interim fixes, cumulative fixes, and fix packs for more information about using the command.

**Command name**

updateWizard.sh and updateWizard.bat, graphical interface to the installer.jar file.

**Related command**

updateSilent.sh and updateSilent.bat, command-line interface to the installer.jar file.

See “updateSilent command” on page 277.

**Location of the command**

See Installing interim fixes, cumulative fixes, and fix packs for a list of product installation roots, fix pack space requirements and names, and other information that also applies when using the **updateWizard** command interface.

**Syntax and panel examples**

**Using the updateWizard interface to work with interim fixes**

See updateWizard examples for interim fixes for more information.

**Using the updateWizard interface to work with cumulative fixes and fix packs**

See updateWizard examples for cumulative fixes and fix packs for more information.

## Uninstalling interim fixes, cumulative fixes, and fix packs

This topic describes the proper procedure for using the update installer application to uninstall an interim fix, a cumulative fix, or a fix pack. The update installer program is also known as the updateInstaller program or the Update installation wizard.

The update installer program uninstalls interim fixes, cumulatives fixes, and fix packs from WebSphere Application Server products.

Three different Web sites contain interim fixes for WebSphere Application Server products and features. Three sites exist because two of the features of the base product have their own service and support sites.

You cannot install or uninstall interim fixes for either of the two features using the update installer program for WebSphere Application Server. See the following tips for more information:

Table 40. Installation tip

Operating platform	Tip
All platforms	<ul style="list-style-type: none"> <li>• Installing interim fixes for the IBM HTTP Server feature and the embedded messaging feature</li> <li>• Uninstalling interim fixes for the IBM HTTP Server feature and the embedded messaging (WebSphere MQ) feature before installing cumulative fixes and fix packs to the features</li> </ul>

You must use the update installer program to uninstall cumulative fixes and fix packs for the two features. The relationship among interim fixes, cumulative fixes, and fix packs is shown in the Cumulative Fix Strategy for WebSphere Application Server V5.0 and V5.1 Web page.

Fix packs are also known as *fixpacks*, *FixPaks* and *program temporary fixes*, or PTFs.

Removing an interim fix, a cumulative fix, or a fix pack requires setting the JAVA\_HOME environment variable for the update installer. The update installer performs the task by running the **setupCmdLine** or **setupClient** command script. It is possible that the update installer cannot set the JAVA\_HOME environment variable. If the update installer throws an error because it cannot set the Java environment, set the JAVA\_HOME variable yourself. Then use the update installer to remove an interim fix, a cumulative fix, or a fix pack using either its wizard interface, the **updateWizard** command or its silent, command-line interface, the **updateSilent** command.

The update installer application can also install interim fixes, cumulative fixes, and fix packs. See Installing interim fixes, cumulative fixes, and fix packs for more information.

Three requirements govern removing an interim fix, a cumulative fix, or a fix pack from a cell, to ensure the continued, smooth interaction of the various WebSphere Application Server products:

- **Requirement 1:** Within a cell, the Network Deployment product must be at the highest interim fix, cumulative fix, or fix pack level.  
For example, you cannot use the **addNode** command to add a V5.0.1 base WebSphere Application Server node to a V5.0.0 deployment manager cell.
- **Requirement 2:** The WebSphere Business Integration Server Foundation product must be at the same interim fix, cumulative fix, or fix pack level as the product it extends:
  - If the Integration Server product extends a base WebSphere Application Server node, the interim fix level, the cumulative fix level, or the fix pack level of the Integration Server product must be the same as that of the base WebSphere Application Server product.
  - If the Integration Server product extends a deployment manager node, the interim fix level, the cumulative fix level, or the fix pack level of the Integration Server product must be the same as that of the Network Deployment product.
- **Requirement 3:** Temporarily, while installing or removing a WebSphere Business Integration Server Foundation product interim fix, cumulative fix, or fix pack, the base or Network Deployment product must be at the higher interim fix, cumulative fix, or fix pack level.

For example, install the interim fix, cumulative fix, or fix pack on the base product, or on the Network Deployment product before installing it on the Integration Server product. Or remove the interim fix, cumulative fix, or fix pack from the Integration Server product before removing it from the base product or the Network Deployment product.

Verify that the interim fix level, the cumulative fix level, or the fix pack level of each base WebSphere Application Server node within the cell is the same as, or lower than that of the deployment manager. No base node within the cell is allowed at a higher level than the deployment manager node. Uninstall an interim fix, a cumulative fix, or a fix pack from every base node, if you uninstall the interim fix, cumulative fix, or fix pack from the deployment manager node.

According to the guidelines:



1. Remove an interim fix, a cumulative fix, or a fix pack from all base nodes:
  - a. Remove the interim fix, cumulative fix, or fix pack from the Integration Server product that extends the base node.
  - b. Remove the interim fix, cumulative fix, or fix pack from the base product on the node.
2. Remove the interim fix, cumulative fix, or fix pack from the Integration Server product that extends the deployment manager.
3. Remove the interim fix, cumulative fix, or fix pack from the deployment manager.

Refer to the following tip for information about updating cluster members:

*Table 41. Installation tip*

Operating platform	Tip
All platforms	Updating all cluster members to the same service level

Use the `versionInfo` command in the `bin` directory of the installation root to verify the exact fix and version level. Do not use the **`versionInfo`** command while installing the interim fix, cumulative fix, or fix pack.

You can also use the silent update installer application to:

- View interim fix information. See `updateSilent` examples for interim fixes for more information.
- View cumulative fix or fix pack information. See `updateSilent` examples for cumulative fixes and fix packs for more information.

Before installing or uninstalling interim fixes and fix packs on a machine, stop all Java processes on the machine that use the IBM SDK that WebSphere Application Server provides to support the Java 2 SDK on your operating system platform, such as the IBM Developer Kit for AIX, Java Technology Edition. Stop all Application Servers, the `nodeagent`, the deployment manager server, and all servers, such as the `jmsserver`, that belong to serviceable features. Features with servers include the IBM HTTP Server and the embedded messaging feature. Stop all Java processes, if necessary. If you do install or uninstall an interim fix, a cumulative fix, or a fix pack while a WebSphere Application Server-related Java process runs, IBM does not guarantee that the product can continue to run successfully, or without error.

Refer to the following tip for information about updating cluster members:

*Table 42. Installation tip*

Operating platform	Tip
All platforms	Updating all cluster members to the same service level

Although it talks about installing interim fixes and fix packs, the same principle applies to uninstalling interim fixes and fix packs. All clusters must be at the same service level.

This procedure describes a scenario for removing an interim fix, a cumulative fix, or a fix pack from a base node, from an entire cell, or from any part of the cell in a WebSphere Business Integration Server Foundation environment. According to the guidelines, uninstall the interim fix, cumulative fix, or fix pack from each base node in a cell before you uninstall the interim fix, cumulative fix, or fix pack from the deployment manager node. Remove the interim fix, cumulative fix, or fix pack from the Integration Server product when you remove it from the base or Network Deployment product.

See *Installing interim fixes, cumulative fixes, and fix packs* to install an interim fix, a cumulative fix, or a fix pack to an entire cell, or to selected parts of the cell.

Always uninstall the highest level interim fix, cumulative fix, or fix pack before uninstalling other interim fixes or fix packs.

1. Remove the highest level interim fix, cumulative fix, or fix pack from all base nodes.

Determine the base nodes from which you intend to remove the interim fix, cumulative fix, or fix pack, and perform the following steps for each node:

- a. Stop each base node with the **stopNode** command.

Stop all WebSphere Application Server-related Java processes. On a Windows platform, you can use the task manager to stop Java processes. On a UNIX-based platform, use the **kill** command to stop Java processes.

- b. Stop each server on the base node with the **stopServer** command.

- c. Set up and configure the environment.

- 1) If you do not have the update installer application, you can download it from the Support page.
- 2) Create an `install_root/update` directory, if it does not already exist.
- 3) Extract the contents of the update installer zip file to the update directory.

On Windows platforms, the `pkunzip` utility might not decompress the download image correctly. Use another utility (such as WinZip) to unzip the image.

- 4) Set the Java environment for the update installer:

**Setting the JAVA\_HOME environment variable:** If the update installer can set the Java environment, this step is unnecessary. Otherwise, this is a required step.

The location of the `update`, `fixes`, and `fixpacks` directories is arbitrary. You can create the directories anywhere so long as you do not use a directory name with one or more spaces.

It is possible that the update installer cannot set the `JAVA_HOME` environment variable. If you receive a message that the update installer cannot set `JAVA_HOME`, set the environment variable yourself, or issue the appropriate command script from the `bin` directory of the product installation root:

- a) Open a command-line window.

- b) Change directory to the `bin` directory of the installation root.

- c) Run the appropriate command:

- `. install_root/bin/setupCmdLine.sh` (source the command on UNIX platforms - There is a space between the period and the directory.)
- `source install_root/bin/setupCmdLine.sh` (source the command on Linux platforms )
- `install_root\bin\setupCmdLine.bat` (Windows platforms only)
- `. install_root/bin/setupClient.sh` (source the command for the Application Server client)
- `source install_root/bin/setupClient.sh` (Linux platforms only)
- `install_root\bin\setupClient.bat` (Windows platforms only)

- d. Remove the highest level interim fix, cumulative fix, or fix pack from the Integration Server product.

- e. Uninstall the WebSphere Business Integration Server Foundation product manually if you cannot successfully uninstall the interim fix, cumulative fix, or fix pack.

See *Uninstalling manually* for a description of platform-specific procedures for uninstalling the product. Each procedure guides you through removing every trace of the products and features you might have installed, including directories that might have changed data. Before you begin one of the procedures, use the **backupConfig** command to back up the `config` and `properties` `install-root` directories. Backing up the directories lets you refer to the changed data when you reinstall.

- f. Remove the interim fix, cumulative fix, or fix pack from the base node.

Depending on the interface you use to the update installer:

- Refer to `updateWizard` command for usage information.
- Refer to the **updateSilent** command description for the proper syntax for uninstalling the interim fix, cumulative fix, or fix pack:
  - Uninstalling interim fixes
  - Uninstalling cumulative fixes and fix packs

For example, to uninstall the `was51_fp1_win` fix pack, use this **updateSilent** command:

```
C:\WebSphere\AppServer\update> updateSilent -fixpack
    -installDir "C:\Program Files\WebSphere\AppServer"
    -skipIHS
    -fixpackDir "C:\Program Files\WebSphere\AppServer\update\fixpacks"
    -uninstall
    -fixpackID was51_fp1_win
```

- g. Uninstall the base WebSphere Application Server product manually if you cannot successfully uninstall the interim fix, cumulative fix, or fix pack as described previously.
- h. Restart each server on the node with the **startServer** command.
- i. Restart the node agent for the base node with the **startNode** command.
- j. Verify that each base node is fully functional and has the interim fix, cumulative fix, or fix pack removed.

There are several ways to verify the successful removal of an interim fix, a cumulative fix, or a fix pack:

- Does the interim fix, cumulative fix, or fix pack appear in the Uninstallable fix selection panel or in the panel that lists installed cumulative fixes or fix packs? If so, the interim fix, cumulative fix, or fix pack is installed.
  - Does the interim fix, cumulative fix, or fix pack appear in the Installable fix selection panel or in the Cumulative fix and fix pack selection panel? If so, the interim fix, cumulative fix, or fix pack is uninstalled.
  - Is there a [fixID].efix or [fix packID].ptf files in the install\_root/properties/version/version directory, or a [fixID].efixApplied, [fixID].efixDriver, [fix packID].ptfApplied, or [fix packID].ptfDriver file in the install\_root/properties/version/history directory?
  - Do the product version and history reports show the interim fix, cumulative fix, or fix pack as installed or removed?
  - Does viewing interim fix information show that the interim fix is installed or removed?
  - Does the viewing fix pack information show that the fix pack is installed or removed?
2. Stop the deployment manager with the **stopManager** command.  
If you do not have a deployment manager node, you are finished with this procedure.
  3. Remove the interim fix, cumulative fix, or fix pack from the Network Deployment node.

If you remove the interim fix, cumulative fix, or fix pack from every base node in the cell, you can also remove the interim fix, cumulative fix, or fix pack from the Network Deployment node. The interim fix level of the Network Deployment node must be equal to, or higher than the interim fix level of any base node in the cell.

Use the following procedure to perform this task:

- a. Set up and configure your WebSphere Application Server environment. Set the JAVA\_HOME environment variable for the update installer.

#### Setting the JAVA\_HOME environment variable

**Important:** If the update installer can set the Java environment, this step is unnecessary. Otherwise, this is a required step.

The location of the update, fixes, and fixpacks directories is arbitrary. You can create the directories anywhere so long as you do not use a directory name with one or more spaces.

It is possible that the update installer cannot set the JAVA\_HOME environment variable. If you receive a message that the update installer cannot set JAVA\_HOME, set the environment variable yourself, or issue the appropriate command script from the **bin** directory of the product installation root:

- 1) Open a command-line window.
- 2) Change directory to the bin directory of the installation root.
- 3) Source the setupCmdLine script as described previously.

- b. Use the appropriate command to remove the interim fix, cumulative fix, or fix pack from the Integration Server node.

Depending on the interface you use to the update installer:

- Refer to updateWizard command for usage information.
- Refer to the **updateSilent** command description for the proper syntax for uninstalling the interim fix, cumulative fix, or fix pack:
  - Uninstalling interim fixes
  - Uninstalling cumulative fixes and fix packs

- c. Remove the interim fix, cumulative fix, or fix pack from the deployment manager node.

For example, to uninstall the was51\_nd\_fp1\_win fix pack, use this **updateSilent** command:

```
C:\WebSphere\DeploymentManager\update> updateSilent -fixpack
      -installDir "C:\Program Files\WebSphere\DeploymentManager"
      -skipIHS
      -fixpackDir "C:\Program Files\WebSphere\DeploymentManager\update\fixpacks"
      -uninstall
      -fixpackID was51_nd_fp1_win
```

The example appears on more than one line for clarity.

- d. Uninstall the Network Deployment product manually if you cannot successfully uninstall the interim fix, cumulative fix, or fix pack as described previously.

4. Start the deployment manager node with the **startManager** command.

5. Verify that the deployment manager node is fully functional and has the interim fix, cumulative fix, or fix pack removed as described previously.

You can also run the installation verification test on the node to verify that the node is operational.

6. Specify that file sets on one node match those on the deployment manager node.

Ensure consistent configuration data across a cell. You can synchronize files on individual nodes or throughout your system. To synchronize files throughout the system, use the deployment manager administrative console page, **System administration > Nodes > *check\_each\_node\_name* > Full Resynchronization**. You can use the administrative console page, **System Administration > Node Agents > nodeagent > File Synchronization Service**, to specify automatic synchronization every minute until all base node servers are brought online.

7. Verify that all nodes are online and that the cell is functioning correctly.

8. Restore your original file synchronization settings.

The cell is now fully functional. All operations are available and functioning normally.

You can successfully remove interim fixes and fix packs from WebSphere Application Server products.

---

## Product version and history information

The WebSphere Application Server product contains structural differences from previous versions. The `/properties/version` directory in the `install_root` contains important data about the product and its installed components, such as the build version and build date. This information is included in `[product].product` and `[component].component` files. The `/properties/version/history` directory in the `install_root` contains a collection of records for installed interim fixes and fix packs. This information is included in `[interim fixID].efixApplied`, `[interim fixID].efixDriver`, `[fix packID].ptfApplied`, and `[fix packID].ptfDriver` files. A driver file has useful information about the entire contents of an interim fix or fix pack. The applied file has relevant information about the interim fixes or fix packs that are currently applied. Event.history files are also present. They contain a detailed log about updates you have applied, either successfully or unsuccessfully. Time-stamped, detailed logs record each update process in the `/properties/version/log` directory of the `install_root`.

This topic describes the XML data files that store product information for Version 5 WebSphere Application Server products. By default, the document type declarations (DTDs) for these files are in the `properties/version/dtd` folder of the `install_root`, or the server root directory. See the Storage locations section for more information.

This topic includes these sections:

- “Product information files”
- “Reports” on page 286
- “Logs and component backups” on page 287
- “Storage locations” on page 288
- “Operational description” on page 289
- “Data dictionary” on page 289

## Product information files

### XML files in the in the `/properties/version` directory that store version information: `platform.websphere`

One file whose existence indicates that a WebSphere Application Server product is installed. An example of the file follows:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE websphere PUBLIC "websphereId" "websphere.dtd">
<websphere name="IBM WebSphere Application Server" version="5.0"/>
```

The following XML files in the `/properties/version` directory represent installed items and installation events.

#### *product-id*.**product**

One file whose existence indicates the particular WebSphere Application Server product that is installed. Data in the file indicates the version, build date, and build level. For example, the file might be the `ND.product` file, which indicates that the installed product is WebSphere Application Server Network Deployment. An example of the file follows:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE product PUBLIC "productId" "product.dtd">
<product name="IBM WebSphere Application Server for Network Deployment">
  <id>ND</id>
  <version>5.0.0</version>
  <build-info date="10/5/02" level="s0239.28"/>
</product>
```

#### *component-name*.**component**

Any number of component files that each indicate the presence of an installed component, which is part of the product. Data in the file indicates the component build date, build version, component name, and product version. For example, the file might be the `activity.component` file, which indicates that the **activity** component is installed. The activity component is part of the Network Deployment product. An example of the file follows:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE component PUBLIC "componentId" "component.dtd">
<component build-date="10/5/02" build-version="s0239.28"
  name="activity" spec-version="5.0"/>
```

#### *extension.id*.**extension**

Any number of extension files that each indicate the presence of an extension that you install as a user extension, as part of a service engagement, or as installed by a third party product. The `<extension.id>.extension` files are not created, logged, or removed by WebSphere Application Server products.

#### *fix-id*.**efix**

Any number of interim fix files that each indicate the presence of an installed fix.

#### *ptf-id*.**ptf**

Any number of files, that each indicate the presence of an installed fix pack.

### **XML files in the /properties/version/history directory that store version history information files: event.history**

One file that lists update events that have occurred. An update event is an operation that installs or uninstalls an interim fix or a fix pack. The file is sorted by the date and time of the events that are listed.

The following XML files in the /properties/version/history directory describe fixes and fix packs that are currently installed. These XML files are related to installation items by the primary ID information, which is shown in the following examples as italicized text.

#### ***fix-id.efixDriver***

Interim fix-driver defining information

#### ***fix-id.efixApplied***

Interim fix installation details

#### ***ptf-id.ptfDriver***

Fix pack-driver defining information

#### ***ptf-id.ptfApplied***

Fix pack installation details

### **Reports**

You can view product information by examining files in the properties/version directory, including the properties/version/history directory.

WebSphere Application Server provides the ability to generate two types of reports about the data in the files, **Version** reports and **History** reports. The following report-generation scripts are available in the install\_root bin directory.

### **Product version reports**

The following report generation scripts extract data from XML data files in the properties/version folder:

- versionInfo script  
Lets you use parameters to create a version report on Linux and UNIX-based platforms, or on Windows platforms.
- genVersionReport script  
Generates the versionReport.html report file in the bin directory on Linux and UNIX-based platforms, or on Windows platforms. The report includes the list of components, fixes, and fix packs.

### **Product history reports**

The following report generation scripts extract data from XML data files in the properties/version/history folder.

#### **historyInfo.bat**

Lets you use parameters to create a history report of installed and uninstalled fixes and fix packs, on Windows platforms. You can also specify a component name to create a report that shows the history for that component.

#### **Parameters:**

##### **-format**

text | html

Selects the format of the report. The default is TEXT.

##### **-file** *fileName*

Specifies the output file name. The report goes to standard output (stdout) by default.



**-updateID *ID***

Specifies the ID of an interim fix or fix pack update. When specified, the product history report displays events for only the specified update. When not specified, the report displays events for all updates.

**-component *componentName***

Specifies the name of a component. When specified, the product history report displays events for only the named component. When not specified, the report displays events for all components.

**historyInfo.sh**

Lets you use parameters to create a history report on UNIX-based platforms. Parameters are the same as for the Windows version.

**genHistoryReport.bat**

Generates the `historyReport.html` report file in the `bin` directory on Windows platforms. The report includes all updates and components.

**genHistoryReport.sh**

Generates the `historyReport.html` report file in the `bin` directory on UNIX-based platforms. The report includes all updates and components.

**Logs and component backups**

WebSphere Application Server products use two other directories when performing update operations, for logging and backups:

***install\_root/properties/version/log***

Product updates log directory prior to Fix Pack 2.

WebSphere Application Server products store log files to document component, interim fix and fix pack operations and updates.

***install\_root/logs/update***

Product updates log directory beginning with Fix Pack 2.

Beginning with the version of the `updateInstaller` program that is bundled with Fix Pack 2, log files are in the `install_root/logs/update` directory.

***install\_root/properties/version/backup***

Product updates backup directory

WebSphere Application Server products back up components before applying interim fixes and fix packs. If you uninstall an interim fix or fix pack, WebSphere Application Server products restore the backed-up component JAR file.

**File naming convention****Time stamp**

YYYYMMDD\_HHMMSS

For example: 20020924\_211832 is 24-Sep-2002, 9:18:32 pm, GMT. All time stamps are in GMT.

**ID**

Interim fix ID or fix pack ID  
For example: `apar6789c` is an interim fix ID; `PTF_1` is a fix pack ID.

**Operation**

`install` | `uninstall`

**Interim fix log file names**

*timeStamp\_fixId\_operation.log*

For example, prior to Fix Pack 2:  
`properties/version/log/20020924_211832_apar6789c_install.log` and  
`properties/version/log/20020924_211912_apar6789c_uninstall.log`

At Fix Pack 2 or later, the `updateInstaller` creates these logs:  
`install_root/logs/update/20020924_211832_apar6789c_install.log` and  
`install_root/logs/update/20020924_211912_apar6789c_uninstall.log`

### Interim fix component log file names

*timeStamp\_fixId\_componentName\_operation.log*

For example, prior to Fix Pack 2:

properties/version/log/20020924\_211832\_apar6789c\_ras\_install.log and  
properties/version/log/20020924\_211912\_apar6789c\_ras\_uninstall.log

At Fix Pack 2 or later, the updateInstaller creates these logs:

install\_root/logs/update/20020924\_211832\_apar6789c\_ras\_install.log and  
install\_root/logs/update/20020924\_211912\_apar6789c\_ras\_uninstall.log

### Fix pack log file names

*timeStamp\_ptfId\_operation.log*

For example, prior to Fix Pack 2:

properties/version/log/20030324\_211832\_was50\_fp1\_install.log and  
properties/version/log/20030325\_211912\_was50\_fp1\_uninstall.log

At Fix Pack 2 or later, the updateInstaller creates these logs:

install\_root/logs/update/20030324\_211832\_was50\_fp2\_install.log and  
install\_root/logs/update/20030325\_211912\_was50\_fp2\_uninstall.log

### Fix pack component log file names

*timeStamp\_ptfId\_componentName\_operation.log*

For example, prior to Fix Pack 2:

properties/version/log/20030324\_211832\_was50\_fp1\_ras\_install.log and  
properties/version/log/20030325\_211912\_was50\_fp1\_ras\_uninstall.log

At Fix Pack 2 or later, the updateInstaller creates these logs:

install\_root/logs/update/20030324\_211832\_was50\_fp2\_ras\_install.log and  
install\_root/logs/update/20030325\_211912\_was50\_fp2\_ras\_uninstall.log

### Backup JAR file names

*timeStamp\_ptfId\_componentName\_undo.jar* or *timeStamp\_fixId\_componentName\_undo.jar*

For example: 20020924\_211832\_apar6789c\_ras\_undo.jar Do not delete a backup JAR file. You cannot remove a component update if the corresponding backup JAR file is not present.

Update processing might also use a temporary directory, if necessary. A Java property specifies this directory as described in the next section.

### Storage locations

Product information files are located relative to the WebSphere Application Server product `install_root`, or the server root directory.

Default file paths are:

#### Version directory

*install\_root/properties/version* or *server\_root/properties/version*

#### History directory

*install\_root/properties/version/history*

#### Updates log directory

Prior to Fix Pack 2: *install\_root/properties/version/log*

The version of the updateInstaller that is bundled with Fix Pack 2 and later fix packs, stores log files in the *install\_root/logs/update* directory.

#### Updates backup directory

*install\_root/properties/version/backup*

#### DTD directory

*install\_root/properties/version/dtd*

#### Temporary directory

Specified by the `java.io.tmpdir` Java system property

## Operational description

WebSphere Application Server products update the product version history information while performing events that install or uninstall fixes or fix packs. Events that might occur include:

- A WebSphere Application Server product adds an interim fix file (with an extension of `.efix`) to the version directory to indicate that an interim fix is currently installed.
- A WebSphere Application Server product removes an interim fix file from the version directory when it uninstalls the corresponding fix.
- A WebSphere Application Server product adds an interim fix driver file (with an extension of `.efixDriver`) to the history directory when an interim fix is installed. An interim fix driver file contains defining information for a fix.
- A WebSphere Application Server product removes an interim fix driver file when it removes the corresponding fix.
- A WebSphere Application Server product adds an interim fix application file (with an extension of `.efixApplied`) to the history directory when it installs an interim fix. An interim fix application file contains information that identifies component updates that have been applied for a fix. The application file also provides links to component log and backup files.
- A WebSphere Application Server product removes an interim fix application file when it removes the corresponding fix.
- A WebSphere Application Server product adds a fix pack, with an extension of `.ptf`, to the version directory to indicate that a fix pack is currently installed.
- A WebSphere Application Server product removes a fix pack file from the version directory when it uninstalls the corresponding fix pack.
- A WebSphere Application Server product adds a fix pack driver file (with an extension of `.ptfDriver`) to the history directory when it installs a fix pack. A fix pack driver file contains defining information for a fix pack.
- A WebSphere Application Server product adds a fix pack application file (with an extension of `.ptfApplied`) to the history directory when it installs a fix pack. A fix pack application file contains information that identifies component updates that have been applied for a fix pack. The application file also provides links to component log and backup files.
- A WebSphere Application Server product makes entries in the history file, `event.history`, when it installs or uninstalls an update.
- A WebSphere Application Server product stores a parent event for each interim fix that it installs or uninstalls.
- A WebSphere Application Server product stores a parent event for each fix pack that it installs or uninstalls.
- A WebSphere Application Server product stores child component events for each component update that it installs or uninstalls, beneath the corresponding interim fix or fix pack parent event.
- A WebSphere Application Server product stores one log file in the `logs/update` directory as it installs or uninstalls one interim fix or fix pack.
- A WebSphere Application Server product stores one log file in the `logs/update` directory as it installs or uninstalls an interim fix or fix pack, in response to each component update that occurs.
- A WebSphere Application Server product stores a component backup file in the backup directory for each component update that it installs.
- A WebSphere Application Server product removes a component backup file from the backup directory for each component update that it uninstalls.

## Data dictionary

### Type Family: websphere product family

#### File Types:

websphere

#### File Type:

websphere

**Elements:**

name	string	required
version	string	required

**Persistence:**

*versionDir/platform.websphere*

**Type Detail:**

The websphere file denotes the presence of WebSphere family products.

**Element Detail:**

websphere.name	The WebSphere product family name.
websphere.version	The WebSphere product family version.

Type Family: product

File Types: product  
component  
extension

File Type: product

Persistence: *versionDir/id.product*

Elements:	id	string	required
	name	string	required
	version	string	required
	build-info	complex	required

**Type Detail:**

A product file is placed to denote the presence of a specific WebSphere family product.

The product ID is embedded in the product file name.

**Element Detail:**

product.id	The id of the product.
product.name	The name of the product.
product.version	The version of the product.
product.build-info	An element containing build information for the product.

Element Type: build-info

Elements:	date	date	required
	level	string	required

**Type Detail:**

A build-info instance details the build of a specific installed WebSphere family product.

**Element Detail:**

build-info.date	The date on which the product was build.
build-info.level	The level code of the product's build.

File Type: component

Persistence: *versionDir/name.component*

Elements:	name	string	required
-----------	------	--------	----------

spec-version	string	required
build-version	string	required
build-date	date	required

#### File Detail:

A component file denotes the presence of a specific component. The component name is embedded in the component file name.

#### Element Detail:

component.name	The name of the component.
component.spec-version	The specification version of the component.
component.build-version	The build level of the component.
component.build-date	The build date of the component.

File Type: extension

Persistence: *versionDir/id.extension*

Elements:	id	string	required
	name	string	required

#### File Detail:

An extension file denotes the presence of a specific extension. The extension's id is embedded in the extension file name.

The elements of an extension file are minimally specified. The listed elements are required. Additional elements may be present as determined by the actual installed extension.

#### Element Detail:

extension.id	The id of the extension.
extension.name	The name of the extension.

Type Family: update

File Types: efix  
ptf  
efix-applied  
ptf-applied

File Type: efix

Persistence: *versionDir/id.efix*

Elements:	id	string	required
	apar-number	string	optional
	pmr-number	string	optional
	short-description	string	required
	long-description	string	required
	is-temporary	boolean	required
	build-version	string	required
	build-date	date	required
	component-update	complex	min=1, max=unbounded
	platform-prereq	complex	min=0, max=unbounded
	product-prereq	complex	min=0, max=unbounded
	efix-prereq	complex	min=0, max=unbounded
	custom-property	complex	min=0, max=unbounded

#### Type Detail:

An efix file denotes the presence of some portion of a specific fix. The ID of the interim fix is embedded in the file name.

An efix file contains all interim fix data, such as description, a listing of component updates, and prerequisite information.

Almost always, when installing a fix, all of the potential component updates within the interim fix are required to be installed.

A separate application file must be examined to determine the components which have been updated for a particular fix.

A list of custom properties may be provided. These are provided for future use.

Element Detail:

efix.id	The id of the fix.
efix.short-description	A short description of the fix.
efix.long-description	A long description of the fix.
efix.is-trial	A flag indicating whether or not an interim fix is considered a trial fix. Generally, a trial interim fix will be followed up with a more permanent fix.
efix.expiration-date	A date on which the interim fix is obsolete.
efix.build-version	The build version of the fix. This is distinct from the build version of component updates contained within the fix.
efix-build-date	The build date of the fix. This is distinct from the build version of the component updates contained within the fix.
efix.apar-info	A list of APAR's which are associated with the fix.
efix.component-update	A list of updates for components. For a fix, these are usually all required, and are all patch updates. At least one component update must be present.
efix.efix-prereq	A list of prerequisite fixes for the fix. Note that prerequisite fixes may be negative (see below). This list may be (and is often) empty.
efix.plaform-prereq	A list of platforms on which the interim fix may be installed. This list may be empty, in which case the interim fix may be installed on all platforms.
efix.product-prereq	A list of products on which the interim fix may be installed. This list may be empty, in which case the interim fix may be installed on all products.
efix.custom-property	A list of properties, provided for future use.

File Type: ptf

Persistence: *versionDir/id.ptf*

Elements:	id	string	required
	short-description	string	required
	long-description	string	required
	build-version	string	required
	build-date	date	required
	component-update	complex	min=1, max=unbounded
	product-update	complex	min=0, max=unbounded



platform-prereq	complex	min=0, max=unbounded
product-prereq	complex	min=0, max=unbounded
included-efix	complex	min=0, max=unbounded
custom-property	complex	min=0, max=unbounded

#### Type Detail:

A ptf file denotes the presence of some portion of a specific fix pack. The id of the fix pack is embedded in the fix pack file name.

A ptf file contains all fix pack data, such as description, a listing of component updates, and prerequisite information.

Usually, when installing a fix pack, you can omit certain potential component updates, but only when the corresponding component is not installed.

You must examine a separate application file, to determine which components a particular fix pack has updated.

A fix pack can include updates for a number of fixes.

A list of custom properties might be provided. These are for future use.

#### Element Detail:

ptf.id	The ID of the fix pack.
ptf.short-description	A short description of the fix pack.
ptf.long-description	A long description of the fix pack.
ptf.build-version	The build version of the fix pack. This is distinct from the build version of component updates contained within the fix pack.
ptf-build-date	The build date of the fix pack. This is distinct from the build version of the component updates contained within the fix pack.
ptf.component-update	A list of updates for components. For a fix pack, these are usually all required, and are all patch updates. At least one component update must be present.
ptf.plaform-prereq	A list of platforms on which you can install the fix pack. This list might be empty. If so, you can install the fix pack on all platforms.
ptf.product-prereq	A list of products on which you can install the fix pack. This list might be empty. If so, you can install the fix pack on all products.
ptf.included-efix	A list of fixes which are included (fixed) by the fix pack.
ptf.custom-property	A list of properties, provided for future use.

Element Type: component-update

Elements:	component-name	string	required
	update-type	enum	required [enumUpdateType]
	is-required	boolean	required
	is-recommended	boolean	required
	is-optional	boolean	required
	is-external	boolean	required
	root-property-file	anyURL	optional
	root-property-name	string	optional
	root-property-value	anyURL	optional

is-custom	boolean	required
primary-content	string	required
component-prereq	complex	min=0, max=unbounded
final-version	complex	optional
custom-property	complex	min=0, max=unbounded

#### Type Detail:

A component update represents a potential component update which is packaged in an update (an interim fix or a fix pack).

An component update may be required, in which case the parent update may not be installed unless the component update can be installed. (A component update can be installed if the corresponding component is installed.)

A component update may be a custom update, in which case the content which was provided must be an executable file. Otherwise, the content which is provided must be an update JAR file.

A component update has a type. A final version may be required according to the update type.

#### Element Detail:

component-update.component-name	The name the component which is to be updated.
component-update.update-type	The type of the component update, one of 'add', 'replace', 'remove', or 'patch'. Final version information must be provided when the update type is 'add' or 'replace'.
component-update.is-required	A flag which, when true, specifies that the parent update may not be applied unless this component update is applied.
component-update.is-recommended	A flag which, when true, specifies that this component update, although optional, should be installed.
component-update.is-optional	A flag which, when true, specifies that this update may be omitted even if its corresponding component is installed.
component-update.is-external	A flag which, when true, specifies that this component update may live outside of the usual install root.
component-update.root-property-file	For a component with an external root, this properties file provides the root value.
component-update.root-property-name	For a component with an external root, this named property provides the root value.
component-update.root-property-value	For a component with an external root, this value provides the default root value.
component-update.is-custom	A flag which, when true, specifies that the update is a custom update. When true, the content must be an executable program. When false, the content must be an update JAR.
component-update.primary-content	The name of the content which is provided for the

update. This will be an entry which is packaged in the 'components' directory of the update.

component-update.component-prereq A list of component versions, one of which must be present for this update to be installed. When this list is empty, any component version is allowed.

component-update.final-version Final version information for the component. A final version is required when the update operation is 'add' or 'replace'.

component-update.custom-property A list of properties, provided for future use.

Element Type: apar-info

Elements:	number	string	required
	date	date	required
	short-description	string	required
	long-description	string	optional

Type Detail:

An apar-info object provides information about an APAR which is associated with a fix, usually indicating that the interim fix provides an interim fix for the APAR.

Element Detail:

apar-info.number The number of the associated APAR.

apar-info.date The date of the APAR.

apar-info.short-description A short description of the APAR.

apar-info.long-description An optional long description of the APAR.

Element Type: efix-prereq

Elements:	efix-id	string	required
	is-negative	boolean	required
	install-index	int	optional

Type Detail:

An efix-prereq instance denotes an interim fix that must be present (or, if negative, must be absent) for the parent interim fix to be installed.

efix-prereq instances can specify a cycle, in which case the prerequisite specification is treated as a corequisite specification.

The following chart summarizes the interpretation of prerequisite information for two fixes:

fix1	fix2	
-	-	Install the fixes without regard to each other.
fix2	-	fix1 must be installed after fix2 is installed.
-	fix1	fix2 must be installed after fix1 is installed.
fix2	fix1	fix1 and fix2 must be installed together.
!fix2	-	fix1 may not be installed after fix2 is installed.
-	!fix1	fix2 may not be installed after fix1 is installed.
!fix2	!fix1	fix1 and fix2 may not ever be installed together.
!fix2	fix1	This is an erroneous specification.

fix2 !fix1 This is an erroneous specification.

The installation index element provides ordering information for corequisite fixes that must be installed in a particular order.

Element Detail:

fix-prereq.efix-id The id of the prerequisite fix.

fix-prereq.is-negative A flag which indicates if the prerequisite interim fix is required or prohibited. If false, you must install the interim fix before installing the parent fix. If true, you must not install the interim fix before you install the parent fix.

fix-prereq.install-index An optional index number which is used to order corequisite fixes.

Element Type: product-update

Elements:	product-id	string	required
	product-name	string	required
	build-version	string	required
	build-date	date	required
	build-level	string	required

Type Detail:

A product update specifies a replacement to a product file.

The product update information matches the information in product files.

Multiple product updates may be present, in which case each matching product is updated.

Element Detail:

product-update.product-id The id of the product that is updated.

product-update.product-name The name of the product.

product-update.build-version The build version of the product.

product-update.build-date The build date of the product.

product-update.build-level The build level of the product.

Element Type: component-prereq

Elements:	component-name	string	required
	spec-version	string	required
	build-version	string	required
	build-date	date	required

Element Type: platform-prereq

Elements:	architecture	string	required
	os-platform	string	optional
	os-version	string	optional

Type Detail:

A platform prerequisite instance denotes a platform which must be present for an update to be installed. The element values are according to the values supplied for the matching java properties.

Note that when multiple platform prerequisites are specified, these

prerequisites have an OR relationship: At least one of the platform prerequisites must be satisfied.

Element Detail:

platform-prereq.architecture	The name of an architecture which must be present.
platform-prereq.os-platform	The name of an operating system which must be present. This element is optional. When absent, the architecture is checked, but the os-platform and os-version are not.
platform-prereq.os-version	The version of a the operating system which must be present. This element is optional. When absent, the architecture and os-platform are checked, but os-version is not. (When os-platform is absent, os-version should not be set.)

Element Type: product-prereq

Elements:	product-id	string	required
	build-version	string	optional
	build-date	date	optional
	build-level	string	optional

Type Detail:

A product prerequisite specifies that a particular product must be present for an update to be installed.

Note that when multiple product prerequisites are specified, these prerequisites have an OR relationship: At least one of the product prerequisites must be satisfied.

Note that all of the elements are required. When multiple products having the same id are supported by an update, multiple product prerequisites must be specified.

Element Detail:

product-prereq.product-id	The id of the product which must be present.
product-prereq.build-version	The version of the product which must be present.
product-prereq.build-date	The build date of the product which must be present.
product-prereq.build-level	The level date of the product which must be present.

Element Type: component-prereq

Elements:	component-name	string	required
	spec-version	string	required
	build-version	string	required
	build-date	date	required

Type Detail:

A version prerequisite specifies that a particular component version must be present for an update to be installed.

Note that when multiple version prerequisites are specified, these prerequisites have an OR relationship: At least one of the version prerequisites must be satisfied.

Element Detail:

version-prereq.component-name The name of the component which must be present.

version-prereq.spec-version The specification version of the component which must be present.

version-prereq.build-version The version of the component which must be present.

version-prereq.build-date The build date of the component which must be present.

Element Type: included-efix

Elements: efix-id string required

Type Detail:

An included-efix identifies an interim fix by ID and indicates that the fix is included in the fix pack.

Element Detail:

included-efix.efix-id The ID of the interim fix that the fix pack includes.

Element Type: custom-property

Elements: property-name string required  
property-type string optional  
property-value string optional

Type Detail:

A custom property encodes a key-value pair, with an optional type element. Custom properties are provided for future use.

Element Detail:

custom-property.property-name The name of the custom property.

custom-property.property-type An optional type of the custom property. The semantics of this type are defined by user of the property value.

custom-property.property-value The value of the custom property.

File Type: efix-applied

Persistence: *versionDir/id.efixApplied*

Elements: efix-id string required  
component-applied complex min=0, max=unbounded

Type Detail:

An efix-applied collection specifies what components have been updated for the interim fix as specified by the efix-id.

Element Detail:

efix-applied.efix-id The id of the interim fix for which applieds are recorded.

efix-applied.component-applied The list of recorded applications.

File Type: ptf-applied



Persistence: *versionDir/id.ptfApplied*

Elements:	ptf-id	string	required
	component-applied	complex	min=0, max=unbounded

Type Detail:

A ptf-applied collection specified what components have been updated for the fix pack as specified by the fix pack ID.

Element Detail:

ptf-applied.efix-id                    The ID of the fix pack for which applieds are recorded.

ptf-applied.component-applied    The list of recorded applications.

Element Type:            component-applied

Elements:	component-name	string	required
	update-type	enum	required [enumUpdateType]
	is-required	boolean	required
	is-optional	boolean	required
	is-external	boolean	required
	root-property-file	anyURL	optional
	root-property-name	string	optional
	root-property-value	string	optional
	is-custom	boolean	required
	log-name	anyURL	required
	backup-name	anyURL	required
	time-stamp	date	required
	initial-version	complex	optional
	final-version	complex	optional

Type Detail:

An applied instance is present to indicate the application of an update for a particular interim fix or fix pack to a particular component. (The particular interim fix or fix pack is as specified by the applied's parent.) An applied provides sufficient information to undo itself.

The elements of an applied are copies of values from update events.

Element Detail:

component-applied.component-name    The name of the component which was updated.

component-applied.update-type        The type of the component update.

component-applied.is-required        A true value specifies that the parent update requires this component update.

component-applied.is-optional        A flag which, when true, specifies that the parent update does not require this component update, even if the component is installed.

component-applied.is-external        A flag which, when true, specifies that this component update was applied to a location different than the usual `install_root`.

component-applied.root-property-file    For an update against a component having an external root, this properties file provides the root value.

component-applied.root-property-name    For an update against a component having an

external root, this named property provides the root value.

`component-applied.root-property-value` For an update against a component having an external root, this is a record of the actual external root.

`component-applied.is-custom` A flag which, when true, specifies that the application was a custom update. When true, an executable program was applied. When false, the contents of an update JAR were applied.

`component-applied.log-name` The name of the log file that was generated by this application.

`component-applied.backup-name` The name of the backup file which was generated by this application.

`component-applied.time-stamp` The time of this application (the ending time of the corresponding update event).

`component-applied.initial-version` The version of the component before the application. This version will be null if the application was an add.

`component-applied.final-version` The version of the component after application. This will be null if the update was a removal.

Element Type: `initial-version`

Elements:	<code>component-name</code>	string	required
	<code>spec-version</code>	string	required
	<code>build-version</code>	string	required
	<code>build-date</code>	string	required

Type Detail:

A `initial-version` instance is used to describe a component level as the initial version of a component.

Element Detail:

`initial-version.component-name` The name of the component.

`initial-version.spec-version` The new specification version for the component following the update.

`initial-version.build-version` The new build version for the component.

`initial-version.build-date` The new build date for the component.

Element Type: `final-version`

Elements:	<code>component-name</code>	string	required
	<code>spec-version</code>	string	required
	<code>build-version</code>	string	required
	<code>build-date</code>	string	required

Type Detail:

A `final-version` instance is used to supply a component level for a component which has been added or replaced.

Element Detail:

`final-version.component-name` The name of the new component.

final-version.spec-version The new specification version for the component following the update.

final-version.build-version The new build version for the component.

final-version.build-date The new build date for the component.

Enum Type: enumUpdateType

Values: 0 add  
1 replace  
2 remove  
3 patch

#### Type Detail:

An update type instance specifies the type of an update. An 'add' update adds a component into an installation. A 'replace' update replaces a particular version of a component with a different version of that component. A 'remove' update removes a component. A 'patch' update performs a limited update to a component, in particular, without changing the version of the component.

When adding a component, that component may not already be present.  
When replacing or removing a component, that component must be present.  
When patching a component, that component must be present.

When replacing or removing a component, or when patching a component, usually, at least one version prerequisite will be specified for the component update.

#### Value Detail:

enumUpdateType.add Specifies that an update adds a component.

enumUpdateType.replace Specifies that an update replaces a component.

enumUpdateType.remove Specifies that an update removes a component.

enumUpdateType.patch Specifies that an update modifies a component, but does not change its version.

Type Family: history

File Type: event-history

Persistence: *historyDir/event.history*

Elements: update-event complex min=0, max=unbounded

#### Type Detail:

One event history is provided for a websphere product family installation. This event history contains history of update events, corresponding with the actual update events for that product family.

#### Element Detail:

event-history.update-event The list of update events for the websphere product family. The top level events are fix and fix pack events, each containing one or more component events.

Element Type: update-event

Elements: event-type enum required [enumEventType]

parent-id	string	required	
id	string	required	
update-type	enum	required	[enumUpdateType]
is-required	boolean	required	
is-optional	boolean	required	
is-external	boolean	required	
root-property-file	anyURL	optional	
root-property-name	string	optional	
root-property-value	string	optional	
is-custom	boolean	required	
primary-content	anyURI	required	
event-action	enum	required	[enumEventAction]
log-name	anyURI	required	
backup-name	anyURI	required	
start-time-stamp	dateTime	required	
end-time-stamp	dateTime	optional	
status	enum	optional	[enumEventResult]
status-message	string	optional	
initial-version	complex	optional	
final-version	complex	optional	
update-event	complex	optional	

#### Type Detail:

An update event denotes a single update action, applying to either a fix, a fix pack, or to a component, according to the set event type.

Interim fix (efix) and fix pack (ptf) type events each have a collection of component events.

Currently, component events have no child events.

#### Element Detail:

update-event.event-type	The type of this event, either an interim fix or fix pack (ptf) type event, or a component type event.
update-event.parent-id	This element is present only for component events. The ID of the parent interim fix or fix pack of this event.
update-event.id	The ID of the fix, fix pack, or component that was updated, interpreted according to the type of the event.
update-event.update-type	The type of update for component events.
update-event.is-required	A flag which, when true, specifies that this component update is required.
update-event.is-optional	A flag which, when true, specifies that this component update is optional, even if the component is installed.
update-event.is-external	A flag which, when true, specifies that this update used an external root.
update-event.root-property-file	For an update of an external component, this properties file contains the external root value.

update-event.root-property-name	For an update of an external component, the property having this name specifies the external root value.
update-event.root-property-value	For an update of an external component, the root value.
update-event.is-custom	A flag that, when true, specifies that the application was a custom update. When true, an executable program was applied. When false, the contents of an update JAR file were applied.
update-event.primary-content	The URL of the primary content for the update.
update-event.event-action	The type of action for this event.
update-event.log-name	The name of the log file that was generated for this event.
update-event.backup-name	The name of the backup file that was generated for this event.
update-event.start-time-stamp	The XML timestamp of the starting time of the event. This timestamp follows the XML timestamp format, meaning that time zone information is included.
update-event.end-time-stamp	The XML timestamp of the ending time of the event. This timestamp follows the XML timestamp format, meaning that time zone information is included. When absent, the update operation corresponding to the parent event failed with a non-recoverable exception.
update-event.status	The result of the update.
update-event.status-message	Message text provided in addition to the basic status code. Exception text is provided through the status-message when an update fails.
update-event.initial-version	This element is not used unless the update is a component type update. The initial version of the component which was updated. This element is absent when the update is an add type update.
update-event.final-version	This element is not used unless the update is a component type update. The final version of the component which was updated. This element is absent when the update is a remove type update.
update-event.update-event	A collection of child events. This collection is used for interim fix and fix pack type events. This collection is empty for component type events.

Element Type:    initial-version

Elements:	spec-version	string	required
	build-version	string	required
	build-date	string	required

Type Detail:

A initial-version instance is used to describe a component level as the initial version of a component.

Element Detail:

initial-version.spec-version The new specification version for the component following the update.

initial-version.build-version The new build version for the component.

initial-version.build-date The new build date for the component.

Element Type: final-version

Elements:	spec-version	string	required
	build-version	string	required
	build-date	string	required

Type Detail:

A final-version instance is used to supply a component level for a component which has been added or replaced.

Element Detail:

final-version.spec-version The new specification version for the component following the update.

final-version.build-version The new build version for the component.

final-version.build-date The new build date for the component.

Enum Type enumEventType

Values:	0 Interim fix (efix)
	1 Fix pack (ptf)
	2 Component

Type Detail:

An event type instance specifies the type of an update event, which is either an interim fix (efix) event, a fix pack (ptf) event or a component event. The interpretation of particular event elements depends on the set event type.

Value Detail:

enumEventType.efix Specifies that an event is for an interim fix update.

enumEventType.ptf Specifies that an event is for a fix pack update.

enumEventType.component Specifies that an event is for a component update.

Enum Type: enumEventAction

Values:	0 Install
	1 Uninstall
	2 Selective install
	3 Selective uninstall

Type Detail:

An event action instance specified the operation performed by an update, which can be an install or uninstall operation, and which may be a selective operation. Component operations are always either install or uninstall type operations, only interim fix and fix pack operations may be selective operations.

A selective operation is an installation which is applied to a preset list of components. In particular, potential component updates may be skipped, and component updates which were already applied may be reapplied.

A selective uninstall operation is used to back out an update which was cancelled by the user.



#### Value Detail:

<code>enumEventAction.install</code>	Specifies that an event is an install operation.
<code>enumEventAction.uninstall</code>	Specifies that an event is an uninstall operation.
<code>enumEventAction.selective-install</code>	Specifies that an event is an install operation with a preset list of components that are updated.
<code>enumEventAction.selective-uninstall</code>	Specifies that an event is an uninstall operation with a preset list of components that are updated.

Enum Type: `enumUpdateType`

Values:

- 0 Add
- 1 Replace
- 2 Remove
- 3 Patch

#### Type Detail:

An update type instance specifies the type of a component update.  
An 'add' update adds a component into an installation.  
A 'replace' update replaces a particular version of a component with a different version of that component.  
A 'remove' update removes a component.  
A 'patch' update performs a limited update to a component, in particular, without changing the version of the component.

To add a new component, the component must not exist.  
To replace or remove a component, the component must exist.  
To patch a component, the component must exist.

When replacing or removing a component, or when patching a component, usually, at least one version prerequisite is specified for the component update.

#### Value Detail:

<code>enumUpdateType.add</code>	Specifies that an update adds a component.
<code>enumUpdateType.replace</code>	Specifies that an update replaces a component.
<code>enumUpdateType.remove</code>	Specifies that an update removes a component.
<code>enumUpdateType.patch</code>	Specifies that an update modifies a component, but does not change its version.

Enum Type: `enumEventResult`

Values:

- 0 Succeeded
- 1 Failed
- 2 Cancelled

#### Type Detail:

An event result instance denotes a particular result for an update event. The result indicates success, failure, or cancellation.

#### Value Detail:

`enumEventResult.succeeded` Specifies that the operation was successful.

enumEventResult.failed Specifies that the operation failed.

enumEventResult.cancelled Specifies that the operation was cancelled.

## versionInfo command

The **versionInfo** command generates reports from data it extracts from XML files in the `properties/version` folder.

### Product version and history information

The `/properties/version` directory in the installation root contains important data about the product and its installed components, such as the build version and build date. This information is included in `product.product` and `component.component` files. The `/properties/version/history` directory in the installation root contains a collection of records for installed interim fixes and fix packs. This information is included in `interim fixID.efixApplied`, `interim fixID.efixDriver`, `fix packID.ptfApplied`, and `fix packID.ptfDriver` files. A driver file has useful information about the entire contents of an interim fix or fix pack. The applied file has relevant information about the interim fixes or fix packs that are currently applied. `Event.history` files are also present. They contain a detailed log about updates you have applied, either successfully or unsuccessfully. Time-stamped, detailed logs record each update process in the `/properties/version/log` directory of the installation root.

You can view product information by examining files in the `properties/version` directory, including the `properties/version/history` directory. WebSphere Application Server also provides the ability to generate two types of reports about the data in the files, **Version** reports and **History** reports.

**Restriction:** There is one restriction. Do not use the `versionInfo.sh` or `versionInfo.bat` script while installing or uninstalling the product, or while installing or uninstalling an interim fix or fix pack.

### Product version reports

The following report generation scripts extract data from XML data files in the `properties/version` folder:

- `versionInfo` script  
Lets you use parameters to create a version report on Linux and UNIX-based platforms, or on Windows platforms.
- `genVersionReport` script  
Generates the `versionReport.html` report file in the `bin` directory on Linux and UNIX-based platforms, or on Windows platforms. The report includes the list of components, fixes, and fix packs.

### Location of the command file

The command file is a script. On Linux and UNIX platforms, the command file is named `versionInfo.sh` in the `install_root/bin` directory. On Windows platforms, the command file is named `versionInfo.bat` in the `install_root\bin` directory.

### Syntax for the versionInfo command on a Linux or UNIX-based platform

The command syntax is:

```
versionInfo.sh [ -format text | html]
               [ -file output file]
               [ -long ]
               [ -efixes ]
               [ -efixDetail ]
               [ -ptfs ]
               [ -ptfDetail ]
               [ -components ]
```

```
[ -componentDetail ]
```

```
versionInfo.sh [ -help | -? | /help | /? | -usage ]
```

Issue the command from the *install\_root/bin* directory.

### Syntax for the versionInfo command on a Windows platform

The command syntax is:

```
versionInfo [ -format text | html ]  
            [ -file output file ]  
            [ -long ]  
            [ -efixes ]  
            [ -efixDetail ]  
            [ -ptfs ]  
            [ -ptfDetail ]  
            [ -components ]  
            [ -componentDetail ]
```

```
versionInfo [ -help | -? | /help | /? | -usage ]
```

Issue the command from the *install\_root\bin* directory.

### Parameters

#### **-? or /? (Windows only)**

Displays command syntax.

#### **-components**

Adds a list of installed components to the report.

#### **-componentDetail**

Adds details about installed components to the report.

#### **-efixes**

Adds a list of applied interim fixes to the report.

#### **-efixDetail**

Adds details about applied interim fixes to the report.

#### **-file *fileName***

Specifies the output file name. The report goes to standard output (stdout) by default.

#### **-format text | html**

Selects the format of the report. The default is "text".

#### **-help or /help (Windows only)**

Displays command syntax.

#### **-long**

Creates the long version of the report.

#### **-ptfDetail**

Adds details about applied fix packs to the report.

#### **-ptfs**

Adds a list of applied fix packs to the report.

#### **-usage**

Displays command syntax.

## Logging

As the tool runs, it creates reports instead of log entries. Reports appear on the console unless directed to a file with the `-file filename` parameter. There is no default file name. You must specify a file name to generate a file.

When issued on a Windows platform, from the bin directory of the Network Deployment product that has no interim fixes or fix packs applied, the `versionInfo.bat` script displays the following information:

```
D:\Program Files\WebSphere\DeploymentManager\bin>versionInfo
WVER0010I: Copyright (c) IBM Corporation 2002; All rights reserved.
WVER0011I: WebSphere Application Server Release 5.0
WVER0012I: VersionInfo reporter version 1.14, dated 5/9/03
```

```
-----
IBM WebSphere Application Server Product Installation Status Report
-----
```

Report at date and time 2003-10-05T11:01:45-04:00

### Installation

```
-----
```

```
Product Directory  D:\Program Files\WebSphere\DeploymentManager
Version Directory  ${product.dir}\properties\version
DTD Directory      ${version.dir}\dtd
Log Directory      D:\Program Files\WebSphere\DeploymentManager\logs\update
Backup Directory   ${version.dir}\backup
TMP Directory      D:\DOCUME~1\ADMINI~1\LOCALS~1\Temp
```

### Installation Platform

```
-----
```

```
Name      IBM WebSphere Application Server
Version   5.1
```

### Technology List

```
-----
```

```
ND      installed
```

### Installed Product

```
-----
```

```
Name      IBM WebSphere Application Server Network Deployment
Version   5.1.0
ID        ND
Build Level  b0334.18
Build Date  8/30/03
```

```
-----
End Installation Status Report
-----
```

## genVersionReport command

The **genVersionReport** command generates the `versionReport.html` report file in the bin directory on Linux and UNIX-based platforms, or on Windows platforms. The report includes the list of components, fixes, and fix packs.

## Product version and history information

The `/properties/version` directory in the installation root contains important data about the product and its installed components, such as the build version and build date. This information is included in `[product].product` and `[component].component` files. The `/properties/version/history` directory in the installation root contains a collection of records for installed interim fixes and fix packs. This information is included in `[interim fixID].efixApplied`, `[interim fixID].efixDriver`, `[fix packID].ptfApplied`, and `[fix packID].ptfDriver` files. A driver file has useful information about the entire contents of an interim fix or fix pack. The applied file has relevant information about the interim fixes or fix packs that are currently applied. `Event.history` files are also present. They contain a detailed log about updates you have applied, either successfully or unsuccessfully. Time-stamped, detailed logs record each update process in the `/properties/version/log` directory of the installation root.

You can view product information by examining files in the `properties/version` directory, including the `properties/version/history` directory. WebSphere Application Server also provides the ability to generate two types of reports about the data in the files, **Version** reports and **History** reports.

## Product version reports

The following report generation scripts extract data from XML data files in the `properties/version` folder:

- `versionInfo` script  
Lets you use parameters to create a version report on Linux and UNIX-based platforms, or on Windows platforms.
- `genVersionReport` script  
Generates the `versionReport.html` report file in the `bin` directory on Linux and UNIX-based platforms, or on Windows platforms. The report includes the list of components, fixes, and fix packs.

## Location of the command file

The command file is a script. On Linux and UNIX platforms, the command file is named `genVersionReport.sh` in the `install_root/bin` directory. On Windows platforms, the command file is named `genVersionReport.bat` in the `install_root\bin` directory.

## Syntax for the `versionInfo` command on a Linux or UNIX-based platform

The command syntax is:

```
genVersionReport.sh
```

Issue the command from the `install_root/bin` directory.

## Syntax for the `versionInfo` command on a Windows platform

The command syntax is:

```
genVersionReport.bat
```

Issue the command from the `install_root\bin` directory.

## Logging

As the tool runs, it creates the `versionReport.html` report file instead of log entries.

## Creating the report

This example shows how to issue the command on a Windows platform, from the `bin` directory of the Network Deployment product:

```
D:\Program Files\WebSphere\DeploymentManager\bin>genVersionReport
WVER0010I: Copyright (c) IBM Corporation 2002; All rights reserved.
WVER0011I: WebSphere Application Server Release 5.0
WVER0012I: VersionInfo reporter version 1.14, dated 5/9/03
```

When the Network Deployment product has no interim fixes or fix packs applied, the genVersionReport.bat script creates the following information in the versionReport.html report file, which is edited to show only the first few components:

IBM WebSphere Application Server Product Installation Status Report

```
-----
Report at date and time 2003-10-05T11:58:40-04:00

Installation
Product Directory D:\Program Files\WebSphere\DeploymentManager
Version Directory ${product.dir}\properties\version
DTD Directory ${version.dir}\dtd
Log Directory D:\Program Files\WebSphere\DeploymentManager\logs\update
Backup Directory ${version.dir}\backup
TMP Directory D:\DOCUME~1\ADMINI~1\LOCALS~1\Temp

Installation Platform
Name IBM WebSphere Application Server
Version 5.1

Technology List
ND installed

Installed Product
Name IBM WebSphere Application Server for Network Deployment
Version 5.1.0
ID ND
Build Level b0334.18
Build Date 8/30/03

Installed Component
Component Name activity
Spec Version 5.0
Build Version b0334.18
Build Date 8/30/03

Installed Component
Component Name activity.impl
Spec Version 5.0
Build Version b0334.18
Build Date 8/30/03

Installed Component
Component Name activity.session
Spec Version 5.0
Build Version b0334.18
Build Date 8/30/03
```

```
-----
```

End Installation Status Report



---

## Uninstalling the product

This task describes how to uninstall WebSphere Business Integration Server Foundation from the root user on a Linux platform or a UNIX-based platform, or from a user ID that belongs to the administrator group on a Windows platform.

Several factors affect the procedure for uninstalling WebSphere Application Server products:

- Security
- Migrating
- Coexisting
- Using the embedded messaging feature
- Being part of a deployment manager cell

WebSphere Business Integration Server Foundation provides an uninstaller program, which you can call with the `uninstall` command.

If you have installed interim fixes or fix packs to WebSphere Business Integration Server Foundation or to the product that Integration Server extends, use the update installer application to remove the interim fixes or fix packs before uninstalling Integration Server. Uninstalling Integration Server does not remove interim fixes or fix packs from the product that Integration Server extends, either the base product or the Network Deployment product.

Before issuing the command, locate your particular scenario for uninstalling and follow the recommended procedure. The potential exists for losing the embedded messaging feature code for WebSphere Application Server products that remain on the machine unless you follow the particular procedure. Another possible consequence of not following the correct procedure for uninstalling is losing the configuration of a federated node after migration.

The uninstaller program removes registry entries, uninstalls the product, and removes all related features and products, such as plug-ins. However, the uninstaller program does not remove some files. The uninstaller program does not delete any configuration files that are changed as the result of selecting installation options, or running Samples, for example. The uninstaller program does not delete log files.

When uninstalling WebSphere Business Integration Server Foundation from a base node, the uninstaller program does not remove applications from the base node that might use Integration Server extensions. You must remove those applications or change them to remove any calls that the applications make to Integration Server extensions.

### Uninstalling products in the proper sequence

Uninstall WebSphere Application Server products in the following sequence when you are uninstalling more than one product:

1. WebSphere Business Integration Server Foundation on Network Deployment and Network Deployment
2. WebSphere Business Integration Server Foundation on a base node and the base product

If you are uninstalling WebSphere Business Integration Server Foundation on a federated base node, the uninstaller program unfederates the base node before uninstalling Integration Server. If you do not uninstall the base product as you uninstall Integration Server, refederate the node after uninstalling Integration Server.

**Planning for time to uninstall** The time required to uninstall a product depends on the number of configured servers. The uninstaller program attempts to stop all running servers. As a result, the time required to uninstall is directly proportional to the number of defined servers. The uninstaller program attempts to contact each configured server and waits for a timeout before assuming that a server is not

running. Therefore, uninstalling many servers can take several minutes. The uninstaller program can run slightly faster if all servers are running, which avoids waiting for a timeout condition.

### Examining logs from the uninstalling operation

Examine the `install_root/logs/WAS.WBISF.uninst.log` file to verify that no file system or other unusual errors occurred. Also examine the `install_root/logs/uninstlog.txt` file if you uninstall the base product or Network Deployment while you are uninstalling Integration Server.

1. Close all Web browser processes. Before uninstalling, verify that you have no open Web browsers that are accessing the administrative console. Otherwise, the potential for locked file errors exists.
2. Stop the IBM HTTP Server and any related Java processes. Stop these processes only if the processes are running on the same machine.
3. Disable WebSphere Application Server security. If security is on and Application Servers are running, the uninstaller program cannot detect the status of the Application Servers because security is on. The uninstall procedure fails because it cannot stop the Applications Server processes.

Another scenario involving security is when a federated Application Server is stopped. The uninstall procedure fails because the uninstaller program cannot remove the node from the cell when security is enabled.

4. Stop all Java processes that are related to WebSphere Application Server products on the machine. If you are uninstalling WebSphere Business Integration Server Foundation on a federated base node, you can leave the deployment manager running. Uninstalling the Integration Server product on a federated base node removes the node from the cell.
  - a. Stop any embedded messaging feature services, such as WebSphere embedded messaging publish and subscribe, `jmsserver`, or WebSphere MQ queue managers, and any related Java processes. Stop these processes only if the processes are running on the same machine.

For example, if you have a federated base product with the embedded messaging server and client feature installed on the same Linux machine, use the following command from the `/opt/WebSphere/AppServer/bin` directory to stop the `jmsserver` process:

```
./stopServer.sh jmsserver
```

- b. Stop any Java processes related to federated WebSphere Application Server processes with the **stopServer** command and the **stopNode** command. Stop all server processes for WebSphere Application Server that are running on the machine. For example, use the following commands from the `/opt/WebSphere/AppServer/bin` directory on a Linux machine to stop the `server1` and `nodeagent` processes:

```
./stopServer.sh server1  
./stopNode.sh
```

If you have another installation instance of WebSphere Application Server, V5.0.x or V5.1, stop all servers that are running on the other instances too.

If servers are running and security is enabled, the uninstaller program cannot shut down the servers and the uninstall procedure fails. Manually stop all servers before uninstalling.

- c. Use the **wsinstance** command to delete any configuration instances of the product that you are uninstalling. The following example command is on more than one line for formatting purposes. Enter the command on one line to delete the configuration instance named `shasti` from a Linux machine:

```
./wsinstance.sh -name shasti -host planetlinux -delete
```

- d. Stop the deployment manager `dmgr` process with the **stopManager** command. Stop all `dmgr` processes that are running on the machine. For example, issue this command on a Linux machine from the `/opt/WebSphere/DeploymentManager/bin` directory:

```
./stopManager.sh
```

5. Uninstall the product. Select your uninstalling scenario from the following list of options:

- Uninstall Enterprise when neither migration nor coexistence are involved.

- Uninstall WebSphere Business Integration Server Foundation when neither migration nor coexistence are involved.
  - Uninstall Integration Server on a Network Deployment node.
  - Uninstall Integration Server on a base WebSphere Application Server node.
  - Uninstall Enterprise or Integration Server in a migration scenario.
  - Uninstall Integration Server in a coexistence scenario.
6. Optional: Uninstall manually before reinstalling. The uninstaller program leaves some log and configuration files that were changed during installation. You can manually uninstall the product to remove all artifacts of the product instance from the platform. This step is required before you can reinstall the product into the same installation root directory. Follow the reinstallation scenario for V5.1 if you left the embedded messaging feature installed and now you want to reinstall the V5.1 product. Follow the other procedure when you did not leave the embedded messaging feature installed, or when you are removing all product artifacts from V5.1 or V5.0.x.
- Uninstall manually after uninstalling V5.1:
    - Uninstall manually on all platforms but Solaris and HP-UX before reinstalling.
    - Uninstall manually on Solaris platforms before reinstalling.
    - Uninstall manually on HP-UX platforms before reinstalling.
  - Uninstall manually after uninstalling V5.0.x, or when you are removing all product artifacts from V5.1.

You can uninstall the product.

Return to Installing WebSphere Application Server.

## uninstall command

The **uninstall** command uninstalls the product. Uninstalling the product also selects the feature uninstaller programs, such as the uninstaller program for the IBM HTTP Server if you installed IBM HTTP Server as a feature of the base product. The uninstaller wizard prompts you to uninstall the embedded messaging feature because other product instances might share the feature. Options on the silent parameter of the uninstaller program control the removal of an existing embedded messaging feature when you uninstall silently.

### Before you begin uninstalling the product

If servers are running and security is enabled, the uninstaller program cannot shut down the servers and the uninstall procedure fails. Manually stop all servers before uninstalling the product.

### Overview of uninstalling the product

The uninstaller wizard displays a panel when it begins. Click **Next** to begin uninstalling the product when the embedded messaging feature is not installed, or to display a panel with a prompt for uninstalling the embedded messaging feature, if the feature is installed.

If the embedded messaging feature is installed, click the check box to clear the selection and leave the embedded messaging feature installed. You can do this legally only when there is another instance of a WebSphere Application Server product on the machine that also uses the embedded messaging feature and shares the embedded messaging code. Another example of properly retaining the embedded messaging code occurs when migrating to a new version or release of a WebSphere Application Server product that also uses the embedded messaging code.

Leave the check box selected to uninstall the embedded messaging feature.

Click **Next** to begin uninstalling the product.

## Location of the command file

The command file is located in the `_uninstWBISF` directory in the installation root directory on an Integration Server system.

The command file is named `uninstall` for Linux and UNIX-based platforms and `uninstall.bat` on Windows platforms.

## Before you uninstall WebSphere Business Integration Server Foundation on Network Deployment

Stop the deployment manager before uninstalling WebSphere Business Integration Server Foundation from a Network Deployment node by running the **stopManager** command.

## Command syntax

Command parameters are described at the end of this topic. This section describes the recommended command syntax, which starts the uninstaller wizard.

### Command syntax for uninstalling WebSphere Business Integration Server Foundation

- On Linux and UNIX-based platforms, issue a fully qualified command from any directory or the command name from the `_uninstWBISF` directory. For example, use either of the following commands:

```
# "/opt/WebSphere/AppServer/_uninstWBISF/uninstall"  
(/opt/WebSphere/AppServer/_uninstWBISF) # ./uninstall"
```

- On Windows platforms, issue one of the following commands when the Integration Server product is extending the Network Deployment product, for example:

From any directory:

```
"C:\WebSphere\NetworkDeployment\_uninstWBISF> uninstall.bat"  
"C:\WebSphere\NetworkDeployment\_uninstWBISF> uninstall"
```

From the `C:\WebSphere\NetworkDeployment\_uninstWBISF` directory:

```
uninstall.bat  
uninstall
```

## Uninstalling the base product or Network Deployment when uninstalling Integration Server

You can uninstall the base product or the Network Deployment product when you uninstall the WebSphere Business Integration Server Foundation product, depending on which product the Integration Server is extending. A panel appears that prompts you to uninstall the extended product. If you select to uninstall the product, the uninstaller program removes the product along with the Integration Server. If you select to leave the extended product, the uninstaller program does not remove the product as it uninstalls the Integration Server.

## Logging the results of the uninstall procedure for Integration Server

Examine the `install_root/logs/WAS.WBISF.uninstall.log` file to verify that there were no file system or other unusual errors while uninstalling.

If you also uninstalled the base product or the Network Deployment product while you uninstalled the Integration Server product, examine the `install_root/logs/uninstlog.txt` file to verify success.

If there are problems, correct them, and see “Uninstalling manually” on page 335 before reinstalling the product.

## Command syntax for using the `-silent` parameter

If you remove the embedded messaging feature when uninstalling V5.1, any instance of WebSphere Application Server, Version 5.0 on your system cannot properly use the embedded messaging function. If

you do not remove the embedded messaging feature, you are responsible for verifying that you are (and that you remain) properly licensed to use the embedded messaging feature on this system.

If WebSphere Application Server, Version 5.0 is not installed on this system and you remove WebSphere Application Server, Version 5.1, you may not have any such right to use the embedded messaging feature. By using the silent uninstall method, you indicate your acknowledgment of this condition and your agreement to comply with the relevant licensing terms as they apply to your use of the embedded messaging feature.

Please refer to the license information documents for WebSphere Application Server, Version 5.1 and WebSphere Application Server, Version 5.0 for further details.

Uninstall silently using one of the commands in the following series of tables. Uninstalling silently does not display the uninstaller program wizard.

**Use the following commands on an Integration Server node:**

*Table 43. Uninstalling silently on Linux and UNIX platforms*

Command  (from the <i>install_root/_uninst/</i> directory)	Effect on extended product		Effect on the embedded messaging feature
	Effect on the base product	Effect on Network Deployment	
<code>uninstall -silent</code>	Retains the base product	Retains Network Deployment	Retains the feature
<code>uninstall -silent -W setUninstBaseOrNDtoTrue.active = "true" -W SetRetainMQToTrue.active = "true"</code>	Uninstalls the base product	Uninstalls Network Deployment	Retains the feature
<code>uninstall -silent -W setUninstBaseOrNDtoTrue.active = "true" -W SetRetainMQToTrue.active = "false"</code>	Uninstalls the base product	Uninstalls Network Deployment	Uninstalls the feature

*Table 44. Uninstalling silently on Windows platforms*

Command  (from the <i>install_root/_uninst/</i> directory)	Effect on extended product		Effect on the embedded messaging feature
	Effect on the base product	Effect on Network Deployment	
<code>uninstall.bat -silent</code>	Retains the base product	Retains Network Deployment	Retains the feature
<code>uninstall.bat -silent -W setUninstBaseOrNDtoTrue.active = "true" -W SetRetainMQToTrue.active = "true"</code>	Uninstalls the base product	Uninstalls Network Deployment	Retains the feature
<code>uninstall.bat -silent -W setUninstBaseOrNDtoTrue.active = "true" -W SetRetainMQToTrue.active = "false"</code>	Uninstalls the base product	Uninstalls Network Deployment	Uninstalls the feature

**Using the silent uninstall response file to uninstall Integration Server**

You can use the `uninstall.response` file in the `_uninstWBISF` directory to uninstall Integration Server. Issue one of the following commands (on one line):

```
> "C:\WebSphere\AppServer\_uninstWBISF\uninstall"
  -options
  "C:\WebSphere\AppServer\_uninstWBISF\uninstall.response"

# /opt/WebSphere/AppServer/_uninstWBISF/uninstall
  -options
  "/opt/WebSphere/AppServer/_uninstWBISF/uninstall.response"
```

You can modify the `uninstall.response` file to uninstall or leave installed the product that the Integration Server product extends and the embedded messaging feature.

## uninstall.response file

This topic describes the response file for uninstalling the WebSphere Business Integration Server Foundation product. The response file lets you uninstall without using the wizard and without entering the **uninstall** command and all of its required parameters on the command line.

Uninstall silently as the root user on a Linux or UNIX-based platform, or as a user that belongs to the administrator group on a Windows platform. Some steps for uninstalling silently on a Windows platform require the administrator group user to have the advanced user rights *Act as part of the operating system* and *Log on as a service*.

Uninstalling silently is an uninstalling method that reads all choices from the `uninstall.response` file, which you must customize. This file does not affect the wizard for uninstalling in any way.

## Location

The sample `uninstall.response` file is in the `_uninstWBISF` directory in the installation root directory.

## Usage notes

- The file is not a read-only file.
- Edit this file directly with your flat file editor of choice, such as WordPad on a Windows platform.
- The file is not updated by any product components.
- The file does not have to exist to uninstall silently. You can uninstall silently using the options that are described for the `uninstall` command. If you use the following command syntax for the **uninstall** command, the uninstaller program reads the `uninstall.response` file to determine options:

```
uninstall -options uninstall.response
```

You can name the file with any name that you choose to use. You must refer to the file on the command.

## Options in the uninstall.response file

```
#
#
# IBM Confidential OCO Source Material
# 5639-D57, 5630-A36, 5630-A37, 5724-D18 (C) COPYRIGHT International Business Machines Corp. 1997, 2004
# The source code for this program is not published or otherwise divested
# of its trade secrets, irrespective of what has been deposited with the
# U.S. Copyright Office.
#
#
# *****
# Response file for uninstalling WebSphere Business Integration Server Foundation v5.1
# on an existing WebSphere Application Server v5.1 or WebSphere Application
# Server Network Deployment v5.1
# *****
# *****
```



```

# Usage:
# Windows:
#     uninstall.exe -options uninstall.response
#
# Other Platforms:
#     ./uninstall -options uninstall.response
# *****

# =====
# Please follow the comments to use the response file and understand
# the various options. You must carefully complete or change the various
# values. If the values are not completed properly, the uninstall may be
# unsuccessful.
#
# NOTE: This file is for silent uninstall only.
#
# IMPORTANT: ALL VALUES MUST BE ENCLOSED IN DOUBLE QUOTES ( "" ).
# -----

-silent

# =====
# If you would like to silent uninstall WebSphere Application Server v5.1
# and WebSphere Application Server Network Deployment v5.1 while you are
# uninstalling WebSphere Business Integration Server Foundation v5.1,
# set the value to "true". Otherwise, set the value to "false".
# -----

-W setUninstBaseOrNDtoTrue.active="false"

# =====
# If you would like to silent uninstall Embedded Messaging feature, set
# the value to "false", otherwise set it to "true".
#
# NOTE: This value will be ignored if you do not uninstall WebSphere Application
# Server v5.1 or WebSphere Application Server Network Deployment v5.1.
# -----

-W SetRetainMQToTrue.active="false"

```

## vpd.properties file

The installer program for any WebSphere Application Server product uses the Install Shield for Multiplatforms (ISMP) program to install code. ISMP uses the vpd.properties file to track WebSphere products that it installs on all platforms but Solaris and HP-UX. The vpd.properties file lists program components that are currently installed. The file helps ISMP and the installer programs of WebSphere Application Server products to recognize previous installations of WebSphere Application Server products and to control options for new installations.

### Situations that require you to edit the vpd.properties file

Certain situations require you to edit the vpd.properties file before reinstalling a WebSphere Application Server product. The uninstaller programs for WebSphere Application Server products edit the vpd.properties while uninstalling a product, to remove entries for the product and any of its features that might have entries in the file.

It is necessary to remove product entries in the vpd.properties file before you can reinstall the product. Some situations that occur require manually removing entries from the vpd.properties file before you can reinstall a product. These situations include:

- Removing entries for the embedded messaging feature when the feature was left intact but the product was uninstalled
- Bypassing the uninstaller program to uninstall a product manually
- Manually uninstalling a product when the uninstaller program is not present or is not working

If the `vpd.properties` file has entries for a product you uninstalled, you must edit the file and remove the entries. If you do not edit the `vpd.properties` file to remove entries for a product or features of a product, you cannot reinstall the product into the same directory structure. If product entries in the `vpd.properties` file are present, the installer program reads the `vpd.properties` file, determines that the product is already installed, and displays the panel that prompts you to install additional features into the existing instance or to install a new instance. Unfortunately, the existing instance might not be a valid installation. The installer program does not verify the products that it finds listed in the `vpd.properties` file.

### Location of the `vpd.properties` file

The location of the `vpd.properties` file varies per operating platform:

- AIX platforms: The root directory or the `usr/lib/objrepos` directory
- Linux platforms: The root directory
- Windows platforms: installation directory of the operating system, such as the `C:\WINNT` directory or the `C:\windows` directory.

### Example of the `vpd.properties` file

The following example shows the first ten entries for the `vpd.properties` file for Version 5.0.2 of the base product on a Windows platform. The example shows the entire first line but breaks the line for formatting purposes. The example truncates the rest of the lines in the file. The identifier for the first component is highlighted. The installation location of the first component is also highlighted.

```

WSBACAA|5|0|0|0| |1=Admin Console|Admin Console|
    $L(com.ibm.ws.install.resourcebundle.
    WSResourceBundle,Features.admin.console.description) | | | |
    D:\WebSphere\AppServer50|0|2|
    WSBSRAA|5|0|0|0| |0|0|2|ref_759810|
    WSBASAA|5|0|0|0| |0|0|2|ref_58595|1|
    WSBADAA|5|0|0|0| |1|0|false| |true|3|
    WSBACAA|5|0|0|0| |1|
WSBAC2AA|5|0|0|0| |1=adminConsoleRegKeyComponent|admin
WSBSR4AA|5|0|0|0| |1=serverConfigWithoutSamplesCompone
WSBMSAA|5|0|0|0| |1=mqSeriesServer|MQSeries Server|$L(
WSBC05AA|5|0|0|0| |1=IsmplauncherComponent|Ismplaunche
WSBASAA|5|0|0|0| |1=Admin Scripting|Admin Scripting|$L
WSBAC1AA|5|0|0|0| |1=adminConsoleFilesComponent|adminC
WSBC04AA|5|0|0|0| |1=pbwServerConfigWithMQGood|pbwSamp
WSBSMAA|5|0|0|0| |1=Samples|Samples|$L(com.ibm.ws.inst
WSBSM2AA|5|0|0|0| |1=samplesRegKeyComponent|samplesReg

```

### Example of the `vpd.properties` file after a coexistence or migration installation

The following example shows the first ten entries of the `vpd.properties` file when you install V5.1 of the base WebSphere Application Server product onto a Windows platform that already has V5.0.2 installed.

The example shows partial entries and breaks the lines for formatting purposes. Highlighting shows differences in the identifiers and the installation directories of the components. V5.1 identifiers have "51" at the end except for the application clients identifier.

The last two lines in the example show how entries identify a second instance of a component with a common identifier. Highlighting in these lines shows how to identify entries for a particular version.

```

WSBJD8AA51|1|3| |1| |1=javaRegistryComponent|javaRegistryUpdate| | | |
  D:\WebSphere\AppServer51|0|0|1|...
WSBACAA|5|0|0|0| |1=Admin Console|Admin Console|...
  D:\WebSphere\AppServer50|0|2|...
WSBMS2AA51|5|1|0|0| |1=samplesRegKeyComponent|...
  D:\WebSphere\AppServer51|0|0|1|
WSBAC2AA|5|0|0|0| |1=adminConsoleRegKeyComponent|...
  D:\WebSphere\AppServer50|0|0|1|...
WSBSR4AA|5|0|0|0| |1=serverConfigWithoutSamplesComponent|...
  D:\WebSphere\AppServer50|0|0|1|
WSBMSAA|5|0|0|0| |1=mqSeriesServer|MQSeries Server|...
  C:\Program Files\IBM\WebSphere MQ|0|1|...
WSBAS2AA51|5|1|0|0| |1=adminScriptingRegKeyComponent|adminScriptingR
WSBSR4AA51|5|1|0|0| |1=serverConfigWithoutSamplesComponent|config| |
WSBC05AA|5|0|0|0| |1=IsmpLauncherComponent|IsmpLauncherComponent| |
WSBAC1AA51|5|1|0|0| |1=adminConsoleFilesComponent|adminConsoleFiles|
.
.
WSBMQ4AA|5|0|0|0| |2=mqSeriesPropFilesComponent|...
  D:\WebSphere\AppServer51\properties|0|0|1|...
WSBMQ4AA|5|0|0|0| |1=mqSeriesPropFilesComponent|...
  D:\WebSphere\AppServer50\properties|0|0|1|...

```

### Example of the vpd.properties file after uninstalling V5.1 but keeping the embedded messaging feature

The following example shows entries for the vpd.properties file after uninstalling the V5.1 base product but keeping the embedded messaging feature for use with coexisting WebSphere Application Server products. The example shows all entries for V5.1 that remain in the file after uninstalling V5.1.

The example shows partial entries and breaks the lines for formatting purposes. Highlighting identifies the V5.1 entries that still remain in the file. The last line shows an entire entry.

```

WSBACAA|5|0|0|0| |1=Admin Console|Admin Console|...
  D:\WebSphere\AppServer50|0|2|...
WSBAA51|5|1|0|0| |1=WebSphere Application Server|...
  D:\WebSphere\AppServer51...
WSBMQ4AA|5|0|0|0| |2=mqSeriesPropFilesComponent|...
  D:\WebSphere\AppServer51\properties|0|0|1|...
WSBMQAA|5|0|0|0| |2=MQSeries|MQSeries|...
  D:\WebSphere\AppServer51|0|0|1|...
WSBMS2AA|5|0|0|0| |2=mqSeriesWindowsConfig|...
  D:\WebSphere\AppServer51|0|0|1|...
WSBMQ3AA|5|0|0|0| |2=mqSeriesLibFilesComponent|...
  D:\WebSphere\AppServer51\lib|0|0|1|...
WSBMS1AA|5|0|0|0| |2=mqSeriesWindowsInstall|...
  D:\WebSphere\AppServer51|0|0|1|...
WSBMQ2AA|5|0|0|0| |2=mqSeriesBinComponent|...
  D:\WebSphere\AppServer51\bin|0|0|1|...
WSBMQ1AA|5|0|0|0| |2=mqSeriesSetupFileComponent|
mqSeriesSetupFileComponent| | | |
  D:\WebSphere\AppServer51\_uninst\mq|0|0|1|
WSBMQAA|5|0|0|0| |2|0|false| |true|3|WSBMQ1AA|5|0|0|0| |2

```

### Editing the vpd.properties file before reinstalling V5.1

If you uninstall V5.1 in a coexistence or migration environment, you can reinstall the product.

There are two options for reinstalling the product:

- Installing into a new directory.
  - Edit the vpd.properties file to remove the **WSBAA51** entry.
  - Select another installation path during the installation.

- Edit the `vpd.properties` file to remove all entries that identify V5.1 and reinstall into the same directory structure as the original V5.1 product.

Edit the `vpd.properties` file in a flat-file editor. Edit the file on the operating platform where the file resides to avoid problems with line-end characters. Use an editor that shows line breaks so that you can see each identifier at the beginning of a line.

With either option, you can select coexistence and assign non-conflicting ports, or select migration and migrate the configuration from the V5.0.x product to the V5.1 product. You can also select to neither coexist or migrate to run each product when the other is not running.

Perform the following procedure to remove all entries in the `vpd.properties` file and to reinstall into the original V5.1 installation root directory:

1. Back up the `vpd.properties` file before you edit it.
2. Search for and delete lines that start with an identifier that ends in "51". For example, delete the following entry from the file:

```
WSBAA51|5|1|0|0| |1=WebSphere Application Server|IBM WebSphere Application Server
D:\WebSphere\AppServer51|0|0|1|WSBAA51|5|1|0|0| |1|0|false|"_uninst" "uninst"
```

3. Search for and delete all multiple instance entries that specify the original installation root. For example, delete the following entries from the file:

```
WSBMQ4AA|5|0|0|0| |2=mqSeriesPropFilesComponent|
mqSeriesPropFilesComponent| | | |
D:\WebSphere\AppServer51\properties|0|0|1|
WSBMQAA|5|0|0|0| |2|0|false| |true|3|WSBMQ4AA|5|0|0|0| |2
WSBMQAA|5|0|0|0| |2=MQSeries|MQSeries|...
D:\WebSphere\AppServer51|0|0|1|...
WSBMS2AA|5|0|0|0| |2=mqSeriesWindowsConfig|...
D:\WebSphere\AppServer51|0|0|1|...
WSBMQ3AA|5|0|0|0| |2=mqSeriesLibFilesComponent|...
D:\WebSphere\AppServer51\lib|0|0|1|...
WSBMS1AA|5|0|0|0| |2=mqSeriesWindowsInstall|...
D:\WebSphere\AppServer51|0|0|1|...
WSBMQ2AA|5|0|0|0| |2=mqSeriesBinComponent|...
D:\WebSphere\AppServer51\bin|0|0|1|...
WSBMQ1AA|5|0|0|0| |2=mqSeriesSetupFileComponent|
mqSeriesSetupFileComponent| | | |
D:\WebSphere\AppServer51\_uninst|mq|0|0|1|
WSBMQAA|5|0|0|0| |2|0|false| |true|3|WSBMQ1AA|5|0|0|0| |2
```

4. Rename the installation root directory to back it up. For example, change the name from `D:\WebSphere\AppServer51` to `D:\WebSphere\AppServer51Backup`.
5. Reinstall the base WebSphere Application Server into the `D:\WebSphere\AppServer51` directory.

### Identifying entries in the `vpd.properties` file

Use the following table to help identify product entries. The first three characters of any identifier are unique to a product. Version 5.1 identifiers end with "51" as the last two characters except for the application clients, which is the same for all versions.

Table 45. Identifiers in the `vpd.properties` file for WebSphere products

Identifier	Product
WSB...	WebSphere Application Server (base product)
WSB...51	WebSphere Application Server, Version 5.1
WSBM...	WebSphere Application Server embedded messaging feature
WSC...	WebSphere Application Server application clients, all releases
WSE...	WebSphere Application Server Enterprise, Version 5.0.x
WSE...51	WebSphere Business Integration Server Foundation, Version 5.1

Table 45. Identifiers in the `vpd.properties` file for WebSphere products (continued)

Identifier	Product
WSN...	WebSphere Application Server Network Deployment
WSN...51	WebSphere Application Server Network Deployment, Version 5.1
WSNM...	WebSphere Application Server Network Deployment embedded messaging client feature
WSM...	WebSphere MQ (the stand-alone product, not the embedded messaging feature)

## Uninstalling WebSphere Business Integration Server Foundation

WebSphere Business Integration Server Foundation provides an uninstaller program that you can use to uninstall the product. This task describes how to use the uninstaller program to uninstall the Integration Server product that is extending either the base product or the Network Deployment product. You can also uninstall the product that Integration Server is extending while you uninstall the Integration Server.

If you have installed interim fixes or fix packs to WebSphere Business Integration Server Foundation, use the update installer application to remove the interim fixes or fix packs before uninstalling Integration Server. Uninstalling Integration Server does not remove interim fixes or fix packs from the product that Integration Server extends, either the base product or the Network Deployment product.

Before uninstalling, verify that you have no open Web browsers that are accessing the administrative console.

When uninstalling WebSphere Business Integration Server Foundation on a federated base node, the uninstaller program unfederates the base node before uninstalling Integration Server.

It is important that you understand that unfederating a base node loses the configuration of the node. The configuration for the base node is restored back to its original configuration, before it was federated and before you changed it with the administrative console of the deployment manager. This means that you lose the configuration for any additional servers that you created on the base node from the deployment manager. (The additional servers will not exist any more.) You also lose any other configuration you performed from the deployment manager administrative console.

If you do not uninstall the base product, you can refederate the base node after uninstalling Integration Server.

1. Stop any browsers, delete any configuration instances, and stop any Java processes related to WebSphere Application Server products, as described in “Uninstalling the product” on page 311.
2. Change directories to the `_uninstWBISF` directory before issuing the **uninstall** command. The command file is located in the `/_uninstWBISF` directory on a Linux or UNIX-based platform, and in the `install_root\_uninstWBISF` directory on a Windows system.

For example, to change directories on a Linux platform, issue this command if your installation root is `/opt/WebSphere/NetworkDeployment`:

```
# cd /opt/WebSphere/NetworkDeployment/_uninstWBISF
```

Issue the following command to change directories on a Windows platform:

```
> CD C:\WebSphere\NetworkDeployment\_uninstWBISF
```

3. Issue the **uninstall** command. The command file is named `uninstall` for Linux and UNIX-based platforms and `uninstall.bat` on Windows platforms.

On Linux and UNIX-based platforms, issue the **uninstall** command from the `install_root/_uninstWBISF` directory:

```
# ./uninstall
```

On Windows platforms, use the **uninstall.bat** command. Issue the program directly from the `install_root\_uninstWBISF` directory:

> uninstall.bat

4. Click **Next** to begin uninstalling the product. A panel appears that prompts you to uninstall the base product or the Network Deployment product while uninstalling the Integration Server, depending on which product the Integration Server is extending. If you select to uninstall the product, the uninstaller program removes the product along with the Integration Server.

If you select to leave the extended product, the uninstaller program does not remove the product as it uninstalls the Integration Server. If you do not uninstall the base product or the Network Deployment product, the service level of the product is V5.1.0.2 after the Integration Server is uninstalled. V5.1.0.2 is the service level of the cumulative fix pack.

5. Uninstall the product that WebSphere Business Integration Server Foundation is extending and click **Next**. The wizard prompts you to uninstall the embedded messaging feature, if the feature is installed. To obey licensing rules, always remove the embedded messaging feature unless other product instances share the code.

This panel can appear whenever the embedded messaging feature is installed on the node and not just when you are uninstalling an instance that has the feature installed. For example, assume that you install the embedded messaging feature when you install the base product. Assume that you install a second instance of the base product, but do not install the embedded messaging feature with the product. If you uninstall the second instance, the Installation wizard displays the prompt to uninstall the embedded messaging feature.

6. Uninstall or retain the embedded messaging feature and click **Next** to continue uninstalling WebSphere Business Integration Server Foundation. The wizard displays the Summary panel that lists the products and features that you are uninstalling.
7. Click **Next** to continue uninstalling WebSphere Business Integration Server Foundation. The wizard prompts you to remove changed configuration files and log files.
8. Retain or delete the changed files and click **Next** to continue uninstalling WebSphere Business Integration Server Foundation. The wizard begins to remove registry entries, files, and directories.
9. Click **Finish** to close the wizard.
10. Optional: Uninstall the product manually before reinstalling. This step is required before you can reinstall the product into the same installation root directory. If you are reinstalling after leaving the embedded messaging feature installed, use one of the following procedures:
  - Uninstall manually on all platforms but Solaris and HP-UX before reinstalling.
  - Uninstall manually on Solaris platforms before reinstalling.
  - Uninstall manually on HP-UX platforms before reinstalling.

If you are uninstalling every WebSphere Application Server product on the machine before reinstalling, see [Uninstalling manually](#).

11. Add the base node to the Network Deployment cell again if you uninstalled Integration Server from a federated base node and left the base node installed. Uninstalling Integration Server from a base node removes the base node from the deployment manager cell. Use the **addNode** command to refederate the base node after uninstalling Integration Server.

You can uninstall WebSphere Business Integration Server Foundation that is extending either the base product or the Network Deployment product.

Return to [Uninstalling the product](#).

## Uninstalling Integration Server on a Network Deployment node

This task describes uninstalling the WebSphere Business Integration Server Foundation product when it is extending the WebSphere Application Server Network Deployment product. You can let the uninstaller program for the Integration Server product uninstall the Network Deployment product while uninstalling the Integration Server product. A panel appears that prompts you to uninstall Network Deployment when you are using the wizard. You can also select the option with the silent uninstall procedure.



If you have installed interim fixes or fix packs to WebSphere Business Integration Server Foundation, use the update installer application to remove the interim fixes or fix packs before uninstalling Integration Server. Uninstalling Integration Server does not remove interim fixes or fix packs from the product that Integration Server extends, either the base product or the Network Deployment product.

Before uninstalling, verify that you have no open Web browsers that are accessing the administrative console.

**Uninstalling products in the proper order** Uninstall WebSphere Application Server products in the following sequence when you are uninstalling more than one product:

1. WebSphere Business Integration Server Foundation on Network Deployment
2. WebSphere Business Integration Server Foundation on base nodes
3. WebSphere Application Server Network Deployment
4. WebSphere Application Server (base product)

1. Stop any browsers, delete any configuration instances, and stop any Java processes related to WebSphere Application Server products, as described in “Uninstalling the product” on page 311.
2. Change directories to the `_uninstWBISF` directory before issuing the **uninstall** command. The command file is located in the `install_root/_uninstWBISF` directory on a Linux or UNIX-based platform, and in the `install_root\_uninstWBISF` directory on a Windows system.

For example, to change directories on a Linux platform, issue this command if your installation root is `/opt/WebSphere/NetworkDeployment`:

```
# cd /opt/WebSphere/NetworkDeployment/_uninstWBISF
```

Issue the following command to change directories on a Windows platform:

```
> CD C:\WebSphere\NetworkDeployment\_uninstWBISF
```

3. Issue the **uninstall** command. The command file is named `uninstall` for Linux and UNIX-based platforms and `uninstall.bat` on Windows platforms.

On Linux and UNIX-based platforms, issue the **uninstall** command from the `install_root/_uninstWBISF` directory:

```
# ./uninstall
```

On Windows platforms, use the **uninstall.bat** command:

```
> uninstall.bat
```

Call the program directly from the `install_root\_uninstWBISF` directory. For example, if the installation root is `C:\WebSphere\NetworkDeployment`, change directories and issue the following command:

```
# ./uninstall
```

4. Click **Next** to begin uninstalling the product. A panel appears that prompts you to uninstall the Network Deployment product while uninstalling the Integration Server. If you select to uninstall the product, the uninstaller program removes the product along with the Integration Server.  
If you select to leave the Network Deployment product, the uninstaller program does not remove the product as it uninstalls the Integration Server. If you do not uninstall the Network Deployment product, the service level of the product is V5.1.0.2 after the Integration Server is uninstalled. V5.1.0.2 is the service level of the cumulative fix pack.
5. Select to uninstall the Network Deployment product and click **Next**. The wizard prompts you to uninstall the embedded messaging feature, if the feature is installed. To obey licensing rules, always remove the embedded messaging feature unless other product instances share the code.
6. Retain or uninstall the embedded messaging feature and click **Next** to continue uninstalling WebSphere Business Integration Server Foundation. The wizard displays a Summary panel that lists the products and features that you are uninstalling.
7. Click **Next** to continue uninstalling WebSphere Business Integration Server Foundation. The wizard prompts you to remove changed configuration files and log files.
8. Retain or remove the changed files and click **Next** to continue uninstalling WebSphere Business Integration Server Foundation. The wizard unfederates a federated base node and begins to remove registry entries, files, and directories.

9. Click **Finish** to close the wizard.
10. Optional: Uninstall manually before reinstalling the product. This step is required before you can reinstall the product into the same installation root directory. If you are reinstalling after leaving the embedded messaging feature installed, use one of the following procedures:
  - Uninstall manually on all platforms but Solaris and HP-UX before reinstalling.
  - Uninstall manually on Solaris platforms before reinstalling.
  - Uninstall manually on HP-UX platforms before reinstalling.

If you are uninstalling every WebSphere Application Server product on the machine before reinstalling, see Uninstalling manually.

You can uninstall the WebSphere Business Integration Server Foundation product that extends the Network Deployment product.

Return to Uninstalling the product.

## Uninstalling Integration Server on a base WebSphere Application Server node

This task describes using the uninstaller program to uninstall WebSphere Business Integration Server Foundation that is extending a base WebSphere Application Server product. You can also let the uninstaller program for the Integration Server uninstall the base product while uninstalling the Integration Server. A panel appears that prompts you to select to uninstall the base product when you are using the wizard. You can also select the option with the silent uninstall procedure.

If you have installed interim fixes or fix packs to WebSphere Business Integration Server Foundation, use the update installer application to remove the interim fixes or fix packs before uninstalling Integration Server. Uninstalling Integration Server does not remove interim fixes or fix packs from the product that Integration Server extends, either the base product or the Network Deployment product.

Before uninstalling, verify that you have no open Web browsers that are accessing the administrative console.

### Uninstalling products in the proper sequence

Uninstall WebSphere Application Server products in the following sequence when you are uninstalling more than one product:

1. WebSphere Business Integration Server Foundation on Network Deployment
2. WebSphere Business Integration Server Foundation on base nodes
3. WebSphere Application Server Network Deployment
4. WebSphere Application Server (base product)
  1. Stop any browsers, delete any configuration instances, and stop any Java processes related to WebSphere Application Server products as described in “Uninstalling the product” on page 311.
  2. Change directories to the `_uninstWBISF` directory before issuing the **uninstall** command. The command file is located in the `install_root/_uninstWBISF` directory on a Linux or UNIX-based platform, and in the `install_root\_uninstWBISF` directory on a Windows system.

For example, to change directories on a Linux platform, issue this command if your installation root is `/opt/WebSphere/NetworkDeployment`:

```
# cd /opt/WebSphere/AppServer/_uninstWBISF
```

Issue the following command to change directories on a Windows platform:

```
> CD C:\WebSphere\NetworkDeployment\_uninstWBISF
```
  3. Issue the **uninstall** command. The command file is named `uninstall` for Linux and UNIX-based platforms and `uninstall.bat` on Windows platforms.

On Linux and UNIX-based platforms, issue the **uninstall** command from the *install\_root/\_uninstWBISF* directory:

```
# ./uninstall
```

On Windows platforms, change directories and issue the **uninstall.bat** command:

```
> uninstall.bat
```

Issue the command directly from the *install\_root/\_uninstWBISF* directory. For example, if the installation root is C:\WebSphere\AppServer, change directories to C:\WebSphere\AppServer\\_uninstWBISF directory and issue the following command at the command prompt:

```
> uninstall.bat
```

4. Click **Next** to begin uninstalling the product. A panel appears that prompts you to select to uninstall the base product while uninstalling the Integration Server. If you select to uninstall the product, the uninstaller program removes the product along with the Integration Server.

If you select to leave the extended product, the uninstaller program does not remove the product as it uninstalls the Integration Server. If you do not uninstall the base product, the service level of the base product is V5.1.0.2 after the Integration Server is uninstalled. V5.1.0.2 is the service level of the cumulative fix pack.

5. Select to uninstall the base product and click **Next**. The uninstaller program prompts you to uninstall the embedded messaging feature, if the feature is installed. To obey licensing rules, always remove the embedded messaging feature unless other product instances also share the code.
6. Select to uninstall the embedded messaging feature and click **Next** to continue uninstalling WebSphere Business Integration Server Foundation. The uninstaller program displays the Exit summary panel that lists the products and features that you are uninstalling.
7. Click **Next** to continue uninstalling WebSphere Business Integration Server Foundation. The uninstaller program prompts you to remove changed configuration files and log files.
8. Select to retain the changed files and click **Next** to continue uninstalling WebSphere Business Integration Server Foundation. The uninstaller program unfederates a federated base node and begins to remove registry entries, files, and directories.
9. Click **Finish** to close the program.
10. Optional: Uninstall manually before reinstalling. This step is required before you can reinstall the product into the same installation root directory. If you are reinstalling after leaving the embedded messaging feature installed, use one of the following procedures:
  - Uninstall manually on all platforms but Solaris and HP-UX before reinstalling.
  - Uninstall manually on Solaris platforms before reinstalling.
  - Uninstall manually on HP-UX platforms before reinstalling.

If you are uninstalling every WebSphere Application Server product on the machine before reinstalling, see Uninstalling manually.

11. Add the base node to the Network Deployment cell again if you uninstalled Integration Server from a federated base node and left the base node installed. Uninstalling Integration Server from a base node removes the base node from the deployment manager cell. Use the **addNode** command to refederate the base node after uninstalling Integration Server.

You can uninstall WebSphere Business Integration Server Foundation on a base WebSphere Application Server node.

Return to Uninstalling the product.

## Uninstalling Enterprise or Integration Server in a migration scenario

This task describes uninstalling Enterprise or Integration Server in a migration scenario. You can uninstall during the migration procedure when an incompatibility exists, such as when migrating WebSphere Application Server Enterprise, V5.0.1 on a base WebSphere Application Server node with the embedded

messaging feature to WebSphere Business Integration Server Foundation, V5.1 on a base V5.1 node. After migrating Version 5.0.x to Version 5.1, you have the option of uninstalling one of the two nodes in the migration process, either the V5.0.x node or the V5.1 node. This procedure describes uninstalling the V5.0.x Enterprise product.

If you have installed interim fixes or fix packs to WebSphere Business Integration Server Foundation, use the update installer application to remove the interim fixes or fix packs before uninstalling Integration Server. Uninstalling Integration Server does not remove interim fixes or fix packs from the product that Integration Server extends, either the base product or the Network Deployment product.

Several scenarios can occur when uninstalling during migration or after migration. Unless an incompatibility exists between the products that you are migrating between, leave the old product installed during testing and verification. After you make the decision to keep or uninstall the new product, uninstall either the old product or the new one.

Various scenarios that you can follow include:

- Uninstalling during migration because the old product is not compatible with the new one
  - Uninstalling a node that does not have the embedded messaging feature
  - Uninstalling a base node that has the embedded messaging server and client feature
  - Uninstalling a node that has the embedded messaging client feature
1. Stop any browsers, delete any configuration instances, and stop any Java processes related to WebSphere Application Server products, as described in “Uninstalling the product” on page 311.
  2. Uninstall the Enterprise product by selecting one of the following paths:
    - Uninstall during migration because the old product is not compatible with the new one.  
The general process for uninstalling during migration is described in Migrating V5.0.0 or V5.0.1 Enterprise with embedded messaging on a base node to Integration Server V5.1 and “Migrating V5.0.0 or V5.0.1 Enterprise with embedded messaging to V5.1 Integration Server on Network Deployment” on page 376. Uninstall the Enterprise product and the product that it extends with the following procedure:
      - a. Run the uninstall command from the *install\_root\\_uninstPME* directory of the product that you are uninstalling.
      - b. Let the Enterprise uninstaller program uninstall the base product for you too.
      - c. Run the platform-specific uninstall procedure to complete the removal by removing all of the artifacts of the earlier product from the system.
      - d. Complete the migration by installing the new WebSphere Business Integration Server Foundation product and running the WASPostUpgrade tool after the installation is complete.
    - Uninstall an Enterprise node or an Integration Server node when the embedded messaging feature is not installed.
    - Uninstall Enterprise or Integration Server on a base node when the server and client feature exists.
    - Uninstall Enterprise or Integration Server when the embedded messaging client feature is installed.

You can uninstall an Enterprise node or a WebSphere Business Integration Server Foundation node during migration or after migration.

Return to Uninstalling the product.

## **Uninstalling Enterprise or Integration Server when embedded messaging is not installed**

This task describes the proper procedure for uninstalling an Integration Server node that does not have the embedded messaging feature installed.

If you have installed interim fixes or fix packs to WebSphere Business Integration Server Foundation, use the update installer application to remove the interim fixes or fix packs before uninstalling the Integration Server product. Uninstalling the Integration Server product does not remove interim fixes or fix packs from the product that the Integration Server product extends, either the base product or the Network Deployment product.

Uninstalling the WebSphere Business Integration Server Foundation product on a Network Deployment node, a federated base node, or a stand-alone base WebSphere Application Server node after migration is affected by the presence of the embedded messaging feature. If the embedded messaging feature is not installed, uninstalling the product is straightforward. This task describes how to uninstall when no embedded messaging feature exists.

1. Stop any browsers, delete any configuration instances, and stop any Java processes related to WebSphere Application Server products, as described in “Uninstalling the product” on page 311.
2. Select the appropriate procedure for uninstalling either Enterprise or Integration Server.
  - Uninstall Integration Server on a Network Deployment node.
  - Uninstall Integration Server on an unfederated base node.
  - Uninstall Enterprise or Integration Server on a federated base node, as described in the following step.
3. Optional: Uninstall Enterprise or Integration Server on a federated base node.
  - a. Change directories to the `bin` directory on the node that you are uninstalling. Change directories to the `install_root/bin` directory on a Linux or UNIX-based platform, or to the `install_root\bin` directory on a Windows system.

For example, to change directories on a Linux platform, issue this command if your installation root is `/opt/WebSphere/AppServer`:

```
cd /opt/WebSphere/AppServer/bin
```
  - b. Run the **pre\_uninst50ws** command to prevent unfederating the node that you migrated from or the node that you migrated to.

For example, run the following command on a Linux platform:

```
pre_uninst50ws.sh
```

If you are uninstalling V5.0.2 Enterprise and the script is not present in the V5.0.2 directory, copy it from the V5.1 base product directory.

If you do not run this script, verify that the deployment manager is not running before uninstalling the product.
  - c. Uninstall Integration Server or uninstall Enterprise on the base node. Uninstall the base node as you uninstall Integration Server or Enterprise:
    - **Uninstall Integration Server**
      - 1) Change directories to the `install_root/_uninstWBISF` directory.
      - 2) Issue the **uninstall.bat** command.
      - 3) Choose to uninstall the base product.
      - 4) Choose to remove any changed files.
    - **Uninstall Enterprise**
      - 1) Change directories to the `install_root/_uninstPME` directory.
      - 2) Issue the **uninstall.exe** command.
      - 3) Choose to uninstall the base product.

You can uninstall Enterprise or WebSphere Business Integration Server Foundation from a base node or a Network Deployment node that does not have the embedded messaging feature installed.

Return to Uninstalling the product.

## Uninstalling Enterprise or Integration Server when the server and client feature exists

This task describes uninstalling WebSphere Application Server Enterprise, V5.0.2 or WebSphere Business Integration Server Foundation, V5.1 on a base WebSphere Application Server node after migrating from Enterprise V5.0.2 to Integration Server V5.1. In most situations you uninstall V5.0.2 after migrating to V5.1. However, some situations might require that you uninstall V5.1 while both versions are on the machine.

If you have installed interim fixes or fix packs to WebSphere Business Integration Server Foundation, use the update installer application to remove the interim fixes or fix packs before uninstalling Integration Server. Uninstalling Integration Server does not remove interim fixes or fix packs from the product that Integration Server extends, either the base product or the Network Deployment product.

Before uninstalling, verify that you have no open Web browsers that are accessing the administrative console.

1. Stop any browsers, delete any configuration instances, and stop any Java processes related to WebSphere Application Server products as described in “Uninstalling the product” on page 311.
2. Identify which product node you are uninstalling. Uninstall either the V5.0.2 node and leave the V5.1 node installed, or uninstall the V5.1 node and leave the V5.0.2 node installed. Write down the installation root directory of the node that you intend to uninstall if the path names are similar. Examples in this task use the following path names for nodes on a Linux platform:

- **Enterprise V5.0.2:** /opt/WebSphere/AppServer50
- **Integration Server V5.1:** /opt/WebSphere/AppServer51

The required steps to uninstall each node are different. Each set of steps is presented as sub-steps in an optional step in this procedure.

3. Change directories to the `bin` directory on the node that you are uninstalling. Change directories to the `install_root/bin` directory on a Linux or UNIX-based platform, or to the `install_root\bin` directory on a Windows system.

For example, issue this command to change directories on a Linux platform:

```
# cd /opt/WebSphere/AppServer50/bin
```

4. Run the `pre_uninst50ws` command to prevent removing the *migrated-from* node and the *migrated-to* node from the deployment manager cell and to preserve the `jmsserver` process, which is the embedded messaging queue manager for the federated base node.

For example, run the following command on a Linux platform:

```
# ./pre_uninst50ws.sh
```

If you are uninstalling V5.0.2 and the script is not present in the V5.0.2 directory, copy it from the V5.1 directory.

If you do not run this script, verify that the deployment manager is not running before uninstalling the product.

5. Optional: Uninstall the V5.0.2 node.

- a. Change directories to the V5.1 `install_root51/bin` directory.

For example, issue this command to change directories on a Linux platform:

```
# cd /opt/WebSphere/AppServer51/bin
```

- b. Start the V5.1 `server1` process to preserve the queue manager. For example, use the following command to start the V5.1 `server1` node on a Linux platform:

```
# ./startServer.sh server1
```

It is possible that the V5.1 `server1` process might fail while uninstalling the V5.0.2 node. You restart the process in a later step so it is not a concern if it fails.

It is also possible that the queue manager might not be preserved, in which case you recreate it in a later step. It is not a concern if you lose the queue manager other than the loss of persistent data, such as messages and durable subscriptions.



- c. Run the **pre\_uninst502mq** command. The command helps avoid removing the embedded messaging feature code. On Windows platforms, the command creates dummy registry entries. On all platforms, the command creates a dummy queue manager, WAS\_COEXIST that helps retain the embedded messaging feature code. Run the script from the *install\_root/bin* directory of the V5.1 installation:

```
./pre_uninst502mq.sh
```

- d. Change directories to the *install\_root50/\_uninstPME* directory in the V5.0.2 installation root before issuing the **uninstall** command to uninstall the Enterprise product. The command file is located in the *install\_root50/\_uninstPME* directory on a Linux or UNIX-based platform, and in the *install\_root50\\_uninstPME* directory on a Windows system.

For example, use this command to change directories on a Linux platform:

```
cd /opt/WebSphere/AppServer50/_uninstPME
```

- e. Issue the **uninstall** command. The command file is named `uninstall` for Linux and UNIX-based platforms and `Uninstall.exe` on Windows platforms. The command file for V5.0.2 on Linux for S/390 platforms is named `uninstall.sh`.

On Windows platforms, issue the **Uninstall.exe** command:

```
install_root\_uninst\Uninstall.exe
```

Run the program directly from the *install\_root\\_uninstPME* directory. For example, if the installation root is `C:\WebSphere\AppServer50`, issue the following command:

```
C:\WebSphere\AppServer50\_uninstPME> Uninstall.exe
```

On Linux and UNIX-based platforms, issue the **uninstall** command from the *install\_root/\_uninstPME* directory:

```
./uninstall
```

(To uninstall V5.0.x on a Linux for S/390 platform, use the `uninstall.sh` script.)

- f. Change directories to the V5.1 *install\_root51/bin* directory.

For example, issue this command to change directories on a Linux platform:

```
cd /opt/WebSphere/AppServer51/bin
```

- g. Run the **post\_uninst502mq** command. The command removes the dummy registry entries. Run the script from the *install\_root/bin* directory of the V5.1 installation:

```
./post_uninst502mq.sh
```

- h. Delete the dummy queue manager if it still exists. Issue the following commands from the *install\_root51/bin* directory to delete the dummy queue manager:

```
./endmqm WAS_COEXIST
./dlmqm WAS_COEXIST
```

- i. Recreate the default queue manager if necessary. Issue the **createmq** command from the *install\_root51/bin* directory to create the default queue manager. Issue the command on one line. The following examples show the commands on several lines for clarity:

#### Linux and UNIX platforms:

```
createmq.sh install_root51
           cellName
           nodeName
           server1
```

#### Windows platforms:

```
createmq.bat install_root51
             cellName
             nodeName
             server1           mq_dir
             broker_dir
```

The command that the installer program used to create your original queue manager is in the *install\_root51/logs/createMQ.nodename\_server1.log* file.

- j. Stop and restart the V5.1 Application Server node. For example, issue the following commands from the *install\_root51/bin* directory to recycle the `server1` process on a Linux platform:

```
./stopServer.sh server1
```

```
./startNode.sh
```

```
./startServer.sh server1
```

- k. Optional: Uninstall manually before reinstalling. This step is required before you can reinstall the V5.0.x Enterprise or base product into the same installation root directory. Otherwise, you must reinstall the products into another directory.
6. Optional: Uninstall the V5.1 WebSphere Business Integration Server Foundation node.
  - a. Change directories to the V5.0.2 *install\_root50/bin* directory. For example, issue this command to change directories on a Linux platform:

```
# cd /opt/WebSphere/AppServer50/bin
```
  - b. Start the V5.0.2 *server1* process to preserve the queue manager. For example, use the following command to start the V5.0.2 *server1* node on a Linux platform:

```
# ./startServer.sh server1
```

It is possible that the V5.0.2 *server1* process might fail while uninstalling the V5.1 node. You restart the process in a later step so it is not a concern if the V5.0.2 *server1* process fails.

It is also possible that the queue manager might not be preserved, in which case you recreate it in a later step. It is not a concern if you lose the queue manager other than the loss of persistent data, such as messages and durable subscriptions.
  - c. Change directories to the *install\_root51/\_uninstWBISF* directory in the V5.1 installation root before issuing the **uninstall** command. The command file is located in the *install\_root51/\_uninstWBISF* directory on a Linux or UNIX-based platform, and in the *install\_root51\\_uninstWBISF* directory on a Windows system.

For example, use this command to change directories on a Linux platform:

```
# cd /opt/WebSphere/AppServer51/_uninstWBISF
```
  - d. Issue the **uninstall** command. The command file is named *uninstall* for Linux and UNIX-based platforms and *Uninstall.bat* on Windows platforms.

On Linux and UNIX-based platforms, issue the **uninstall** command from the *install\_root/\_uninstWBISF* directory:

```
# ./uninstall
```

On Windows platforms, change directories to the *install\_root51\\_uninstWBISF* directory and use the **Uninstall.bat** command:

```
> Uninstall.bat
```

Issue the command directly from the *install\_root51\\_uninstWBISF* directory. For example, if the installation root is *C:\WebSphere\AppServer51*, change directories to the *C:\WebSphere\AppServer51\\_uninstWBISF* directory and issue the following command:

```
> Uninstall.bat
```
  - e. Use the Uninstaller wizard panel or the uninstaller silent response file to uninstall the base product at the same time that you are uninstalling the Integration Server. When the V5.1 Uninstaller wizard displays a panel that prompts you to uninstall the base product, select the check box to uninstall the base product.
  - f. Use the Uninstaller wizard panel to keep the embedded messaging feature code installed. When the V5.1 Uninstaller wizard displays a panel that prompts you to uninstall the embedded messaging feature, clear the check box to leave the feature installed so that the V5.0.2 node can continue to use the code.
  - g. After the uninstaller removes the V5.1 code, change directories to the *install\_root50/bin* directory.
  - h. Start the V5.0.2 deployment manager with the **startManager** command.
  - i. Recreate the default queue manager if necessary. Issue the **createmq** command from the *install\_root50/bin* directory to create the default queue manager. Issue the command on one line. The following examples show the commands on several lines for clarity:

## Linux and UNIX platforms

```
./createmq.sh install_root50  
             cellName  
             nodeName  
             server1
```

## Windows platforms

```
createmq.bat install_root50  
            cellName  
            nodeName  
            server1           mq_dir  
            broker_dir
```

The command that the installer program used to create your original queue manager is in the *install\_root50/logs/createMQ.nodeName\_server1.log* file.

- j. Stop and restart the V5.0.2 Application Server. For example, run these commands from the *install\_root50/bin* to recycle the *server1* process and the *nodeagent* process on a Linux platform:

```
./stopServer.sh server1
```

```
./startNode.sh
```

```
./startServer.sh server1
```

- k. Optional: Uninstall V5.1 artifacts before reinstalling V5.1. Select a platform-specific procedure for completing the removal of the product:
- Uninstall manually on all platforms but Solaris and HP-UX before reinstalling.
  - Uninstall manually on Solaris platforms before reinstalling.
  - Uninstall manually on HP-UX platforms before reinstalling.

This step is required before you can reinstall the Integration Server product or the base product into the same installation root directory.

You can uninstall the WebSphere Business Integration Server Foundation product on a base node that has the embedded messaging server and client feature.

Return to Uninstalling the product.

## Uninstalling Enterprise or Integration Server when the embedded messaging client feature is installed

This topic describes the uninstall process when the embedded messaging client feature is installed on more than one Network Deployment or base WebSphere Application Server nodes on the machine. When more than one node on a machine uses the client feature, uninstalling a single node can remove the embedded messaging client code so that none of the nodes can have access to the feature. This topic describes how to avoid that situation.

If you have installed interim fixes or fix packs to WebSphere Business Integration Server Foundation, use the update installer application to remove the interim fixes or fix packs before uninstalling Integration Server. Uninstalling Integration Server does not remove interim fixes or fix packs from the product that Integration Server extends, either the base product or the Network Deployment product.

This task describes how to uninstall a V5.0.2 Enterprise node that has the client feature and a V5.1 Integration Server node that has the client feature. You have the option of uninstalling either node. But you do not have to uninstall both nodes.

Select your scenario in the following procedure.

1. Stop any browsers, delete any configuration instances, and stop any Java processes related to WebSphere Application Server products, as described in “Uninstalling the product” on page 311.
2. Uninstall the node. Select your scenario from the following list of procedures:

- Uninstall a V5.0.2 Enterprise node, a V5.0.2 Network Deployment node, or a V5.0.2 federated base node that has the embedded messaging client feature.
- Uninstall a V5.1 WebSphere Business Integration Server Foundation node that has the embedded messaging client feature.

You can uninstall a node that has the client feature.

Return to Uninstalling Integration Server in a migration scenario.

### ***Uninstalling V5.0.2 Enterprise when the embedded messaging client feature is installed:***

This task describes how to uninstall the Enterprise, Version 5.0.2 product when the product has the embedded messaging client feature.

Uninstalling a V5.0.2 node that has the embedded messaging client feature affects all other nodes that also use the feature. The uninstaller program on V5.0.2 does not give you the option of leaving the client feature installed when you uninstall a product. However, you can rename the *install\_root/\_uninst/mq* directory to keep the code for the embedded messaging client feature installed when you uninstall the product.

Two alternatives exist for preserving the embedded messaging client code:

- **Renaming the *\_uninst/mq* directory before uninstalling the V5.0.2 product**

If you rename the *\_uninst/mq* directory before uninstalling the V5.0.2 product, you do not have to reinstall the embedded messaging client feature because you avoid uninstalling the client. Renaming the directory is the recommended method.

- **Reinstalling the embedded messaging client code after uninstalling the V5.0.2 product**

If you uninstall V5.0.2 without renaming the *\_uninst/mq* directory, you also uninstall the embedded messaging client code. You can recover by reinstalling the embedded messaging client feature. The general procedure is to uninstall V5.0.2 and to reinstall the client feature from the V5.1 base product installation image, which is usually the base product CD-ROM. You can also reinstall V5.0.2 and reinstall the client feature from the V5.0.2 product installation image, which is usually where you downloaded and unzipped Fix Pack 2. Product CD-ROMs are available for some platforms.

Before uninstalling, verify that you have no open Web browsers that are accessing the administrative console.

1. Stop any browsers, delete any configuration instances, and stop any Java processes that are related to WebSphere Application Server products as described in “Uninstalling the product” on page 311.
2. Optional: Rename the *install\_root/\_uninst/mq* directory to prevent uninstalling the embedded messaging client feature, uninstall the product, and rename the directory to its original name.
  - a. Rename the *install\_root/\_uninst/mq* directory to prevent uninstalling the embedded messaging client feature.
  - b. Follow the normal procedure for uninstalling the V5.0.2 Enterprise product.
  - c. Rename the *install\_root/\_uninst/mq* directory to its correct name.
3. Optional: Reinstall the embedded messaging client feature on a Windows machine. You do not have to reinstall the embedded messaging client if you renamed the *install\_root\\_uninst\mq* directory as described in the previous step.
  - a. Locate the V5.1 base WebSphere Application Server CD-ROM.
  - b. Identify the original installation location of the embedded messaging client feature. Use the V5.1 administrative console to examine the value of the *MQ\_INSTALL\_ROOT* variable in **Environment > Manage WebSphere variables**.
  - c. Optional: Issue the command to reinstall the embedded messaging client code on a Windows platform:

```
source_path\wmsetup /installc parm1 parm2 parm3 parm4
```

**source\_path**

The fully qualified file path to the **wmsetup** command, either on disk or in the \messaging\client directory on the product CD-ROM.

**parm1**

The file path where the embedded messaging feature was originally installed, which is by default C:\Program Files\IBM\WebSphere MQ on a Windows platform.

**parm2**

The source location of embedded messaging software, such as the \messaging\client directory on the product CD-ROM.

**parm3**

The path and file name for recording log messages.

**parm4**

A code that represents the installation language. For example, 1033 for US English.

For example, you can use the following command by entering it all on one line:

```
E:\WASTEST\messaging\client\Setup\wmsetup /installc  
C:\Program Files\IBM\WebSphere MQ  
I:\Windows\messaging\client  
C:\temp\mq_install.log  
1033
```

4. Issue the command to reinstall the embedded messaging client code on a Linux or UNIX-based platform. You do not have to reinstall the embedded messaging client if you renamed the *install\_root/\_uninst/mq* directory as described in the previous step. **Command to use on a Linux or UNIX-based platform:**

```
source_path/wmsetup installc logfile
```

**source\_path**

The fully qualified file path to the **wmsetup** command, either on disk or in the /messaging/client directory on the product CD-ROM.

*logfile*

The path and file name for recording log messages.

For example:

```
wmsetup installc /tmp/mq_install.log
```

You can uninstall a V5.0.2 Enterprise node that uses the embedded messaging client feature without affecting other nodes that also use the client feature.

Return to Uninstalling Integration Server when the embedded messaging client feature is installed.

***Uninstalling Integration Server V5.1 and leaving the embedded messaging client feature installed:***

This task describes how to uninstall the WebSphere Business Integration Server Foundation product on a Network Deployment node or on a federated base WebSphere Application Server, Version 5.1 node when the embedded messaging client feature is installed. The uninstaller program on V5.1 provides an option for leaving the embedded messaging client feature installed when the program uninstalls the Integration Server product.

If you have installed interim fixes or fix packs to WebSphere Business Integration Server Foundation, use the update installer application to remove the interim fixes or fix packs before uninstalling Integration Server. Uninstalling Integration Server does not remove interim fixes or fix packs from the product that Integration Server extends, either the base product or the Network Deployment product.

Uninstalling a V5.1 node that has the embedded messaging client feature can affect all the other nodes that use the feature. The uninstaller program on V5.1 gives you the option to uninstall a V5.1 node that uses the embedded messaging client feature and not affect other nodes that also use the feature.

1. Stop any browsers, delete any configuration instances, and stop any Java processes related to WebSphere Application Server products, as described in “Uninstalling the product” on page 311.
2. Change directories to the `_uninstWBISF` directory before issuing the **uninstall** command. The command file is located in the `install_root/_uninstWBISF` directory on a Linux or UNIX-based platform, and in the `install_root\_uninstWBISF` directory on a Windows system.

For example, to change directories on a Network Deployment node that is located on a Linux platform, issue the following command if your installation root is `/opt/WebSphere/NetworkDeployment`:

```
# cd /opt/WebSphere/NetworkDeployment/_uninstWBISF
```

For example, to change directories on a base node that is located on a Linux platform, issue this command if your installation root is `/opt/WebSphere/AppServer`:

```
# cd /opt/WebSphere/AppServer/_uninstWBISF
```

Issue the following command to change directories on a Windows platform:

```
> CD C:\WebSphere\NetworkDeployment\_uninstWBISF
```

3. Issue the **uninstall** command to uninstall the Integration Server. The command file is named `uninstall` for Linux and UNIX-based platforms and `Uninstall.bat` on Windows platforms.

On Linux and UNIX-based platforms, issue the **uninstall** command from the `install_root/_uninstWBISF` directory:

```
# ./uninstall
```

On Windows platforms, use the **Uninstall.bat** command from the `install_root\_uninstWBISF` directory:

```
> uninstall
```

For example, if the installation root is `C:\WebSphere\NetworkDeployment`, change directories to the `C:\WebSphere\NetworkDeployment\_uninstWBISF` directory and issue the following command:

```
> Uninstall.bat
```

For example, if the installation root is `C:\WebSphere\AppServer`, change directories to the `C:\WebSphere\AppServer\_uninstWBISF` directory and issue the following command:

```
> Uninstall.bat
```

Uninstalling the product also selects the feature uninstaller programs, such as the uninstaller program for the embedded messaging client feature.

The wizard begins and displays a panel.

4. Click **Next** to begin uninstalling the Integration Server. The wizard prompts you to uninstall the product that the Integration Server is extending, either the base product or the Network Deployment product. Select the check box to uninstall the product while uninstalling the Integration Server.
5. Click **Next** to begin uninstalling the product. In situations where the embedded messaging client feature is installed, the V5.1 wizard displays another panel that prompts you to uninstall the embedded messaging feature.
6. Clear the check box so that you do not uninstall the embedded messaging client feature. On that same panel, click **Next** to continue uninstalling the product. The wizard displays a Summary panel that lists the product and features that you are uninstalling.
7. Click **Next** to continue uninstalling the product.
8. Click **Finish** to close the wizard after the wizard removes the product.
9. Optional: Uninstall manually before reinstalling. This step is required before you can reinstall the product into the same installation root directory:
  - Uninstall manually on all platforms but Solaris and HP-UX before reinstalling.
  - Uninstall manually on Solaris platforms before reinstalling.
  - Uninstall manually on HP-UX platforms before reinstalling.



You can uninstall V5.1 WebSphere Business Integration Server Foundation and the product that it extends, while leaving the embedded messaging client feature installed for other product instances to use.

Return to Uninstalling the product.

## Uninstalling Integration Server in a coexistence scenario

This task describes how to uninstall the WebSphere Business Integration Server Foundation product in a coexistence scenario, when various releases of IBM WebSphere Application Server products might be on the same machine, each running in a uniquely named node. There is a separate uninstaller program for each product, located in its installation root directory.

If you have installed interim fixes or fix packs to WebSphere Business Integration Server Foundation, use the update installer application to remove the interim fixes or fix packs before uninstalling Integration Server. Uninstalling Integration Server does not remove interim fixes or fix packs from the product that Integration Server extends, either the base product or the Network Deployment product.

Several scenarios can occur when uninstalling coexisting products. All of these scenarios have the embedded messaging feature installed. Steps in this task describe the following scenarios:

- Uninstalling an Integration Server node that does not have the embedded messaging feature
  - Uninstalling Integration Server on a base node that has the embedded messaging server and client feature
  - Uninstalling Integration Server on a node that has the embedded messaging client feature
1. Stop any browsers, delete any configuration instances, and stop any Java processes related to WebSphere Application Server products as described in “Uninstalling the product” on page 311.
  2. Uninstall Integration Server on a Network Deployment node that does not have the embedded messaging client feature installed.
  3. Uninstall Integration Server on a Network Deployment node that has the embedded messaging client feature installed.
  4. Uninstall Integration Server on a base WebSphere Application Server node.

You can uninstall WebSphere Business Integration Server Foundation in a coexistence scenario.

Return to Uninstalling the product.

## Uninstalling manually

This task describes how to remove all artifacts of an instance of the product so that you have a clean machine with regard to the instance. Repeat the procedure for each instance of the product that you intend to remove.

Uninstalling manually occurs after running the uninstaller program, or because you cannot run the uninstaller program because the program might affect federated nodes, coexisting products, or features. The following for manually uninstalling the product are specific to the platform on which the product is installed.

Before uninstalling, verify that you have no open Web browsers that are accessing the administrative console. Otherwise, there is the potential for locked file errors as you uninstall.

Even if you run the uninstaller program to remove registry entries, uninstall the product code, and remove all related features and products, such as plug-ins, there are some files that the uninstaller program does not remove. The uninstaller program does not delete any configuration files that are changed as the result of selecting installation options, or running Samples, for example. The uninstaller program does not delete log files. The uninstaller program for the base product and the Network Deployment product also leaves a readme file in the `_uninst` directory after it runs, to describe how to completely uninstall the product.

1. Stop any embedded messaging feature services, such as WebSphere Embedded Messaging Publish And Subscribe, jmsserver, or WebSphere MQ queue managers, and any related Java processes.
2. Stop the IBM HTTP Server and any related Java processes.
3. Stop any WebSphere Application Server Java processes with the **stopManager** or **stopServer** commands.
4. Back up all configuration and log files. The uninstaller program leaves some log and configuration files that were changed during installation. Before manually uninstalling the product, copy all configuration and log files that are left behind in the WebSphere, the IBMHTTPServer, and the IBM/MQSeries directories. You can refer to your copy of the configuration and log files after you reinstall to compare the configuration data, if necessary.
5. Use one of the following platform-specific uninstalling procedures to delete the directories that are left behind for your product instance, and to perform other tasks that let you reinstall the product on your operating system. You cannot reinstall into the old directories. Deleting the directories and registry entries lets you reinstall with a clean system. If you do plan to reinstall the product, it is important that you follow the procedure for your platform to completely remove all artifacts of the previous installation. The following topics describe how to uninstall the product from supported operating systems. The IBM WebSphere Application Server supported hardware, software, and APIs Web site describes which operating systems are supported.
  - Manually uninstalling on AIX platforms
  - Manually uninstalling on HP-UX platforms
  - Manually uninstalling on Linux
  - Manually uninstalling on Solaris
  - Manually uninstalling on Windows

You can completely uninstall the product after which you can reinstall.

Return to Installing WebSphere Application Server.

## Manually uninstalling on AIX platforms

This task describes how to uninstall the product on an AIX platform.

Use the following procedure to remove all remnants of a WebSphere Application Server product. This produces a clean system that allows you to reinstall the product. Verify that you are removing only the product instance that you intend to remove and not coexisting products, or products that you might have migrated and do not intend to delete. It is important to know the installation root directory for the product instance that you are removing.

Uninstall WebSphere Application Server products in the following sequence when you are uninstalling more than one product:

1. WebSphere Business Integration Server Foundation on Network Deployment
2. WebSphere Application Server Network Deployment
3. WebSphere Business Integration Server Foundation on the base product
4. WebSphere Application Server (base product)

In the following steps:

- The default *install\_root* for WebSphere Application Server is the `/usr/WebSphere/AppServer` directory.
- The default *install\_root* for the Integration Server product that extends the base WebSphere Application Server product is the `/usr/WebSphere/AppServer` directory.
- The default *install\_root* for the Integration Server product that extends the Network Deployment product is the `/usr/WebSphere/DeploymentManager` directory.

1. Use the **killall -9 java** command to kill all Java processes that are running.

If there are Java processes running that are not related to WebSphere Application Server products, and it is not possible to stop them, stop all WebSphere Application Server product-related processes. Use the following command to determine all processes that are running:

```
ps -ef | grep java
```

Stop all WebSphere Application Server-related processes with the **kill -9 java\_pid\_1 java\_pid\_2...java\_pid\_n** command.

2. Halt any running MQ queue managers.
  - a. Type **dspmq** to show the state of any queue managers.
  - b. Type **endmqm -i** for each running queue manager.
  - c. Type **\$ ipcs -a** to check for any IPCs.
  - d. Type **\$ ipcrm -[qms] [ID]** to delete the IPCs.
3. Type **kill -9 amq\_pid\_1 amq\_pid\_2 ... amq\_pid\_n** to stop any MQ processes that are running. You can use a **ps -e | grep #AMQ\_COMMAND#** command structure to specify the command for amq to find each amq pid.
4. Search for related packages. Either use **smit** to remove packages, or search for and remove packages manually:
  - Type **smit** to clean up remnants.
    - a. Click **Software Installation and Maintenance**.
    - b. Click **Software Maintenance and Utilities**.
    - c. Click **Remove Installed Software**.
    - d. Click **LIST** by Software name.
    - e. Search for packages that contain the words **IBM** or **WS** to identify all WebSphere Application Server product-related packages, including those that belong to **IBM HTTP Server** and the embedded messaging feature, which is based on **IBM WebSphere MQ** technology.
    - f. Change the **PREVIEW ONLY** option to **NO**.
    - g. Click **OK**.

- Manually search for, and remove packages that are only in the instance that you intend to delete. Do not remove IBM WebSphere MQ packages if you have installed IBM WebSphere MQ as a separate product.

Do not remove embedded messaging packages if you intend to leave the embedded messaging feature installed on the machine.

If you do intend to remove WebSphere MQ or embedded messaging packages, include them in the commands you are running to remove packages. For example, type these commands to search for, and remove related packages:

- a. Search for related packages:
  - 1) **ls1pp -l | grep WS** to show packages for WebSphere Application Server products and the IBM HTTP Server product
  - 2) **ls1pp -l | grep wemps** to show packages related to the embedded messaging feature or to IBM WebSphere MQ.
  - 3) **ls1pp -l | grep mqjava** to show packages related to the embedded messaging feature or to IBM WebSphere MQ.
  - 4) **ls1pp -l | grep mqm** to show packages related to the embedded messaging feature or to IBM WebSphere MQ.

You can also run the following command from root to remove the embedded messaging feature from your system:

```
installp -u wemps mqjava mqm
```

Reply y[es] to all prompts.

However, do not remove any mqm or mqjava packages if you have installed IBM WebSphere MQ separately or if you have other WebSphere Application Server products that use the embedded messaging feature.

The examples below show typical package names that might appear on a system with the base WebSphere Application Server product.

If no packages appear when using these commands, skip the next step.

- b. Type **smit remove packagename1 packagename2 packagename3 ...** to remove any WebSphere Application Server-related packages. Do not remove packages for any products that you intend

to keep. You can identify packages that belong to V5.1 by the 51 on the end of WSB packages and WSN packages. WSBM and WSNM packages are for the embedded messaging feature.

Do not remove IBM WebSphere MQ packages if you have installed IBM WebSphere MQ as a separate product, or if you have installed the embedded messaging feature and other product instances are using the feature.

Do not remove IBM WEMPS packages unless you are certain that there is no embedded messaging data to preserve.

5. Change the directory to the `usr` directory.
6. Type `rm -rf WebSphere` to delete this WebSphere Application Server-related directory, if the only subdirectories are the `AppServer` and `DeploymentManager` directories and if the only product instances they contain are those that you intend to delete.
7. Change directory to the `usr/opt` directory.
8. Type `rm -rf wemps` to delete the embedded messaging feature directory if you are certain that there is no embedded messaging data to preserve. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging packages or directories.
9. Change the directory to the `/usr` directory.
10. Type `rm -rf IBMHttpServer` to delete the IBM HTTP Server directory.
11. If you do not have IBM WebSphere MQ installed as a separate product on this machine, type `rm -rf mqm` to delete the embedded messaging feature directory if you are certain that there is no embedded messaging data to preserve. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging packages or directories.

If you installed IBM WebSphere MQ as a separate product on this host to use as the messaging provider, and if you do not want to continue using WebSphere MQ, you can uninstall the product as described in the WebSphere MQ information.

12. Edit the `vpd.properties` file.

Do not delete or rename the `vpd.properties` file because the InstallShield for MultiPlatforms (ISMP) program uses it for other products that it installs.

When the process completes, the product is completely uninstalled. You are now ready to reinstall.

### Example of displaying package names beginning with `mqm`, for the embedded messaging feature

```
==>ls1pp -l | grep mqm
```

```
mqm.base.runtime      5.3.0.1 COMMITTED WebSphere MQ Runtime for
mqm.base.sdk          5.3.0.1 COMMITTED WebSphere MQ Base Kit for
mqm.client.rte        5.3.0.1 COMMITTED WebSphere MQ Client for AIX
mqm.java.rte          5.3.0.1 COMMITTED WebSphere MQ Java Client and
mqm.msg.De_DE         5.3.0.1 COMMITTED WebSphere MQ Messages - German
mqm.msg.Es_ES         5.3.0.1 COMMITTED WebSphere MQ Messages -
mqm.msg.Fr_FR         5.3.0.1 COMMITTED WebSphere MQ Messages - French
mqm.msg.It_IT         5.3.0.1 COMMITTED WebSphere MQ Messages -
mqm.msg.Ja_JP         5.3.0.1 COMMITTED WebSphere MQ Messages -
mqm.msg.Zh_CN         5.3.0.1 COMMITTED WebSphere MQ Messages -
mqm.msg.Zh_TW         5.3.0.1 COMMITTED WebSphere MQ Messages -
mqm.msg.de_DE         5.3.0.1 COMMITTED WebSphere MQ Messages - German
mqm.msg.en_US         5.3.0.1 COMMITTED WebSphere MQ Messages - U.S.
mqm.msg.es_ES         5.3.0.1 COMMITTED WebSphere MQ Messages -
mqm.msg.fr_FR         5.3.0.1 COMMITTED WebSphere MQ Messages - French
mqm.msg.it_IT         5.3.0.1 COMMITTED WebSphere MQ Messages -
mqm.msg.ja_JP         5.3.0.1 COMMITTED WebSphere MQ Messages -
mqm.msg.ko_KR         5.3.0.1 COMMITTED WebSphere MQ Messages - Korean
mqm.msg.pt_BR         5.3.0.1 COMMITTED WebSphere MQ Messages -
mqm.msg.zh_CN         5.3.0.1 COMMITTED WebSphere MQ Messages -
mqm.msg.zh_TW         5.3.0.1 COMMITTED WebSphere MQ Messages -
mqm.server.rte       5.3.0.1 COMMITTED WebSphere MQ Server
```

## Example of displaying package names beginning with wemps, for the embedded messaging feature

```
==>ls1pp -l | grep wemps
```

```
wemps.base.runtime          2.1.0.0  COMMITTED  WebSphere Embedded Messaging
```

## Example of displaying package names beginning with WS, for WebSphere Application Server-related products

```
==>ls1pp -l | grep WS
```

```
WSBAA          5.0.0.0  COMMITTED  ISMP installed entry
WSBAAA        5.0.0.0  COMMITTED  Installs tools for assembly
WSBAC1AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBACAA       5.0.0.0  COMMITTED  Includes adminconsole.ear, the
WSBADAA       5.0.0.0  COMMITTED  Installs the Administrative
WSBAS1AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBASAA       5.0.0.0  COMMITTED  Includes wsadmin, the
WSBAT1AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBATAA       5.0.0.0  COMMITTED  Includes a GUI-based tool for
WSBAU1AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBAUAA       5.0.0.0  COMMITTED  Includes Apache ANT, a
WSBC01AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBC04AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBC05AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBC0AA       5.0.0.0  COMMITTED  ISMP installed entry
WSBDT1AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBDTAA       5.0.0.0  COMMITTED  Includes a command-line
WSBES1AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBES3AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBESAA       5.0.0.0  COMMITTED  Includes samples for
WSBGK2AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBGKAA       5.0.0.0  COMMITTED  ISMP installed entry
WSBIHAA       1.3.28.0  COMMITTED  Installs an Apache-powered Web
WSBIHAB       1.3.28.0  COMMITTED  ISMP installed entry
WSBJA1AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBJAAA       5.0.0.0  COMMITTED  Installs WebSphere public
WSBJD3AA      1.3.1.0  COMMITTED  ISMP installed entry
WSBJD7AA      1.3.1.0  COMMITTED  ISMP installed entry
WSBJD9AA      1.3.1.0  COMMITTED  ISMP installed entry
WSBJDAA       1.3.1.0  COMMITTED  ISMP installed entry
WSBLA1AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBLAAA       5.0.0.0  COMMITTED  Includes a graphical utility
WSBMQ1AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBMQ2AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBMQ3AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBMQAA       5.0.0.0  COMMITTED  Installs Java Messaging
WSBMS2AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBMS4AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBMS5AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBMSAA       5.0.0.0  COMMITTED  Includes JMS
WSBPL1AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBPLAA       5.0.0.0  COMMITTED  Installs plugins to configure
WSBPTAA       5.0.0.0  COMMITTED  Installs tools for performance
WSBSM1AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBSMAA       5.0.0.0  COMMITTED  Includes samples, including
WSBSR1AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBSR5AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBSR6AA      5.0.0.0  COMMITTED  ISMP installed entry
WSBSRAA       5.0.0.0  COMMITTED  Installs the application
WSEAA         5.0.0.0  COMMITTED  ISMP installed entry
WSEBDA       5.0.0.0  COMMITTED  Installs the application
WSEBR01AA     5.0.0.0  COMMITTED  ISMP installed entry
WSEBRAA       5.0.0.0  COMMITTED  Business Rule Beans allows you
WSECF01AA     5.0.0.0  COMMITTED  ISMP installed entry
WSECF0203AA   5.0.0.0  COMMITTED  ISMP installed entry
WSECF0205AA   5.0.0.0  COMMITTED  ISMP installed entry
WSECF02AA     5.0.0.0  COMMITTED  ISMP installed entry
```



WSECF03AA	5.0.0.0	COMMITTED	ISMP installed entry
WSECF04AA	5.0.0.0	COMMITTED	ISMP installed entry
WSECF06AA	5.0.0.0	COMMITTED	ISMP installed entry
WSECF07AA	5.0.0.0	COMMITTED	ISMP installed entry
WSECFAA	5.0.0.0	COMMITTED	ISMP installed entry
WSEDQ01AA	5.0.0.0	COMMITTED	ISMP installed entry
WSEDQ02AA	5.0.0.0	COMMITTED	ISMP installed entry
WSEDQAA	5.0.0.0	COMMITTED	Dynamic Query Service enables
WSEEM01AA	5.0.0.0	COMMITTED	ISMP installed entry
WSEEMAA	5.0.0.0	COMMITTED	Extended Messaging provides
WSEFC01AA	5.0.0.0	COMMITTED	ISMP installed entry
WSEFC0301AA	5.0.0.0	COMMITTED	ISMP installed entry
WSEFC0303AA	5.0.0.0	COMMITTED	ISMP installed entry
WSEFC03AA	5.0.0.0	COMMITTED	This feature installs the Flow
WSEFCAA	5.0.0.0	COMMITTED	Service Choreographer is the
WSEOS01AA	5.0.0.0	COMMITTED	ISMP installed entry
WSEOS03AA	5.0.0.0	COMMITTED	ISMP installed entry
WSEOSAA	5.0.0.0	COMMITTED	This feature installs WorkArea
WSEOT03AA	5.0.0.0	COMMITTED	ISMP installed entry
WSEOTAA	5.0.0.0	COMMITTED	ISMP installed entry
WSESA01AA	5.0.0.0	COMMITTED	ISMP installed entry
WSESA04AA	5.0.0.0	COMMITTED	ISMP installed entry
WSESAAA	5.0.0.0	COMMITTED	The scheduler provides

Return to Uninstalling WebSphere Application Server to continue.

## Manually uninstalling on HP-UX platforms

This task describes how to uninstall the product on an HP-UX platform.

Use the following procedure to remove all remnants of a WebSphere Application Server product. This produces a clean system that allows you to reinstall the product. Verify that you are removing only the product instance that you intend to remove and not coexisting products, or products that you might have migrated and do not intend to delete. It is important to know the installation root directory for the product instance that you are removing.

Uninstall WebSphere Application Server products in the following sequence when you are uninstalling more than one product:

1. WebSphere Business Integration Server Foundation on Network Deployment
2. WebSphere Application Server Network Deployment
3. WebSphere Business Integration Server Foundation on the base product
4. WebSphere Application Server (base product)

In the following steps:

- The default *install\_root* for WebSphere Application Server is the /opt/WebSphere/AppServer directory.
- The default directory for IBM HTTP Server is /opt/IBMHttpServer.
- The default *install\_root* for the Integration Server product that extends the base WebSphere Application Server product is the /opt/WebSphere/AppServer directory.
- The default *install\_root* for the Integration Server product that extends the Network Deployment product is the /opt/WebSphere/DeploymentManager directory.
- The default directories for the embedded messaging feature, which is based on WebSphere MQ, are /opt/wemps and /opt/mqm.

1. Use the **killall -9 java** command to kill all Java processes that are running.

If there are Java processes running that are not related to WebSphere Application Server products, and it is not possible to stop them, stop all WebSphere Application Server product-related processes. Use the following command to determine all processes that are running:

```
ps -ef | grep java
```

Stop all WebSphere Application Server-related processes with the **kill -9 java\_pid\_1 java\_pid\_2...java\_pid\_n** command.

2. Halt any running WebSphere MQ queue managers.



- a. Type `dspsmq` to show the state of any queue managers.
  - b. Type `endmqm -i` for each running queue manager.
  - c. Type `$ ipcs -a` to check for any IPCs.
  - d. Type `$ ipcrm -[qms] [ID]` to delete the IPCs.
3. Search for mqm processes by typing: `ps -eaf | grep mqm` or `ps -eaf | grep ^MQ*`. Type `kill -9 amq_pid_1 amq_pid_2 ... amq_pid_n` to stop any MQ processes that are running. Do not remove IBM WebSphere MQ packages if you have installed IBM WebSphere MQ as a separate product. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging packages or directories. You can use a `ps -e | grep #AMQ_COMMAND#` command structure to specify the command for amq to find each amq pid.
  4. Search for other related packages. Do not remove IBM WebSphere MQ packages if you have installed IBM WebSphere MQ as a separate product. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, which is based on WebSphere MQ, do not remove the WebSphere MQ packages or directories.
 

If you do intend to remove embedded messaging feature packages, use HP-UX System Administration Manager (SAM) to remove packages for the instance that you intend to delete. Then search for the packages to verify their removal.

    - a. Start the SAM utility and verify that your DISPLAY and TERM environment variables are set properly.
      - 1) Click **Software management**.
      - 2) Click **View installed software**.
      - 3) Look for these two entries in the SD list:
        - MQSERIES -> B.11.530.01 WebSphere MQ for HP-UX
        - MQSERIES -> B.11.530.03 WebSphere MQ Update (U485562) for HP-UX
        - MQSERIES -> B.11.530.04 WebSphere MQ Update (U486875) for HP-UX
      - 4) Close the SD list.
      - 5) Click **Remove local host software**.
      - 6) On the **SD Remove list**, remove these instances, if they exist:
        - MQSERIES -> B.11.530.01 WebSphere MQ for HP-UX
        - MQSERIES -> B.11.530.03 WebSphere MQ Update (U485562) for HP-UX
        - MQSERIES -> B.11.530.04 WebSphere MQ Update (U486875) for HP-UX
        - a) Highlight the MQSERIES instances on the SD List.
        - b) Click **Actions > Remove....**
        - c) On **Remove Analysis** dialog, verify that **Status** is **ready**.
        - d) Click **OK**.
        - e) Check the result message displayed on the dialog.
        - f) If the removal fails, follow the instructions that appear.
      - 7) Return to the **SD Remove List**.
      - 8) Click **IBM HTTP Server, MQSERIES, WEMPS, WSBA, WSNA, gsk7bas**. You can identify packages that belong to V5.1 by the 51 on the end of WSB packages and WSN packages. WSBM and WSNM packages are for the embedded messaging feature.
      - 9) Click **Actions > Mark for remove**.
      - 10) Click **Actions > Remove**.
      - 11) Click **OK** in the **Remove analysis** dialog box.
      - 12) Click **Logs** to display real-time removal of selected packages.
      - 13) Click **Done** when all packages are removed.
      - 14) Exit SAM.
    - b. Verify that you removed the packages that you intend to remove. Type these commands to search for related packages:
      - 1) `swlist | grep WS` to show packages for WebSphere Application Server products and the IBM HTTP Server product.
      - 2) `swlist | grep WEMPS` to show packages for the embedded messaging feature or for the IBM WebSphere MQ product. You can delete these packages. If you have other instances of

WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging packages or directories.

- 3) `swlist | grep MQ` to show packages for the embedded messaging feature or for the IBM WebSphere MQ product.
5. Type `rm -rf /opt/WebSphere/AppServer/` to remove WebSphere Application Server directories in the instance installed in the `/opt/WebSphere/AppServer` installation root. Do not remove installation root directories for products that you intend to keep.
6. Type `rm -rf /opt/WebSphere/AppServer/ /opt/WebSphere/DeploymentManager/` to remove multiple directories. Again, do not remove directories for products that you intend to keep.
7. Type `rm -fr /var/wemps /opt/wemps` if you are certain that there is no embedded messaging data to preserve. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging packages or directories.
8. Type `rm -rf IBMHttpServer` to delete the IBM HTTP Server directory.
9. If you do not have IBM WebSphere MQ installed as a separate product on this machine, and if you do not have the embedded messaging server and client feature installed on this machine, type `rm -fr /var/mqm /opt/mqm` if you are certain that there is no embedded messaging data to preserve. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging packages or directories.  
If you installed IBM WebSphere MQ as a separate product on this host to use as the messaging provider, and if you do not want to continue using WebSphere MQ, you can uninstall the product as described in the WebSphere MQ information.

When the process completes, the product is completely uninstalled. You are now ready to reinstall.

Return to Uninstalling WebSphere Application Server to continue.

## Manually uninstalling on Linux platforms

This task describes uninstalling the product on Linux platforms.

Use the following procedure to remove all remnants of a WebSphere Application Server product. This produces a clean system that allows you to reinstall the product. Verify that you are removing only the product instance that you intend to remove and not coexisting products, or products that you might have migrated and do not intend to delete. It is important to know the installation root directory for the product instance that you are removing.

Uninstall WebSphere Application Server products in the following sequence when you are uninstalling more than one product:

1. WebSphere Business Integration Server Foundation on Network Deployment
2. WebSphere Application Server Network Deployment
3. WebSphere Business Integration Server Foundation on the base product
4. WebSphere Application Server (base product)

In the following steps:

- The default *install\_root* for WebSphere Application Server is the `/opt/WebSphere/AppServer` directory.
  - The default *install\_root* for the Integration Server product that extends the base WebSphere Application Server product is the `/opt/WebSphere/AppServer` directory.
  - The default *install\_root* for the Integration Server product that extends the Network Deployment product is the `/opt/WebSphere/DeploymentManager` directory.
  - The default directory for IBM HTTP Server is `/opt/IBMHttpServer`.
  - The default directories for the embedded messaging feature, which is based on WebSphere MQ, are `/opt/wemps` and `/opt/mqm`.
1. Use the `killall -9 java` command to kill all Java processes that are running.

If there are Java processes running that are not related to WebSphere Application Server products, and it is not possible to stop them, stop all WebSphere Application Server product-related processes. Use the following command to determine all processes that are running:

```
ps -ef | grep java
```

Stop all WebSphere Application Server-related processes with the **kill -9 java\_pid\_1 java\_pid\_2...java\_pid\_n** command.

2. Halt any running WebSphere MQ queue managers.
  - a. Type **dspmq** to show the state of any queue managers.
  - b. Type **endmqm -i** for each running queue manager.
  - c. Type **\$ ipcs -a** to check for any IPCs.
  - d. Type **\$ ipcrm -[qms] [ID]** to delete the IPCs.
3. Type **kill -9 amq\_pid\_1 amq\_pid\_2 ... amq\_pid\_n** to stop any MQ processes that are running. You can use a **ps -e | grep #AMQ\_COMMAND#** command structure to specify the command for amq to find each amq pid.
4. Search for related packages. Type these commands to search for related packages:
  - **rpm -qa | grep WS** to show packages for the WebSphere Application Server products and the IBM HTTP Server product
  - **rpm -qa | grep MQ** to show packages related to the embedded messaging feature or to IBM WebSphere MQ
  - **rpm -qa | grep wemps** to show packages related to the embedded messaging feature or to IBM WebSphere MQ

Do not remove packages for WebSphere Application Server products that you are not uninstalling. You can identify packages that belong to V5.1 by the 51 on the end of WSB packages and WSN packages. WSBM and WSNM packages are for the embedded messaging feature.

Do not remove IBM WebSphere MQ packages if you have installed IBM WebSphere MQ as a separate product.

Do not remove embedded messaging packages if you intend to leave the embedded messaging feature installed on the machine.

5. If there are packages to delete, type **rpm -e packagename** to remove any WebSphere Application Server-related packages for the product you are uninstalling.

You can remove more than one package with the following command:

```
rpm -qa | grep package_prefix | xargs rpm -e
```

However you should verify that everything in the list is something you want to remove before adding **| xargs rpm -e** to the command.

If you do intend to remove WebSphere MQ or embedded messaging packages, include them in the commands you are running to remove packages. For example, run these commands as root:

```
rpm -e MQSeriesClient-5.3.0-1
rpm -e MQSeriesMsg_Zh_CN-5.3.0-1
rpm -e MQSeriesMsg_Zh_TW-5.3.0-1
rpm -e MQSeriesMsg_de-5.3.0-1
rpm -e MQSeriesMsg_es-5.3.0-1
rpm -e MQSeriesMsg_fr-5.3.0-1
rpm -e MQSeriesMsg_it-5.3.0-1
rpm -e MQSeriesMsg_ja-5.3.0-1
rpm -e MQSeriesMsg_ko-5.3.0-1
rpm -e MQSeriesMsg_pt-5.3.0-1
rpm -e MQSeriesRuntime-5.3.0-1
rpm -e MQSeriesSDK-5.3.0-1
rpm -e MQSeriesJava-5.3.0-1
rpm -e MQSeriesServer-5.3.0-1
rpm -e MQSeriesJava-5.3.0-1
rpm -e wemps-runtime-2.1.0-0
rpm -e wemps-msg-De_DE-2.1.0-0
rpm -e wemps-msg-Es_ES-2.1.0-0
rpm -e wemps-msg-Fr_FR-2.1.0-0
```

```
rpm -e wemps-msg-It_IT-2.1.0-0
rpm -e wemps-msg-Ja_JP-2.1.0-0
rpm -e wemps-msg-Ko_KR-2.1.0-0
rpm -e wemps-msg-Pt_BR-2.1.0-0
rpm -e wemps-msg-Zh_CN-2.1.0-0
rpm -e wemps-msg-Zh_TW-2.1.0-0
```

If there is a problem with package dependencies, you can use the following command to remove the packages:

```
rpm -e packagename --nodeps --justdb
```

The nodeps option skips the dependency check. The justdb option updates only the package database, and not the file system. Using only the nodeps option can cause a failure in package removal if there is any mismatch in the dependent file system (files and directories).

6. Type **rm -rf /opt/WebSphere/AppServer/** to remove WebSphere Application Server directories in the instance installed in the /opt/WebSphere/AppServer installation root. Do not remove installation root directories for products that you intend to keep.
7. Type **rm -rf /opt/WebSphere/AppServer/ /opt/WebSphere/DeploymentManager/** to remove multiple directories. Again, do not remove directories for products that you intend to keep.
8. Type **rm -fr /var/wemps /opt/wemps** if you are certain that there is no embedded messaging data to preserve. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging packages or directories.
9. Type **rm -rf IBMHttpServer** to delete the IBM HTTP Server directory.
10. If you do not have IBM WebSphere MQ installed as a separate product on this machine, and if you do not have the embedded messaging server and client feature installed on this machine, type **rm -fr /var/mqm /opt/mqm** if you are certain that there is no embedded messaging data to preserve. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging packages or directories.

If you installed IBM WebSphere MQ as a separate product on this host to use as the messaging provider, and if you do not want to continue using WebSphere MQ, you can uninstall the product as described in the WebSphere MQ information.

11. Edit the vpd.properties file.

Do not delete or rename the vpd.properties file because the InstallShield for MultiPlatforms (ISMP) program uses it for other products that it installs.

When the process completes, the product is completely uninstalled. You are now ready to reinstall.

### Example of displaying package names beginning with MQ, for the embedded messaging feature

```
==>rpm -qa | grep MQ
MQSeriesMsg_Zh_CN-5.3.0-1
MQSeriesMsg_Zh_TW-5.3.0-1
MQSeriesMsg_ko-5.3.0-1
MQSeriesClient-5.3.0-1
MQSeriesMsg_de-5.3.0-1
MQSeriesMsg_es-5.3.0-1
MQSeriesMsg_fr-5.3.0-1
WSBMQ1AA-5.0-0
WSBMQ2AA-5.0-0
WSBMQ3AA-5.0-0
MQSeriesMsg_it-5.3.0-1
MQSeriesMsg_ja-5.3.0-1
MQSeriesMsg_pt-5.3.0-1
MQSeriesSDK-5.3.0-1
MQSeriesJava-5.3.0-1
MQSeriesServer-5.3.0-1
MQSeriesRuntime-5.3.0-1
```

### Example of displaying package names beginning with wemps, for the embedded messaging feature

```
==>rpm -qa | grep wemps
wemps-msg-De_DE-2.1.0-0
wemps-msg-Es_ES-2.1.0-0
wemps-msg-Fr_FR-2.1.0-0
wemps-msg-It_IT-2.1.0-0
wemps-msg-Ja_JP-2.1.0-0
wemps-msg-Ko_KR-2.1.0-0
wemps-msg-Pt_BR-2.1.0-0
wemps-msg-Zh_CN-2.1.0-0
wemps-msg-Zh_TW-2.1.0-0
wemps-runtime-2.1.0-0
```

### Example of displaying package names beginning with WSB, for the base WebSphere Application Server product

```
# rpm -qa | grep WSB
WSBSR1AA51-5.1-0
WSBMQ4AA-5.0-0
WSBTV1AA51-5.1-0
WSBJD5AA51-1.3-1
WSBDM1AA51-5.1-0
WSBJD7AA51-1.3-1
WSBDT1AA51-5.1-0
WSBMS3AA-5.0-0
WSBAU1AA51-5.1-0
WSBMQ3AA-5.0-0
WSBPL1AA51-5.1-0
WSBMS6AA-5.0-0
WSBPS1AA51-5.1-0
WSBC05AA51-5.1-0
WSBSR4AA51-5.1-0
WSBC01AA51-5.1-0
WSBSM1AA51-5.1-0
WSBAC1AA51-5.1-0
WSBMQ1AA-5.0-0
WSBJD9AA51-1.3-1
WSBGK2AA51-5.1-0
WSBES1AA-5.0-0
WSBJA1AA51-5.1-0
WSBLA1AA51-5.1-0
WSBAS1AA51-5.1-0
WSBMQ2AA-5.0-0
WSBIH1AA51-1.3-28
```

### Example of displaying package names beginning with WSN, for the WebSphere Application Server Network Deployment product

```
# rpm -qa | grep WSN
WSNC02AA51-5.1-0
WSNWG1AA51-5.1-0
WSNJD5AA51-1.3-1
WSNCF1AA51-5.1-0
WSNUR1AA51-5.1-0
WSNJD9AA51-1.3-1
WSNMQ1AA51-5.1-0
WSNCF4AA51-5.1-0
WSNMC5AA-5.0-0
WSNSR1AA51-5.1-0
WSNC01AA51-5.1-0
```

### Example of displaying package names beginning with WSE, for the WebSphere Business Integration Server Foundation product

```
# rpm -qa | grep WSE
WSEOS05AA51-5.1-0
WSESA0303AA51-5.1-0
```

WSEBR01AA51-5.1-0  
WSEEM05AB51-5.1-0  
WSEFC0301AA51-5.1-0  
WSECF03AA51-5.1-0  
WSEDQ0404AA51-5.1-0  
WSEOS0404AA51-5.1-0  
WSEDQ05AA51-5.1-0  
WSEOS0405AA51-5.1-0  
WSEOS03AA51-5.1-0  
WSECE05AA51-5.1-0  
WSEWL01AA51-5.1-0  
WSECPF01AA51-5.1-0  
WSEEM0305AA51-5.1-0  
WSEWL02AA51-5.1-0  
WSECF0203AA51-5.1-0  
WSEDQ01AA51-5.1-0  
WSECF12AA51-5.1-0  
WSEDQ0403AA51-5.1-0  
WSECD01AA51-5.1-0  
WSEOS07AA51-5.1-0  
WSEFC01AA51-5.1-0  
WSESA0305AA51-5.1-0  
WSEON03AA51-5.1-0  
WSEBR0301AA51-5.1-0  
WSEFC06AA51-5.1-0  
WSEOS07AB51-5.1-0  
WSEBR0305AA51-5.1-0  
WSEFC0303AA51-5.1-0  
WSEND02AA51-5.1-0  
WSEEM05AA51-5.1-0  
WSECF09AA51-5.1-0  
WSEBS01AA51-5.1-0  
WSEBR0303AA51-5.1-0  
WSEFC07AA51-5.1-0  
WSESA07AB51-5.1-0  
WSECE01AA51-5.1-0  
WSEFC0304AA51-5.1-0  
WSEAC04AA51-5.1-0  
WSEEM06AA51-5.1-0  
WSECF04AA51-5.1-0  
WSEEM0304AA51-5.1-0  
WSECF0207AA51-5.1-0  
WSEOS0403AA51-5.1-0  
WSEOS01AA51-5.1-0  
WSEOS0406AA51-5.1-0  
WSESA01AA51-5.1-0  
WSESA0301AA51-5.1-0  
WSECF01AA51-5.1-0  
WSESA0306AA51-5.1-0  
WSEON04AA51-5.1-0  
WSESA07AA51-5.1-0  
WSESA04AA51-5.1-0  
WSEAC01AA51-5.1-0  
WSEFC09AA51-5.1-0  
WSEBR0304AA51-5.1-0  
WSEFC06AB51-5.1-0  
WSEDQ02AA51-5.1-0  
WSEOS08AA51-5.1-0  
WSEOT03AA51-5.1-0  
WSEOS0401AA51-5.1-0  
WSEEM01AA51-5.1-0  
WSESA08AA51-5.1-0  
WSEJA01AA51-5.1-0  
WSEEM0301AA51-5.1-0  
WSECF11AA51-5.1-0  
WSEDQ0401AA51-5.1-0  
WSEEM0303AA51-5.1-0



Return to Uninstalling WebSphere Application Server to continue.

## Manually uninstalling on Solaris platforms

This task describes uninstalling the product on the Solaris operating platform.

Use the following procedure to remove all remnants of a WebSphere Application Server product. This produces a clean system that allows you to reinstall the product. Verify that you are removing only the product instance that you intend to remove and not coexisting products, or products that you might have migrated and do not intend to delete. It is important to know the installation root directory for the product instance that you are removing.

Uninstall WebSphere Application Server products in the following sequence when you are uninstalling more than one product:

1. WebSphere Business Integration Server Foundation on Network Deployment
2. WebSphere Application Server Network Deployment
3. WebSphere Business Integration Server Foundation on the base product
4. WebSphere Application Server (base product)

In the following steps:

- The default *WAS\_install\_root* for WebSphere Application Server is the `/opt/WebSphere/AppServer` directory.
- The default directory for IBM HTTP Server is `/opt/IBMHttpServer`.
- The default *install\_root* for the Integration Server product that extends the base WebSphere Application Server product is the `/opt/WebSphere/AppServer` directory.
- The default *install\_root* for the Integration Server product that extends the Network Deployment product is the `/opt/WebSphere/DeploymentManager` directory.

1. Use the **killall -9 java** command to kill all Java processes that are running.

If there are Java processes running that are not related to WebSphere Application Server products, and it is not possible to stop them, stop all WebSphere Application Server product-related processes. Use the following command to determine all processes that are running:

```
ps -ef | grep java
```

Stop all WebSphere Application Server-related processes with the **kill -9 java\_pid\_1 java\_pid\_2...java\_pid\_n** command.

2. Halt any running WebSphere MQ queue managers.
  - a. Type **dspmq** to show the state of any queue managers.
  - b. Type **endmqm -i** for each running queue manager.
  - c. Type **\$ ipcs -a** to check for any IPCs.
  - d. Type **\$ ipcrm -[qms] [ID]** to delete the IPCs.
3. Type **kill -9 amq\_pid\_1 amq\_pid\_2 ... amq\_pid\_n** to stop any MQ processes that are running.
4. Search for related packages. Type these commands to search for related packages:
  - **pkginfo | grep WS** to show packages for WebSphere Application Server products and the IBM HTTP Server product
  - **pkginfo | grep wemps** to show packages related to the embedded messaging feature or to IBM WebSphere MQ. You can delete these packages.
  - **pkginfo | grep mqm** to show packages related to the embedded messaging feature or to IBM WebSphere MQ.

Do not remove IBM WebSphere MQ packages if you have installed IBM WebSphere MQ as a separate product.

If no packages appear when using these commands, skip the next step.

5. Type **pkgrm packagename1 packagename2 packagename3 ...** to remove any WebSphere Application Server-related packages. Do not remove packages for WebSphere Application Server products that

you are not uninstalling. You can identify packages that belong to V5.1 by the 51 on the end of WSB packages and WSN packages. WSBM and WSNM packages are for the embedded messaging feature.

Do not remove embedded messaging packages if you intend to leave the embedded messaging feature installed on the machine.

Do not remove mqjava, mqm-upd04, or mqm packages if you have installed IBM WebSphere MQ as a separate product. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, which is based on WebSphere MQ, do not remove the embedded messaging or mqjava, mqm-upd04, or mqm packages or directories.

If you do not have IBM WebSphere MQ installed as a separate product on this machine, and if you do not have the embedded messaging server and client feature installed on this machine, you can remove wemps packages.

Remove the **mqm** package last, or you cannot remove any other embedded messaging feature packages. You will have to reinstall the embedded messaging feature to remove the packages. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging packages or directories.

If you do intend to remove WebSphere MQ or embedded messaging packages, include the packages in the commands you are running to remove packages. For example, use the following command as root to remove the embedded messaging feature from your system:

```
pkgrm wemps mqjava mqm-upd04 mqm
```

Reply y[es] to all prompts.

Alternatively, you can type the following commands to search for and remove any WebSphere Application Server product-related packages from the `/var/sadm/pkg` directory, or use `pkginfo` from any directory.

```
pkginfo | grep WSB | awk '{print $2} | xargs ....
```

- a. `ls | grep WSB | xargs -i pkgrm -n {}` for the base WebSphere Application Server product
- b. `ls | grep WSN | xargs -i pkgrm -n {}` for the Network Deployment product
- c. `ls | grep WSE | xargs -i pkgrm -n {}` for the Integration Server V5.1 product
- d. `ls | grep WSC | xargs -i pkgrm -n {}` for the WebSphere Application Server Java client
- e. `ls | grep wemps | xargs -i pkgrm -n {}` for the WebSphere embedded messaging publish and subscribe function
- f. `ls | grep mqjava | xargs -i pkgrm -n {}` for IBM WebSphere MQ
- g. `ls | grep mqm | xargs -i pkgrm -n {}` for IBM WebSphere MQ

A known problem in ISMP causes ISMP to rename packages from beginning with **WS** to beginning with **ISWS**. Search for and remove ISWS packages as well:

- a. `ls | grep ISWSB | xargs -i pkgrm -n {}` for the base WebSphere Application Server product
- b. `ls | grep ISWSN | xargs -i pkgrm -n {}` for the Network Deployment product
- c. `ls | grep ISWSE | xargs -i pkgrm -n {}` for the Integration Server V5.1 product
- d. `ls | grep ISWSC | xargs -i pkgrm -n {}` for the WebSphere Application Server Java client
- e. `ls | grep wemps | xargs -i pkgrm -n {}` for the WebSphere embedded messaging publish and subscribe function
- f. `ls | grep mqjava | xargs -i pkgrm -n {}` for IBM WebSphere MQ
- g. `ls | grep mqm | xargs -i pkgrm -n {}` for IBM WebSphere MQ

If there is a problem removing the packages, remove the related package directories in the `/var/sadm/pkg` directory.

6. Type `rm -rf /opt/WebSphere/AppServer/` to remove WebSphere Application Server directories in the instance installed in the `/opt/WebSphere/AppServer` installation root. Do not remove installation root directories for products that you intend to keep.
7. Type `rm -rf /opt/WebSphere/AppServer/ /opt/WebSphere/DeploymentManager/` to remove multiple directories. Again, do not remove directories for products that you intend to keep.

8. Type `rm -fr /var/wemps /opt/wemps` if you are certain that there is no embedded messaging data to preserve. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging packages or directories.
9. Type `rm -rf IBMHttpServer` to delete the IBM HTTP Server directory.
10. If you do not have IBM WebSphere MQ installed as a separate product on this machine, and if you do not have the embedded messaging server and client feature installed on this machine, type `rm -fr /var/mqm /opt/mqm` if you are certain that there is no embedded messaging data to preserve. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging packages or directories.

If you installed IBM WebSphere MQ as a separate product on this host to use as the messaging provider, and if you do not want to continue using WebSphere MQ, you can uninstall the product as described in the WebSphere MQ information.

When the process completes, the product is completely uninstalled. You are now ready to reinstall.

### Example of displaying package names beginning with mqm, for the embedded messaging feature

```
pkginfo |grep mqm
```

```
application mqm           WebSphere MQ for Sun Solaris
```

### Example of displaying package names beginning with wemps, for the embedded messaging feature

```
pkginfo |grep wemps
```

```
application wemps           WebSphere Embedded Messaging Publish and Subscribe Edition
```

### Example package names for the base package

```
application ISWSBIH1A      ihsComponent
application ISWSBJD9A      javaCommonConfigComponent
application ISWSBJD9A.2    javaCommonConfigComponent
application ISWSBLA1A      logAnalyzerComponent
application ISWSBLAAA      LogAnalyzer
application WSBAA          WebSphere Application Server
application WSBAAA         Application And Assembly Tools
application WSBAC1AA       adminConsoleFilesComponent
application WSBACAA        Admin Console
application WSBADAA        Admin
application WSBAS1AA       adminScriptingFilesComponent
application WSBASAA        Admin Scripting
application WSBAT1AA       applicationAssemblyToolComponent
application WSBATAA        Application Assembly Tool
application WBSAU1AA       antUtilityComponent
application WBSAUAA        Ant Utility
application WSBC01AA       commonFiles
application WSBC04AA       pbwServerConfigWithMQGood
application WSBC05AA       IsmplauncherComponent
application WSBC0AA        commonFeature
application WSBDM1AA       DCMStdComponent
application WSBDMAA        Dynamic Cache Monitor
application WSBDT1AA       deployToolComponent
application WSBDTAA        Deploy Tool
application WSBES1AA       messagingSampleFileComponentBean
application WSBESAA        mqSeriesSamples
application WSBGK2AA       gskitUnixComponent
application WSBGK3AA       gskit4SolarisComponent
application WSBGKAA        gskitFeature
application WSBIHAA        ihsFeature
application WSBJA1AA       javadocComponent
application WSBJAA         Javadoc
application WSBJD4AA       javaSolarisComponent
```

application	WSBJD7AA	javaUninstallComponent
application	WSBJDAA	Java
application	WSBMQ1AA	mqSeriesSetupFileComponent
application	WSBMQ2AA	mqSeriesBinComponent
application	WSBMQ3AA	mqSeriesLibFilesComponent
application	WSBMQAA	MQSeries
application	WSBMS6AA	mqSeriesSunConfig
application	WSBMSAA	mqSeriesServer
application	WSBPL1AA	component8
application	WSBPLAA	Plugins
application	WSBPS1AA	perfServletComponent
application	WSBPSAA	Performance Servlet
application	WSBPTAA	PerformanceAndAnalysisTools
application	WSBSM1AA	samplesComponent
application	WSBSMAA	Samples
application	WSBSR1AA	serverStdComponent
application	WSBSR4AA	serverConfigWithoutSamplesComponent
application	WSBSRAA	Server
application	WSBTV1AA	tivoliViewerComponent
application	WSBTVAA	TivoliPerformanceViewer

### Example package names for the Network Deployment package

application	ISWSNMQ1A	mqClientFiles
application	ISWSNMQAA	mqFeature
application	WSNAA	WebSphere Network Deployment
application	WSNCF1AA	configFiles
application	WSNCF4AA	configSunLinuxWithMQComponent
application	WSNCFAA	Config
application	WSNCO1AA	commonFiles
application	WSNCO2AA	IsmplauncherComponent
application	WSNCOAA	commonFeature
application	WSNJD4AA	javaSolarisComponent
application	WSNJDAA	Java
application	WSNSR1AA	serverStdComponent
application	WSNSRAA	Server
application	WSNUR1AA	uddiComponent
application	WSNURAA	UDDI
application	WSNWG1AA	wsgwComponent
application	WSNWGAA	Web Services Gateway
application	WSNWSAA	Web Services

### Example package names for the V5.0.2 Enterprise product

application	ISWSEBDAA	Destination For Base
application	ISWSEBR01	BRB Files
application	ISWSEBR03	BRB Samples
application	ISWSEBRAA	BRB
application	ISWSECC01	Corba Files
application	ISWSECC02	Corba IR
application	ISWSECC05	Corba C++ Samples
application	ISWSECC06	gskitFeature
application	ISWSECCAA	Corba
application	ISWSECF01	CommonFilesComponent
application	ISWSECF02	Setup Cmd
application	ISWSECF03	LAFilesComponent
application	ISWSECF04	IsmplauncherComponent
application	ISWSECF06	PRTFilesComponent
application	ISWSECF08	eFixInstaller
application	ISWSECF09	Uninstaller
application	ISWSECF11	UnzipPluginzipFile_CF_Unix
application	ISWSECF12	Set_InstallCF_TRUEComponent
application	ISWSECF14	PluginActionSequence_CF
application	ISWSECFAA	CommonFeature_WAS
application	ISWSEDQ01	EJBQuery
application	ISWSEDQ02	EJBQueryJar
application	ISWSEDQ04	DQSamples
application	ISWSEDQAA	DQ

application ISWSEEM01	CMM Files
application ISWSEEM03	CMM Samples
application ISWSEEM05	UnzipPluginzipFile_EM_Unix
application ISWSEEM06	Set_InstallEM_TRUEComponent
application ISWSEEM07	PluginActionSequence_EM
application ISWSEEMAA	CMM
application ISWSEFC01	Workflow Files
application ISWSEFC03	Process Choreographer Samples
application ISWSEFC04	feature23
application ISWSEFC06	UnzipPluginzipFile_PC_Unix
application ISWSEFC07	Set_InstallPC_TRUEComponent
application ISWSEFC08	PluginActionSequence_PC
application ISWSEFCAA	ProcessChoreographer
application ISWSEOS01	Other Services Files
application ISWSEOS03	OtherServices_PropertiesUpdate
application ISWSEOS04	OS Samples
application ISWSEOS05	AppProfile Files
application ISWSEOS07	UnzipPluginzipFile_OS_Unix
application ISWSEOS08	Set_InstallOS_TRUEComponent
application ISWSEOS09	PluginActionSequence_OS
application ISWSEOSAA	OtherServices
application ISWSEOT03	ConfigFileCopy
application ISWSEOTAA	OneTimeInstall_WAS
application ISWSESA01	SCHED Files
application ISWSESA03	SCHED Samples
application ISWSESA04	SCHED_DefaultWorkManager
application ISWSESA07	UnzipPluginzipFile_SA_Unix
application ISWSESA08	Set_InstallSA_TRUEComponent
application ISWSESA09	PluginActionSequence_SA
application ISWSESAAA	Scheduler
application WSEAA	WebSphere Application Server Enterprise

### Example package names for a V5.1 system with the base product and the Network Deployment product

application IBMHTTPSV	IBM HTTP Server
application ISIH.S.bas	HTTPServer base
application ISIH.S.con	component23
application ISIH.S.htt	feature13
application ISIH.S.ins	component26
application ISIH.S.ssl	component57
application ISWSBIH1A	ihComponent
application ISWSBJD9A	javaCommonConfigComponent
application ISWSBLA1A	logAnalyzerComponent
application ISWSBLAAA	LogAnalyzer
application ISWSNJD9A	javaCommonConfigComponent
application ISWSNMQ1A	mqClientFiles
application ISWSNMQAA	mqFeature
application WSBAA51	WebSphere Application Server
application WSBAAAA51	Application And Assembly Tools
application WSBAC1AA51	adminConsoleFilesComponent
application WSBACAA51	Admin Console
application WSBADAA51	Admin
application WSBAS1AA51	adminScriptingFilesComponent
application WSBASAA51	Admin Scripting
application WSBAAU1AA51	antUtilityComponent
application WSBAAUA51	Ant Utility
application WSBAA01AA51	commonFiles
application WSBAA05AA51	IsmpLauncherComponent
application WSBAA0AA51	commonFeature
application WSBAA01AA51	DCMStdComponent
application WSBAA0MAA51	Dynamic Cache Monitor
application WSBAA0T1AA51	deployToolComponent
application WSBAA0TAA51	Deploy Tool
application WSBAA0S1AA	messagingSampleFileComponentBean
application WSBAA0SAA	mqSeriesSamples

application WSBGK2AA51	gskitUnixComponent
application WSBGK3AA51	gskit4SolarisComponent
application WSBGKAA51	gskitFeature
application WSBIHAA51	ihsFeature
application WSBJA1AA51	javadocComponent
application WSBJAAA51	Javadoc
application WSBJD4AA51	javaSolarisComponent
application WSBJD7AA51	javaUninstallComponent
application WSBJDAA51	Java
application WSBMC4AA	mqSeriesClientUnixInstall
application WSBMQ1AA	mqSeriesSetupFileComponent
application WSBMQ2AA	mqSeriesBinComponent
application WSBMQ3AA	mqSeriesLibFilesComponent
application WSBMQAA	MQSeries
application WSBMS4AA	mqSeriesUnixInstall
application WSBMS6AA	mqSeriesSunConfig
application WSBMSAA	mqSeriesServer
application WSBPL1AA51	component8
application WSBPLAA51	Plugins
application WSBPS1AA51	perfServletComponent
application WSBPSAA51	Performance Servlet
application WSBPTAA51	PerformanceAndAnalysisTools
application WSBM1AA51	samplesComponent
application WSBMAA51	Samples
application WBSR1AA51	serverStdComponent
application WBSR4AA51	serverConfigWithoutSamplesComponent
application WBSRAA51	Server
application WSBTV1AA51	tivoliViewerComponent
application WSBTVAA51	TivoliPerformanceViewer
application WSNAA51	WebSphere Network Deployment
application WSNCF1AA51	configFiles
application WSNCF4AA51	configSunLinuxWithMQComponent
application WSNCFAA51	Config
application WSNCO1AA51	commonFiles
application WSNCO2AA51	IsmLauncherComponent
application WSNCOAA51	commonFeature
application WSNJD4AA51	javaSolarisComponent
application WSNJDAA51	Java
application WSNSR1AA51	serverStdComponent
application WSNSRAA51	Server
application WSNUR1AA51	uddiComponent
application WSNURAA51	UDDI
application WSNWG1AA51	wsgwComponent
application WSNWGAA51	Web Services Gateway
application WSNWSAA51	Web Services
application gsk4bas	gsk4bas
application gsk7bas	Certificate and SSL Base Runtime (gsk7bas)
application mqm	WebSphere MQ for Sun Solaris
application mqm-upd04	WebSphere MQ for Sun Solaris 2 - U486877
application wemps	WebSphere Embedded Messaging Publish and Subscribe Edition

Return to Uninstalling WebSphere Application Server to continue.

## Manually uninstalling on Windows platforms

This task describes how to uninstall the product on a Windows platform.

Use the following procedure to remove all remnants of a WebSphere Application Server product. This produces a clean system that allows you to reinstall the product. Verify that you are removing only the product instance that you intend to remove and not coexisting products, or products that you might have migrated and do not intend to delete. It is important to know the installation root directory for the product instance that you are removing.



There are three items you must delete to remove a WebSphere Application Server product or feature: files, registry entries, and the MSI record (when you have installed the embedded messaging feature). If you are uninstalling in a coexistence environment, there are registry entries only for the installation image that you installed last. If you are uninstalling any version but the last image you installed, you need to delete only the file structure for the installation image you are deleting. You do not need to delete registry entries or the MSI record. If you are using the embedded messaging feature in other product instances on the machine, you need to delete only the file structure for the installation image you are deleting. You do not need to delete the MSI record.

Uninstall WebSphere Application Server products in the following sequence when you are uninstalling more than one product:

1. WebSphere Business Integration Server Foundation on Network Deployment
2. WebSphere Application Server Network Deployment
3. WebSphere Business Integration Server Foundation on the base product
4. WebSphere Application Server (base product)

In the following steps:

- The default installation root for WebSphere Application Server is the *drive:\Program Files\WebSphere\AppServer* directory.
  - The default installation root for the Integration Server product that extends the base WebSphere Application Server product is the *drive:\Program Files\WebSphere\AppServer* directory.
  - The default installation root for the Integration Server product that extends the Network Deployment product is the *drive:\Program Files\WebSphere\DeploymentManager* directory.
  - The default directory for the embedded messaging feature is the *drive:\Program Files\IBM\WebSphere MQ* directory.
  - The default directory for the IBM Key Management utility (for Web server support) is the *drive:\Program Files\IBM\gsk7* directory.
1. Verify that you have an Emergency Recovery Disk. Instructions for creating this disk are in the Windows help documentation.
  2. Use the *regback.exe* program from the Windows Resource Kit to back up the Registry.
  3. If you have not installed IBM WebSphere MQ as a separate product on this machine, and if you do not have other product instances that are using the embedded messaging feature, verify that the embedded messaging feature has been uninstalled. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging registry entries or directories.
    - a. If you are not using the embedded messaging feature or the WebSphere MQ product on other instances on the machine, use the Add/Remove program to verify if the following programs are still listed:
      - IBM WebSphere EMPS
      - IBM WebSphere MQ
    - b. If either of these programs is still listed, complete the following steps: If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not complete these steps to remove the embedded messaging registry entries or directories.
      - 1) Delete any broker or queue manager defined for WebSphere Application Server.
        - To delete any broker defined for WebSphere Application Server, run the **wempsdeletebroker.exe** program, if it still exists:

```
drive:\IBM\WebSphere MQ\WEMPS\bin\wempsdeletebroker.exe brokername -q
```

The *-q* option deletes the Broker's WebSphere MQ queue manager. For example:

```
drive:\IBM\WebSphere MQ\WEMPS\bin\wempsdeletebroker.exe WAS_nodename_server1 -q
```
        - To delete any Queue Manager defined for WebSphere Application Server, run the **dltmqm** command, if it still exists:

```
drive:\IBM\WebSphere MQ\bin\dltmqm.exe queuemanagename
```

- 2) If you are not using the embedded messaging feature or the WebSphere MQ product on other instances on the machine, use the Add/Remove utility to remove the following programs, if listed:

IBM WebSphere EMPS  
IBM WebSphere MQ

If you installed IBM WebSphere MQ as a separate product, do not remove it now. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging registry entries or directories.

- c. If you are not using the embedded messaging feature or the WebSphere MQ product on other instances on the machine, remove the WebSphere MQ Windows tray icon if it present.

The MQ Windows tray icon in the lower right corner indicates that a WebSphere MQ process (**amqmtbrn.exe**) is running. Remove the tray icon to close the process.

To remove the tray icon, right click the icon and click **Hide**.

4. Delete WebSphere Application Server product registry entries only if the instance you are removing was the last instance installed. This step is optional in a coexistence environment. Perform this step only if you are removing the image that you last installed.

If you are not using the embedded messaging feature or the WebSphere MQ product on other instances on the machine, remove any WebSphere Application Server product or feature that appears in the Add/Remove Programs panel, which is available from the Control Panel.

5. Invoke **regedit.exe** from a command prompt, to edit the Windows system registry. This step is optional in a coexistence environment. Perform this step only if you are removing the image that you last installed.

### Handle the Registry with care

**Note:** You can easily make a mistake while using the **regedit.exe** editor to view and edit registry contents. The editor does not warn you of editing errors, which can be extremely dangerous. A corrupt Registry can disrupt your system to the point where your only option is to reinstall the Windows operating system.

- a. Use **Ctrl-F** to search for all instances of **WebSphere**, **IBM HTTP Server**, or **IBM MQSeries**, to determine whether you should delete each entry. You might not be able to remove all of the entries related to WebSphere Application Server, which is not a problem. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging registry entries or directories.
- b. Expand and select keys related to **WebSphere Application Server** and its features, **IBM HTTP Server**, and **IBM WebSphere MQ**.

Delete the following keys:

- **HKEY\_LOCAL\_MACHINE\ SOFTWARE\ IBM\ HTTP Server\ 1.3.28**
- **HKEY\_LOCAL\_MACHINE\ SOFTWARE\ IBM\ WebSphere Application Server\ 5.1.x.y**, where *x* and *y* identify the specific modification and service levels
- **HKEY\_CURRENT\_USER\ Software\ Microsoft\ Windows\ CurrentVersion\ Explorer\ MenuOrder\ Start Menu\ Programs\ IBM WebSphere\ Application Server v5.1**
- **HKEY\_CURRENT\_USER\ HKEY\_USERS\ S-1-5-21-3097617641-2550431553-14499587-500\ Software \ Microsoft\ Windows\ CurrentVersion\ Explorer\ MenuOrder\ Start Menu\ Programs\ IBM Websphere\ Application Server v5.1**
- **HKEY\_LOCAL\_MACHINE\ SOFTWARE\ IBM\ WebSphereEmbeddedMessagingPublishAndSubscribe**

If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove this embedded messaging registry entry.

- **HKEY\_LOCAL\_MACHINE\ SOFTWARE\ IBM\ WebSphere Network Deployment\ 5.1.x.0**
- **HKEY\_LOCAL\_MACHINE\ SOFTWARE\ IBM\ WebSphere Network Deployment\ 5.0.x.0**

- **HKEY\_LOCAL\_MACHINE\ SOFTWARE\ IBM\ WebSphere Business Integration Server Foundation\ 5.1.x.0**
  - If you have installed IBM WebSphere MQ as a separate product on this machine, or if you have other instances of WebSphere Application Server products on the same machine that use the embedded messaging feature, do not remove the following embedded messaging registry entry: **HKEY\_LOCAL\_MACHINE\ SOFTWARE\ IBM\ MQSeries\ CurrentVersion**
- c. Click **Edit > Delete** from the menu bar for each related key.
  - d. Click **Yes** when asked to confirm deletion of the key.
  - e. Click **Registry > Exit** from the menu bar when you are finished.
6. Restart the Windows platform. Reboot before reinstalling any of the products.
  7. If you have installed IBM WebSphere MQ as a separate product on this machine, or if you have other instances of WebSphere Application Server products on the same machine that use the embedded messaging feature, do not perform this step. If you intend to delete the IBM WebSphere MQ program, or to delete the embedded messaging feature from this machine, use the Microsoft MSI Cleanup Utility to remove MRI records. The utility is available from the Microsoft Web site as `msicuu.exe`. Click on the `msicuu.exe` file after downloading it, to install the utility. Once installed, the utility appears on the program menu.

When MSI starts, it lists all products that it knows about. To uninstall using this technique:

- a. Select a product and click **Remove** to remove its MSI record. These WebSphere MQ product entries might be present:
  - IBM WebSphere EMPS
  - IBM WebSphere MQ

Do not remove the entry for IBM WebSphere MQ if you installed the product separately. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging registry entries or directories.

8. Delete the base product installation root directory, `drive:\WebSphere\AppServer` and all subdirectories if it is the installation root directory for the instance you are uninstalling.
9. Delete the Network Deployment installation root directory, `drive:\WebSphere\DeploymentManager`, and all subdirectories if it is the installation root directory for the instance you are uninstalling.
10. Delete the IBM HTTP Server installation root, which is usually in the `drive:\Program Files\IBMHttpServer` directory by default.
11. Delete the `drive:\IBM\WebSphere MQ\WEMPS` directory if there are no other product instances on this machine that are using the embedded messaging feature.
12. Depending on whether you installed IBM WebSphere MQ as a separate product and whether you installed the embedded messaging feature on any other installation instances on the machine, delete the WebSphere MQ directory. If you do not have IBM WebSphere MQ installed as a separate product on this machine and if you do not use the embedded messaging feature on another installation instance on the machine, delete the `drive:\IBM\WebSphere MQ` directory for the embedded messaging feature.
 

If you installed IBM WebSphere MQ as a separate product on this host to use as the messaging provider, and do not want to continue using WebSphere MQ, you can uninstall the product as described in the WebSphere MQ information.
13. Delete the `drive:\Program Files\IBM\gsk7` directory to remove the IBM Key Management utility.
14. Delete the `drive:\WINDOWS\IsUninst.exe` file.
15. Delete the `drive:\WINDOWS\gsk7bui.exe` file.
16. Edit the `vpd.properties` file.
 

Do not delete or rename the `vpd.properties` file because the InstallShield for MultiPlatforms (ISMP) program uses it for other products that it installs.
17. Restart your machine if you removed the embedded messaging feature.

When you finish, the product is completely uninstalled. You are now ready to reinstall.

Return to Uninstalling WebSphere Application Server to continue.

---

## Reinstalling V5.1 after uninstalling and leaving the embedded messaging feature installed

This task describes how to reinstall WebSphere Business Integration Server Foundation, Version 5.1 with the embedded messaging feature after uninstalling the product and leaving the embedded messaging feature installed. Follow this procedure to reinstall the product into its original directory.

If you uninstall V5.1 and leave the embedded messaging feature installed to work with other instances on the system, you must follow this procedure before reinstalling V5.1. The uninstaller program on V5.1 gives you the option of leaving the embedded messaging feature installed when there is another instance that has the feature installed. But the V5.0.2 uninstaller program does not have this enhancement of leaving the embedded messaging feature. Therefore, there are different procedures for preparing to reinstall, depending on the version you are reinstalling.

1. Stop any browsers, delete any configuration instances, and stop any Java processes related to WebSphere Application Server products as described in “Uninstalling the product” on page 311.
2. Uninstall manually after uninstalling V5.1. Select your scenario from the following list:
  - Uninstall V5.1 manually on Solaris platforms before reinstalling.
  - Uninstall V5.1 manually on HP-UX platforms before reinstalling.
  - Perform the manual uninstalling procedure for Version 5.1 nodes for platforms other than Solaris and HP-UX. and use the following guidelines.

### Guidelines for running the procedure

**Important:** When you edit the `vpd.properties` file, do not delete entries in the file for the embedded messaging feature or for V5.0.x products.

The `vpd.properties` file topic describes how to edit the file and how to identify entries in the file. For example:

- Any entry that ends with **51** is one that you want to delete. Such entries are for the V5.1 product. Remove all such entries before reinstalling.
- Look for the original installation root directory of the V5.1 product in an entry to verify that the entry is describing a component in the V5.1 product. These are the entries that you want to delete.

3. Reinstall the V5.1 product. Select the embedded messaging feature when you reinstall.

You can reinstall the V5.1 product with the embedded messaging feature after uninstalling V5.1 but leaving the feature installed.

Return to Installing WebSphere Application Server.

---

## Migrating and coexisting

This topic describes migrating, which is copying the configuration from a previous release of a WebSphere Application Server product into a new release. This topic also describes coexisting, which is running a new release of a WebSphere Application Server product on the same machine at the same time as you run an earlier release.

Determine if an existing version of WebSphere Application Server is installed on the machine where you plan to install your Version 5.1 product.

If you have a previous version, you must decide whether to copy the configuration and applications of the previous version to the new version. Migration does not uninstall the previous version. The earlier release is still functional but you cannot run both releases at the same time. To run an earlier release and the new release at the same time is coexistence. You must provide non-default port assignments to support coexistence, by selecting the **coexistence** option during installation. See “Migration and coexistence overview” on page 359 for more information.

Coexistence is described as an optional step in the following procedure. Migration is also optional but the steps are not listed as optional. Use the following procedure to migrate applications and configurations:

1. Prepare to migrate or update product prerequisites and corequisites to supported versions.

Refer to the IBM WebSphere Application Server supported hardware, software, and APIs site for current requirements.

Examples include upgrading to the level of DB2 supported in V5.1 and the embedded messaging feature.

V5.0.0 and V5.0.1 use a level of embedded messaging that is incompatible with the level supported by V5.0.2 or V5.1. To solve this problem, upgrade V5.0.0 or V5.0.1 to V5.0.2 by applying Fix Pack 2.

2. Prepare to use the migration function of the Installation wizard, to migrate silently, or to migrate using the migration tools. You have the option of letting the Installation wizard issue the commands to use the migration tools or you can issue the commands after installation.

The Installation wizard detects a previously installed version, and displays a coexistence panel. If you choose not to coexist with the existing product, the Installation wizard displays a migration panel. You can select either option or no option.

- a. Start the administrative server of WebSphere Application Server Standard Edition (V3.5.x) or WebSphere Application Server Advanced Edition (V3.5.x or V4.0.x). When you start the administrative server, the migration tools can use the XMLConfig tool to export the configuration data repository. It is not necessary that you start the administrative server for WebSphere Application Server Advanced Single Server Edition, V4. The migration tools use the XML Metadata Interchange (XMI) configuration files directly.
- b. Select the migration option and click **Next** when using the Installation wizard. When using the silent installation method, select the appropriate option. Enter a fully qualified path for the backup directory, where the migration tools store and read the saved configuration and other files. During migration, the wizard backs up the old version of the administrative configuration and the user data files, but does not uninstall the old version. The wizard automatically configures the new installation with the previous configuration data and copies some application data to the newer version.

The Installation wizard uses the WASPreUpgrade migration tool to export the current administrative configuration. After this phase completes, the wizard runs the second phase, which uses the WASPostUpgrade migration tool to convert the backed-up administrative configuration into the new V5.1 configuration. You can stop the administrative server of the earlier version after the migration is complete. You must stop the administrative server of the earlier version before starting the V5.1 WebSphere Application Server.

The installation program prompts you for the following information during migration:

- Backup directory.
- Currently installed WebSphere Application Server directory. You must install V5.1 in a different directory.

- c. Plan to complete the migration after the installation is complete. Here is an overview of the tasks that you must perform to complete the migration:
  - 1) Stop all servers from the earlier version.
  - 2) Load existing applications into your development environment and fix any known problems.
  - 3) Start the Application Servers in the new installation.
  - 4) Deploy the changed applications in a test environment.
  - 5) Test all applications thoroughly.
  - 6) Follow normal test procedures as you move the test environment into production.



The Installation wizard backs up the earlier version but does not uninstall it, exports the current configuration, and migrates the configuration to the new installation. If errors result when using the WASPreUpgrade tool, the Installation wizard does not run the WASPostUpgrade tool. The wizard displays the WASPreUpgrade.log and the WASPostUpgrade.log files if errors occur.

- d. Migrate the configuration of a previous version to IBM WebSphere Business Integration Server Foundation using the Installation wizard or during a silent installation.
  - e. Migrate the configuration using the migration tools if you prefer a more incremental approach. The Migrating topic describes migrating from V4.x (little to consider) or V3.5.x (several things to consider). The topic describes differences between V3.5.x and V5.1 that result from the full compliance of V5.1 with Java 2 Platform, Enterprise Edition (J2EE) specifications.
3. Set up multiple versions of WebSphere Application Server to coexist. No run-time conflicts can exist for multiple instances and versions of WebSphere Application Server to run at the same time on the same machine. Potential conflicts can occur in these areas:
- Prerequisites and corequisites, including the level of the embedded messaging feature
  - Operating system registration
  - Environmental conflicts
  - File system
  - Port assignments
- a. Run V3.5.x and V5.1 together.
  - b. Run V4.0.x and V5.1 together.
  - c. Install V5.1 more than once on the same machine.

The migration function migrates all of your resources and applications, but does not migrate entities in your classes directory. As the Installation wizard for the WebSphere Application Server product migrates applications to Version V5.1, it also migrates any applications that use IBM WebSphere Business Integration Server Foundation Edition, Version 4.0.x.

The base migration removes (from the server configuration) those parts of your configuration that are dependent upon the Integration Server services.

Migration saves the following files in the backup directory.

**For Version 3.5.x:**

- bin/setupCmdLine.sh (or bin/setupCmdLine.bat for Windows platforms)
- classes (not saved for iSeries)
- deployableEJBs (Advanced Edition only)
- deployedEJBs (Advanced Edition only)
- hosts
- properties
- servlets

**For Version 4.0.x:**

- bin/setupCmdLine.sh (or bin/setupCmdLine.bat for Windows platforms)
- classes (not saved for iSeries)
- config
- installableApps
- installedApps (by default unless overridden within a specified developer configuration file)
- installedConnectors (Version 4.x Advanced Edition only)
- properties (including iSeries as of V5.1 migration tooling)

**For Version 5.0.x:**

- classes (not saved for iSeries)
- config
- installableApps
- installedApps
- properties



You can coexist with, or migrate the applications and configuration from a previous version of WebSphere Application Server.

Migration from V5.0.x to V5.1 does not require extensive tuning but does require that you use the new migration tools. Use the tools to migrate an embedded messaging queue manager and a federated node.

Migration from V4.x to V5.1 does not require extensive tuning. Migration from V3.5.x to V5.1 does require that you examine the migrating applications. See Migrating configuration data for a description of fine tuning a migration. Part of the procedure for using the migration tools includes a description of what to tune after using the tools. After migrating, return to installing the product.

For more information on coexistence among releases, see “Migration and coexistence overview.”

## Migration and coexistence overview

WebSphere Application Server contains migration tools that provide migration functionality. The installation wizard can call the migration tools, or you can call them at a later time. The migration tools migrate applications and configuration information to the new version, as described in “Migrating” in the front matter of this document and in Configuration mapping during migration.

You can also find information about migrating the configuration and the applications from a previous version of WebSphere Application Server to Version 5.0.x in the IBM Redbook, Migrating to WebSphere V5.0: An End-to-End Migration Guide, SG24-6910-00.

Table 46. Overview of migrating from release to release

Migration path	Description
V5.0.x to V5.1	<p>The migration from V5.0.x to V5.1 is routine if there is no embedded messaging feature and if the node is unfederated. You can use the installer program to migrate and have little or no post-migration tuning to perform. When the embedded messaging feature is installed, you must perform one of the following tasks:</p> <ul style="list-style-type: none"> <li>• Upgrade V5.0.0 or V5.0.1 to V5.0.2 by applying Fix Pack 2 before migrating to V5.1, and run special scripts before and after uninstalling the V5.0.2 node</li> <li>• Use the migration tools to save the V5.0.0 or V5.0.1 configuration data, uninstall V5.0.0 or V5.0.1, install V5.1, and use the migration tools again to restore the configuration data.</li> </ul> <p>Upgrading and using the special scripts is necessary to avoid using incompatible levels of the embedded messaging feature, and to retain the queue manager and persistent data. After migrating a federated node, uninstalling the V5.0.x node can also cause the V5.1 node to unfederate unless you run the migration tools, <code>pre_uninst50ws</code> and <code>post_uninst50ws</code>, before and after uninstalling the V5.0.x node.</p>
V4.0.x to V5.1	<p>The migration tools perform a fairly routine migration from V4 to V5.1. For example, Java 2 Platform, Enterprise Edition (J2EE) 1.2 enterprise archive (EAR) files in V4 work in V5.1 of WebSphere Application Server, which also supports the J2EE 1.3 specification. Similarly, it is not necessary to redeploy enterprise Java bean (EJB) 1.1 Java archive (JAR) files when moving them from V4 to V5.x, which also supports EJB 2.0 JAR files.</p>
V3.5.x to V5.1	<p>The migration from V3.5 to V5.1 involves significant changes in application structures, development, and deployment. The migration tools assist in this transition by migrating system configurations and creating J2EE artifacts, including mapping previous security settings to J2EE security roles. These security mappings let you access migrated assets during the transition. The migration tools create initial J2EE enterprise applications based on V3.5.x configurations. However, because of the significant changes in the application structures, carefully test and fine tune migrated applications using development and deployment tools.</p>

You can select from three combinations of migration and coexistence options in the installation wizard or when customizing the response file for silent installation:

- Migrate only
- Coexist only
- Neither migrate nor coexist

If you neither migrate nor coexist with an earlier version of WebSphere Application Server, you are choosing to ignore the previous installation. You can run only one version at a time because of conflicting default port assignments and the potential for conflicting levels of the embedded messaging feature. It is possible that both versions might run at the same time without conflict if you use non-default ports in the earlier version and if they both use the same level of embedded messaging. To resolve conflicting port assignments, the coexistence panel lets you assign ports for Version 5 to ensure that it can run with an earlier version.

If you use the embedded messaging feature, the earlier version must use the same level of embedded messaging. For example, Version 5.0.2 and V5.1 use the CSD04 level of embedded messaging. V5.0.0 and V5.0.1 use earlier versions. V5.0.2 and later are the only versions that can coexist with V5.1, when embedded messaging is installed. If you want an instance of V5.0.0 or V5.0.1 to coexist with an instance of V5.0.2 or V5.1, upgrade the V5.0.x instance to V5.0.2 by applying Fix Pack 2.

You can specify port assignments for coexistence on the installation wizard coexistence panel, by editing configuration files, by wsadmin scripting, or by using the **Servers > Application Servers > server1 > End Points** administrative console page.

Migrating and coexisting have roughly opposite goals. The goal of migration is to reconstruct your earlier version in a nearly identical V5.1 environment, including applications, configuration settings, universal resource identifier (URI) descriptors, and Web server context roots. The installation wizard can use the migration tools to migrate the previous configuration and applications. The goal of coexistence is to create an environment that is not in conflict with an earlier version, so far as port settings are concerned. The installation wizard displays a panel where you can set non-conflicting port values that allow the V5.x product to coexist with the earlier version, without port conflicts. This allows both nodes to start and run at the same time. Coexistence processing changes the following configuration files:

- The `virtualhosts.xml` file:
  - HTTP Transport Port
  - IBM HTTP Server Port
  - HTTPS Transport Port
  - HTTP Administrative Console Port
  - HTTPS Administrative Console Secure Port
- The `serverindex.xml` file:
  - Bootstrap Port
  - SOAP Connector Address
  - DRS Client Address
  - JMS Server Queued Address
  - JMS Server Direct Address
  - SAS SSL ServerAuth Address
  - CSIV2 ServerAuth Listener Address
  - CSIV2 MultiAuth Listener Address
- The `server1/server.xml` file:
  - HTTP Transport Port
  - HTTPS Transport Port
  - HTTP Administrative Console Port
  - HTTPS Administrative Console Secure Port
  - JMS Server Security Port

See Default coexistence settings for port numbers for more information.

After choosing coexistence, start server1 and use it to change any ports that are in conflict, so that there is no conflict with the earlier version. Then you can run both versions at the same time.

Consider these issues in a migration or coexistence scenario:

- Conflicting context roots when attempting to share the same Web server.  
A procedure for configuring a Web server for sharing between WebSphere Application Server versions is described in the information center for the base WebSphere Application Server product.
- Installing WebSphere Application Server multiple times on the same machine.
- Having multiple V5.0.0 or V5.0.1 instances use the embedded messaging feature and attempting to upgrade one instance to V5.0.2, or attempting to install V5.1 with the embedded messaging feature.  
The service level of the embedded messaging feature for V5.0.0 and V5.0.1 is not compatible with the service level for V5.0.2 or V5.1 (CSD04).

## Configuration mapping during migration

This topic describes what changes during migration, which always involves migrating a single instance to another single instance on the same machine or a separate machine. An example is a server group node from a Version 4.0.x environment migrating to a Version 5.x node that you later federate into a deployment manager cell.

Many migration scenarios are possible. The Version 5.x migration tools map objects and attributes to the Version 5.x environment when you restore a configuration from a previous version.

### Bootstrap port

Migration maps a default bootstrap NameServer port setting, 900, from V3.5.x and V4.0.x Advanced Edition to the V5.x NameServer default, 2809. The migration tools map a non-default value directly into the V5.x environment.

For Advanced Single Server Edition migration, the bootstrap NameServer port maps to the NameServer value of the Application Server defined in the server configuration file.

### Command line parameters

The migration tools convert appropriate command line parameters to Java virtual machine (JVM) settings in the server process definition. Most settings are mapped directly. Some settings, such as memory heap sizes, are not migrated because their roles in the V5.x configuration either do not exist, have different meanings, or have different scopes.

### Cluster members

Version 4.0.x server groups are converted to Version 5.x clusters. Migration configures cluster members differently than stand-alone servers. When migrating a server group, all servers in the group are assigned to the HTTP transport port number of the server group, regardless of whether or not they each had a unique port number. Therefore, after migration, all the Application Servers in the new cluster use the same HTTP transport port. Migrated cluster members cannot run until federated into a Network Deployment cell. You can use the administrative console to assign unique port numbers, which lets you run the server without federating it.

### Default Server

The name of the default server in Version 5.x is server1. All objects previously owned by the DefaultServer of the prior version, are owned by server1 of Version 5.x after migration.

### Enterprise applications for cluster members

Migration does not deploy enterprise applications on cluster members when migrating from Version 3.5.x or Version 4.0.x. You must manually deploy these applications on the cluster using scripting or the deployment manager administrative console.

### Java database connectivity (JDBC) drivers and data sources

Version 5.x significantly redefines JDBC and data source objects. The migration tools map V3.5.x and V4.0.x data sources to Version 5.x data sources, using predecessor settings as input variables. The data source that is used is the WebSphere Application Server V4.0.x data source that uses the ConnectionManager architecture.

## Migration after federation

You cannot migrate a previous version configuration to a Version 5.x Application Server node after the node is federated into a deployment manager cell. The master copy of the configuration no longer resides on the Version 5.x Application Server node. A master configuration is on the deployment manager node.

You can perform the migration by removing the Application Server node from the cell, migrating, and refederating the node to the cell. As the node is federated, the deployment manager copies the migrated configuration into the master configuration that it maintains for the Application Server node.

### Migration of a V5.0.x node to a V5.1.x node

You can migrate a V5.0.x node that belongs to a cell without removing the node from the cell.

Migrate the deployment manager first, before migrating any base nodes in the cell.

Table 47. Migration tip

Operating platform	Tip
All platforms	Avoiding the use of a V5.0.x deployment manager after migrating to V5.1

Use the same cell name when migrating Network Deployment from V5.0.x to V5.1.x. If you use a different cell name, federated nodes cannot successfully migrate to the Network Deployment V5.1.x cell.

Migrating a base WebSphere Application Server node that is within a cell to V5.1.x also migrates the node agent to V5.1.x. A cell can have some V5.1.x nodes and other nodes that are at V5.0.x levels.

## Models, clones, and server groups

Version 3.5.x models and clones and V4.0.x server groups are redefined in V5.x as clusters. Application servers are the only objects supported as models and cluster members in V5.x. This change is a significant difference from V3.5.x, in which many objects can be models and clones. All models and clones relating to Application Servers are mapped to clusters in V5.

Special mapping occurs during the migration of all the other objects that you could previously clone. All clones are treated as simple objects and map as if they are not cluster members. Models that are not Application Server models are ignored and unmapped.

## Name bindings

Version 5.x has a new naming structure. All references, such as Enterprise JavaBeans (EJB) references that were valid in previous versions no longer work in Version 5.x. However, you can use the administrative console to add a name binding that maps an old name into the new Version 5.x naming structure. For example, the name of the Version 3.5.x or 4.0.x enterprise bean reference can be both the name of the binding and the Java Naming and Directory Interface (JNDI) name in the Version 5.x name space.

For an example, see *Migrating to WebSphere V5: An End-to-End Migration Guide*, which is available from the Redbooks Web site at <http://www.ibm.com/redbooks>.

## Node name

A Version 3.5.x and a Version 4.0.x repository can contain more than one node name and associated children. The WASPostUpgrade tool processes only those objects and children that match the node name of the migrating node. The tool identifies node names in the configuration files that it is migrating and selects any nodes names in a configuration file that match the long network name or short network name of the migrating machine.

## PageList servlet

The configuration of the PageList servlet has changed in Version 5.x. Direct use of the servlet has been deprecated. The PageList servlet is available as part of the servlet extension configuration in the Web archive (WAR) file. All references are updated to the servlet configuration supported in Version 5.

You can also use the Assembly Toolkit, which is available on the IBM WebSphere Application Server Toolkit (ASTK) CD-ROM to modify the servlet configuration.

If you use or extend the PageList servlet, you might see an error similar to the following example when running a migrated application that uses the servlet:

```
Error 500: No PageList information is configured for servlet  
EmpInfoApp.SearchByDept
```

Use the Assembly Toolkit to correct the error, by moving the usage or extension to your migrated Enterprise archive (EAR) file:

1. Start the Assembly Toolkit to load the EAR file that generates the error.
2. Open the Web modules within the EAR file.
3. Expand the Web module that generates the error.
4. Open the Web components and find the one that generates the error.
5. Expand the Servlets. The **PageList Extensions** option displays.
6. Add your extension information.
7. Save the EAR file and redeploy it.

### **Properties directory, classes directory, and the lib/app directory**

Migration copies files from prior version directories into the Version 5.1.x configuration. See the following section for more information.

#### **Property file migration from Version 3.5.x and Version 4.0.x**

V5.1 migration does migrate property files from V3.5.x and V4.0.x if these files are also present in WebSphere Application Server, V5.1. Specifically, property-file migration includes these files:

- converter.properties
- encoding.properties (If the "ko" setting is incorrect, no migration occurs.)
- sas.client.props
- TraceSettings.properties
- uddi.properties (V4.0,x only)

You must manually convert settings in other property files to the equivalent V5.1 configuration.

#### **Property file migration from Version 5.0.x to Version 5.1.x**

WebSphere Application Server V5.1 migrates all the property files that are installed with V5.0.x by merging settings into the V5.1.x property files with these exceptions:

- j2c.properties
- samples.properties

Migration does not overlay property files.

### **Samples**

No migration of Samples from previous versions is available. Equivalent Version 5.x Samples are available to use.

### **Security**

Java 2 Security is enabled by default in Version 5.x. Security enablement might cause some applications to run on Version 4.0 and not run on Version 5.x. Several techniques are available that you can use to define different levels of Java 2 Security in Version 5.x. One is to create a was.policy file as part of the application, to enable all security permissions. The migration tools call the **wsadmin** command to add an existing was.policy file in the Version 5.x properties directory to enterprise applications as they migrate. The migration tools perform this task while moving Version 4.0 applications into Version 5.

Global security that uses Lightweight Third Party Authentication (LTPA) in Versions 3.5.x and 4.0.x is migrated to the base WebSphere Application Server product and to the Network Deployment product. However, although global security was enabled in Versions 3.5.x and 4.0.x, it is disabled during migration to Version 5.x.

If you add this node later to an IBM WebSphere Application Server Network Deployment, Version 5.x configuration, you can enable and use the LTPA configuration. Use the administrative console to generate keys for the migrated LTPA mechanism. After generating the keys, you can enable global security.

The Global security feature that uses *localos* authentication mechanisms in Versions 3.5.x and 4.0.x is migrated to the Network Deployment product. However, although global security was enabled in Versions 3.5.x and 4.0.x, it is disabled during migration to Version 5.x. The Network Deployment product does not support the authentication mechanism known as SWAM. Migration sets the authentication mechanism in Version 5.x to LTPA. Use the administrative console to generate keys for the migrated LTPA. After generating the keys, you can enable global security.

Version 4.0.x introduced properties to support tuning the JNDI search timeout value along with LDAP reuse connection. These two properties are now settings in the Security Center of the Version 5.x administrative console. Version 4.0.x property values are not migrated to Version 5.x settings.

- The `jndi.LDAP.SearchControl.TimeLimit` property is equivalent to the Version 5.x Search Timeout setting, which is 300 by default in Version 5.
- The `jndi.LDAP.URLContextImplementation` property is equivalent to the Version 5.x Reuse Connection setting, which is true by default in Version 5.

Use the Version 5.x administrative console to change these settings to match your Version 4 property values, if necessary.

### **Servlet package name changes**

The package that contains the `DefaultErrorReporter`, `SimpleFileServlet`, and `InvokerServlet` servlets has changed for Version 5.x. In Versions 3.5.x and 4.0.x, the servlets are in the `com.ibm.servlet.engine.webapp` class. In Version 5, the servlets are in the `com.ibm.ws.webcontainer.servlet` class.

### **Stdin, stdout, stderr, passivation, and working directories**

The location for these directories is typically within the installation directory of a previous version. The default location for `stdin`, `stdout`, and `stderr` is the `logs` directory of the Version 5.x installation root. The migration tools attempt to migrate existing passivation and working directories. Otherwise, appropriate Version 5.x defaults are used.

Using common directories between versions in a coexistence scenario can cause problems.

### **Transport ports**

The migration tools migrate all ports. The tools warn about port conflicts in a log when a port already exists. You must resolve port conflicts before running the servers that are in conflict, at the same time.

The default transport type of the servlet engine in Version 3.5.x is Open servlet engine (OSE). Because Version 5.x no longer supports OSE transport, the migration tools map these transports to HTTP transports, using the same port assignments.

You must manually add `VirtualHost` alias entries for each port.

### **Web modules**

The specification level of the Java 2 Platform, Enterprise Edition (J2EE) that Version 5.x implements requires behavior changes in the Web container for setting the content type. If a default servlet writer does not set the content type, not only does the Version 5.x Web container no longer default to it, the Web container returns the call as "null". This situation might cause some browsers to display resulting Web container tags incorrectly. Migration sets the `autoResponseEncoding` IBM extension to true for Web modules as it migrates enterprise applications. This action prevents the problem.



## Version 3.5.x to Version 5.x migration

The migration tools assist in the transition from Version 3.5.x to Version 5, by migrating system configurations and creating J2EE artifacts, including J2EE security roles mapping. The migration tools create initial J2EE enterprise applications based on Version 3.5.x configurations. However, because of the significant change in application structures, plan to carefully test and fine tune migrated applications, using development and deployment tools, to determine exactly how the applications function in Version 5.x.

Analyze the `WASPostUpgrade.log` file for detailed information about migrated enterprise beans. The J2EE programming model specifies an architecture for how applications are created and deployed. Because applications in Version 3.5.x do not have the same architecture, the `WASPostUpgrade` tool recreates applications. It creates all migrated Web resources and enterprise beans in J2EE applications. It maps all enterprise applications from the Version 3.5.x installation into J2EE applications with the same name, deployed in the same server.

The `WASPostUpgrade` tool maps Web resources and enterprise beans that are not included in an enterprise application, into a default J2EE application that includes the name of the server. The tool maps Web applications to J2EE WAR files. The tool deploys enterprise beans as EJB 1.1 beans in J2EE JAR files. The tool combines resources in a J2EE EAR file and deploys it in the Version 5.x configuration. Some differences exist between the EJB 1.0 and EJB 1.1 specifications, but in most cases, EJB 1.0 beans can run successfully as EJB 1.1 beans.

### Mapping details for V3.5.x to Version 5.x migration

- **data sources.xml**

You can use a Version 3.5.x `data sources.xml` file to augment data source configuration settings. Version 3.5.x stores the file in the `properties` directory. The migration tools migrate an existing `data sources.xml` file by merging properties in the file into the data source and JDBC driver configuration.

- **Enterprise applications**

The Version 3.5.x enterprise application entries are optional. The entries group sets of objects together for security definitions. The enterprise bean and Web application portions of the enterprise application point to their respective entries in other portions of the XML file. Processing each enterprise application creates a J2EE application with the same name. The enterprise bean and Web application entries become pointers to the definitions of enterprise beans and Web applications. Entry details help build a J2EE application.

For enterprise bean files, the JAR file definition helps locate the JAR files to redeploy and add to the J2EE application. Document root entries in the Web application help locate the resources used within the Web application, such as HTML pages and JSP pages, which become part of the WAR file within the J2EE application. Class path entries in the Web application help locate servlets and JAR files, which become part of the WAR file within the J2EE application. Version 3.5.x migration to V5.x creates J2EE 1.2 compatible enterprise applications that contain EJB 1.1, Servlet 2.2, and JSP 1.1 level modules. This migration provides the most straight forward compatibility and enables interoperability with previous WebSphere Application Server versions.

- **Enterprise beans**

Version 3.x supports only the EJB 1.0 Components Specification level. Version 5.x supports EJB 1.1 and 2.0 components. However, many EJB 1.0 beans can successfully deploy as EJB 1.1 beans. The migration tools redeploy enterprise beans automatically as part of the application migration phase. Check the `WASPostUpgrade.log` file for deployment details of these enterprise beans. Make any necessary changes and redeploy.

No redeployment is required when moving EJB 1.1 JAR files from Version 4.

Specify only one backend data store vendor per JAR file. If enterprise beans use different backend data stores, package them into separate JAR files.

- **J2EE security**

The security authorization model in Version 3.5.x is based on the notion of enterprise application and method groups. The cross product of the enterprise application and the method groups is a WebSphere Application Server permission. The J2EE specification includes an authorization model based on roles.

To convert from the WebSphere Application Server permission model in Version 3.5.x to the role-based authorization model in Version 5, the migration tools create a one-to-one mapping from a WebSphere Application Server permission to a new role under that application. Therefore, for each enterprise application and each method group in Version 3.5.x, the migration tools create a role in Version 5, contained in the J2EE application deployment descriptor. The authorized subjects for each role are contained in an authorization table found in the J2EE application binding.

The J2EE specification includes an authorization model based on roles. WebSphere Application Server interprets the role to mean a set of permissions to access a resource. In the case of an enterprise bean method invocation, the permission to access the method on a particular bean is specified by a method permission. This method permission is associated with one or more roles in the deployment descriptor of the bean JAR file.

In the case of accessing Web resources, the permission to access a Web URI and invoke an HTTP method on that URI is specified in terms of Web resource collections and security constraints in the J2EE specification. The deployment descriptor in the WAR file of the Web application contains the security constraints and Web resource collections.

- **JSP levels**

Version 5.x runs JSP 1.0 and 1.1 objects as JSP 1.2 objects, which is the only supported level.

- **Servlet redirector**

Version 5.x does not support the servlet redirector from previous versions. The migration tools ignore these objects.

- **Servlet package name changes when migrating from V3.5.x to V5.x**

If the Version 3.5.x configuration defines the SimpleFileServlet servlet, this servlet is not migrated. The migration tools set the FileServingEnabled attribute in the `ibm-web-ext.xml` Web module file to `true`.

If the Version 3.5 configuration defines the InvokerServlet servlet, the servlet is not migrated. The migration tools set the ServeServletsByClassnameEnabled attribute in the `ibm-web-ext.xml` Web module file to `true`.

If the Version 3.5.x configuration defines the DefaultErrorReporter servlet, the servlet is migrated into the `web.xml` Web module file. Migration uses the new package to set the class name.

- **Transports**

The default transport type of the servlet engine in Version 3.5.x is Open servlet engine (OSE). Because Version 5.x no longer supports OSE transport, the migration tools map these transports to HTTP transports, using the same port assignments. You must manually add VirtualHost alias entries for each port.

- **Integration of generated EAR files into WebSphere Studio Application for Developers**

You can import the enterprise applications that are generated during this migration into WebSphere Application Server for Developers and use them as a skeleton when developing a J2EE enterprise application for Version 5.x. Although the generated enterprise application might be complete, it might also contain too many files or an insufficient number of files. It is highly recommended that you complete these enterprise applications using a full development cycle.

## **Version 4.0.x to Version 5.x migration**

This migration is much less complicated than moving from V3.5.x to V5.x. The V4.0.x configuration is already at the J2EE 1.2 specification level. Although Version 5.x is at the J2EE 1.3 specification level, J2EE 1.2 objects are supported.

- **Enterprise beans**

No redeployment is required when moving EJB 1.1 JAR files from Version 4.0.

Specify only one backend data store vendor per JAR file. If enterprise beans use different backend data stores, package them into separate JAR files.

- **JMS Resources**

All JMS resources from Version 4.0 are mapped into generic JMS resources in the Version 5.x configuration. Reconfigure JMS resources that use IBM WebSphere MQ as IBM WebSphere MQ-specific resources. MQ JMS resources have better integration with system management. You do not need to manually define entries in the name space. You can see the backing MQ queue definitions through MQ JMS entries.

- **JSP precompiling**

In Version 4.0.x, the classes generated from JSP pages are in a package based on the directory structure of the WAR file. Any JSP at the top of the context root is in the unnamed package. JSP pages in subdirectories of the root are in packages named after the subdirectories. In Version 5, the classes generated from JSP pages are all in the `org.apache.jsp` package. Therefore, the class files are not compatible between versions.

When migrating an enterprise application from Version 4.0.x to Version 5, recompile the JSP pages to regenerate the class files into the correct packages.

The migration tools provide this support, by using the `-preCompileJSPs` option of the **wsadmin** tool during the installation of the application.

Use the same option to install any Version 4.0.x enterprise applications that you manually move to Version 5.x.

- **J2EE security**

You can apply security in two Version 4.0.x locations to enterprise applications. Information in the repository has precedence over information in the enterprise application bindings. The migration tools migrate information in the repository to the enterprise application.

- **Secure Sockets Layer (SSL) migration**

The following SSLConfig attributes that point to user-defined key files are migrated from WebSphere Application Server Advanced Edition, Version 4.0.x to V5.x as follows:

**V4.0.x settings**

```
<key_file_name>dir_name/WASLDAPKeyring.jks</key_file_name>  
<trust_file_name>dir_name/WASLDAPKeyring.jks</trust_file_name>
```

The `dir_name` variable identifies the original location of the WASLDAPKeyring.jks file.

**V5.x settings**

```
keyFileName="dir_name/WASLDAPKeyring.jks"  
trustFileName="dir_name/WASLDAPKeyring.jks"
```

The `dir_name` variable identifies the original location of the WASLDAPKeyring.jks file.

**V4.0.x settings**

```
<key_file_name>${WAS_HOME}/keys/WASLDAPKeyring.jks</key_file_name>  
<trust_file_name>${WAS_HOME}/keys/WASLDAPKeyring.jks</trust_file_name>
```

**V5.x settings**

```
keyFileName="${USER_INSTALL_ROOT}/keys/WASLDAPKeyring.jks"  
trustFileName="${USER_INSTALL_ROOT}/keys/WASLDAPKeyring.jks"
```

The migration tools do not copy the key files (for example, `.jks`, or `.kdb`) to the corresponding directory in the base WebSphere Application Server product or the Network Deployment product. You must complete the migration of the SSL configuration by copying qualifying key store files to Version 5.x directories.

If the `key-file-name` and `trust-file-name` attributes point to the `DummyServerKeyFile.jks` file in the WebSphere Application Server Advanced Edition V4.0.x configuration, the `key-file-name` and `trust-file-name` attributes are not migrated to V5.x. Instead the V5.x default value of `${USER_INSTALL_ROOT}/etc/DummyServerKeyFile.jks` is left unchanged.

- **Servlet package name changes when migrating from Version 4.0 to Version 5.x**

If the `web.xml` Web module file for Version 4.0 defines the `SimpleFileServlet` servlet, the migration tools update the class name to reflect the Version 5.x package. The tools also set the `FileServing Enabled` attribute to `true`.

If the `web.xml` file defines the `InvokerServlet` servlet, the migration tools update the class name to reflect the Version 5.x package. The tools also set the `ServeServletsByClassnameEnabled` attribute to `true`.

If the `web.xml` file defines the `DefaultErrorReporter` servlet, the migration tools update the class name to reflect the Version 5.x package.

### Version 5.0.x to Version 5.1 migration

Migrating V5.0.x to V5.1 is much less complicated than migrating from V4.0.x or V3.5.x. Both sides of the migration use the same underlying definitions. The task involves mapping configuration files from the V5.0.x to the V5.1 configuration and copying installed applications into the new product. The migration tools support the migration of federated nodes and support the full migration of a Network Deployment node.

#### Java heap size for migrating EAR files

When migrating all 5.0.x EAR files to V5.1 using the `wsadmin` tool, the `WASPostUpgrade` tool uses the default maximum Java heap size value of 64MB to install the EAR files.

If a V5.0.x EAR file fails to install during migration because the Java heap size is not large enough, you see a message similar to the following error:

```
java.lang.OutOfMemoryError JVMXE006:OutOfMemoryError
```

Increase the maximum Java heap size. Then use the following information to manually install the EAR file. Assume that the new maximum heap size is represented by number signs (`###`) in the following example. If the `install_app_name.jacl` file is in the `$WAS50_backup` directory created by migration, run the following command from the `bin` directory of the V5.1 WebSphere Application Server. (The command appears on more than one line for clarity.)

```
wsadmin -conntype NONE
        -javaoption
        -Xmx###m
        -f $WAS50_backup/install_app_name.jacl
```

If the `install_app_name.jacl` file does not exist in the `$WAS50_backup` directory created by migration, run the following command from the `install_root/bin` directory of the Version 5.1 base WebSphere Application Server product or the Network Deployment product.

### Installing the application on WebSphere Application Server, Version 5.1

Assume that:

#### Installation root

`C:\WebSphere\AppServer`

#### Number signs (`###`)

Maximum heap size value

#### *EAR\_file\_name*

The name of the EAR file

#### *app\_name*

The name of the application.

#### *server\_name*

The name of the server on which the EAR file installs

#### *node\_name*

The name of the node on which the server is configured

The command appears on more than one line for clarity.

```
wsadmin -conntype NONE
        -javaoption
        -Xmx###m
        -c "$AdminApp install
           C:\WebSphere\AppServer\installableApps\
           EAR_file_name
```

```
{-nodeployejb
-appname app_name
-server server_name
-node node_name}"
```

## Installing the application on WebSphere Application Server Network Deployment, Version 5.1

Assume that:

### Installation root

C:\WebSphere\DeploymentManager

### Number signs (###)

Maximum heap size value

*EAR\_file\_name*

The name of the EAR file

*app\_name*

The name of the application.

*cluster\_name*

The name of the cluster on which the EAR file should be installed

The command appears on more than one line for clarity.

```
wsadmin -conntype NONE
-javaoption
-Xmx###m
-c "$AdminApp install
  C:\WebSphere\DeploymentManager\installableApps\
  EAR_file_name>
{-nodeployejb
-appname app_name
-cluster cluster_name}"
```

### No migration of configuration instances from V5.0.x to V5.1

The migration tools do not support the migration of configuration instances from V5.0.x to V5.1

## Migrating configuration data

You can migrate administrative configurations with the Installation wizard or with the migration tools, as this task describes. If you decide to use the migration tools, do not select the Migration check box on the Migration panel of the Installation wizard.

If you use an earlier version of WebSphere Application Server, the system administrator might have fine-tuned various application and server settings for your environment. It is important to have a strategy for migrating these settings with maximum efficiency and minimal loss.

You can perform incremental migration of V3.5.x or V4.0.x nodes by calling the migration tools multiple times, each time specifying a different configuration file. Various reasons exist for having multiple configuration files. Whatever the reason, migrating one configuration file at a time lets you test applications incrementally before continuing to the next configuration file.

Before using the migration tools, consult the V5.1 Release Notes document to understand what fixes you must apply to earlier versions. Applying fixes to an earlier version might also apply fixes to files that have a role in the migration. Apply any fixes to ensure the most effective migration of configurations and applications possible.

The migration tools in V5.1 support migration from all supported versions of WebSphere Application Server, including V5.0.x.

IBM provides a set of migration tools for migrating administrative configurations from V3.5.x, V4.x, or V5.0.x to the base product, Network Deployment, or WebSphere Business Integration Server Foundation product.

The overall migration process when you issue the commands to use the migration tools instead of letting the installation program issue the commands is:

1. Save the current configuration and necessary files with the WASPreUpgrade migration tool.
2. Install the Version V5.1 product without selecting the automated migration option.
3. Restore the configuration from the earlier release with the WASPostUpgrade migration tool.

WASPostUpgrade uses the **backupConfig** command to save the existing V5.1 configuration before performing migration. The results are stored in the *install\_root/temp* directory. You can use the **restoreConfig** command to restore the backup, if required.

1. Migrate Enterprise Edition, Version 4.1 or Enterprise, Version 5.0.x to WebSphere Business Integration Server Foundation. Use this procedure if you are migrating from Enterprise Edition V4.1 or Enterprise V5.0.x to WebSphere Business Integration Server Foundation, V5.1.
2. Migrate to WebSphere Business Integration Server Foundation on the Network Deployment product. Select one of the following migration scenarios for information about how to migrate configuration data to a V5.1 Integration Server that extends a Network Deployment node:
  - Migrate V3.5.x and V.4.0.x to Integration Server V5.1 on a deployment manager node.
  - Migrate V5.0.x of Enterprise to Integration Server V5.1 on a deployment manager node.
3. Start the deployment manager before migrating base nodes that are federated.
 

Start the V5.1 deployment manager. During migration, the V5.1 deployment manager must be running for the migration tools to:

  - Update the configuration for each federated node
  - Request full synchronization

If the V5.1 deployment manager is not running, failures can occur.

Table 48. Migration tip

Operating platform	Tip
All platforms	Recovering from configuration errors when the deployment manager was not running during migration.

#### 4. Migrate base WebSphere Application Server nodes. **Guidelines for migrating federated nodes**

Rule	Description
A federated node has no control over its feature configuration.	The deployment manager owns the configuration of all federated nodes, including the configuration of features on those nodes. When migrating a federated node, the configuration on the base node is owned by the deployment manager and cannot be changed.
Unfederate a node to let the node own its configuration, if you must add features to the node.	It is always true that you must unfederate a node before adding features. You then add the node back to the cell to cause the deployment manager to add the changed configuration of the base node.
Install the V5.1 node with features that make it appear to be a clone of the node that you are migrating.	When migrating, select the same features for the new node that are in the existing node. Adding or changing features can cause configuration problems in a federated node. The most trouble-free path is to select the same features.
It is possible to migrate from one machine to another.	One of the tasks introduced in this topic describes how to migrate a federated node to V5.1 on a different machine.



If you are migrating a federated node, select the same type of installation that you chose when you installed the earlier release. If you selected a full installation type, select a full installation type now. If you selected a custom installation type, select a custom installation type now and select the same features that you did for the V5.0.x release. Federated nodes have configurations that are controlled by the deployment manager that controls the cell.

Migrating a federated node installs the same features for the V5.1 node that are in the configuration for the V5.0.x node.

If the Enterprise node that you are migrating is part of a deployment manager cell, migrate V5.0.x Enterprise to Integration Server V5.1 on the deployment manager node first, before continuing this procedure. The deployment manager node must always be at the highest release level within the cell. Select one of the following migration scenarios for information about how to migrate configuration data to base WebSphere Application Server nodes:

- Migrating Version 3.5.x or Version 4.0.x of WebSphere Application Server to Integration Server
  - Migrating Version 3.5.x or Version 4.0.x of WebSphere Application Server to a remote Integration Server machine
  - Migrate Version 5.0.x of WebSphere Application Server to Version 5.1.
  - Migrate Version 5.0.x of WebSphere Application Server to a remote Version 5.1 machine.
  - Migrate from an operating system that is no longer supported.
  - Add or change features on a federated node while performing a manual reconfiguration. Use this procedure to add or change features.
5. After migrating each base node, start each node. Use the `startNode.sh` or `startNode.bat` script from the `install_root/bin` directory of each base Application Server to start the nodeagent process:

```
startNode.sh
```

Occasionally, for example after rebooting an Application Server machine, you must restart the node agent server on the Application Server node, by running the `startNode.sh` or `startNode.bat` script. To keep your Application Server nodes running without accessing the `bin` directory of each one, use the operating system to monitor and restart the nodeagent process on each Application Server node. (You can also set up the dmgr server as a managed process on the deployment manager node.) Adding a node automatically issues the `startNode.sh` or `startNode.bat` script for the node.

6. Configure the Application Server after migration. Configuring the Application Server after migration is a way of verifying the results of the migration tools. You can also use Configuration mapping during migration to verify the results of the migration. The topic has a detailed description of how the migration tools migrate objects, and what you should verify.

You can use the migration tools to migrate from one version of WebSphere Application Server to another.

Return to Migrating and coexisting to continue.

## **Migrating to WebSphere Business Integration Server Foundation**

This topic describes migrating IBM WebSphere Application Server Enterprise Edition, Version 4.x or IBM WebSphere Application Server Enterprise, Version 5.0.x to WebSphere Business Integration Server Foundation, Version 5.1.

As the WebSphere Application Server Installation wizard migrates applications to Version 5.1, it also migrates any applications that use IBM WebSphere Application Server Enterprise Edition, Version 4.x or IBM WebSphere Application Server Enterprise, Version 5.0.x. If you install and migrate the WebSphere Application Server base product before installing WebSphere Business Integration Server Foundation, the base migration removes the parts of your configuration from the server configuration that are dependent upon Integration Server services.

The migration process of the base product issues warnings that describe the parts of your configuration that are disabled. It records these warnings in a log file. Disabled services are unavailable to Version 5.1 applications until you install and migrate to WebSphere Business Integration Server Foundation, which restores the disabled classes.

There are several scenarios for migrating Enterprise to WebSphere Business Integration Server Foundation:

- The base product was previously installed and migrated before installing WebSphere Business Integration Server Foundation. Select the WebSphere Business Integration Server Foundation migration option to re-enable the disabled classes.
- The base product was previously installed but not migrated. Select the WebSphere Business Integration Server Foundation product migration option to migrate the base product.
- The base product and the Network Deployment product were installed but not migrated. Select the WebSphere Business Integration Server Foundation product migration option to migrate the base product when you install WebSphere Business Integration Server Foundation for the base product. Select the WebSphere Business Integration Server Foundation product migration option to migrate the Network Deployment product when you install WebSphere Business Integration Server Foundation for the Network Deployment product.
- The base product and the Network Deployment product were installed and both were migrated. Select the WebSphere Business Integration Server Foundation product migration option to re-enable the disabled classes when you install WebSphere Business Integration Server Foundation for the base product.
- The base product is at the V5.0.2 level and has the V5.0.2 Enterprise product installed:
  1. Stop all V5.0.2 processes related to the base WebSphere Application Server product.
  2. Install the V5.1 base product and do not select the migration option or the coexistence option.
  3. Install the WebSphere Business Integration Server Foundation product and select the migration option.
- The Network Deployment product is at the V5.0.2 level and has the V5.0.2 Enterprise product installed:
  1. Stop all V5.0.2 processes related to the Network Deployment V5.0.2 product.
  2. Install the V5.1 Network Deployment product and do not select the migration option or the coexistence option.
  3. Install the WebSphere Business Integration Server Foundation product and select the migration option.

Use the following procedure to migrate both products.

1. Install and migrate the WebSphere Business Integration Server Foundation product. The Installation wizard lets you install Integration Server and the required base product at the same time, in an umbrella installation. If V5.1 products exist, the Installation wizard prompts you to install Integration Server to extend one of the existing products. If you extend the base product, the Installation wizard automatically installs base features that it requires.

The Installation wizard for Integration Server prompts you to migrate a previous version of a WebSphere Application Server product, if one exists.

An error can occur during migration when installing the Integration Server product on a Network Deployment node after adding base Application Server nodes. A Migration messages panel displays at the end of the installation with messages similar to the following example:

```
MIGR0122E: Unable to read configuration file
/opt/WebSphere/DeploymentManager/config/cells/ws-sunfish2Network/nodes/.
  at com.ibm.websphere.migration.postupgrade.TransformBaseConfiguration.
    resolveDirectory(TransformBaseConfiguration.java:690)
  at com.ibm.websphere.migration.postupgrade.TransformBaseConfiguration.
    initializeDataModel(TransformBaseConfiguration.java:587)
  at com.ibm.websphere.migration.postupgrade.TransformBaseConfiguration.
    doIt(TransformBaseConfiguration.java:1145)
  at com.ibm.websphere.migration.postupgrade.Restore.doIt(Restore.java:153)
  at com.ibm.websphere.migration.postupgrade.Restore.<init>(Restore.java:93)
  at com.ibm.websphere.migration.postupgrade.WASPostUpgrade.
    restore(WASPostUpgrade.java:196)
```

```

at com.ibm.websphere.migration.postupgrade.WASPostUpgrade.
    main(WASPostUpgrade.java:665)
at java.lang.reflect.Method.invoke(Native Method)
at com.ibm.ws.bootstrap.WSLauncher.main(WSLauncher.java:94)
com.ibm.websphere.migration.exceptions.WASUpgradeInvalidConfigurationException:
MIGR0122E: Unable to read configuration file
/opt/WebSphere/DeploymentManager/config/cells/ ws-sunfish2Network/nodes/.

```

The workaround is to invoke the WASPostUpgrade migration tool after installation has completed. Use the `-nodeName` parameter to specify the deployment manager node on the WASPostUpgrade command.

You might have already installed and migrated the base WebSphere Application Server product before installing the Integration Server product. If so, installing and migrating the Integration Server product synchronizes both versions and completes the migration of any applications that used Enterprise Edition, Version 4.x or Enterprise, V5.0.2.

You can also install the Integration Server product silently, and migrate an earlier version configuration silently. You must supply values for silent migration options when you customize the option response files for installing Integration Server on either the base product or the Network Deployment product.

2. Manually register CORBA C++ SDK (deprecated) servers in the implementation repository for Version 5.1. No automatic registration of registered Version 4.x servers **or Version 5.1 servers** occurs.

CORBA C++ SDK servers are registered in the implementation repository of Enterprise Edition, Version 4.x or Enterprise, V5.0.2. You must manually register them in the implementation repository of Integration Server to migrate them.

The CORBA C++ SDK is a deprecated function. For more information about CORBA deprecation, see `corba/tasks/tcor_epdevelop.dita`.

3. Perform the installation verification test (IVT).

Return to Migrating from, or coexisting with, another version of WebSphere Application Server to continue.

## Migrating V3.5.x and V.4.0.x to Integration Server V5.1

You can migrate Version 3.5.x or Version 4.0.x of WebSphere Application Server to WebSphere Business Integration Server Foundation, V5.1 by migrating to the base WebSphere Application Server V5.1 product and migrating to the Network Deployment product. After migrating, install the WebSphere Business Integration Server Foundation on all nodes.

Migrating WebSphere Application Server Advanced Edition to WebSphere Business Integration Server Foundation V5.1 requires migrating all the nodes in the collection to WebSphere Application Server V5.1. When migrating a model or server group from an earlier version to a Version 5.1 cluster, migrate the model or server group node to a Version 5.1 base WebSphere Application Server node. After migration, install the Integration Server product. This base node migration converts any Enterprise Edition V4 applications that are on the previous version node. Migrated applications are in the `installableapps` folder in the installation root directory of the base WebSphere Application Server node.

Install Network Deployment V5.1 and select the migration option. Follow the instructions in this task to migrate the model or server group configuration to the deployment manager. Migration creates the appropriate number of Version 5.1 clusters. To install a migrated application on a cluster, copy the Enterprise archive (EAR) file from the `installableApps` folder of the base Version 5.1 WebSphere Application Server node. After migrating to Network Deployment, install WebSphere Business Integration Server Foundation V5.1.

The configuration of the earlier version contains one or more node configurations, one for each node in the repository. You have a choice of where to install the Network Deployment product. You can install it either:

- On one of the nodes where you are installing and migrating applications to WebSphere Application Server.

This choice maps the single domain with multiple nodes to a single Version 5.1 cell with the same number of nodes. Network Deployment is on one of the nodes. This placement provides a configuration that is equivalent to the previously installed version.

- On an additional machine that does not have WebSphere Application Server.

This choice maps the single domain with multiple nodes to a single Version 5 cell with the same number of nodes, but with Network Deployment on an additional node.

You can vary the order in which you migrate these nodes. This task describes the most direct method.

After federating an Application Server node into a deployment manager cell, you cannot use the WASPostUpgrade migration tool on the Application Server node. To use the tool again, remove the node from the cell, use the tool, and add the node to the cell again. You can, however, use the migration tool on a Network Deployment node after base Application Server nodes have been added. Use the `-nodeName` parameter on the **WASPostUpgrade** command to specify the Deployment Manager node.

You can also perform a silent migration to Network Deployment during a silent installation.

1. Install the base V5.1 product on each base node. See the information center for the base product to learn how to install the product. Select the migration option during the installation to migrate the applications and configuration from the previous version. The migration does not migrate some applications, such as the administrative console application because an administrative console application already exists in the V5.1 product. You must migrate each node that you intend to add to the Network Deployment configuration.
2. Install WebSphere Business Integration Server Foundation on each base node. Perform a typical or custom Integration Server installation on each node in the repository.
3. Install the V5.1 Network Deployment product.
  - When installing Network Deployment on a WebSphere Application Server node that you migrated:
    - If the previous version is still installed and running, select the migration option when you install.
    - If the previous version is no longer installed, perform a manual migration against the WASPreUpgrade backup directory on the node, or against the directory from another migrated node. Issue the **WASPostUpgrade backupDirectory** command from the `install_root/bin` directory.
  - When installing Network Deployment on a machine that did not have an earlier version of the WebSphere Application Server, perform a manual migration against the WASPreUpgrade backup directory on another node that you migrated from the previous domain. Use the **WASPostUpgrade backupDirectory** command from the `install_root/bin` directory after installing Network Deployment.
4. Install the V5.1 WebSphere Business Integration Server Foundation product on the Network Deployment node.

You can also install the Network Deployment product and then install the Integration Server product silently. Customize the option response file to install WebSphere Business Integration Server Foundation silently. Do not select the migration options.

5. Start the deployment manager on the Network Deployment node. On the system that has Network Deployment installed, start the deployment manager in either of these ways:
  - Click **Programs > WebSphere Application Server > Deployment Manager** from the Start menu on a Windows platform.
  - Issue the **startManager** command from the `install_root/bin` directory.
6. Use the **addNode** command from the `install_root/bin` directory of each WebSphere Application Server node to add each node to the deployment manager cell. The following procedure supports adding migrated nodes to a deployment manager cell, whether the nodes are cloned, stand-alone, or a combination of the two.
  - a. Use the **addNode** command from the `install_root/bin` directory of each base node to add the node to the Network Deployment cell. For example, use the following command on a Linux platform to add a base node to the deployment manager running on the testhost node:

```
addNode.sh testhost 8879 -includeapps
```

- b. Install any clustered applications on the appropriate cluster, using either the administrative console of the deployment manager node, or using the **wsadmin** command. Use the EAR file that the migration tools create when migrating the earlier version to the Version 5.1 base WebSphere Application Server. You can find the EAR file in the *install\_root/installableApps* directory that is in the base product.

The deployment manager automatically propagates enterprise applications to Application Server nodes in the cluster.

After federating an Application Server node into the Network Deployment cell, the configuration repository for the cell contains the master copy of the node configuration. The deployment manager maintains the permanent configuration for the node. Changes that you make with the administrative console of the deployment manager directly update the configuration files stored on the deployment manager node.

7. Use the First Steps application to perform the installation verification test (IVT).

Occasionally, for example after rebooting an Application Server machine, you must restart the nodeagent server on the Application Server node, by running the **startNode** command from the *install\_root/bin* directory of the Application Server. To keep your Application Server nodes running, without having to access the *bin* directory of each one, use the operating system to monitor and restart the nodeagent process on each Application Server node. (You can also set up the dmgr server as a managed process on the deployment manager node.) Adding a node automatically issues the **startNode** command for the node.

Return to Migrating configuration data to continue.

## Migrating Enterprise V5.0.x on a deployment manager node to Integration Server V5.1 on a deployment manager node

The migration tools of WebSphere Business Integration Server Foundation, Version 5.1 support migrating the configuration of WebSphere Application Server Enterprise, Version 5.0.x on a deployment manager node to Integration Server, Version 5.1 on a deployment manager node.

This topic describes migrating V5.0.x Enterprise that extends a V5.0.x Network Deployment node to V5.1 Integration Server that is extending a V5.1 Network Deployment node.

Migrate the deployment manager node before migrating the base nodes that comprise the cell. The deployment manager node must always be at the highest release and fix level within a cell, to allow it to manage all nodes in the cell. Nodes in the cell can be at any V5.x level.

Use the following procedure to migrate the deployment manager node.

1. Stop the V5.0.x deployment manager. Use the **stopManager** command from the *install\_root/bin* directory. For example, use the following command on a Linux platform:

```
stopManager.sh
```

If you have security enabled, specify the **-user** and **-password** parameters of the command.

You can migrate a V5.0.x node without stopping it. But it is not necessary to have the node running to migrate its configuration. The migration tools can retrieve all the configuration data while the node is stopped. And you must stop the node before you can start the V5.1 node that you are installing. So, you can stop the node now.

Table 49. Migration tip

Operating platform	Tip
All platforms	Avoiding the use of a V5.0.x deployment manager after migrating to V5.1

2. Use the migration tools to migrate the V5.0.x configuration to V5.1. The steps vary depending on whether you are migrating a V5.0.0 or V5.0.1 node with the embedded messaging client installed.



- Migrate V5.0.0 or V5.0.1 of Enterprise with embedded messaging to V5.1 Integration Server on a deployment manager node. Use this procedure if you have V5.0.0 or V5.0.1 with the embedded messaging feature installed.
- Perform the following steps if you have V5.0.0 or V5.0.1 without the embedded messaging feature installed, or if you have V5.0.2 with or without the embedded messaging client installed:
  - a. Install Version 5.1 of the Network Deployment product. Do not select the migration option.
  - b. Install WebSphere Business Integration Server Foundation, Version 5.1 on the deployment manager node. Select the migration option when it appears. If the migration option does not appear, cancel the installation.

In some cases, such as when installing a non-English version, the installation wizard might not detect a previous version. You can force the migration panel to appear, by starting the installation with an option on the **install** command.

For example, on Linux and UNIX-based platforms, use this command from the CD-ROM mount point:

```
./install -W PME_PreviousVersionPanel.migrationSelected="true"
```

- c. Verify the installation of the V5.1 Integration Server. Use the First Steps tool when it appears at the end of installing the product, or run the installation verification test yourself, if the First Steps tool does not appear for some reason.
- d. Optional: Uninstall the V5.0.x deployment manager. Do not uninstall the V5.1 node.  
Perform this step only after you are certain that you have successfully migrated the configuration of the node you intend to delete.

The migration tools do not migrate V5.0.0 or V5.0.1 Samples to the V5.1 Network Deployment node. A synchronization removes the Samples from the V5.0.0 or V5.0.1 base nodes.

The migration tools do migrate V5.0.2 Samples to the V5.1 Network Deployment node, to support cell members at the V5.0.2 level. If the migration did not migrate the V5.0.2 Samples, a synchronization would remove the Samples from the V5.0.2 nodes. After migrating all federated nodes to V5.1, the V5.0.2 Samples remain in the configuration. You can remove the V5.0.2 Samples at that time or replace them with the V5.1 samples.

Return to Migrating configuration data to continue.

### ***Migrating V5.0.0 or V5.0.1 Enterprise with embedded messaging to V5.1 Integration Server on Network Deployment:***

The migration tools of WebSphere Business Integration Server Foundation, Version 5.1 support migrating WebSphere Application Server Enterprise, Version 5.0.0 or Version 5.0.1 on Network Deployment, Version 5.0.0 or Version 5.0.1 with embedded messaging to Version 5.1.

This topic describes migrating Enterprise on WebSphere Application Server Network Deployment, Version 5.0.0 or Version 5.0.1 with the embedded messaging client feature installed, to Version 5.1. If you are migrating a V5.0.0 or V5.0.1 deployment manager without the embedded messaging client, or if you are migrating a V5.0.2 deployment manager, see “Migrating Enterprise V5.0.x on a deployment manager node to Integration Server V5.1 on a deployment manager node” on page 375.

The embedded messaging feature places certain restrictions on migrating V5.0.0 or V5.0.1 nodes to V5.1. If embedded messaging is not involved, you can migrate any level of V5.0.x to a V5.1 during the installation of the V5.1 Integration Server that extends the V5.1 Network Deployment product. If the embedded messaging client is installed on the V5.0.0 or V5.0.1 deployment manager node, you must first either upgrade the node to V5.0.2, or use this task to perform the manual migration procedure for V5.0.0 or V5.0.1 Enterprise on deployment manager nodes with the embedded messaging client.

1. Stop the V5.0.0 or V5.0.1 deployment manager. Use the **stopManager** command from the `install_root/bin` directory. For example, use the following command on a Linux platform:



stopManager.sh

If you have security enabled, specify the -user and -password parameters of the command.

You can migrate a V5.0.0 or V5.0.1 node without stopping it. But it is not necessary to have the node running to migrate its configuration. The migration tools can retrieve all the configuration data while the node is stopped. And you must stop the node before you can start the V5.1 node that you are installing. So, you can stop the node now.

Table 50. Migration tip

Operating platform	Tip
All platforms	Avoiding the use of a V5.0.x deployment manager after migrating to V5.1

2. Obtain the V5.1 Integration Server product CD-ROM. On this CD is the migration/bin directory. This directory contains a special environment that you can use to run the WASPreUpgrade tool without installing V5.1 Integration Server.
3. Save the current configuration using the WASPreUpgrade script from the /migration/bin directory of the V5.1 product CD-ROM. Save the configuration in the migration-specific-backup directory on the V5.0.0 or V5.0.1 machine.

```
WASPreUpgrade /opt/tmp/migration-specific-backup /opt/websphere/deploymentmanager
```

The WASPreUpgrade tool provides status to the screen and to the log files in the /migration-specific-backup directory. ASCII log file names start with the text WASPreUpgrade and include a date time stamp.

4. Uninstall the V5.0.0 or V5.0.1 Enterprise product on the deployment manager node. Use the following steps to uninstall the node:
  - a. Run the uninstall command from the *install\_root*\\_uninstPME directory of the Network Deployment product that you are uninstalling.
  - b. Run the platform-specific uninstalling procedure to complete the removal by removing all artifacts of the earlier product from the system.
5. Uninstall the V5.0.0 or V5.0.1 deployment manager node. Use the following steps to uninstall the node:
  - a. Run the uninstall command from the *install\_root*\\_uninst directory of the product that you are uninstalling. See the information center for the Network Deployment product for more information.
  - b. Run the platform-specific uninstalling procedure to complete the removal by removing all artifacts of the earlier product from the system.
6. Install V5.1 of Network Deployment without selecting the migration option, if it appears. See the information center for the Network Deployment product for more information.
7. Install V5.1 of Network Deployment without selecting the migration option, if it appears.
8. Add the V5.0.0 or V5.0.1 configuration to the V5.1 configuration. Use the WASPostUpgrade tool in the *install\_root*/bin directory of the V5.1 installation root directory to add the V5.0.0 or V5.0.1 configuration to the V5.1 configuration.

```
WASPostUpgrade /opt/tmp/migration-specific-backup
```

You can use the migration tools to migrate V5.0.0 or V5.0.1 of Enterprise on Network Deployment with the embedded messaging client to WebSphere Business Integration Server Foundation, Version 5.1.

Return to Migrating Version 5.0.x of Network Deployment to Version 5.1 to continue migrating the cell.

## Migrating WebSphere Application Server Enterprise, Version 4.1 or later to Integration Server

You can use the migration tools to migrate configuration data from WebSphere Application Server Enterprise, Version 4.1 or later to WebSphere Business Integration Server Foundation, Version 5.1 running on WebSphere Application Server, Version 5.1.

If you use an earlier version of WebSphere Application Server, the system administrator might have fine-tuned various application and server settings for your environment. It is important to have a strategy for migrating these settings with maximum efficiency and minimal loss.

You can migrate administrative configurations with the Installation wizard or manually, as described in this topic, by calling the tool commands yourself. If you decide to migrate manually, do not select the migration check box on the Installation wizard migration panel.

Manual migration provides a more incremental migration approach than the complete migration that the Installation wizard provides. IBM provides a set of migration tools for migrating administrative configurations to the WebSphere Business Integration Server Foundation product from Enterprise Edition V4.1.x or later. The overall migration process backs up the current configuration and necessary files, installs the Version 5 product, and restores the configuration.

You can perform incremental manual migration by calling the migration tools multiple times, each time specifying a different configuration file. Various reasons exist for having multiple configuration files. Whatever the reason, migrating one configuration file at a time lets you test applications incrementally before continuing to the next configuration file.

Before using the migration tools, consult the Release Notes document to understand what fixes you must apply to earlier versions. Applying fixes to an earlier version might also apply fixes to files that have a role in the migration. Apply any fixes to ensure the most effective migration of configurations and applications possible.

Typically, you use the WASPreUpgrade and WASPostUpgrade migration tools from the latest release of a WebSphere Application Server product to migrate the configuration and applications from an earlier release on the same machine. If your scenario includes migrating a V4.1.x or later configuration on one machine to WebSphere Business Integration Server Foundation V5.1 on another machine, use the alternate procedure described in “Migrating Enterprise Edition V4.1.0 or later to a remote Integration Server machine” on page 380.

After federating an application server node into a deployment manager cell, you cannot use the WASPostUpgrade migration tool on the Application Server node until you remove the node from the cell. To use the tool again, remove the node from the cell, use the tool, and add the node to the cell again.

This topic describes using the V5.1 migration tools to migrate WebSphere Application Server Enterprise Edition V4.0.x to WebSphere Business Integration Server Foundation, V5.1.

The WASPreUpgrade tool saves the existing V4.1.x configuration into a *migration-specific-backup* directory. The WASPostUpgrade tool uses this directory to add the old configuration settings to the new V5.1 environment.

You can select the migration option in the Installation wizard to migrate automatically during installation. Migrate during the installation of the WebSphere Business Integration Server Foundation product and not during the installation of the product that the Integration Server extends. Use the following procedure to migrate manually, without selecting the migration option during installation.

1. Obtain the product CD-ROM for V5.1 of WebSphere Business Integration Server Foundation. On this CD is the *operating\_system\_directory/migration/bin* directory. This directory contains a special environment that you can use to run the WASPreUpgrade tool without installing Integration Server.
2. Save the current configuration using the WASPreUpgrade script from the *migration/bin* directory of the Integration Server CD-ROM. Save the configuration in the *migration-specific-backup* directory:  

```
./WASPreUpgrade.sh /usr/tmp/migration-specific-backup /usr/websphere/appserver yourNodeName
```

Verify that the administrative server of the existing environment is running unless you are migrating from Enterprise Edition on a V4.1.0 or later Advanced Single Server Edition.

V4.1.x Advanced Single Server Edition does not require the administrative server to run at the time of migration. The WASPreUpgrade tool copies the `server-cfg.xml` file from the `install_root/config` directory to the `migration-specific-backup/config` directory. The WASPreUpgrade tool provides status to the screen and to log files in the `migration-specific-backup` directory. ASCII log file names start with the text WASPreUpgrade and include a date and time stamp.

The WASPreUpgrade tool saves all the files from the following directories in the existing V4.1.x configuration to the `backup` directory:

- `bin`
- `classes`
- `config` (Version 4.1.x Advanced Single Server Edition only)
- `installableApps`
- `installedApps`
- `installedConnectors` (Version 4.1.x Advanced Edition only)
- `properties`

The WASPreUpgrade tool saves selected files from the V4.1.x `install_root/bin` directory. It also exports the existing Application Server configuration from the V4.1.x repository. The WASPreUpgrade tool calls the XMLConfig tool to export the existing V4.1.x repository to the `websphere_backup.xml` file in the `migration-specific-backup` directory.

If errors occur while running the WASPreUpgrade tool, you might have to apply fixes to the V4.1.x installation to successfully complete the export step. See the IBM Support page for the latest fixes that might be applicable. When viewing this information from the information center, click **Support** to link to the IBM Support page.

3. Install the WebSphere Business Integration Server Foundation product and select the umbrella installation of the V5.1 base product. Do not select the migration option, if it appears. You can select the option even after running the WASPreUpgrade tool. The installation procedure describes how to select the migration option during installation. This topic describes issuing the tool commands yourself. After each use of the WASPostUpgrade tool, verify the following V5.1 port settings in two files:
  - Verify the `BOOTSTRAP_ADDRESS` port assignment for `server1` in the `serverindex.xml` file  
If the `BOOTSTRAP_ADDRESS` port of the earlier version is 900, migration maps this value to 2809. If the `BOOTSTRAP_ADDRESS` port of the earlier version is not 900, migration maps the value to `server1` in an Advanced Edition migration, or to the actual server name in an Advanced Single Server Edition migration.
  - Verify the HTTP transport port assignments in the `server.xml` file  
The WASPostUpgrade tool adds the HTTP transport ports from the earlier version to the Version 5.1 `server.xml` file. Now, `server1` contains duplicate HTTP transport port assignments, from both the Coexistence panel and the previous version *Default Server*.
4. Migrate the previous configuration to the new installation with the WASPostUpgrade tool in the `install_root/bin` directory of the V5.1 installation of the Integration Server. The WASPostUpgrade tool migrates V4.1.x configuration information created by the WASPreUpgrade tool to the V5.1 installation. The WASPostUpgrade tool does not migrate Samples or the administrative console application because Samples and an administrative console application already exist in V5.1. The WASPostUpgrade tool records detailed information specific to each enterprise bean that it deploys, in the `WASPostUpgrade.log` file.
5. Stop the administrative server of the earlier version if it is running, before starting the Version 5.1 Application Server.
6. Configure WebSphere Application Server after migration. Configuring WebSphere Application Server after migration is a way of verifying the results of the migration tools. You can also use Configuration mapping during migration to verify the results of the migration. This topic has a detailed description of how the migration tools migrate objects, and what you must verify.

You can use the migration tools to perform a manual migration from Version 4.1.0 or later of WebSphere Application Server Enterprise Edition to Version 5.1.

After you test and verify the applications and configuration data that you moved to the V5.1 node, you can uninstall the V4.1.x Application Server, as described in the information centers for Version 4. Click **Library** at the bottom of any V5.1 information center topic to locate the information center for Version 4.

Return to Migrating configuration data to continue.

## Migrating Enterprise Edition V4.1.0 or later to a remote Integration Server machine

You can use the migration tools to migrate configuration data from Version 4.1.0 or later of WebSphere Application Server Enterprise Edition to WebSphere Business Integration Server Foundation, Version 5.1 running on a remote machine.

Typically you use the WASPreUpgrade and WASPostUpgrade migration tools from the latest release of a WebSphere Application Server product to migrate the configuration and applications from an earlier release on the same machine. Use this procedure if your scenario includes migrating a V4.1.x configuration on one machine to WebSphere Business Integration Server Foundation, V5.1 on a remote machine. If you are migrating on the same machine, follow the procedure in “Migrating WebSphere Application Server Enterprise, Version 4.1 or later to Integration Server” on page 377.

Some scenarios require that you migrate the V4.1 configuration on one machine to Integration Server on a different machine. One of these scenarios is when you install new machines for your latest V5.1 environment but need to migrate your existing V4.1.x configuration from other machines.

This topic describes using the V5.1 migration tools to migrate WebSphere Application Server Enterprise Edition V4.1.x.

The WASPreUpgrade tool saves the existing V4.1.x configuration into a *migration-specific-backup* directory. The WASPostUpgrade tool uses this directory to add the old configuration settings to the new V5.1 environment.

You can select the migration option in the installation wizard to migrate automatically during installation. But you cannot migrate from one machine to another machine. Use the following procedure to migrate manually, without selecting the migration option during installation.

1. Obtain the product CD-ROM for V5.1 of WebSphere Business Integration Server Foundation. This CD contains the *operating\_system\_directory/migration/bin* directory. This directory contains a special environment that you can use to run the WASPreUpgrade tool without installing Integration Server.
2. Save the current configuration using the WASPreUpgrade script from the */migration/bin* directory of the V5.1 product CD-ROM, which you must mount on the V4.1 machine. Save the configuration in the *migration-specific-backup* directory on the V4.1 machine.

```
WASPreUpgrade /opt/tmp/migration-specific-backup /opt/websphere/appserver adminNodeName
```

For all scenarios except V4.1.x Enterprise Edition running on V4.1.x Advanced Single Server Edition, verify that the administrative server of the existing environment is running. V4.1.x Advanced Single Server Edition does not require the administrative server to run at the time of migration. The WASPreUpgrade tool copies the *server-cfg.xml* file from the *install\_root/config* directory to the *migration-specific-backup/config* directory. The WASPreUpgrade tool provides status to the screen and to log files in the *migration-specific-backup* directory. ASCII log file names start with the text, WASPreUpgrade, and include a date and time stamp.

The WASPreUpgrade tool saves selected files from the V4.1.x */bin* directory. It also exports the existing Application Server configuration from the V4.1.x repository. The WASPreUpgrade tool runs the XMLConfig tool to export the existing V4.1 repository to the *websphere\_backup.xml* file in the *migration-specific-backup* directory.

If errors occur while running the WASPreUpgrade tool, you might have to apply fixes to the V4.1 installation to successfully complete the export step. See the IBM Support page for the latest fixes that might be applicable. When viewing this information from the information center, click **Support** to link to the IBM Support page.

3. Copy the *migration-specific-backup* directory from the V4.1 machine to the V5.1 machine. Use the **ftp** command, shared storage, or some other mechanism to copy the file to the new machine. Perform the following steps on the machine with V5.1 of WebSphere Business Integration Server Foundation.
  4. Copy the *migration-specific-backup/websphere\_backup.xml* or the *migration-specific-backup/config/server-cfg.xml* file and store it as an archive. You edit the original file in the next step.
  5. Edit the *migration-specific-backup/websphere\_backup.xml* or the */migration-specific-backup/config/server-cfg.xml* file to correct machine-dependent settings. Make the following changes in the file:
    - a. Change the node name in the *migration-specific-backup/websphere\_backup.xml* file. No node name exists in the *migration-specific-backup/config/server-cfg.xml* file. If you are using the same node name for the V5.1 machine that you use for the original V4.1 configuration, do not change the name. Otherwise, you must change all occurrences of the V4.1 node name to the node name that you are using for WebSphere Business Integration Server Foundation, V5.1. The node name occurs in many XML stanzas throughout the file. Failing to change all occurrences results in an incomplete migration of data.
    - b. Change the path names in the *migration-specific-backup/websphere\_backup.xml* or the *migration-specific-backup/config/server-cfg.xml* file. The configuration file refers to path names in many XML stanzas throughout the file. Update any reference to a file outside of the V4.1 directory structure to the equivalent directory on the new machine, even if you must create an equivalent directory. The implication of configuring a matching environment means that you might have to copy the original directory to the V5.1 machine. Or you might have to install the appropriate software.
    - c. Check the files in the *properties* directories for references that contain path names. In particular, edit the *migration-specific-backup/properties/sas.client.props* and the *migration-specific-backup/properties/TraceSettings.properties* files to correct machine-dependent settings. Make the following changes in the file:
      - 1) Change the path values of any property in the file.  
Each property file contains properties that refer to paths. Update any reference to a file outside of the V4.1 directory structure to the equivalent directory on the new machine, even if you must create an equivalent directory.
      - 2) Correct specification styles for path values that are dependent on the operating system.  
You must correct path specifications if they differ from what works on the machine running V5.1.
    - d. Correct specification styles for path names that are dependent on the operating system. You must correct path specifications if they differ from what works on the machine running Integration Server. For example, if you are moving from V4.1.x on a Windows platform to Integration Server on a Linux platform, change any Windows-specific path in the configuration file to use the Linux path style. Change `c:\mystuff\somepath` to `/opt/mystuff/somepath`.
    - e. Change user IDs and passwords to match security requirements. You might have to change user IDs and passwords if these values are not identical to those in use on the V5.1 machine.  
To change an encoded password to a clear-text password, change `<password>{xor}LCoxayht</password>` to `<password>mypassword</password>`.
    - f. Change other machine-specific information. The configuration might refer to other software products or configurations that do not exist on the new machine. For example, the old machine might have a database. The Integration Server configuration still points to the database on the old machine possibly. Modify the data source to point to the database on the V4.1 machine.
6. Install the WebSphere Business Integration Server Foundation product and select the umbrella installation of the V5.1 base product. Do not select the migration option, if it appears. You can select the option even after running the WASPreUpgrade tool. The installation procedure describes how to select the migration option during installation. This topic describes issuing the tool commands yourself. After each use of WASPostUpgrade, verify the following V5.1 port settings in two files:
  - Verify the BOOTSTRAP\_ADDRESS port assignment for server1 in the *serverindex.xml* file



If the `BOOTSTRAP_ADDRESS` port of the earlier version is 900, migration maps this value to 2809. If the `BOOTSTRAP_ADDRESS` port of the earlier version is not 900, migration maps the value to `server1` in an Advanced Edition migration, or to the actual server name in an Advanced Single Server Edition migration.

- Verify the HTTP transport port assignments in the `server.xml` file

WASPostUpgrade processing adds the HTTP transport ports from the earlier version to the Version 5.1 `server.xml` file. This addition means that `server1` contains duplicate HTTP transport port assignments, from both the coexistence panel and the previous version *default server*.

7. Add the V4.1 configuration to the new installation with the WASPostUpgrade tool in the `install_root/bin` directory of the V5.1 installation of the Integration Server. The WASPostUpgrade tool migrates V4.1.x configuration information created by the WASPreUpgrade tool to the V5.1 installation.

```
WASPostUpgrade /opt/tmp/migration-specific-backup
```

The WASPostUpgrade tool records detailed information specific to each enterprise bean that it deploys, in the `WASPostUpgrade.log` file.

8. Configure WebSphere Application Server after migration. Configuring WebSphere Application Server after migration is a way of verifying the results of the migration tools. You can read Configuration mapping during migration to learn more about the results of migration. This topic has a detailed description of how the migration tools migrate objects, and what you must verify.

You can migrate WebSphere Application Server Enterprise Edition from V4.1.x to the Integration Server on a remote machine.

Return to Migrating configuration data manually to continue.

## Migrating V5.0.x WebSphere Application Server Enterprise to a remote V5.1 Integration Server machine

You can use the migration tools to migrate between two machines.

Typically you can use the WASPreUpgrade and the WASPostUpgrade migration tools from WebSphere Business Integration Server Foundation, Version 5.1 to upgrade from Enterprise Version 5.0.x to Integration Server, Version 5.1 on the same machine.

However, some scenarios require that you migrate the V5.0.x configuration on one machine to Integration Server V5.1 on a different machine. One of these scenarios is when you install new machines for your V5.1 environment, but need to migrate your existing V5.0.x configuration from other machines.

If the node you are migrating is part of a deployment manager cell, install Network Deployment, Version 5.1 without selecting the migration option. Then install Integration Server to extend the deployment manager. Select the migration option during the installation of the Integration Server. Follow the procedure described in `ae/tins_migratend50xw.dita` to install and migrate the deployment manager and Integration Server before continuing this procedure. The deployment manager node must always be at the highest release level within the cell.

This task describes how to use the V5.1 migration tools to migrate WebSphere Application Server Enterprise, Version 5.0.x to WebSphere Business Integration Server Foundation, Version 5.1 on a separate machine.

The WASPreUpgrade tool saves the existing V5.0.x configuration into a *migration-specific-backup* directory. The WASPostUpgrade tool uses this directory to add the old configuration settings to the new V5.1 environment.

1. Obtain the V5.1 product CD-ROM. On this CD is the `migration/bin` directory. This directory contains a special environment that you can use to run the WASPreUpgrade tool without installing V5.1.



2. Save the current configuration using the WASPreUpgrade script from the migration/bin directory of the V5.1 product CD-ROM, which you must mount to the V5.0.x machine. Save the configuration in the *migration-specific-backup* directory on the V5.0.x machine.

```
WASPreUpgrade /opt/tmp/migration-specific-backup /opt/websphere/appserver
```

The WASPreUpgrade tool provides status to the screen and to log files in the *migration-specific-backup* directory. ASCII log file names start with the text WASPreUpgrade and include a date and time stamp.

3. Copy the *migration-specific-backup* directory from the V5.0.x machine to the V5.1 machine. Use the **ftp** command, shared storage, or some other mechanism to copy the directory to the new machine.
4. Install V5.1 of Integration Server without selecting the migration option. Install the same features as the earlier release.
5. Add the V5.0.x configuration to the V5.1 configuration. Use the WASPostUpgrade tool in the *install\_root/bin* directory of the V5.1 installation to add the V5.0.x configuration to the V5.1 configuration.

```
WASPostUpgrade /opt/tmp/migration-specific-backup
```

The WASPostUpgrade tool records detailed information specific to each enterprise bean that it deploys, in the *migration-specific-backup/WASPostUpgrade.log* file.

6. Modify the configuration using the WebSphere Application Server 5.1 administration interfaces. Make these changes:
  - a. Change user IDs and passwords to match security requirements. You might have to change user IDs and passwords if they are not identical to those in use on the V5.0.x machine.
  - b. Change other machine-specific information. The configuration might refer to other software products or configurations that do not exist on the new machine. For example, the old machine might have a database. Modify the data source to point to the database on the old machine.

You can migrate WebSphere Application Server Enterprise from V5.0.x to a remote Integration Server V5.1 machine.

Return to Migrating configuration data to continue.

## **Migrating V5.0.x of WebSphere Application Server Enterprise to Integration Server V5.1**

You can use the migration tools of WebSphere Business Integration Server Foundation, Version 5.1 to migrate configuration data from WebSphere Application Server Enterprise, V5.0.x to the Integration Server.

This task describes how to migrate the configuration of a V5.0.0 or a V5.0.1 Enterprise node without the embedded messaging feature installed, or a V5.0.2 node with or without embedded messaging, to WebSphere Business Integration Server Foundation, Version 5.1. This task describes how to use the migration tools on the Integration Server product CD-ROM to perform the migration.

If the node you are migrating is part of a deployment manager cell

1. Install Network Deployment, Version 5.1 without selecting the migration option.
2. Install Integration Server to extend the deployment manager.
3. Select the migration option during the installation of the Integration Server.

Follow the procedure described in *ae/tins\_migratend50xw.dita* to install and migrate the deployment manager and Integration Server before continuing this procedure. The deployment manager node must always be at the highest release level within the cell.

If your scenario includes migrating a V5.0.x configuration on one machine to Integration Server V5.1 on another machine, use the alternate procedure described in “Migrating V5.0.x WebSphere Application Server Enterprise to a remote V5.1 Integration Server machine” on page 382.

If your scenario includes migrating V5.0.0 or V5.0.1 WebSphere Application Server with embedded messaging installed, use the alternate procedure described in Migrating V5.0.0 or V5.0.1 of WebSphere Application Server with embedded messaging to Integration Server V5.1.

Use the following procedure to migrate a V5.0.0 or a V5.0.1 node without the embedded messaging feature installed, or a V5.0.2 node with or without embedded messaging, to Integration Server.

1. Stop the V5.0.x deployment manager and start the V5.1 migrated deployment manager if the deployment manager is not already running.

During migration the V5.1 deployment manager must be running for the migration tools to:

- Update the configuration for each federated node
- Request full synchronization

If the V5.1 deployment manager is not running, failures can occur.

Table 51. Migration tip

Operating platform	Tip
All platforms	Recovering from configuration errors when the deployment manager was not running during migration.

2. Stop all of the V5.0.x Application Servers that are running on the node. Use the **stopServer** command from the *install\_root/bin* directory. For example, issue the following command to stop server1 on a Linux platform:

```
stopServer.sh server1
```

If security is enabled, specify the **-user** and **-password** parameters on the **stopServer** command.

You can migrate a V5.0.x node without stopping it. But it is not necessary to have the node running to migrate its configuration. The migration tools can retrieve all the configuration data while the node is stopped. You must stop the node before you can start the V5.1 node that you are installing.

3. Stop the messaging service provider, if the embedded messaging server feature is installed. Run the **stopServer** command from the *install\_root/bin* directory of the V5.0.x Application Server. For example, issue the following command to stop the jmsserver process on a Linux platform:

```
stopServer.sh jmsserver
```

If security is enabled, specify the **-user** and **-password** parameters on the **stopServer** command.

4. Stop the node agent process. Run the **stopNode** command from the *install\_root/bin* directory of the V5.0.x Application Server. For example, issue the following command to stop the nodeagent process on a Linux platform:

```
stopNode.sh
```

If security is enabled, specify the **-user** and **-password** parameters on the **stopNode** command.

5. Install the Integration Server. Select the migration option when it appears. If the migration option does not appear, cancel the installation.

In some cases, such as when installing a non-English version, the installation wizard might not detect a previous version. You can force the Migration panel to appear, by starting the installation with an option on the **Install.exe** command or on the **install** command.

For example, on Linux and UNIX-based platforms, use this command from the CD-ROM mount point:

```
./install -W PME_PreviousVersionPanel.migrationSelected="true"
```

On the Migration panel, specify the same value for the node name that the V5.0.x product uses. The V5.0.x product and the V5.1 product must have identical node names. The host names can be identical, but it is not a requirement.

The installer program calls the WASPreUpgrade migration tool before installing the new product, to save the configuration from the old product in a backup directory. The installer program calls the WASPostUpgrade migration tool after installing the new product, backing up the configuration of the new product and then adding the configuration of the old product from the backup directory to the configuration of the new product.

Read the messages from the migration tools that appear on the installer program panels. Each migration tool also records events in its log file.

6. Close the First Steps tool when it appears. Do not verify the installation of the V5.1 Application Server because of node differences when migrating a federated node.
7. Start the node agent for the V5.1 node. Your newly migrated V5.1 node is federated if the V5.0.x node is federated. Use the **startNode** command from the *install\_root/bin* directory of the V5.1 Application Server. For example, issue the following command to start the nodeagent process on a Linux platform:

```
startNode.sh
```

If security is enabled, specify the **-user** and **-password** parameters on the **startNode** command.

8. Start all V5.1 Application Servers. Issue the **startServer** command from the *install\_root/bin* directory of the V5.1 installation. For example, issue the following command to start server1 on a Linux platform:

```
startServer.sh server1
```

If security is enabled, specify the **-user** and **-password** parameters on the **startServer** command.

The server1 Java process begins.

9. Start the messaging service provider if the node is part of a deployment manager cell and the embedded messaging server feature is installed. Issue the following command from the *install\_root/bin* directory of the V5.1 installation.

```
startServer.sh jmsserver
```

If security is enabled, specify the **-user** and **-password** parameters on the **startServer** command.

The jmsserver Java process begins.

You can migrate a Version 5.0.x Enterprise node to WebSphere Business Integration Server Foundation, Version 5.1.

Return to Migrating configuration data to continue.

## Migrating from an operating system that is no longer supported

You can migrate an earlier WebSphere Application Server Version 3.5.x or Version 4.0.x release that is running on an operating system that Version 5.x does not support.

1. Start up the WebSphere Application Server Version 3.5.x or Version 4.0.x Administrative Server.
2. Run the **WASPreUpgrade** command line migration tool. There are two options. You can run the command from the *migration\bin* (or *migration/bin*) directory in the *platform\_root* of the Version 5 CD-ROM. Or, you can copy the files in the directory on the CD-ROM to a directory you create on your hard drive.

Identify the Version 3.5.x or 4.0.x release, and identify a backup directory where the command stores configuration files and migrating applications from the earlier version. See the *WASPreUpgrade* topic for command syntax.

- a. Run the command from the *migration\bin* (or *migration/bin*) directory in the *platform\_root* of the Version 5 CD-ROM. Identify the backup directory and the location of the configuration files.

```
CD_drive:\WASPreUpgrade backupDirectory filepath\WebSphere\AppServer yourNodeName
```

If this works, go to Step 4. If this does not work for some reason, perform steps 2B through 2F.

- b. Make a **migration** directory on your hard drive.

- c. Copy the `WASPreUpgrade.bat` (or `WASPreUpgrade.sh`) and the `setupCmdLine.bat` (or `setupCmdLine.sh`) files from the `migration\bin\` (or `migration/bin/`) directory in the *platform\_root* of the Version 5 CD-ROM, to the directory you created on your hard drive.
- d. Edit the `setupCmdLine.bat` (or `setupCmdLine.sh`) file in your new directory. Change the following variables:
  - **WAS\_HOME** to point to the fully qualified path to the migration directory you created
  - **JAVA\_HOME** to point to the fully qualified path to your IBM Developer Kit or the Java directory
- e. Ensure that the executable bit is on for the `setupCmdLine.sh` and `WASPreUpgrade.sh` files in the `migration/bin` directory in the *UNIX-based\_platform\_root* of the Version 5 CD-ROM, if you are backing up a UNIX-based installation.
- f. Run the command from the migration directory you created. Identify the backup directory and the location of the configuration files.

*yourMigrationDirectory\WASPreUpgrade backupDirectory filepath\WebSphere\AppServer yourNodeName*

3. Shut down the WebSphere Application Server Version 3.5.x or Version 4.0.x release by stopping all server nodes in the configuration, including the administrative server node.
4. Tar or zip the backup directory and FTP it to another system.
5. Install the new operating system, keeping the same host name. If possible, keep the system name and passwords the same as the old system. Place any database files related to applications you are migrating in the same path as the previous system. In general, try to keep paths the same. However, do not install Version 5 in the same directory as the previous version. If you do change paths and names, you can edit the XML configuration files to reflect the changes. Make such changes before running the **WASPostUpgrade** command below.
6. FTP the backup directory from the other system and unzip it.
7. Install WebSphere Application Server, Version 5. Do not select the migration option, if it appears.
8. Run the **WASPostUpgrade** command line migration tool, from the `bin` directory of the Version 5 `install_root`. Specify the backup directory (and any non-standard configuration file name in the directory) that the **WASPreUpgrade** command created. See the *WASPostUpgrade* topic for proper command syntax.

*install\_root\bin\WASPostUpgrade WAS\_HOME\migration*

Return to Migrating administrative configurations to continue.

## Migration tools

This topic introduces the migration tools that WebSphere Application Server provides. All of the migration tools are in the `install_root/bin` directory after installation. The `WASPreUpgrade.sh` or `WASPreUpgrade.bat` scripts also ship in the `/migration/bin` directory on the product CD-ROM so that you can store the configuration of an existing release before installing the V5.1 product. It is important to use the migration tools for the version of Application Server that you are installing. The tools change over time. The tools on the product CD-ROM provide the necessary function for migrating from a previous release of Application Server to the one on the product CD-ROM. The tools on the CD-ROM match the product on the CD-ROM. If you use migration tools from an earlier release of Application Server, you are likely to encounter a problem with the migration.

### **clientUpgrade.sh (and clientUpgrade.bat)**

Upgrades the client application to a new release level.

### **pre\_uninst50ws.sh (and pre\_uninst50ws.bat)**

Prevents a federated node that you migrate to a new version, from removing the new node from the cell when you uninstall the old node.

### **post\_uninst50ws.sh (and post\_uninst50ws.bat)**

Restores the normal uninstaller environment that allows the uninstaller to remove a base node from a cell prior to uninstalling the base node.

**pre\_uninst502mq.sh (and pre\_uninst502mq.bat)**

Prevents the uninstaller from uninstalling the embedded messaging feature and the message queue when it uninstalls a V5.0.2 node that you have migrated to V5.1.

**post\_uninst502mq.sh (and post\_uninst502mq.bat)**

Restores the normal uninstaller environment that allows the uninstaller to uninstall a base V5.0.2 node and delete the embedded messaging feature and its queue manager.

**WASPreUpgrade.sh (and WASPreUpgrade.bat)**

Saves the applications and configuration data from a previous installation of WebSphere Application Server to a backup directory. The WASPostUpgrade script restores the configuration data from the directory to the new installation. The installer calls the WASPreUpgrade.sh script during installation, if you select migration. You can also use the command to perform a manual migration, after installing the new version.

**WASPostUpgrade.sh (and WASPostUpgrade.bat)**

Restores the configuration data from a previous release. WASPostUpgrade reads the data from the backup directory where the WASPreUpgrade script stored the data. The installer calls the WASPostUpgrade.sh script during installation, if you select migration. You can also use the command to perform a manual migration, after installing the new version.

**The clientUpgrade command:**

Use the **clientUpgrade** command to migrate application clients.

**Note:** WebSphere Application Server Version 5.1 does not support the Windows NT platform.

The command file is located in the `bin` subdirectory of the `WAS_install_root`, or the `ND_install_root` directory. By default, the `WAS_install_root` for WebSphere Application Server and WebSphere Application Server Enterprise is:

- Windows NT or Windows 2000 operating platforms - `drive\WebSphere\AppServer` directory
- AIX or UNIX-based operating platforms - `/usr/WebSphere/AppServer` directory

By default, the `ND_install_root` for WebSphere Application Server Network Deployment is:

- Windows NT or Windows 2000 operating platforms - `drive\WebSphere\DeploymentManager` directory
- AIX or UNIX-based operating platforms - `/usr/WebSphere/DeploymentManager` directory

**Linux and UNIX-based platforms:**

```
clientUpgrade.sh EAR_file [-clientJar client_jar ]
                  [-traceString trace_spec [-traceFile file_name ]]
```

**Windows platforms:**

```
clientUpgrade.bat EAR_file [-clientJar client_jar ]
                    [-traceString trace_spec [-traceFile file_name ]]
```

**Parameters**

Supported arguments include the following:

**EAR\_file**

Use this parameter to specify the fully qualified path to the EAR file that contains client JAR files to process.

**-clientJar**

Use this optional parameter to specify a JAR file for processing. If not specified, the program transforms all client JAR files in the EAR file.

### **-traceString -traceFile**

Use these optional parameters to gather trace information for IBM Service personnel. Specify a trace\_spec of `"*=all=enabled"` (with quotation marks) to gather all trace information.

### **-logFileLocation**

Use this optional parameter to specify an alternate location to store the log output.

The following example demonstrates correct syntax:

```
clientUpgrade EAR_file -clientJar ejbJarFile
```

### ***pre\_uninst50ws* command:**

The **pre\_uninst50ws** command is a V5.1 migration tool for use when you migrate a federated V5.0.x node to V5.1. The script changes the normal uninstaller program environment to prevent the uninstaller program from removing the V5.0.x or V5.1 node from the deployment manager cell while uninstalling the base V5.0.x or V5.1 node. The script also prevents the uninstaller program from removing the jmsserver process, which is the embedded messaging queue manager for the federated node.

A problem can occur when you uninstall an earlier version of the base WebSphere Application Server product that you migrated to Version 5.1. If the earlier node is federated, migrating the federated node to Version 5.1 gives you a federated V5.1 node, too. The new node has the same node name as the earlier node, and is a member of the same cell. The problem is that the uninstaller program issues a **removeNode** command when it uninstalls a federated node. So, if you uninstall the earlier version, the uninstaller issues a call to the deployment manager that requests the removal of the node from the cell. You are left with a V5.1 node that is configured as if it were a member of the cell and a deployment manager that does not recognize the node.

The `pre_uninst50ws` script overcomes the problem by renaming the `_nodeuninst.sh` or the `_nodeuninst.bat` script and creating a dummy script that prevents the uninstaller program from logging an error and stopping. Because the uninstaller program is not calling the script that removes the node from the cell, uninstalling the earlier version does not also unfederate the node from the cell. This lets you uninstall the previous node and still have a federated V5.1 node.

The `post_uninst50ws` migration tool restores the environment to allow the uninstaller program to remove a federated node from its cell while uninstalling the base node. If you are completely uninstalling the previous version, it is not necessary to run the `post_uninst50ws` script. If you follow the platform-specific instructions for uninstalling the previous version, you remove the `_nodeuninst.sh` or the `_nodeuninst.bat` script. So there is nothing left for the script to rename.

### **Location of the command file**

The command file is located in the `install_root/bin` directory of the V5.1 node.

If the installation wizard performs the initial migration, the wizard copies the scripts to the `install_root/bin` directory of the V5.0.x node that it is migrating. If you migrate the node by calling the migration tool commands, you might have to copy the following files to the `install_root/bin` directory of the V5.0.x node from the `install_root/bin` directory of the V5.1 node:

- `pre_uninst50ws.sh` and `post_uninst50ws.sh` on a Linux or UNIX-based platform
- `pre_uninst50ws.bat` and `post_uninst50ws.bat` on a Windows platform

### **Recovering when you do not use the pre\_uninst50ws script**

If you uninstall a federated base node without running the `pre_uninst50ws.sh` script, you can recover by recreating whatever configuration data is lost. Lost configuration data includes any configuration that occurred while the original node was federated. Use the `addNode.sh` or the `addNode.bat` script in the `bin` directory of the installation root of the base Application Server node to add the new node back to the



deployment manager cell. Do not use the `-includeapps` parameter to include applications from the node. The installer program included the applications into the deployment manager cell during installation. The `removeNode.sh` script does not delete applications from the cell.

### Using the command when removing a V5.0.x node

The script is new as of Version 5.1.

1. Copy the script files described previously if the **pre\_uninst50ws** command file is not in the `install_root/bin` directory of the WebSphere Application Server, Version 5.0.x instance.
2. Run the **pre\_uninst50ws** command from the `install_root/bin` directory of the WebSphere Application Server, Version 5.0.x instance.
3. Uninstall the WebSphere Application Server, Version 5.0.x instance.

Run the `post_uninst50ws` script from a node only when you have run the `pre_uninst50ws` script on the node and decide not to uninstall the node.

### Using the command when removing a V5.1 node

Use the `pre_uninst50ws` script if you uninstall V5.1 before uninstalling V5.0.2, to make V5.0.2 operational again.

For example, suppose you install V5.1 in spite of missing patches on your operating system and there are problems that require you to uninstall V5.1 to reinstall it. In the meantime, you bring up your V5.0.2 node to have a running WebSphere Application Server node. So you start up the V5.0.2 deployment manager, and the V5.0.2 node before uninstalling V5.1.

Uninstalling V5.1 removes the node from the deployment manager cell if and only if the V5.1 deployment manager is running. If the V5.0.2 deployment manager is running, the `remove-node` part of the uninstalling procedure fails because a V5.1 node cannot communicate with a V5.0.2 deployment manager. The V5.1 `jmsserver` process is not removed either.

However, if you start a V5.1 deployment manager, start the V5.0.2 node, and then uninstall the V5.1 node without running the `pre_uninst50ws` script, there are problems. Removing the V5.1 node causes the same effect as removing the V5.0.2 node. The deployment manager removes the configuration of the node. Follow this procedure to remove the V5.1 node without a problem.

1. Run the `pre_uninst50ws` script from the `install_root/bin` directory of the WebSphere Application Server, Version 5.1 instance.
2. Run the `pre_uninst502mq` script from the `install_root/bin` directory of the WebSphere Application Server, Version 5.0.2 instance if the embedded messaging feature is installed.
3. Uninstall the WebSphere Application Server, Version 5.1 instance.

Run the `post_uninst50ws` script from a node only when you have run the `pre_uninst50ws` script on the node and decide not to uninstall the node.

### pre\_uninst50ws.sh command syntax for Linux and UNIX-based platforms

The command syntax is as follows:

```
pre_uninst50ws.sh
```

### pre\_uninst50ws.bat command syntax for Windows platforms

```
pre_uninst50ws.bat
```

## Parameters

No parameters are associated with this command.

## Migrating from a V5.0.x base node to a V5.1 node

Issue the **pre\_uninst50ws** command before uninstalling the V5.0.x product, from the *install\_root/bin* directory of the product you are uninstalling. This command renames the `_nodeuninst.sh` or the `_nodeuninst.bat` script and creates a dummy, non-operational script. For example, on a Linux platform, issue the following command:

```
pre_uninst50ws.sh
```

## Workaround for uninstalling a federated node without the scripts

It is possible to use the WASPreupgrade tool to save the configuration of a V5.0.x instance before installing the V5.1 instance. Such a scenario is described in *ae/tins\_manualmig51w.dita*. In such a scenario, you do not have access to the following files:

- `pre_uninst50ws.sh` or `pre_uninst50ws.bat`
- `post_uninst50ws.sh` or `post_uninst50ws.bat`

You can perform either of two workarounds to avoid removing the node from the cell:

- Stop the deployment manager so that it does not lose the configuration for the node that you are uninstalling.
- Rename the program on the node that you are uninstalling to prevent the node from requesting that the deployment manager remove the node from the cell:
  1. Rename the `_nodeuninst.sh` or the `_nodeuninst.bat` script.
  2. Create a dummy script named `_nodeuninst.sh` or `_nodeuninst.bat` that is not operational. The dummy script can be an empty file. This prevents the uninstaller program from logging an error and stopping.
  3. Uninstall the V5.0.x product.
  4. Delete the dummy file and restore the `_nodeuninst.sh` or the `_nodeuninst.bat` script.

## ***post\_uninst50ws*** command:

The **post\_uninst50ws** command restores the normal uninstaller program environment in which the uninstaller program removes a federated base node from a cell prior to uninstalling the base WebSphere Application Server node. Run the `post_uninst50ws` script from a node only when you have run the `pre_uninst50ws` script on the node and decide not to uninstall the node.

## Overview

The `post_uninst50ws` tool restores the environment created by the use of the `pre_uninst50ws` tool. The `post_uninst50ws` tool allows the uninstaller program to remove a federated node from its cell while uninstalling the base node.

If you are completely uninstalling the previous version, it is not necessary to run the `post_uninst50ws` script. If you follow the platform-specific instructions for uninstalling the previous version, you remove the `_nodeuninst.sh` or the `_nodeuninst.bat` script along with all other artifacts. So there is nothing left for the script to rename.

Use the `post_uninst50ws` migration tool to reverse the effects of the `pre_uninst50ws` tool when you run the `pre_uninst50ws` tool and then decide not to uninstall the product.

## Location of the command file

The command file is located in the *install\_root/bin* directory of the V5.1 node.

If the installation wizard performs the initial migration, the wizard copies the scripts to the *install\_root/bin* directory of the V5.0.x node that it is migrating. If you migrate the node by calling the migration tool commands, you might have to copy the following files to the *install\_root/bin* directory of the V5.0.x node from the *install\_root/bin* directory of the V5.1 node:

- `pre_uninst50ws.sh` and `post_uninst50ws.sh` on a Linux or UNIX-based platform
- `pre_uninst50ws.bat` and `post_uninst50ws.bat` on a Windows platform

## `post_uninst50ws.sh` command syntax for Linux and UNIX-based platforms

The command syntax is as follows:

```
post_uninst50ws.sh
```

## `post_uninst50ws.bat` command syntax for Windows platforms

```
post_uninst50ws.bat
```

## Parameters

No parameters are associated with this command.

## ***pre\_uninst502mq* command:**

The **`pre_uninst502mq`** command is a V5.1 migration tool for use when you migrate a V5.0.2 node with embedded messaging to V5.1. The script changes the normal uninstaller program environment to prevent the uninstaller program from removing the embedded messaging feature while uninstalling the base V5.0.2 node. Normally the uninstaller program removes the embedded messaging feature while uninstalling the product.

When you migrate the V5.0.2 base node to V5.1, the two installation instances share the same node name, the same embedded messaging feature code, and the same messaging queue manager. Uninstalling either V5 installation instance removes the instance and the embedded messaging feature. The `pre_uninst502mq` script prevents the removal of embedded messaging when the V5.0.2 installation instance is uninstalled. The V5.1 uninstaller program has an option that you can use to prevent the removal of the embedded messaging feature.

The uninstaller program normally stops and removes the default embedded messaging queue manager process before uninstalling the feature. If another embedded messaging process is running on a Linux or UNIX-based machine, the uninstaller program cannot remove the embedded messaging feature. The `pre_uninst502mq` script creates the `WAS_COEXIST` queue manager to prevent the removal of the embedded messaging feature code on Linux and UNIX-based platforms. The uninstaller program does not remove the `WAS_COEXIST` queue manager, which is active and therefore causes the uninstaller program to not remove the embedded messaging feature code.

## Location of the command file

The command file is located in the *install\_root/bin* directory. The command file is a script named `pre_uninst502mq.sh` on Linux and UNIX-based platforms and `pre_uninst502mq.bat` on Windows platforms.

## `pre_uninst502mq.sh` command syntax for Linux and UNIX-based platforms

The command syntax is as follows:

```
pre_uninst502mq.sh
```

## pre\_uninst502mq.bat command syntax for Windows platforms

pre\_uninst502mq.bat

### Parameters

No parameters are associated with this command.

### Migrating a V5.0.2 base node to a V5.1 node

Issue the **pre\_uninst502mq** command after migrating the configuration of a V5.0.2 node that has the embedded messaging feature installed, installing the V5.1 product, and before uninstalling the V5.0.2 node. After issuing the command, uninstall the V5.0.2 node. Because you are using the pre\_uninst502mq script, uninstalling the V5.0.2 node prevents the removal of the embedded messaging feature code.

After using the pre\_uninst502mq script and uninstalling the V5.0.2 product on Linux and UNIX-based platforms, perform this procedure:

1. Run the post\_uninst502mq script to remove the WAS\_COEXIST queue manager.
2. On Linux and UNIX-based platforms, run the following commands to verify that the WAS\_COEXIST queue manager is deleted. Run the commands as root from the *install\_root/bin* directory:

```
endmqm WAS_COEXIST
dltmqm WAS_COEXIST
```

3. Run the **createmq** command from the *install\_root/bin* directory to create the default queue manager:

#### UNIX platforms:

```
createmq.sh install_root
             cellName
             nodeName
             server1
```

#### Windows platforms:

```
createmq.bat install_root
              cellName
              nodeName
              server1           mq_dir
              broker_dir
```

The command that the installer program used to create your original queue manager is in the *install\_root/logs/createMQ.nodeName\_server1.log* file.

To create the default queue manager on a Linux node named wasnode, for example, run the following command:

```
createmq.sh /opt/WebSphere/AppServer wasnode wasnode server1
```

On an unfederated node, the value of the cell name parameter is the node name.

### **post\_uninst502mq** command:

The **post\_uninst502mq** command restores the normal uninstaller program environment, which lets the uninstaller program uninstall a base V5.0.2 node and delete the embedded messaging feature code. Run this command only after using the pre\_uninst502mq tool.

When you migrate the V5.0.2 base node to V5.1, the two installation instances share the same node name, the same embedded messaging feature code, and the same messaging queue manager. Uninstalling either V5 installation instance removes the instance and the embedded messaging feature. The pre\_uninst502mq tool prevents the removal of the embedded messaging feature code when the

V5.0.2 installation instance is uninstalled. The V5.1 uninstaller program has an option that you can use to prevent the removal of the embedded messaging feature code.

The uninstaller program normally stops and removes the default embedded messaging queue manager process before uninstalling the feature. If another embedded messaging process is running on a Linux or UNIX-based machine, the uninstaller program cannot remove the embedded messaging feature. Therefore, the `pre_uninst502mq` script creates the `WAS_COEXIST` queue manager to prevent the removal of the embedded messaging feature code on Linux and UNIX-based platforms. The uninstaller program does not remove the `WAS_COEXIST` queue manager, which is active and therefore causes the uninstaller program to not remove the embedded messaging feature code.

On Windows platforms, the `pre_uninst502mq` script prevents the removal of the embedded messaging feature code by creating dummy registry entries. After using the `pre_uninst502mq` script and uninstalling the V5.0.2 product, run the `post_uninst502mq` script on Windows platforms to remove the dummy registry entries.

### Location of the command file

The command file is located in the `install_root/bin` directory. The command file is a script named `post_uninst502mq.sh` on Linux and UNIX-based platforms and `post_uninst502mq.bat` on Windows platforms.

### post\_uninst502mq.sh command syntax for Linux and UNIX-based platforms

The command syntax is as follows:

```
post_uninst502mq.sh
```

### post\_uninst502mq.bat command syntax for Windows platforms

```
post_uninst502mq.bat
```

### Parameters

No parameters are associated with this command.

### Migrating a V5.0.2 base node to a V5.1 node

Issue the `pre_uninst502mq` command after migrating the configuration of a V5.0.2 node that has the embedded messaging feature installed, installing the V5.1 product, and before uninstalling the V5.0.2 node. After issuing the command, uninstall the V5.0.2 node. Because you are using the `pre_uninst502mq` script, uninstalling the V5.0.2 node prevents the removal of the embedded messaging feature code.

After using the `pre_uninst502mq` script and uninstalling the V5.0.2 product on Linux and UNIX-based platforms, perform this procedure:

1. Run the `post_uninst502mq` script to remove the `WAS_COEXIST` queue manager.
2. On Linux and UNIX-based platforms, run the following commands to verify that the `WAS_COEXIST` queue manager is deleted. Run the commands as root from the `install_root/bin` directory:

```
endmqm WAS_COEXIST
dltmqm WAS_COEXIST
```

3. Run the `createmq` command from the `install_root/bin` directory to create the default queue manager:

#### UNIX platforms:

```
createmq.sh install_root
           cellName
           nodeName
           server1
```

**Windows platforms:**

```

createmq.bat install_root
              cellName
              nodeName
              server1           mq_dir
              broker_dir

```

The command that the installer program used to create your original queue manager is in the *install\_root/logs/createMQ.nodeName\_server1.log* file.

To create the default queue manager on a Linux node named *wasnode*, for example, run the following command:

```
createmq.sh /opt/WebSphere/AppServer wasnode wasnode server1
```

On an unfederated node, the value of the cell name parameter is the node name.

**WASPreUpgrade command:**

The **WASPreUpgrade** command is a migration tool that saves the configuration and applications of a previous version or release to a Version 5.1 WebSphere Application Server node or Network Deployment node.

**Location of command file**

The command file is located in the *install\_root/bin* directory. The command file is a script named *WASPreUpgrade.sh* for Linux and UNIX-based platforms or *WASPreUpgrade.bat* for Windows platforms.

**WASPreUpgrade.sh command syntax for Linux and UNIX-based platforms**

The command syntax is as follows:

```

WASPreUpgrade.sh backupDirectory
                  currentWASDirectory
                  [adminNodeName]
                  [-nameServiceHost host_name [-nameServicePort port_number ]]
                  [-import xmiDataFile ]
                  [-traceString trace_spec [-traceFile file_name ]]

```

**WASPreUpgrade.bat command syntax for Windows platforms**

```

WASPreUpgrade backupDirectory
              currentWASDirectory
              [adminNodeName]
              [-nameServiceHost host_name [-nameServicePort port_number ]]
              [-import xmiDataFile ]
              [-traceString trace_spec [-traceFile file_name ]]

```

**Parameters**

The first two arguments are required and positional. The third argument is required and positional only when upgrading from WebSphere Application Server, Version 3.5.x or Advanced Edition, Version 4.0.x.

Supported arguments include:

**adminNodeName**

Optional, positional name of the node containing the administrative server for the currently installed product. The value of this argument must match the node name given in the topology tree on the Topology tab of the administrative console for the currently installed product. The WASPreUpgrade tool calls the XMLConfig tool using this parameter. This parameter is only required when upgrading from



WebSphere Application Server Standard Edition, Version 3.5.x, WebSphere Application Server Advanced Edition, Version 3.5.x, or WebSphere Application Server Advanced Edition, Version 4.0.x.

No equivalent parameter is available in the silent installation options response file.

### **backupDirectory**

Required positional name of the directory in which the WASPreUpgrade tool stores the saved configuration and files, and from which the WASPostUpgrade tool later reads the configuration and files. The WASPreUpgrade tool creates the directory if the directory does not already exist.

This parameter is equivalent to the `-W PMEMigrationInformationPanel.migrationBackupDir="/tmp/migrationbackup"` parameter in the silent installation options response file.

### **currentWASDirectory**

Required positional name of the installation root for the current V3.5.x, V4.x, or V5.0.x installation. This version can be either WebSphere Application Server Standard Edition, V3.5.x, WebSphere Application Server Advanced Edition, V3.5.x, any form of WebSphere Application Server, V4.0.x, and any form of V5.0.x, including WebSphere Application Server - Express.

This parameter is equivalent to the `-W PME_PreviousVersionPanel.selectedVersionInstallLocation="/opt/WebSphere/AppServer"` parameter in the silent installation options response file.

### **-import xmiDataFile**

The name of the WebSphere Application Server Advanced Single Server Edition, Version 4.0 XML Metadata Interchange (XMI) configuration file to process. This parameter is optional because the program uses the `config\server-cfg.xml` file by default.

When migrating a configuration that uses anything other than the default `server-cfg.xml` file name, you must use the `-import` option along with a path to point to the non-default XMI configuration file. You also must use the `-import` and `path` option when running the WASPostUpgrade tool later, to point to the non-default XMI configuration file in the directory created by the WASPreUpgrade tool.

This parameter is equivalent to the `-W PMEMigrationInformationPanel.selectedVersionConfigFile="/opt/WebSphere/AppServer/config/server-cfg.xml"` parameter in the silent installation options response file.

### **-nameServiceHost -nameServicePort**

When specified, the WASPreUpgrade tool passes these optional parameters to the XMLConfig tool. Use these parameters to override the default host name and port number used by the XMLConfig tool.

No equivalent parameter is available in the silent installation options response file.

### **-traceString trace\_spec -traceFile file\_name**

Optional parameters to gather trace information for IBM Service personnel. Specify a trace specification of `"*=all=enabled"` (with quotation marks) to gather all trace information.

No equivalent parameter is available in the silent installation options response file.

## **Logging**

The WASPreUpgrade tool displays status to the screen while it runs. The tool also saves a more extensive set of logging information in the `backup` directory. You can view the `WASPreUpgrade.log` file with a text editor.

## **Migrating from V3.5.x Standard Edition or Advanced Edition, or from V4.0.x Advanced Edition**

The following example specifies a backup directory named `backupDirectory`, and identifies the root of the existing installation as `d:\WebSphere\AppServer`.

```
WASPreUpgrade backupDirectory d:\WebSphere\AppServer yourNodeName
```

## Migrating from V4.0.x Advanced Single Server Edition with multiple backup directories

This example shows how to migrate incrementally, to migrate separate configuration files from a single node with a single installation of WebSphere Application Server Advanced Single Server Edition. To migrate more than one configuration file, you must run the WASPreUpgrade tool multiple times to multiple backup directories because not all of the applications are in the same `installedApps` directory. For this reason, using a single backup directory for all runs of the WASPreUpgrade tool is not recommended. Use a separate backup directory for each run. The intent of this example is to show how to migrate a single node with multiple configuration files.

1. Run the following WASPreUpgrade commands to migrate applications A, B, C, D, and E, which reside in three separate application directories. Server assumptions include:

- The Application Server uses the default configuration file, `server-cfg.xml`, as well as `myServer1-cfg.xml` and `OldServer-cfg.xml`.

```
> WASPreUpgrade C:\WAS4ABBACKUP G:\WebSphere\AppServer
> WASPreUpgrade C:\WAS4CDBACKUP G:\WebSphere\AppServer
  -import G:\WebSphere\AppServer\config\myServer1-cfg.xml
> WASPreUpgrade C:\WAS4EBACKUP G:\WebSphere\AppServer
  -import G:\WebSphere\AppServer\config\OldServer-cfg.xml
```

2. Run the following WASPostUpgrade commands to restore the applications and configurations to the Version 5 Application Server:

```
> WASPostUpgrade C:\WAS4ABBACKUP
> WASPostUpgrade C:\WAS4CDBACKUP -import C:\WAS4CDBACKUP\myServer1-cfg.xml
> WASPostUpgrade C:\WAS4EBACKUP -import C:\WAS4EBACKUP\OldServer-cfg.xml
```

## Migrating from V5.0.0 or V5.0.1 with the embedded messaging feature

This example shows how to migrate a single instance of base WebSphere Application Server, V5.0.0. Verify that you have stopped all Java processes related to the WebSphere Application Server product that you are migrating. Run the WASPreUpgrade tool against the `installedApps` directory.

1. Run the following WASPreUpgrade.bat command to migrate all applications in the `installedApps` directory of the V5.0.0 Application Server, which has an installation root of `C:\Program Files\WebSphere\AppServer`.

```
> WASPreUpgrade C:\WAS500BACKUP C:\Program Files\WebSphere\AppServer
```

2. Run the following WASPostUpgrade commands to restore the applications and configurations to the Version 5 Application Server:

```
> WASPostUpgrade C:\WAS500BACKUP
```

### WASPostUpgrade command:

The **WASPostUpgrade** command is a migration tool for adding the configuration and applications of a previous version or release to a Version 5.1 WebSphere Application Server node. The configuration includes migrated applications. The tool adds all migrated applications into the `install_root/installedApps` directory for the Version 5.1 installation. The tool locates the saved configuration that the WASPreUpgrade tool saves through a parameter you use to specify the *backup* directory.

### Location of command file

The command file is located in the `install_root/bin` directory. The command file is a script named `WASPostUpgrade.sh` for Linux and UNIX-based platforms or `WASPostUpgrade.bat` for Windows platforms.

### WASPostUpgrade.sh command syntax for Linux and UNIX-based platforms

The command syntax is as follows:

```
WASPostUpgrade.sh backupDirectory
                  [-import xmi_data_file]
                  [-cellName cell_name]
```

```

[-nodeName node_name]
[-serverName server_name]
[-webModuleAdditionalClasspath classpath]
[-documentRootLimit number]
[-substitute "key1=value1 [key2=value2; [...]]"]]
[-portBlock port_starting_number]
[-backupConfig true | false]
[-replacePorts true | false]
[[-traceString trace_spec [-traceFile file_name]]]

```

The first argument is required.

### WASPostUpgrade.bat command syntax for Windows platforms

WASPostUpgrade *backupDirectory*

```

[-import xmi_data_file]
[-cellName cell_name]
[-nodeName node_name]
[-serverName server_name]
[-webModuleAdditionalClasspath classpath]
[-documentRootLimit number]
[-substitute "key1=value1 [key2=value2; [...]]"]]
[-portBlock port_starting_number]
[-backupConfig true | false]
[-replacePorts true | false]
[[-traceString trace_spec [-traceFile file_name]]]

```

The first argument is required.

### Parameters

Supported arguments include:

#### **-backupConfig true | false**

An optional parameter used to back up the existing configuration of the Version 5.1 instance before adding the saved configuration from the earlier release to the Version 5.1 instance. The default is true, to use the **backupConfig** command to save a copy of the Version 5.1 configuration into the `install_root/temp` directory. Use the **restoreConfig** command to restore that configuration as required.

No equivalent parameter is available in the silent installation options response file.

#### **backupDirectory**

Required name of the directory in which the WASPreUpgrade tool stores the saved configuration and files. The WASPostUpgrade tool reads the configuration and files stored in this directory. The WASPreUpgrade tool creates this directory if it does not already exist.

This parameter is equivalent to the `-W PMEMigrationInformationPanel.migrationBackupDir="/tmp/migrationbackup"` parameter in the silent installation options response file.

#### **-cellName *cell\_name***

An optional parameter to specify the cell name for the program to update. If not specified, the program inspects the configuration for cell names. When one cell name exists, the program uses it. Otherwise, the program returns an error.

This parameter is equivalent to the `-W nodeNameBean.cellName="nodenameNetwork"` parameter in the silent installation options response file for the Network Deployment product. No equivalent parameter is available in the silent installation options response file for the base product or the WebSphere Business Integration Server Foundation product.

#### **-documentRootLimit *number***

An optional parameter to specify the number of files that the program copies from the document-root field of Web-application. It is only applicable to Version 3.5.x upgrades. If not specified, the default is 300.

No equivalent parameter is available in the silent installation options response file.

**-import** *xmi\_data\_file*

The name of the WebSphere Application Server Advanced Single Server Edition, Version 4.0 XML Metadata Interchange (XMI) configuration file to process. This parameter is optional because the program uses the `config\server-cfg.xml` file by default.

This parameter is ignored when migrating from V5.0.x, including WebSphere Application Server-Express, V5.

When migrating a configuration that uses anything other than the default `server-cfg.xml` file name, you must use the `-import` option along with the path to the non-default XMI configuration file in the directory created by the WASPreUpgrade tool.

This parameter is equivalent to the `-W PMEMigrationInformationPanel.selectedVersionConfigFile="/opt/WebSphere/AppServer/config/server-cfg.xml"` parameter in the silent installation options response file.

**-nodeName** *node\_name*

An optional parameter to specify the node name for the program to update. If not specified, the program inspects the configuration for node names. When one node name exists, the program uses it. Otherwise, the program returns an error.

This parameter is equivalent to the `-W nodeNameBean.nodeName="nodenameManager"` parameter in the silent installation options response file for the Network Deployment product. No equivalent parameter is available in the silent installation options response file for the base product or the WebSphere Business Integration Server Foundation product.

**-portBlock** *port\_starting\_number*

An optional parameter used to specify the starting value to use when creating ports.

No equivalent parameter is available in the silent installation options response file.

**-replacePorts** *true | false*

An optional parameter used to define how to migrate virtual host and server transport ports. The default is `false`, to not replace default port definitions. By default the migration adds configuration data from the previous version to the existing data in the V5.1.x configuration. In some cases existing port definitions from the earlier release were carefully set to avoid port conflicts with other products. In such cases, it is likely that you would want to migrate the settings into V5.1.x. Use the `-replacePorts` parameter to totally replace settings in the V5.1.x environment with the settings from the previous version. Select `true` to replace all virtual host alias port settings during migration. If migrating from V5.0.x or later, transport settings in existing servers are replaced by the settings from the previous version.

**-serverName** *server\_name*

An optional parameter to specify the server name for the program to update. If not specified, the program inspects the configuration for server names. When one server name exists, with an Application Server name that matches, the program uses it. Otherwise, the program creates a new server.

**-substitute** *key1=value1;key2=value2;...*

Optional argument passed to the XMLConfig tool. Specify values for security variables to substitute (for example, `-substitute "NODE_NAME=admin_node;APP_SERVER=default_server"`).

In the input XML data file, each key appears as `$key$` for substitution. This argument substitutes any occurrence of `$NODE_NAME$` with `admin_node` and `$APP_SERVER$` with `default_server` in the input XML file.

If the substitution string contains semicolons, use `$semiColon$` to distinguish the string from the `;"` delimiter. On Linux and UNIX-based platforms, add an escape character to each dollar sign (\$) within the substitution string (for example, `\$semiColon\$`).

This parameter is applicable for configurations saved from Advanced Edition, Versions 3.5.x and 4.0.x.

No equivalent parameter is available in the silent installation options response file.

**-traceString** *trace\_spec* **-traceFile** *file\_name*

An optional parameters to gather trace information for IBM Service personnel. Specify a trace specification of `"*=all=enabled"` (with quotation marks) to gather all trace information.

No equivalent parameter is available in the silent installation options response file.

**-webModuleAdditionalClasspath** *classpath*

An optional parameter to specify the path or the path and file names of specific directories or files that you do not want copied into the Web archive (WAR) file. Instead, the program adds the paths and the files to the Web Module extension (`ibm-web-ext.xmi`) `additionalClassPath` attribute. This parameter is applicable only when migrating a Version 3.5.x installation.

No equivalent parameter is available in the silent installation options response file.

## Logging

The WASPostUpgrade tool displays status to the screen while running. This tool also saves a more extensive set of logging information in the `logs` directory. You can view the `WASPostUpgrade.log` file with a text editor.

## Migrating from V3.5.x Standard Edition or Advanced Edition, or from V4.0.x Advanced Edition

The following example specifies a backup directory named `backupDirectory`, and identifies the root of the existing installation as `d:\WebSphere\AppServer`.

```
WASPreUpgrade backupDirectory d:\WebSphere\AppServer yourNodeName
```

## Migrating from V4.0.x Advanced Single Server Edition with multiple backup directories

This example shows how to migrate separate configuration files incrementally from a single node with a single installation of WebSphere Application Server Advanced Single Server Edition. To migrate more than one configuration file, you must run the WASPreUpgrade tool multiple times to multiple backup directories because not all of the applications are in the same `installedApps` directory. For this reason, using a single backup directory for all the runs of the WASPreUpgrade tool is not recommended. Use a separate backup directory for each run. The intent of this example is to show how to migrate a single node with multiple configuration files.

1. Run the following WASPreUpgrade commands to migrate applications A, B, C, D, and E, which reside in three separate application directories. Server assumptions include:

- The Application Server uses the `server-cfg.xml` default configuration file, as well as the `myServer1-cfg.xml` and the `OldServer-cfg.xml` files.

```
> WASPreUpgrade "C:\WAS4ABBACKUP" G:\WebSphere\AppServer
> WASPreUpgrade "C:\WAS4CDBACKUP" G:\WebSphere\AppServer
  -import G:\WebSphere\AppServer\config\myServer1-cfg.xml
> WASPreUpgrade "C:\WAS4EBACKUP" G:\WebSphere\AppServer
  -import G:\WebSphere\AppServer\config\OldServer-cfg.xml
```

2. Run the following WASPostUpgrade commands to restore the applications and configurations to the Version 5.1 Application Server:

```
> WASPostUpgrade C:\WAS4ABBACKUP
> WASPostUpgrade "C:\WAS4CDBACKUP" -import "C:\WAS4CDBACKUP\myServer1-cfg.xml"
> WASPostUpgrade "C:\WAS4EBACKUP" -import "C:\WAS4EBACKUP\OldServer-cfg.xml"
```

## Migrating from V5.0.0 or V5.0.1 with the embedded messaging feature

This example shows how to migrate a single instance of base WebSphere Application Server, V5.0.0. Verify that you have stopped all Java processes related to the WebSphere Application Server product that you are migrating. Run the WASPreUpgrade tool against the `installedApps` directory.

1. Run the following WASPreUpgrade.bat command to migrate all applications in the installedApps directory of the V5.0.0 Application Server, which has an installation root of C:\Program Files\WebSphere\AppServer.  
> WASPreUpgrade "C:\WAS500BACKUP" C:\Program Files\WebSphere\AppServer
2. Run the following WASPostUpgrade commands to restore the applications and configurations to the Version 5 Application Server:  
> WASPostUpgrade "C:\WAS500BACKUP"

## Adding or changing features on a federated node

This task describes a manual procedure workaround for changing features on a federated node that you are migrating .

When migrating a federated node, the configuration on the base node is owned by the deployment manager and cannot be changed. It is always true that you must unfederate a node before adding features. When you unfederate the node, you lose any of the configuration for the node that you performed with the administrative console of the deployment manager while the node was federated. After installing additional features, add the node back to the cell to cause the deployment manager to add the configuration of the base node. When migrating a node, always select the same features for the new node that are in the existing node. Adding or changing features can cause configuration problems in a federated node.

If you intend to install additional features, use the following procedure to avoid component regression problems. It is important that you understand that there is no way to add features to a base node without unfederating it from its cell and losing its configuration. The configuration for the base node is restored back to its original configuration, before it was federated and before you changed it with the administrative console of the deployment manager. This means that you will lose the configuration for any additional servers that you created on the base node from the deployment manager. (The additional servers will not exist any more.) You will lose any other configuration you performed from the deployment manager administrative console. Although you can use the **backupConfig** command to save the configuration, you cannot restore it with the **restoreConfig** command because the configuration you restore does not include any features that you add to the base node.

You can use the **backupConfig** command to save the Network Deployment configuration so that you can restore it if necessary. You can also refer to the configuration as you use the administrative console of the deployment manager to reconfigure the base node.

If the node you are migrating is part of a deployment manager cell, install Network Deployment, Version 5.1 without selecting the migration option. Then install Integration Server to extend the deployment manager. Select the migration option during the installation of the Integration Server. Follow the procedure described in ae/tins\_migratend50xw.dita to install and migrate the deployment manager and Integration Server before continuing this procedure. The deployment manager node must always be at the highest release level within the cell.

Use the following procedure to unfederate the V5.0.x node, so that you can add or change features during the migration of the cell to V5.1.

1. Cancel the installation of the base WebSphere Application Server, if you have already begun the installation.
  - a. Click **Cancel**. Confirm that you intend to cancel the installation.
  - b. Open a command window and change directories to the V5.0.x install\_root/bin directory.
2. Unfederate the node. Use the removeNode.sh or the removeNode.bat script. For example, use the following command to remove the node on a Linux platform:  
./removeNode.sh

Wait for the successful conclusion of the command.



3. Optional: Uninstall the V5.0.x node. Click the platform-specific uninstalling procedure in the topic to remove product artifacts from the machine. Verify that you are manually removing artifacts from the V5.0.x node and not another installation instance that might be on the machine. Leave files related to the embedded messaging feature if other installation instances also use embedded messaging.
4. Install the product. Select the custom installation type. Select any features you intend to use.
5. Verify the installation of the Application Server. Use the First Steps tool when it appears at the end of installing the product, or run the installation verification test yourself, if the First Steps tool does not appear for some reason.
6. Verify that the deployment manager is running. If it is not, start the deployment manager with the `startManager.sh` or the `startManager.bat` script, issued from the `install_root/bin` directory of the deployment manager node.
7. Add the V5.x node to the deployment manager cell. Open a command window and change directories to the V5.x `install_root/bin` directory of the base WebSphere Application Server product. Use the `addNode.sh` or the `addNode.bat` script to federate the V5.1 node. For example, use the following command to add the node on a Linux platform:
 

```
./addNode.sh deploymgrNode 8879 -includeapps
```

Use the name of the deployment manager node in place of the `deploymgrNode` variable in this example. Use the `-includeapps` parameter to copy all V5.1 Sample applications to the deployment manager. The default port is SOAP port 8879, which must match the deployment manager port. Wait for the successful conclusion of the command.

The **addNode** command starts the nodeagent process for the V5.1 node.
8. Start the messaging service provider if the embedded messaging server feature is installed. Use the `startServerer.sh` or the `startServer.bat` script from the `install_root/bin` directory of the V5.1 Application Server. For example, use the following command on a Linux platform:
 

```
./startServer.sh jmsserver
```
9. Use the administrative console of the deployment manager to configure the base node.

You can install additional features on a federated node by unfederating the V5.0.x node, uninstalling fix packs and interim fixes, and reinstalling the node with additional features. Adding features to a federated node always involves removing the node from the cell, which loses the cell-controlled configuration. If the deployment manager is at a later release level, such as V5.1, uninstall the V5.0.x node if you must add features and install a V5.1 node. Configure the V5.1 node manually with the administrative console to achieve the intended configuration.

Return to Migrating configuration data to continue.

## Coexistence support

*Coexistence*, as it applies to WebSphere Application Server products, is the ability of multiple installations of WebSphere Application Server to run on the same machine at the same time. Multiple installations include multiple versions and multiple instances of one version. Coexistence also implies various combinations of Web server interaction.

Version 5.x WebSphere Application Server products can coexist with the following supported versions. The installation wizard looks for these existing installations to determine if it should prompt for coexistence information:

- IBM WebSphere Application Server Standard Edition and Advanced Edition, Version 3.5.5 and up
- IBM WebSphere Application Server Advanced Server Single Edition and Advanced Edition, Version 4.0.2 and later
- IBM WebSphere Business Integration Server Foundation Edition, Version 4.1 and later
- IBM WebSphere Application Server, Version 5.0.0 and later
- IBM WebSphere Application Server Network Deployment, Version 5.0.0 and later
- IBM WebSphere Application Server Enterprise, Version 5.0.0 and later
- IBM WebSphere Application Server, Version 5.1.0

- IBM WebSphere Application Server Network Deployment, Version 5.1.0
- IBM WebSphere Business Integration Server Foundation, Version 5.1.0

All combinations of V3.5.x products, V4.x products, and V5.x products can coexist so long as there are no port conflicts. There are some coexistence limitations for V5 products that have the embedded messaging feature installed, as described later. These limitations are described as *No EM* in the following description.

V3.5.5 and later and V4.0.2 and later can coexist with the Version 5.1 WebSphere Application Server clients:

*Table 52. Multiversion WebSphere Application Server clients coexistence scenarios.*

<b>Installed product</b>	<b>WebSphere Application Server clients, V5.1</b>
IBM WebSphere Application Server Standard Edition, Version 3.5.5 and later	No EM
IBM WebSphere Application Server Advanced Edition, Version 3.5.5 and later	No EM
IBM WebSphere Application Server Advanced Single Server Edition, Version 4.0.2 and later	No EM
IBM WebSphere Application Server Advanced Edition, Version 4.0.2 and later	No EM
IBM WebSphere Business Integration Server Foundation Edition, Version 4.1 and later	No EM
IBM WebSphere Application Server, Version 5.0.0	No EM
IBM WebSphere Application Server Network Deployment, Version 5.0.0	No EM
IBM WebSphere Business Integration Server Foundation, Version 5.0.0	No EM
IBM WebSphere Application Server, Version 5.0.1	No EM
IBM WebSphere Application Server Network Deployment, Version 5.0.1	No EM
IBM WebSphere Business Integration Server Foundation, Version 5.0.1	No EM
IBM WebSphere Application Server, Version 5.0.2	Supported
IBM WebSphere Application Server Network Deployment, Version 5.0.2	Supported
IBM WebSphere Business Integration Server Foundation, Version 5.0.2	Supported
IBM WebSphere Application Server clients, Version 5.0.2	Supported
IBM WebSphere Application Server, Version 5.1	Supported
IBM WebSphere Application Server Network Deployment, Version 5.1	Supported
IBM WebSphere Business Integration Server Foundation, Version 5.1	Supported

V3.5.5 and later products and V4.0.2 and later products can coexist with V5.x products:

Table 53. Multiversion coexistence scenarios

Installed product	V5.0.0 and V5.0.1			V5.0.2 and V5.1			
	Application Server	Network Deployment	Enterprise	Application Server	Network Deployment	Enterprise V5.0.2	Integration Server
Standard Edition V3.5.5 and later	Supported	Supported	Supported	Supported	Supported	Supported	Supported
Advanced Edition V3.5.5 and later	Supported	Supported	Supported	Supported	Supported	Supported	Supported
Advanced Single Server Edition V4.0.2 and later	Supported	Supported	Supported	Supported	Supported	Supported	Supported
Advanced Edition V4.0.2 and later	Supported	Supported	Supported	Supported	Supported	Supported	Supported
Enterprise Edition V4.1 and later	Supported	Supported	Supported	Supported	Supported	Supported	Supported
WebSphere Application Server clients V4.0.x	No EM	No EM	No EM	No EM	No EM	No EM	No EM
WebSphere Application Server, V5.0.0	Supported	Supported	Supported	No EM	No EM	No EM	No EM
Network Deployment V5.0.0	Supported	Supported	Supported	No EM	No EM	No EM	No EM
Enterprise, V5.0.0	Supported	Supported	Supported	No EM	No EM	No EM	No EM
WebSphere Application Server clients V5.0.0	Supported	Supported	Supported	No EM	No EM	No EM	No EM
WebSphere Application Server V5.0.1	Supported	Supported	Supported	No EM	No EM	No EM	No EM
Network Deployment V5.0.1	Supported	Supported	Supported	No EM	No EM	No EM	No EM
Enterprise V5.0.1	Supported	Supported	Supported	No EM	No EM	No EM	No EM
WebSphere Application Server clients V5.0.1	Supported	Supported	Supported	No EM	No EM	No EM	No EM
WebSphere Application Server V5.0.2	No EM	No EM	No EM	Supported	Supported	Supported	Supported

Table 53. Multiversion coexistence scenarios (continued)

Installed product	V5.0.0 and V5.0.1			V5.0.2 and V5.1			
	Application Server	Network Deployment	Enterprise	Application Server	Network Deployment	Enterprise V5.0.2	Integration Server
Network Deployment V5.0.2	No EM	No EM	No EM	Supported	Supported	Supported	Supported
Enterprise V5.0.2	No EM	No EM	No EM	Supported	Supported	Supported	Supported
WebSphere Application Server clients V5.0.2	No EM	No EM	No EM	Supported	Supported	Supported	Supported
WebSphere Application Server V5.1	No EM	No EM	No EM	Supported	Supported	Supported	Supported
Network Deployment V5.1	No EM	No EM	No EM	Supported	Supported	Supported	Supported
Integration Server V5.1	No EM	No EM	No EM	Supported	Supported	Supported	Supported
WebSphere Application Server clients V5.1	No EM	No EM	No EM	Supported	Supported	Supported	Supported

**No EM:** This status in the preceding tables describes an incompatibility between the embedded messaging features in different levels of Version 5. Version 5.0.0 and V5.0.1 support the embedded messaging feature at a service level less than CSD04, which is what V5.0.2 and V5.1 support. Because all V5 instances that coexist on a machine must use the same level of embedded messaging, there is a coexistence problem when two V5 instances use different levels of embedded messaging. If you want V5.0.0 to coexist with V5.1, for example, upgrade V5.0.0 to V5.0.2 by applying Fix Pack 2. See *Upgrading V5.0.0 or V5.0.1 to V5.0.2*.

In addition to multiversion coexistence, WebSphere Application Server also lets you install multiple times on one machine (multiple installation instances), or install once and have multiple configurations (multiple configuration instances).

Multiple Version 5 instances on one machine include:

- Multiple Application Server instances from multiple installations of the base WebSphere Application Server product
- Multiple Application Server configuration instances from a single installation of the base product
- Multiple Application Server configuration instances from a single installation of the base product
- Multiple deployment manager instances from multiple installations of the Network Deployment product
- Multiple deployment manager configuration instances from a single installation of the Network Deployment product
- Multiple deployment manager configuration instances from a single installation of the Network Deployment product

See “Federating multiple Version 5 installation instances” on page 410 for information about mixed node cells, where a Version 5.1 deployment manager cell can include Version 5.0.x base nodes.

## Setting up Version 3.5.x and Version 5 coexistence

You must migrate prerequisite and corequisite programs to the levels required by WebSphere Application Server, Version 5. You must also identify ports in use in Version 3.5.x before you begin the Version 5 installation, to avoid possible conflicts during coexistence. The first two steps in this task describe these activities.

You can install WebSphere Application Server Version 3.5.5 (and later) and Version 5 on the same node. When the Version 5 installation wizard detects the Version 3.5.x installation, it displays the migration and coexistence panel, where you can select either option, or neither option. If you select coexistence, the installation wizard displays the port number panel, to ensure you install Version 5 without port conflicts.

Silent installation also supports configuring for coexistence silently. You can specify non-conflicting port assignments in the options response file.

By default, there are port conflicts between Version 3.5.x and Version 5 that you must resolve. Also, if you migrate more than two Version 3.5.5 nodes to Version 5, there are port conflicts that you must resolve, as described in the *Setting up Version 5 coexistence* topic.

1. Migrate prerequisite and corequisite programs to the levels required by WebSphere Application Server, Version 5.

Refer to the IBM WebSphere Application Server supported hardware, software, and APIs site for current requirements.

2. Resolve port conflicts.

Refer to the Port number settings in WebSphere Application Server versions topic to see a list of default port numbers, and where they are defined.

Inspect the configuration of the Version 3.5.x product, either WebSphere Application Server Advanced Edition, or WebSphere Application Server Standard Edition.

If necessary, use the following command to examine existing node and port settings when the administrative server is running.

```
xmlConfig -export config.xml -nodeName theNodeName
```

Review the output xml file to look for `<node action="update" name="nodename">` to determine the node name. You can also find port number assignments in the output.xml file. The installation wizard displays a default set of coexistence port numbers as suggested Version 5 port numbers. Change the values to ports that are not in use. The installation wizard uses whatever values you approve.

Change conflicting HTTP transport ports manually, if necessary.

3. Associate a Web server with each WebSphere Application Server:

- Use a separate Web server for each WebSphere Application Server.
  - a. Create a Web server instance using the Web server documentation.
  - b. Select the appropriate Web server plug-in feature during WebSphere Application Server installation, and identify the Web server configuration file location. (For example, identify the location of the httpd.conf file for IBM HTTP Server.)
- Use the same Web server for both WebSphere Application Server versions.

Upgrade the Web server to the common level supported by both versions of the Application Server.

Prepare the same Web server to support both Application Server versions:

- Migrate IBM HTTP Server, as described in the "Migrating IBM HTTP Server to support multiple WebSphere Application Server versions" (tins\_websIHS) topic in the base WebSphere Application Server information center.
- Migrate iPlanet, now known as the Sun ONE Web server (tins\_websiPI).
- Migrate Lotus Domino (tins\_websDom).
- Migrate Microsoft IIS (tins\_websIIS).

4. Fix any problems with environmental variables on Windows platforms.

For example, installing WebSphere Application Server, Version 5 updates the system variable PATH, potentially affecting tools with the same name across installations. To run tools with conflicting names, alter the PATH environment variable in a command window and place the directory for the former installation before the directory for the latter installation. For example, PATH=E:\WebSphere\AppServer\35\bin;%PATH%. Then, invoke the tools from the bin directory.

Return to Migrating from, or coexisting with a previous version to continue.

## Setting up Version 4.0.x and Version 5.x coexistence

You must migrate prerequisite and corequisite programs to the levels required by WebSphere Application Server, Version 5.x. You must also identify ports in use in Version 4.0.x before you begin the Version 5.x installation, to avoid possible conflicts during coexistence. The first two steps in this task describe these activities.

You can install WebSphere Application Server Version 4.0.x and Version 5 on the same node. When the Version 5 installation wizard detects the Version 4.0.x installation, it displays the migration and coexistence panel, where you can select either option, both options, or neither option. If you select coexistence, the installation wizard displays the coexistence panel to ensure you install Version 5 without port conflicts.

Silent installation also supports configuring for coexistence silently. You can specify non-conflicting port assignments in the options response file.

By default, there are port conflicts between Version 4.0.x and Version 5 that you must resolve. Also, if you migrate more than two Version 4.0.x nodes to Version 5, there are port conflicts that you must resolve, as described in the *Setting up Version 5 coexistence* topic.

1. Migrate prerequisite and corequisite programs to the levels required by WebSphere Application Server, Version 5.

Refer to the IBM WebSphere Application Server supported hardware, software, and APIs site for current requirements.

2. Resolve port conflicts.

Refer to the Port number settings in WebSphere Application Server versions topic to see a list of default port numbers, and where they are defined.

Inspect the configuration of the previous version:

- **For WebSphere Application Server Advanced Single Server Edition, Version 4.0.x:** Inspect the server-cfg.xml file to get port values for the configuration.
- **For WebSphere Application Server Advanced Edition, Version 4.0.x:** Inspect the admin.config file to get port values for the configuration. When the administrative server is running, use this command:

```
xmlConfig -export config.xml -nodeName theNodeName
```

Review the config.xml file to look for <node action="update" name="nodename"> to find the appropriate node and port number assignments in the file. The installation wizard displays a default set of coexistence port numbers as suggested Version 5 port numbers. Change the values to ports that are not in use. The installation wizard uses whatever values you approve.

Change conflicting HTTP transport ports manually, if necessary.

3. Associate a Web server with each WebSphere Application Server.
  - Use a separate Web server for each WebSphere Application Server.
    - a. Create a Web server instance using the Web server documentation.
    - b. Select the appropriate Web Server plug-in feature during WebSphere Application Server installation, and identify the Web server configuration file location. (For example, identify the location of the httpd.conf file for IBM HTTP Server.)
  - Use the same Web server for both WebSphere Application Server versions.



To use the same Web server for both Application Server versions, you must first upgrade the Web server to the common level supported by both versions of the application server.

Follow this procedure to use the same Web server for both WebSphere Application Server versions.

- a. Select the appropriate Web Server plug-in feature during WebSphere Application Server installation, and identify the Web server configuration file location. (For example, identify the location of the `httpd.conf` file for the IBM HTTP Server that is associated with Version 4.0.x.)
- b. Edit the Web server configuration file to remove entries for Version 4.0.x, as described in the *Migrating plug-ins, one machine at a time* (`tins_websmig2`) topic in the base Application Server information center.

The WebSphere Application Server, Version 5 plug-in acts as the routing agent to route requests to both versions.

- c. Generate the plug-in configuration files for both versions of the Application Server.
- d. Edit the Version 4.0.x `plugin-cfg.xml` file and the Version 5 `plugin-cfg.xml` file, to merge their entries into a combined file of all Web context roots.

Web context roots must be unique across Application Server versions. If there is a common context root across versions, requests are served by the plug-in instance that was last loaded.

If you have both Version 4.0.x Samples and Version 5 Samples in the file, you can access only the Version 5 Samples after merging the configuration files because there is one context root for Samples.

Whenever you modify the `plugin-cfg.xml` file for either version, you must manually merge the files again, to make a master file.

This is described in the *Preparing to install and configure a Web server* (`tins_webserver`) topic in the base Application Server information center.

Whenever you modify the `plugin-cfg.xml` file for either version, you must manually merge the files again, to make a master file.

- e. Replace the original `plugin-cfg.xml` file of the Version 5 installation with the master file.
4. Fix any problems with environmental variables on Windows platforms. For example, installing WebSphere Application Server, Version 5.1 updates the system variable `PATH`, potentially affecting tools with the same name across installations. To run tools with conflicting names, alter the `PATH` environment variable in a command window and place the directory for the former installation before the directory for the latter installation. For example, `PATH=E:\WebSphere\AppServer\40\bin;%PATH%`. Then, invoke the tools from the `bin` directory.

Return to *Migrating from, or coexisting with a previous version* to continue.

## Setting up Version 5 coexistence

This task describes how to install a Version 5.1 product to coexist with another installation instance of Version 5.1 or Version 5.0.x.

After installing the WebSphere Application Server product, you can install it again on the same machine.

You can also install the WebSphere Business Integration Server Foundation product multiple times on the same machine to support different installation instances of the base WebSphere Application Server product or the Network Deployment product.

Select the new installation option from the installation wizard panel, to install a new instance instead of adding features to the last installation, and to install into a separate installation directory. Select the coexistence option to provide nonconflicting ports.

Each installation of the base product is a stand-alone Application Server (`server1`) with its own set of unique configuration files.

Each installation of the Network Deployment product is a stand-alone deployment manager (dmgr) with its own set of unique configuration files for its cell.

Be aware of multiple instance limitations, between:

- Incompatible service levels of the embedded messaging feature.

If you attempt to install V5.0.2 or V5.1 when V5.0.0 or V5.0.1 with the embedded messaging feature is already on the machine, you cannot select the embedded messaging feature. An incompatibility exists between the service level versions of embedded messaging. The level of embedded messaging for V5.0.0 and V5.0.1 differs from the level supported on V5.0.2 and V5.1. Upgrade the V5.0.0 or V5.0.1 node to V5.0.2 before installing another instance of V5.0.2 or V5.1.

- The base WebSphere Application Server product and the Network Deployment product.

The deployment manager and the Application Server have two port conflicts in the default configuration settings for both products. Each product is configured to use port 9090 as the administrative console port and port 9043 as the administrative console secure port by default. It is not recommended that you run both the deployment manager and the Application Server on the same production machine, unless you have a machine with the capacity to handle the cumulative requirements of both products. However, if you do so, select the coexistence option during installation to change these port settings. There are no other port conflicts if you install a total of two instances, one base WebSphere Application Server product and one Network Deployment product.

If you install more than two instances, the third and subsequent installations require that you change all port numbers on the coexistence panel, to avoid potential conflicts.

- The base WebSphere Application Server product and another installation of the base WebSphere Application Server product, or the Network Deployment product and another installation of the Network Deployment product.

You can install another instance of either product, by selecting to do so at the prompt, and by changing the installation directory.

The most recent installation is the only one in the operating system registry.

If you install more than two total instances of either product (more than one of each, or two of either and none of the other), the third and subsequent installations require that you change all port numbers on the coexistence panel to avoid potential conflicts.

To uninstall a product instance, always use the operating system remove program function, such as the Add/Remove program on Windows platforms. To uninstall an unregistered instance, use the **Uninstall.exe** or **uninstall** command in the `_uninstall` directory of the `install_root` that matches the instance you intend to remove.

Reasons to use multiple installation instances include:

- You can achieve complete isolation between each WebSphere Application Server instance. You can uninstall one instance independently of the others.
- You can federate each installation instance of the base WebSphere Application Server product to a deployment manager cell.
- You can install the base WebSphere Application Server more than once on the same machine.
- You can install Network Deployment more than once on the same machine.
- You can install V5.0.x Network Deployment and the V5.1 product on the same machine. There are some limitations involving the embedded messaging feature. The level of embedded messaging for V5.0.0 and V5.0.1 differs from the level supported on V5.0.2 and V5.1.

Reasons to not use multiple installation instances include:

- The machine might have a hard disk space constraint.
- You can use the operating system registry to locate the last installed instance of a WebSphere Application Server product only.

When you install any product a second time, the last installation is the one that appears in the registry.

- Uninstalling the last instance removes any record of the product in the registry.

Suppose you have installed three instances of the base WebSphere Application Server product. You use the remove program function of the operating system to uninstall the registered third copy of the

base product. A registry record no longer exists that indicates the existence of the other two installation instances. Other applications cannot use a query of the operating system registry to detect the presence of either base WebSphere Application Server product instance.

The Creating multiple Version 5 configuration instances topic describes installing the base WebSphere Application Server product or the Network Deployment product once and creating multiple configuration instances.

Use the following procedure to install multiple installation instances.

1. Upgrade V5.0.0 or V5.0.1 with embedded messaging to V5.0.2.
2. Use the installation wizard to install another installation. If you intend to share a single Web server among installations, install a Web server plug-in feature during one installation only, as described in the next step.
3. Share a Web server among multiple installation instances.
  - a. Select a Web server plug-in feature during one installation only.
  - b. Generate the plug-in configuration files for every installation instance.
  - c. Edit the `plugin-cfg.xml` configuration files to merge them into one master configuration.
  - d. Replace the original `plugin-cfg.xml` file with the master file on the Application Server where you selected the Web server plug-in feature.

You can access samples from only one of the installation instances.

4. Federate multiple installation instances into a deployment manager cell.
5. Create additional servers in a multiple instance or coexistence environment.
6. Change port assignments in configuration files if you have a node that you cannot start because of port conflicts.

Return to Migrating from, and coexisting with a previous version to continue.

### Upgrading a Version 5.0.0 or Version 5.0.1 product to Version 5.0.2

Install Fix Pack 2 from the Support site for WebSphere Application Server, to upgrade Version 5.0.0 or Version 5.0.1 to Version 5.0.2. Upgrading to Version 5.0.2 also upgrades the service level of the embedded messaging feature to CSD04. This upgrade is important for migrating to Version 5.1, and also for coexisting with Version 5.0.2 and Version 5.1 instances. Version 5.0.0 and Version 5.0.1 cannot coexist with Version 5.0.2 and Version 5.1 when the embedded messaging feature is installed.

Apply Fix Pack 2 to the Application Server, to upgrade the service level of the embedded messaging feature.

Fix packs are available on the Support site for WebSphere Application Server. Download all of the ZIP files for Fix Pack 2 that you require. A separate ZIP file is available for the client and for each WebSphere Application Server product.

1. Locate the download page for Fix Pack 2 on the Support site. See WebSphere Application Server Version 5.0 Fix Pack 2 (Version 5.0.2) at <http://www-1.ibm.com/support/docview.wss?rs=860&context=SW600&q=Fix+Pack+2&uid=swg24005012> for information about applying Fix Pack 2.
2. Download the ZIP files for Fix Pack 2 to a read/write directory. Installing from a read-only directory is not supported at this time. The directory must have no spaces in its name.
3. Unzip the file into the directory. In addition to Fix Pack 2, the ZIP file also contains the update installer program, which you use to install the Fix Pack. The update installer program is also known as the `updateInstaller` program or the update installation wizard.
4. Use the update installer to install Fix Pack 2. Use either the wizard interface, with the **updateWizard** command, or its silent, command-line interface, with the **updateSilent** command.

5. Refer to the readme file for Fix Pack 2 to continue. The readme file is included in the ZIP file for the fix pack. There is also another readme file for update installer.

The download page for Fix Pack 2 at the Support site contains the most current version of the readme files, which you can download separately from the ZIP files for Fix Pack 2.

You can upgrade V5.0.0 or V5.0.1 to V5.0.2 by installing Fix Pack 2.

Return to Setting up Version 5 coexistence to continue.

## Federating multiple Version 5 installation instances

This article describes federating or joining a base WebSphere Application Server node to a WebSphere Application Server Network Deployment cell.

There are two ways to federate a base WebSphere Application Server node into a deployment manager cell:

- Using the deployment manager administrative console
- Using the **addNode** command line script from the `bin` directory of the node you are federating

Always use the `-includeapps` parameter of the **addNode** command unless you included the applications during a previous federation of the base WebSphere Application Server node into the cell. See the description of the **addNode** command for more information about its parameters. The administrative console also provides an option for including applications on the base node into the cell.

Federating from the deployment manager administrative console requires a running base WebSphere Application Server.

Consider a scenario where you install both the base WebSphere Application Server product and the Network Deployment product on the same development machine. Installing a production Application Server on the same machine as the deployment manager is not recommended unless the machine has the capacity to handle both jobs. To let both products run at the same time, you must install the Network Deployment product using the coexistence panel, to select ports that do not conflict with the base WebSphere Application Server ports. After installation, stop the Application Server if it is running. Start the deployment manager server. Issue the **addNode** command from the `bin` directory of the base node. The deployment manager federates the base node and instantiates the `nodeagent` server process on the base Application Server node.

A coexistence environment might have multiple base WebSphere Application Server product installations on one machine. You can federate each installation into the same cell, or into different cells. Whenever the deployment manager federates a node into its cell, it configures the `nodeagent` server process for the node with a set of default ports. If the base node has the embedded messaging feature, the deployment manager also configures a WebSphere Application Server JMS provider, `jmsserver`, which is a server process with another set of default ports.

Plan to configure the node agent and the JMS provider with port assignments that differ from the defaults, to verify that there is no conflict with coexisting installation instances that have similar configurations.

### Mixed node cells

Ensure that the fix level of the Version 5 WebSphere Application Server product matches or is lower than the fix level of the Network Deployment product. For example, in a mixed node environment you can federate a Version 5.0.2 base node into a Version 5.1 deployment manager cell but you cannot federate a Version 5.1 base node into a V5.0.x deployment manager cell.

If you plan to use WebSphere Business Integration Server Foundation extensions on Application Server nodes in the cell, you must install the Integration Server product on the Network Deployment node.

1. Use the **stopNode** command to stop any running node agents that are using default ports on the same physical machine.  
Issue the command from the `bin` directory of the Application Server installation root.
2. Federate the Application Server node into the deployment manager cell, using the **addNode** command from the `bin` directory of the node to federate. This command automatically instantiates the `nodeagent` process, with default ports.  
For example, suppose you federate an installation instance that has a node name of *MyNode*.
3. Log on to the deployment manager administrative console. Go to **System Administration > Node Agents > nodeagent > End Points**. Change port numbers for all end points and save the changes.
4. Log on to the deployment manager administrative console, if you have installed the embedded messaging feature on the node you federated:
  - a. Go to **System Administration > Node Agents > jmsserver > Security Port Endpoints**. Change port numbers for all end points and save the changes.
  - b. Go to **System Administration > Node Agents > jmsserver > End Points**. Change port numbers for all the end points and save the changes.
5. Synchronize the changes using **System Administration > Nodes**. Select the node, *MyNode*, and click **Synchronize**.
6. Stop the node agent on the Application Server node using the **stopNode** command line script. Restart the node agent using the **startNode** command.
7. Change port assignments in the configuration files if you have an Application Server or deployment manager node that you cannot start because of port conflicts.

To continue, return to one of these topics:

- Establishing multimachine environments
- Installing multiple Version 5 configuration instances
- Setting up Version 5 coexistence

## Port number settings in WebSphere Application Server versions

This topic provides reference information about identifying port numbers in versions of WebSphere Application Server, as a means of determining port conflicts that might occur when you intend for an earlier version to coexist or interoperate with Version 5.1.

### Version 3.5.x port numbers

Resolve port conflicts by inspecting the configuration of the Version 3.5.x product, either WebSphere Application Server Advanced Edition or WebSphere Application Server Standard Edition. When the administrative server is running, use this command to examine current node and port settings:

```
xmlConfig -export config.xml -nodeName theNodeName
```

Look for the OSE Remote port assignments.

Table 54. WebSphere Application Server Version 3.5.x default port definitions in the `admin.config` file

Port name	Standard Edition	Advanced Edition
	Value	
Isdport (Location Service Daemon)	9000	9000
bootstrapPort	900	900
LSDSSL (With security on)	9001	9001

### Version 4.0.x port numbers

**For WebSphere Application Server Advanced Single Server Edition, Version 4.0.x:** Inspect the `server-cfg.xml` file to find the Web container HTTP transports port values for the configuration.

**For WebSphere Application Server Advanced Edition, Version 4.0.x:** When the administrative server is running, use this command to extract the configuration from the database:

```
xmlConfig -export config.xml -nodeName theNodeName
```

Look for the Web container HTTP transports port assignments.

Table 55. Port definitions for WebSphere Application Server V4.0.x

Port name	Value	Advanced Edition	IBM WebSphere Business Integration Server Foundation Edition	Advanced Single Server Edition
		File		
bootstrapPort	900			
lsdPort	9000	admin.config	admin.config	
LSDSSLPort	9001			
HTTP transport port	9080			
HTTPS transport port	9443			server-cfg.xml
Admin Console HTTP transport port	9090	database	database	
ObjectLevelTrace	2102			
diagThreadPort	7000			

### Version 5.x port numbers

You can use the administrative console to configure the Version 5.x Application Server, to resolve conflicting ports.

The IBM WebSphere Business Integration Server Foundation product extensions use the same ports as the base WebSphere Application Server product.

Table 56. Port definitions for WebSphere Application Server Version 5.x

Port name	WebSphere Application Server	Network Deployment	File
	Value		
HTTP_TRANSPORT	9080	Not applicable	
HTTPS Transport Port (HTTPS_TRANSPORT)	9443	Not applicable	
HTTP Admin Console Port (HTTP_TRANSPORT_ADMIN)	9090	9090	server.xml and virtualhosts.xml
HTTPS Admin Console Secure Port (HTTPS_TRANSPORT_ADMIN)	9043	9043	
Internal JMS Server (JMSSERVER_SECURITY_PORT)	5557	Not applicable	server.xml
JMSSERVER_QUEUED_ADDRESS	5558	Not applicable	serverindex.xml
JMSSERVER_DIRECT_ADDRESS	5559	Not applicable	
BOOTSTRAP_ADDRESS	2809	9809	serverindex.xml



Table 56. Port definitions for WebSphere Application Server Version 5.x (continued)

Port name	WebSphere Application Server	Network Deployment	File
	Value		
SOAP_CONNECTOR-ADDRESS	8880	8879	serverindex.xml
SAS_SSL_SERVERAUTH_LISTENER_ADDRESS	0	9401	serverindex.xml
CSIV2_SSL_SERVERAUTH_LISTENER_ADDRESS	0	9403	serverindex.xml
CSIV2_SSL_MULTIAUTH_LISTENER_ADDRESS	0	9402	
IBM HTTP Server Port	80	Not applicable	virtualhosts.xml, plugin-cfg.xml, and <i>IHSinstall_root/conf/</i> <i>httpd.conf</i>
IBM HTTPS Server Admin Port	8008	Not applicable	<i>IHSinstall_root/conf/</i> <i>admin.conf</i>
CELL_DISCOVERY_ADDRESS	Not applicable	7277	serverindex.xml
ORB_LISTENER_ADDRESS	9100	9100	
CELL_MULTICAST_DISCOVERY_ADDRESS	Not applicable	7272	

When you federate an Application Server node into a deployment manager cell, the deployment manager instantiates the nodeagent server process on the Application Server node. The nodeagent server uses these port assignments by default:

Table 57. Port definitions for the V5.x nodeagent server process

Port name	Value	File
BOOTSTRAP_ADDRESS	2809	serverindex.xml
ORB_LISTENER_ADDRESS	9900	
SAS_SSL_SERVERAUTH_LISTENER_ADDRESS	9901	
CSIV2_SSL_MUTUALAUTH_LISTENER_ADDRESS	9101	
CSIV2_SSL_SERVERAUTH_LISTENER_ADDRESS	9201	
NODE_DISCOVERY_ADDRESS	7272	
NODE_MULTICAST_DISCOVERY_ADDRESS	5000	
DRS_CLIENT_ADDRESS	7888	
SOAP_CONNECTOR_ADDRESS	8878	

When you federate an Application Server node with the embedded messaging server feature into a deployment manager cell, the deployment manager instantiates a JMS server process, *jmsserver*, on the Application Server node. The JMS server uses these port assignments by default:

Table 58. Port definitions for V5.x *jmsserver* process

Port name	Value	File
JMSSERVER_DIRECT_ADDRESS	5559	serverindex.xml
JMSSERVER_QUEUED_ADDRESS	5558	
SOAP_CONNECTOR_ADDRESS	8876	server.xml
JMSSERVER SECURITY PORT	5557	

## Default coexistence settings for port numbers

This topic provides reference information for identifying port numbers in WebSphere Application Server, Version 5.x in coexistence mode.

You must verify that you are using ports that do not conflict with other products and programs running on your node. These ports are the default coexistence ports. You can display the default coexistence ports when the installation wizard detects a previous installation of Application Server and displays the check box for selecting coexistence ports. Select the check box to show the ports. Change the ports to avoid conflicts.

You can also force the installation wizard to display the coexistence ports by using the following parameter on the installation command. The example shows the installation command for Linux and UNIX-based systems. You can find the commands for supported operating systems in *Installing the product*.

You can also force the appearance of the coexistence panel to change conflicting port number assignments. For example, the AIX WebSM system management server listens on port 9090 by default. To avoid a conflict with the WebSphere HTTPS Administrative Console Secure Port (HTTP\_TRANSPORT\_ADMIN) assignment, which is also 9090 by default, force the coexistence panel to appear using this command:

```
./install -W showCoexistencePanel.active="true"
```

### Default port numbers for coexistence for Version V5.1

After installing a product with the port numbers that you select on the coexistence panel (or in the response file for a silent installation), you can use the administrative console to configure port numbers and resolve conflicting ports.

The WebSphere Business Integration Server Foundation product extensions use the same ports as the base WebSphere Application Server product.

Table 59. Default port settings for coexistence for V5.1

Port name	WebSphere Application Server	Network Deployment	File
	Value		
HTTP_TRANSPORT	9085	Not applicable	
HTTPS Transport Port (HTTPS_TRANSPORT)	9444	Not applicable	
HTTP Admin Console Port (HTTP_TRANSPORT_ADMIN)	9091	9091	server.xml virtualhosts.xml
HTTPS Admin Console Secure Port (HTTPS_TRANSPORT_ADMIN)	9044	9044	
Internal JMS Server (JMSSERVER_SECURITY_PORT)	5567	5567	server.xml
JMSSERVER_QUEUED_ADDRESS	5568	5568	
JMSSERVER_DIRECT_ADDRESS	5569	5569	serverindex.xml
BOOTSTRAP_ADDRESS	2809	9817	serverindex.xml
SOAP_CONNECTOR-ADDRESS	8880	8889	serverindex.xml
SAS_SSL_SERVERAUTH_LISTENER_ADDRESS	0	9819	serverindex.xml
CSIV2_SSL_SERVERAUTH_LISTENER_ADDRESS	0	9502	
CSIV2_SSL_MULTIAUTH_LISTENER_ADDRESS	0	9503	serverindex.xml

Table 59. Default port settings for coexistence for V5.1 (continued)

IBM HTTP Server Port	80	Not applicable	virtualhosts.xml, plugin-cfg.xml, and IHSinstall_root/conf/httpd.conf
IBM HTTPS Server Admin Port	8008	Not applicable	IHSinstall_root/conf/admin.conf
CELL_DISCOVERY_ADDRESS	Not applicable	7278	
ORB_LISTENER_ADDRESS	9100	9703	serverindex.xml
CELL_MULTICAST_DISCOVERY_ADDRESS	Not applicable	7278	

### Detailed definitions of coexistence ports

Use the tables as a reference for finding information about the ports that appear on the coexistence panel of the installation wizard.

Port names, default value, and description	Value
<ul style="list-style-type: none"> <li>Field name in the installation wizard: <b>HTTP Transport Port</b></li> <li>Field name in the base WebSphere Application Server server.xml configuration file: HTTPTransport_1 EndPoint_1</li> <li>Field name in the Network Deployment server.xml configuration file: <b>Not applicable</b></li> <li>virtualhosts.xml: HostAlias_1</li> <li>Field name in the silent installation response file: PME_CoexistenceInformationPanel.httpTransportPort</li> <li>Base WebSphere Application Server, default value: 9080</li> <li>Network Deployment, default value: Not applicable</li> <li>Information center description: Transports</li> </ul>	9085

Port names, default value, and description	Value
<ul style="list-style-type: none"> <li>Field name in the installation wizard: <b>HTTPS Transport Port</b></li> <li>Field name in the base WebSphere Application Server server.xml configuration file: HTTPTransport_2 EndPoint_2</li> <li>Field name in the Network Deployment server.xml configuration file: <b>Not applicable</b></li> <li>virtualhosts.xml: HostAlias_3</li> <li>Field name in the silent installation response file: PME_CoexistenceInformationPanel.httpsTransportPort</li> <li>Base WebSphere Application Server, default value: 9443</li> <li>Network Deployment, default value: Not applicable</li> <li>Information center description: Transports</li> </ul>	9444

Port names, default value, and description	Value
<ul style="list-style-type: none"> <li>Field name in the installation wizard: <b>HTTP Admin Console Port</b></li> <li>Field name in the base WebSphere Application Server server.xml configuration file: HTTPTransport_3 EndPoint_3</li> <li>Field name in the Network Deployment server.xml configuration file: <b>HTTPTransport_1 EndPoint_1</b></li> <li>virtualhosts.xml: HostAlias_4</li> <li>Field name in the silent installation response file: PME_CoexistenceInformationPanel.adminConsolePort</li> <li>Default value: 9090</li> <li>Information center description: Transports</li> </ul>	9091

Port names, default value, and description	Value
<ul style="list-style-type: none"> <li>Field name in the installation wizard: <b>HTTPS Admin Console Secure Port</b></li> <li>Field name in the base WebSphere Application Server server.xml configuration file: HTTPTransport_4 EndPoint_4</li> <li>Field name in the Network Deployment server.xml configuration file: <b>HTTPTransport_1 EndPoint_2</b></li> <li>virtualhosts.xml: HostAlias_5</li> <li>Field name in the silent installation response file: PME_CoexistenceInformationPanel.secureAdminConsolePort</li> <li>Default value: 9043</li> <li>Information center description: Transports</li> </ul>	9044

Port names, default value, and description	Value
<ul style="list-style-type: none"> <li>Field name in the installation wizard: <b>Bootstrap port</b></li> <li>Field name in the base WebSphere Application Server serverindex.xml configuration file: BOOTSTRAP_ADDRESS EndPoint_1</li> <li>Field name in the Network Deployment serverindex.xml configuration file: BOOTSTRAP_ADDRESS <b>EndPoint_2</b></li> <li>Field name in the silent installation response file: PME_CoexistenceInformationPanel.bootstrapPort</li> <li>Base WebSphere Application Server, default value: 2809</li> <li>Network Deployment, default value: 9809</li> <li>Information center description: Example: Modifying port numbers in the serverindex file</li> </ul>	Base: 2810, ND: 9917

- You can use the connector type and port number parameters of certain commands to identify the bootstrap port number that you specify for the remote method invocation (RMI) connector address in a coexistence scenario. For example, to use the **wsadmin** command in a coexistence environment, you can specify either of the following commands:

```
wsadmin.bat/sh -conntype RMI -port portNumber
wsadmin.bat/sh -conntype SOAP -port portNumber
```

Alternatively, you can update the wsadmin.properties file located in the install\_root/properties directory to contain the new port values. If you update this file, you do not need to specify the port parameter when using the wsadmin tool.

The SOAP connection type uses the SOAP connector address port number described next.

If you edit the serverindex.xml file, verify that the host name is the valid host name for the machine and not the generic localhost identifier.

Port names, default value, and description	Value
<ul style="list-style-type: none"> <li>Field name in the installation wizard: <b>SOAP Connector Address</b></li> <li>Field name in the base WebSphere Application Server serverindex.xml configuration file: SOAP_CONNECTOR-ADDRESS EndPoint_2</li> <li>Field name in the Network Deployment serverindex.xml configuration file: SOAP_CONNECTOR-ADDRESS <b>EndPoint_4</b></li> <li>Field name in the silent installation response file: PME_CoexistenceInformationPanel.soapConnectorAddress</li> <li>Base WebSphere Application Server, default value: 8880</li> <li>Network Deployment, default value: 8879</li> <li>Information center description: Port used for the Simple Object Access Protocol (SOAP) connector</li> </ul>	Base: 8881, ND: 8889

Port names, default value, and description	Value
--	-------

You can use the connector type and port number parameters of certain commands to identify the port number that you specify for the SOAP connector address in a coexistence scenario. For example, to use the **wsadmin** command in a coexistence environment, you can specify either of the following commands:

```
wsadmin.bat/sh -conntype RMI -port portNumber
wsadmin.bat/sh -conntype SOAP -port portNumber
```

Alternatively, you can update the `wsadmin.properties` file located in the `install_root/properties` directory to contain the new port values. If you update this file, you do not need to specify the port parameter when using the `wsadmin` tool.

The remote method invocation (RMI) connection type uses the bootstrap port number described previously.

Port names, default value, and description	Value
--	-------

- Field name in the installation wizard: **JMS server queued address**
- Field name in the base WebSphere Application Server `serverindex.xml` configuration file: `JMSSERVER_QUEUED_ADDRESS EndPoint_4`
- Field name in the Network Deployment `serverindex.xml` configuration file: **Not applicable**
- Field name in the silent installation response file: `PME_CoexistenceInformationPanel.jmsServerQueuedAddress`
- Default value: 5558
- Information center description: WebSphere topic connection factory settings

Port names, default value, and description	Value
--	-------

- Field name in the installation wizard: **JMS server security port**
- Field name in the base WebSphere Application Server `server.xml` configuration file: `JMSServer_1 Address_3`
- Field name in the Network Deployment `server.xml` configuration file: **Not applicable**
- Field name in the silent installation response file: `PME_CoexistenceInformationPanel.jmsServerSecurityPort`
- Default value: 5557
- Information center description: Port used in JMS security processing

Port names, default value, and description	Value
--	-------

- Field name in the installation wizard: **JMS Server Direct Address**
- Field name in the base WebSphere Application Server `serverindex.xml` configuration file: `JMSSERVER_DIRECT_ADDRESS EndPoint_5`
- Field name in the Network Deployment `serverindex.xml` configuration file: Not applicable
- Field name in the silent installation response file: `PME_CoexistenceInformationPanel.jmsServerDirectAddress`
- Default value: 5559
- Information center description: WebSphere topic connection factory settings

Port names, default value, and description	Value
--	-------

- Field name in the installation wizard: **SAS SSL ServerAuth Address**
- Field name in the `serverindex.xml` configuration file: `SAS_SSL_SERVERAUTH_LISTENER_ADDRESS EndPoint_6`
- Field name in the silent installation response file: `PME_CoexistenceInformationPanel.sasSSLServerAuthAddr`
- Base WebSphere Application Server, default value: 0; With security, assign your own non-conflicting value: *nnnn*
- Information center description: Configuring inbound transports

Port names, default value, and description	Value
Assign a coexistence port other than 0, which dynamically takes a free port. You must have a fixed port that clients can use to find the Secure Authentication Service (SAS) Secure Sockets Layer (SSL) ServerAuth address. No mechanism exists for clients to use to find a dynamically assigned port.	

Port names, default value, and description	Value
<ul style="list-style-type: none"> <li>Field name in the installation wizard: <b>CSIV2 ServerAuth Listener Address</b></li> <li>Field name in the base WebSphere Application Server <code>serverindex.xml</code> configuration file: <code>CSIV2_SSL_SERVERAUTH_LISTENER_ADDRESS EndPoint_7</code></li> <li>Field name in the Network Deployment <code>serverindex.xml</code> configuration file: <code>CSIV2_SSL_SERVERAUTH_LISTENER_ADDRESS EndPoint_8</code></li> <li>Field name in the silent installation response file: <code>PME_CoexistenceInformationPanel.csivServerAuthListenerAddr</code></li> <li>Base WebSphere Application Server, default value: 0; With security, assign your own non-conflicting value: <code>nnnn</code></li> <li>Network Deployment, default value: 9403 but is not enabled until you enable security</li> <li>Information center description: Configuring inbound transports</li> </ul>	Base: 0, ND: 9502

Assign a coexistence port other than 0, which dynamically takes a free port. You must have a fixed port that clients can use to find the Common Secure Interoperability Specification, Version 2 (CSlv2) ServerAuth listener address. No mechanism exists for clients to use to find a dynamically assigned port.

Port names, default value, and description	Value
<ul style="list-style-type: none"> <li>Installation wizard name: <b>CSIV2 MultiAuth Listener Address</b></li> <li>Field name in the base WebSphere Application Server <code>serverindex.xml</code> configuration file: <code>CSIV2_SSL_MUTUALAUTH_LISTENER_ADDRESS EndPoint_8</code></li> <li>Field name in the Network Deployment <code>serverindex.xml</code> configuration file: <code>CSIV2_SSL_MUTUALAUTH_LISTENER_ADDRESS EndPoint_7</code></li> <li>Field name in the silent installation response file: <code>PME_CoexistenceInformationPanel.csivMultiAuthListenerAddr</code></li> <li>Base WebSphere Application Server, default value: 0; With security, assign your own non-conflicting value: <code>nnnn</code></li> <li>Network Deployment, default value: 9402 but you must enable security to enable this value</li> <li>Information center description: Configuring inbound transports</li> </ul>	Base: 0, ND: 9503

Assign a coexistence port other than 0, which dynamically takes a free port. You must have a fixed port that clients can use to find the Common Secure Interoperability Specification, Version 2 (CSlv2) MultiAuth listener address. No mechanism exists for clients to use to find a dynamically assigned port.

Port names, default value, and description	Value
<ul style="list-style-type: none"> <li>Field name in the installation wizard: <b>ORB Listener Port</b></li> <li>Field name in the base WebSphere Application Server <code>serverindex.xml</code> configuration file: Not applicable</li> <li>Field name in the Network Deployment <code>serverindex.xml</code> configuration file: <code>ORB_LISTENER_ADDRESS EndPoint_5</code></li> <li>Field name in the silent installation response file: Not applicable - See note.</li> <li>Base WebSphere Application Server default value: Not applicable</li> <li>Network Deployment default value: 9100</li> <li>Information center description: Configuring inbound transports</li> </ul>	Base: 9109, ND V5.0.x: 9101, ND V5.1.x: 9703

Setting the object request broker (ORB) listener port to a value of 0 or greater causes all object references in the name space to specify their connection to the server and not depend on the location service daemon (LSD) to redirect connections to the server. An `ORB_LISTENER_ADDRESS` value equal to 0 starts the server on any available port and does not use the LSD. A value greater than 0 starts the server on the specified port and does not use the LSD.



Set the ORB listener port after a silent installation of the Network Deployment product as described in Configuring inbound transports.

Port names, default value, and description	Value
<ul style="list-style-type: none"> <li>Field name in the base WebSphere Application Server installation wizard: <b>IBM HTTP Server Port</b></li> <li>Field name in the base WebSphere Application Server <code>virtualhosts.xml</code> file: <code>HostAlias_2</code></li> <li>Field name in the <code>plugin-cfg.xml</code> configuration file: <code>Virtual Host</code></li> <li>Field name in the IBM HTTP Server <code>IHSinstall_root\conf\httpd.conf</code> configuration file: <code>Port</code></li> <li>Default value: 80</li> <li>Description: Port used to communicate with the IBM HTTP Server</li> </ul>	81

Port names, default value, and description	Value
<ul style="list-style-type: none"> <li>Field name in the base WebSphere Application Server installation wizard: <b>IBM HTTP Server Admin Port</b></li> <li>Field name in the Network Deployment installation wizard: Not applicable</li> <li>Field name in the IBM HTTP Server <code>IHSinstall_root\conf\admin.conf</code> configuration file: <code>Port</code></li> <li>Default value: 8008</li> <li>Description: Port used to communicate with the IBM HTTP administration server</li> </ul>	8009

Port names, default value, and description	Value
<ul style="list-style-type: none"> <li>Field name in the Network Deployment installation wizard: <b>Cell Discovery Address</b></li> <li>Field name in the base WebSphere Application Server installation wizard: Not applicable</li> <li>Field name in the <code>install_root\config\cells\nodeName\nodes\cellName\serverindex.xml</code> configuration file: <code>NamedEndPoint_1 endPointName= "CELL_DISCOVERY_ADDRESS"</code></li> <li>Default value: 7277</li> <li>Description: Port used in cell discovery</li> </ul>	ND 5.0.x: 9989, ND 5.1.x: 7278

Set the Cell discovery address after a silent installation of the Network Deployment product, as described in "Configuring cells" in the information center.

## Configuring WebSphere Application Server after migration

The installation wizard automatically configures IBM WebSphere Application Server, Version 5.1 and all other bundled products. There is no need for additional configuration if you do not migrate from an earlier version.

If you use the installation wizard to migrate a previous installation of WebSphere Application Server, Version 3.5.x, there are some items to review before considering your environment fully configured.

1. Check the `WASPostUpgrade.log` file for deployment details of the Version 3.5.x enterprise beans. Make any necessary changes and redeploy.

**Note:** No redeployment is required when moving EJB 1.1 JAR files from Version 4.

The J2EE programming model specifies an architecture for how applications are created and deployed. The `WASPostUpgrade` tool recreates applications because Version 3.5.x applications do not have the same architecture as Version 5.1 applications. The new Version 5.1 J2EE applications contain all migrated Web resources and enterprise beans. All Version 3.5.x enterprise applications become Version 5.1 J2EE applications with the same name, deployed in the same server.

The `WASPostUpgrade` tool maps Web resources and enterprise beans that are not included in an enterprise application, into a default J2EE application that includes the name of the server. The tool maps Web applications to J2EE WAR files. The tool deploys enterprise beans as EJB 1.1 beans in J2EE JAR files. The tool combines resources in a J2EE EAR file and deploys it in the Version 5.1 configuration. There are some differences between the EJB 1.0 and EJB 1.1 Specifications, but in most cases, EJB 1.0 beans can run successfully as EJB 1.1 beans.

Version 3.5.x supports only the EJB 1.0 components specification level. Version 5.1 supports EJB 1.1 components. However, many EJB 1.0 beans can successfully deploy as EJB 1.1 beans. The migration tools redeploy enterprise beans automatically as part of the application migration phase.

**Note:** After federating an Application Server node into a deployment manager cell, you cannot use the migration tools on the Application Server node. To use these tools again, remove the node from the cell, use the tools, and add the node to the cell again.

2. Examine any Lightweight Third Party Authentication (LTPA) security settings you might have used, and apply the settings in the WebSphere Application Server security settings.

The WASPostUpgrade tool migrates applicable security settings in the Version 3.5.x environment to J2EE security attributes.

Global security that uses Lightweight Third Party Authentication (LTPA) authentication in Versions 3.5.x and 4.0.x is migrated to the base WebSphere Application Server product and to the Network Deployment product. However, although global security was enabled in Versions 3.5.x and 4.0.x, it is disabled during migration to Version 5.1.

If you add this node later to an IBM WebSphere Application Server Network Deployment, Version 5.1 configuration, you can enable and use the LTPA configuration. Use the administrative console to generate keys for the migrated LTPA authentication mechanism. After generating the keys, you can enable global security.

Global security that uses *localos* authentication mechanisms in versions 3.5.x and 4.0.x is migrated to the Network Deployment product. However, although global security was enabled in Versions 3.5.x and 4.0.x, it is disabled during migration to Version 5.1. The Network Deployment product does not support the SWAM authentication mechanism. Migration sets the authentication mechanism in Version 5.1 to LTPA. Use the administrative console to generate keys for the migrated LTPA authentication mechanism. After generating the keys, you can enable global security.

3. Check the WASPostUpgrade.log file in the logs directory, for details about JSP 0.91 objects that the migration tools do not migrate.

Version 5.1 does not support JSP 0.91 objects. The migration tools do not migrate JSP objects configured to run as JSP 0.91 objects. The migration tools do, however, recognize the objects in the output and log them. Version 5.1 runs JSP 1.0 and 1.1 objects as JSP 1.2 objects, which is its only supported level.

4. Review Version 3.5.x models and clones to identify non-migrated objects that you must recreate in Version 5.1.

Version 3.5.x models and clones and Version 4.0.x server groups have been dramatically redefined in Version 5.1 as clusters and cluster members. Application servers are the only objects supported as models and cluster members in Version 5.1. This change is a significant difference from Version 3.5.x, in which many objects are models and clones. All models and clones relating to Application Servers are mapped to cluster members in Version 5.1.

During the migration of all other objects that you could previously clone, special mapping occurs. All clones are treated as simple objects and are mapped as if they are not cluster members. Models that are not Application Server models are ignored and not mapped.

Version 4.0.x Server Groups are converted to Version 5.1 clusters.

5. Identify and use the migration tools to migrate non-migrated nodes in Version 3.5.x and Version 4.0.x repositories that have multiple nodes.

A Version 3.5.x and a Version 4.0.x repository can contain more than one node name and its associated children. The WASPostUpgrade tool processes only those objects and children that match the migrating node. This determination is made by checking the names of nodes in configuration files with fully qualified and non-qualified network names of the migrating machine.

6. Examine any applications that use IBM extensions.

In many cases, IBM provides additional features and customization options that extend the specification level even further. If your existing Version 3.x applications use IBM extensions from earlier product versions, you might need to perform mandatory or optional migration to use the same kinds of extensions in the Version 5.1.

Migration from Version 4.0.x requires little conversion.

7. Update J2EE resources in client JAR files to the new resource format with the ClientUpgrade tool. J2EE applications might exist on the client, if the client has client JAR files with J2EE resources.
8. Migrate Version 3.5.x XML applications to supported XML APIs.

If your XML applications use XML for Java API, Version 2.0.x or earlier, you must migrate them to API Version 3.1 or the equivalent open-source version. Although there are inherent performance improvements in later versions of the XML for Java API, you can gain additional performance by explicitly using nonvalidating parsers in application environments where you can trust the data.

The most significant change is that the TX-compatible APIs are no longer available. The Document API retains the XML manipulation APIs that were in TXDocument, but you must rewrite the following functionality:

- Creating and loading an XML parser: Use a Java API for XML Processing (JAXP) factory class.
- Writing out the Document Object Model (DOM) tree: Use a serializer. One drawback to the DOM Level 2 implementation in this level of the XML for Java API is that the grammar (DTD or schema) is no longer a node in the DOM tree, so you cannot write it out. As a result, only external grammars are recommended. You can query the system ID of the root element and use it to retrieve the name from the statement. After the tree is written to an XML file, you can read the file as text and insert a statement.

In addition to the XML API changes, it is important to understand that the J2EE Version 1.3 specification mandates the use of JAXP 1.1, DOM Version 2, SAX Version 2 and SAX2 extensions, and XSL Transformations (XSLT) 1.0. JAXP Version 1.2, DOM Version 3, and SAX Version 3 are not allowed in products that are compliant with the J2EE Version 1.3 specification. This prohibition exists because the newer versions were *experimental* at the time of the J2EE Version 1.3 specification. Because WebSphere Application Server is compliant with the J2EE Version 1.3 specification, WebSphere Application Server has support for JAXP Version 1.1, DOM Version 2 and SAX Version 2 only.

You must only recompile a Version 4.0.x XML application to migrate it to the Version 5.1 level.

9. Configure WebSphere Application Server to use a database. For example, you can configure WebSphere Application Server to use DB2.
10. Review your Java virtual machine settings to verify that you are using a heap size of at least 50 for improved startup performance.

If you have used a smaller heap size in the past, you can use the default heap size, which is now 50.

Now you are finished with pre-test configuration. You might have to fine tune your WebSphere Application Server environment as you test it. Test all redeployed applications before moving them into production.

Return to Installing WebSphere Application Server to continue.

## XML parser for Java code

On November 9, 1999, the Apache Software Foundation announced the creation of the [xml.apache.org](http://xml.apache.org) project for Open Source Extensible Markup Language (XML) solutions.

As part of that announcement, IBM announced that it was donating its XML4J, XML4C, and LotusXSL technologies to the [xml.apache.org](http://xml.apache.org) project. The parsing technologies have been renamed Xerces, and the LotusXSL technology has been renamed Xalan.

IBM is shifting its XML parsing development resources to work on the Xerces parsers. The objective is to use the Xerces code base as the foundation for XML4J and XML4C. This version of XML4J is based on the Apache Xerces2 code base.

## What is the difference between XML4J and Xerces?

IBM has tested this version of XML4J in addition to the testing done by the xml.apache.org project. The names of the main Java archive (JAR) files have changed from xml4j.jar to xmlParserAPIs.jar and xercesImpl.jar, and from xml4jSamples.jar to xercesSamples.jar.

This version of XML4J contains one major API change and a few relatively minor API changes from the last major release. It's major features are many bugfixes and performance improvements, as well as the addition of a few features.

XML4J 4.2.x ships with the official W3C DOM HTML Recommendation API . The major change to the API was the removal of setSelected from the HTMLOptionElement interface. To workaround this change from XML4J 4.1.x, use setAttribute and removeAttribute from the interface to modify the selected attribute.

## Which part of the API is public, and which is subject to change?

To answer this question, you must understand the terms used for application program interface (API) status:

- **Public** - The typical client developer codes for this API. Any severe problem in this API is addressed. Also, the majority of this API is defined as "public" and has reached World Wide Web Consortium (W3C) Recommendation status or a similar status in the XML Core Working Group. Not much change in these interfaces is expected. A W3C Recommendation indicates that a specification is stable, contributes to Web interoperability, and has been reviewed by all W3C members, who are in favor of supporting its adoption by the industry.
- **Experimental** - These interfaces and classes reflect the latest W3C specifications and Simple API for XML (SAX) specifications from the XML Core Working Group. Because these specifications are not finalized, the interfaces are subject to change. As an experimental specification is adopted at the highest level, such as at the W3C Recommendation level, the specification is upgraded to the Public category.
- **Internal** - These classes are considered internal to Xerces, even though they might be public and have public methods. Developers with complex and specific needs, such as building an XML parser can use these classes. However, the architecture is subject to change.

The following table summarizes API status by interface content:

API Status	API contents (packages, interfaces, classes and methods)	Comments
<b>Public</b>	DOM Level 1 interfaces (found in org.w3c.dom, org.w3c.dom.html) and DOM Level 2 (DOM2) interfaces (found in org.w3c.dom and subpackages)  The DOM2 interfaces are implemented in the same interfaces as DOM1 as new methods.  SAX Level 1 interfaces (found in org.xml.sax. and subpackages) and SAX Level 2 (SAX2) interfaces (found in org.xml.sax. and subpackages)	DOM L1, DOM L2, SAX1, and SAX2 Interfaces are stable.
<b>Experimental</b>	DOM Level 3 (DOM3) and Core DOM Level 3 (DOM3) Abstract Schemas and Load and Save (found in org.apache.xerces.dom3 and subpackages).	DOM L3 is in working draft status. XML4J provides a subset of DOM L3 support.

API Status	API contents (packages, interfaces, classes and methods)	Comments
Internal	All other packages are internal.	The internal Xerces architecture can change.

For more information see XML4J Information.

As an Apache Open Source project, the Xerces community is interested in your questions and feedback regarding the entire API, not just the part that is designated as public.

If you have specific questions, patches, or feedback regarding the Xerces API or code, visit the Apache Web site, and sign up for the mailing list. Send more basic questions or questions specific to XML4J to the AlphaWorks discussion forum.

### Which APIs do I use for new development?

Use the `org.apache.xerces.parsers.*` classes for new development. The four compatibility parser classes are replaced by the following classes:

```
org.apache.xerces.parsers.SAXParser
org.apache.xerces.parsers.DOMParser
```

Validation control has become a feature of the parser, and no longer requires separate classes.

The future direction for the parser instantiation classes is a parser instantiation API that results from the W3C DOM Level 3 effort, which is just getting underway.

To make sure that your code is as stable as possible, use the interfaces that are specified in the Public section of the preceding table (for example DOM1 and SAX1). Updates are made to the table to reflect the new interfaces and the classes that are given Public status (for example, DOM2 and SAX2).

### Is IBM making any additional support guarantees with XML4J?

IBM is not making any additional support guarantees for XML4J. In particular, IBM is not certifying that XML4J is Y2K compliant. XML4J makes no internal date calculations.

### Migrating applications to use the XML4J 4.2.2 parser and the XSLT4J 2.5.4 transformer

The Java API for XML Processing (JAXP) specification defines a pluggability mechanism for a SAX or a DOM parser using the `javax.xml.parsers` APIs. Transformers are pluggable using the `javax.xml.transform` APIs.

The IBM SDK 1.4.1 bundles in Version 5.1 include an XML4J 4.2.2 parser and an XSLT4J 2.5.4 transformer. You can use a different implementation of JAXP in an application. Package the parser and transformer in the application.

You can change an application to remove its dependency on the API in a previous version of the parser or the transformer from an earlier version of WebSphere Application Server. Package the JAR files in the application.

In both cases, set the class loader delegation mode to `PARENT_LAST` on the application or Web module.

Recommendation: Have your applications use the JAXP API instead of using the parser or transformer implementation API directly.

You must recompile a V4.0.x XML application or a V5.0.x XML application to migrate it to the Version 5.1 level.

---

## Installation: Resources for learning

Use the following links to find relevant supplemental information about installation. The information resides on IBM and non-IBM Internet sites, whose sponsors control the technical accuracy of the information.

These links are provided for convenience. Often, the information is not specific to the IBM WebSphere Application Server product, but is useful all or in part for understanding the product. When possible, links are provided to technical papers and Redbooks that supplement the broad coverage of the release documentation with in-depth examinations of particular product areas.

View links to additional information about:

- Planning, business scenarios, and IT architecture
- Programming model and decisions
- Programming instructions and examples
- Programming specifications
- Administration
- Support

### Planning, business scenarios, and IT architecture

- IBM WebSphere Application Server supported hardware, software, and APIs  
The official site for determining product prerequisites for hardware, software and APIs for all WebSphere Application Server products.
- IBM developerWorks WebSphere  
The home of technical information for developers working with WebSphere products. You can download WebSphere software, take a fast path to developerWorks zones, such as VisualAge Java or WebSphere Application Server, learn about WebSphere products through a newcomers page, tutorials, technology previews, training, and Redbooks, get answers to questions about WebSphere products, and join the WebSphere community, where you can keep up with the latest developments and technical papers.
- IBM WebSphere Application Server library and information centers Web site  
The IBM WebSphere Application Server Library Web site contains links to all WebSphere Application Server information centers, for all versions. It also lets you access each information center in your native language.
- IBM WebSphere Application Server home page  
The IBM WebSphere Application Server home page contains useful information, including support links and downloads for fixes, APARs, tools, and trials.
- IBM WebSphere software platform home page  
The IBM WebSphere software platform home page introduces WebSphere products and describes how companies can easily transform to an e-business, with software that can grow as fast as the business it supports.
- Migrating to WebSphere V5.0: An End-to-End Migration Guide, SG24-6910-00  
This IBM Redbook is the definitive migration guide for migrating earlier versions of WebSphere Application Server to Version 5. The Redbook adds a broader scope, including planning for application migration and WebSphere Studio Application Developer tooling and samples. Read this book to formulate an optimal migration strategy.
- The power of Edge of Network technology in IBM WebSphere Application Server Version 5  
A description of WebSphere Application Server Edge Components Version 5.
- WebSphere Application Server - Express, V5  
A description of WebSphere Application Server Express, Version 5.
- WebSphere Application Server, Version 5  
A description of the base product, WebSphere Application Server, Version 5.



- IBM WebSphere Business Integration Server Foundation, Version 5  
A description of IBM WebSphere Business Integration Server Foundation, Version 5.
- Information center for WebSphere Application Server Edge components  
The information center for WebSphere Application Server Edge components contains complete documentation for the Caching Proxy and the Load Balancer in these PDF online books, *WebSphere Application Server Concepts, Planning, and Installation for Edge Components*, the *WebSphere Application Server Caching Proxy Administration Guide*, and the *WebSphere Application Server Programming Guide for Edge Components*.
- Linux on IBM eserver zSeries and S/390: ISP/ASP Solutions  
This IBM Redbook describes how Linux can be combined with z/VM on zSeries and S/390 hardware. This combination of hardware and operating systems enables Internet Service Providers (ISP) and Application Service providers (ASP) to more efficiently provide services.  
The book assumes a broad definition of ASP that includes production enterprise solutions as simple as file serving. In a world of discrete servers, when a new resource is required, workload can either be added to an existing server or a new one can be purchased. Often a new server is installed and the server farm grows in the enterprise.  
S/390 and zSeries hardware, microcode and software allow physical resources to be made virtual among Linux systems. Virtual physical resources allow many hundreds of Linux systems to exist on a single server. Running multiple Linux images as guests of VM/ESA or z/VM is a smart choice.
- Performance Analysis for Java Web sites  
A guide to developing applications that do not have performance and scalability problems when they get deployed to production. The *Performance Analysis for Java Web Sites* book walks you through planning, designing, and testing to verify that you are not surprised when you release your new site. All of the examples use WebSphere Application Server products and applications.  
Stacy Joines, Ruth Willenborg, and Ken Hygh have helped many customers with performance-related issues, and have authored this book to capture their experiences, and to help you test and tune your applications.  
The book is available in book stores and on Amazon.
- developerWorks: Patterns for e-business: Redbooks listing  
This Web page lists links to pattern resources under these categories:
  - Current patterns Redbooks
  - Superseded patterns Redbooks (valid for back-level product versions)
  - Independent analyst reports
  - Patterns CD order offer
  - Back-level version patterns Web site (zip downloads and old Flash tutorial)
  - Customer references
  - White papers
  - Multimedia presentations and screen cams
  - Webcasts
  - Patterns development kit
  - WebSphere technical exchange presentations
- developerWorks: IBM Patterns for e-business  
The IBM developerWorks site is the source for IBM patterns for e-business, a set of tested, reusable intellectual assets that you can use to design and implement your e-business network and architecture!
- Design for Scalability - An Update  
This White paper is from the IBM High Volume Web Sites team. The White paper describes component selection and management techniques you can use to make your Web site ready to adapt to increasing traffic. These techniques are the product of IBM experiences while working with customers seeking to improve the performance and availability of some of the largest Web sites in the world.  
**Abstract:** Optimizing for scalability remains a significant challenge for e-businesses as they balance the demands for availability, reliability, security, and high performance. Vendors are responding with

infrastructure options and supporting hardware and software platforms that address these requirements. This update identifies current products and emerging trends that are most likely to improve the scalability of your e-business infrastructure.

- IBM WebSphere Application Server V5.0 System Management and Configuration: WebSphere Handbook Series

This IBM Redbook provides the knowledge needed to implement WebSphere Application Server V5.0, Network Deployment runtime environment, to package and deploy Web applications, and to perform ongoing management of the WebSphere environment. It is one in a series of handbooks, designed to give you in-depth information on the entire range of WebSphere Application Server products.

This book provides an overview of the architecture, topology options, and new features of WebSphere Application Server Version 5 and WebSphere Application Server Network Deployment Version 5. It takes you through the installation steps needed to install each topology. Platform-specific chapters are included for installation on Windows, AIX, and Solaris.

The book then takes you through the process of configuring WebSphere Application Server. It is organized in the same manner as the WebSphere Application Server Administrative Console. It also includes information on packaging and deploying applications. It concludes with information on troubleshooting runtime problems.

- IBM WebSphere V4.0 Advanced Edition Handbook

This Redbook describes base application topologies and product mappings for WebSphere Application Server. Refer to the IBM Redbooks Web site for the latest update.

- The User centered design (UCD) for different project types, part 1

This Web page is the first of two articles posted to IBM developerWorks that describes useful application design activities for different types of projects.

- The User centered design (UCD) for different project types, part 2

This Web page is the latest of two articles that describes design activities that IBM scientists have found most useful in various types of projects. This article defines user interface design elements, including the design prototype, use case model, and design specification document.

### **Programming model and decisions**

- Designing e-business Solutions for Performance

This White paper describes how the design or implementation of an e-business application can affect performance.

- Managing Web Site Performance

This White paper contains tips and techniques for developers building applications that use session persistence. It also helps administrators to tune the WebSphere Application Server product appropriately for these applications.

### **Programming instructions and examples**

- IBM developerWorks

IBM developerWorks contains many excellent resources for developers, including tutorials on Web development-related topics. There is an excellent tutorial on the JDBC API.

- IBM Redbooks

The IBM Redbooks site contains many WebSphere Application Server related documents.

### **Programming specifications**

- J2EE information

For more information about J2EE specifications, visit the Sun site.

- sun.net.inetaddr.ttl property

The following Java 2 SDK, Standard Edition 1.4 Web site describes the private sun.net.inetaddr.ttl property, which works in both Java 2 SDK, Standard Edition 1.3 (WebSphere Application Server V5.0.0, V5.0.1, and V5.0.2) and Java 2 SDK, Standard Edition 1.4 (WebSphere Application Server V5.1).

- java.net.URLConnection class

The *Networking* section of this Java 2 SDK, Standard Edition 1.4 Web site describes a change in the behavior of the `java.net.URLConnection` class.

### Administration

- Best Practices Zone on WSDD

The WebSphere Best Practices Zone is a collection of best practices for administering WebSphere Application Server. Over time, the zone is intended to grow to include best practices for using other WebSphere software products, and to cover more topics. Use the feedback mechanism to submit your best practice suggestions.

- The IBM Glossary of Computing Terms

This glossary defines technical terms used in many IBM products. It is not a comprehensive resource of all IBM computing terms. This resource is provided for information purposes only and is updated periodically. IBM takes no responsibility for the accuracy of the information it contains.

### Support

- AIX Fix Distribution Service Web site

A Web facility for downloading AIX Version 4 and AIX Version 3 fixes, with a limited search engine designed with the assumption that you know what fix you need. If you do not know what fix you need, there is a pointer at the Web site to the APAR Database Facility. You can also contact your authorized IBM business partner or IBM Support Center.

- Ten Steps to Getting Support for WebSphere Application Server

If you are new to a product, you might have difficulty finding all the information you need. And if you come across a problem, where do you go for help? Whether you are a new user looking for introductory information, or an experienced user looking for a workaround for a specific defect, you can benefit immediately from extensive Web-based support from IBM. It enables you to download fix packs, search on keywords, look up FAQs, Hints and Tips, and so forth. Always use this Web resource before contacting IBM Support directly.

- WebSphere Application Server Support page

Take advantage of the Web-based Support and Service resources from IBM to quickly find answers to your technical questions. You can easily access this extensive Web-based support through the IBM Software Support portal at URL <http://www.ibm.com/software/support/> and search by product category, or by product name. For example, if you are experiencing problems specific to WebSphere Application Server, click **WebSphere Application Server** in the product list. The WebSphere Application Server Support page appears.



---

## Notices

References in this publication to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates. Any reference to an IBM product, program, or service is not intended to state or imply that only IBM's product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any of IBM's intellectual property rights may be used instead of the IBM product, program, or service. Evaluation and verification of operation in conjunction with other products, except those expressly designated by IBM, is the user's responsibility.

IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing  
IBM Corporation  
500 Columbus Avenue  
Thornwood, New York 10594 USA

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation  
Mail Station P300  
522 South Road  
Poughkeepsie, NY 12601-5400  
USA  
Attention: Information Requests

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.





---

## Trademarks and service marks

The following terms are trademarks of IBM Corporation in the United States, other countries, or both:

- AIX
- CICS
- Cloudscape
- DB2
- DFSMS
- Everyplace
- iSeries
- IBM
- IMS
- Informix
- iSeries
- Language Environment
- MQSeries
- MVS
- OS/390
- RACF
- Redbooks
- RMF
- SecureWay
- SupportPac
- ViaVoice
- VisualAge
- VTAM
- WebSphere
- z/OS
- zSeries

IBM, AIX, DB2, and WebSphere are trademarks of IBM Corporation.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Intel, Intel Inside (logos), MMX and Pentium are trademarks of Intel Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

SET and the SET Logo are trademarks owned by SET Secure Electronic Transaction LLC.

Other company, product and service names may be trademarks or service marks of others.