

This presentation will focus on migrating to WebSphere Application Server V6.1



This presentation will address the following topics: overview of migration, migration of the stand-alone Application Server, cell migration, Web server plug-in, script migration and mixed node environment limitations of WebSphere Application Server V6.1. This presentation will also discuss what is new in V6.1 migration.



The definition of migration is to upgrade a WebSphere Application Server installation to a newer major release. WebSphere Application Server Version 6.1 migration leverages the existing environment and applications and changes them to be compatible with the WebSphere Application Server Version 6.1 environment. Existing application components and configuration settings are applied to the Version 6.1 environment during the migration process.

In order to minimize application downtime during migration, WebSphere Application Server V6.1 supports mixed version cells. This means that a cell can support both WebSphere Application Server V5 nodes and V6.1 nodes that operate in a fully functional cell.

Migration involves installing V6.1 and configuring at least one profile. Migration can be done by either running migration utilities, or installing and configuring the application and resources manually.

The previous version will still exist after running migration utilities. However, a V5 deployment manager will be disabled from operation after a migration using migration utilities. The V5 deployment manager can be re-enabled with a provided script.



The migration utilities are a pair of commands.

The **WASPreUpgrade** command is used to save an existing installed WebSphere version's configuration and applications into a migration-specific backup directory.

The **WASPostUpgrade** command is used to process the migration-specific backup directory that was created by WASPreUpgrade and import that configuration and enterprise applications into the current environment.

Note that, you have to create at least one profile in order to perform a migration.

IBM Software Group					IBN	
Supported migration scenarios for V6.1						
Source product scenario	v6.1.y Express	v6.1.y Base3	v6.1.y ND Standalone and Custom Profiles	v6.1.y ND DMgr Profile	<b>v6.1.y</b> Client3, ,5	v6.1.y Embed dable
v5.x.y, v6.0.y Base Standalone	support	support	support			
v5.x.y, v6.0.y Base Federated		support	support			
v5.x.y, v6.0.y ND Standalone	support	support	support			
v5.x.y, v6.0.y ND Federated		support	support			
v5.x.y, v6.0.y ND DMgr				support		
v5.x.y, v6.0.y Client3,5					support	
v5.x.y, v6.0.y Express3	support	support	support			
v5.x.y, v6.0.y Bobcat3,4						support
v5.0.y EEonBase Standalone3,4	support	support	support			
v5.0.y EEonBase Federated 3,4		support	support			
v5.0.y EEonND Standalone3,4	support	support	support			
v5.0.y EEonNDFederated3,4		support	support			
v5.0.y EEonND DMgr3,4				support		

The following combinations of WebSphere versions and offerings are directly supported for 6.1, that is, those scenarios where an Operating System (OS) upgrade or change is not required. Support is provided for all supported operating systems.

This component also provides some tools for upgrading J2EE 1.2 client resources and upgrading the configuration to the latest supported level for those configuration objects that support script compatibility.

## Supported scenarios table reflecting product packaging

## Notes:

In this table \*.y indicates any PTF and Service pack level

In this table V5.x.y indicates V5.0.y and V5.1.y

Scenarios are not supported on zSeries because the specified product is not supported

Scenarios are not supported on iSeries® because the specified product is not supported

Client image is not supported with the Migration Wizard on Distributed. The Migration Wizard is also not supported on iSeries<sup>®</sup> or zSeries.



The next section discusses migration of a Stand-alone Application Server environment.



This example illustrates a more detailed picture of a migration sequence involving WebSphere Application Server V5 as the starting point of the migration.

1. Upgrade web server code and Plug-in

2. Create a V6.1 stand-alone application server profile using profile management tool or using *manageprofiles* command.

\*\* Note that before WASPreUpgrade can run, the servers that are part of the source installation must be stopped. You should stop these manually. If there are servers running, WASPreUpgrade attempts to stop any active servers.

3. Run the **WASPreUpgrade** command which quickly copies your configuration to a backup copy

4. Run the **WASPostUpgrade** command which copies and transforms the configuration data from the backup into the new profile

- 5. Analyze the upgrade logs
- 6. Start the V6.1 Application Server and begin testing.



The next section discusses migration of Network Deployment Cells.



The next several pages will show you a step-by-step process of migrating a full WebSphere Application Server V5 cell to a full WebSphere Application Server V6.1 cell, with intermediate Mixed V5 and V6.1 Nodes.

This scenario starts with a full V5 cell and V5 Web Server Plug-in as shown here.



The first step is to migrate the V5 Deployment Manager to a V6.1 Deployment Manager profile with the same Cell name. Now you are in a Mixed Node environment.

The result is that the V5 Deployment Manager is disabled. The V6.1 Deployment Manager now manages two V5 nodes. These nodes are fully operational.



The next step is to upgrade the Web Server installation and WebSphere Plug-in with a manual installation. Note that the V6.1 Web Server plug-in is compatible with earlier versions in that it can send requests to V5 Application Servers and V6 Application Servers.



The next step is to migrate the first node using the migration utilities. Now the cell consists of a V5 node, and a V6.1 node, which are fully operational.



The next step is to migrate the second node. Both nodes are at V6.1 and are fully operational. Now the cell is a full V6.1 Cell. You still may have V5 Application Clients in the environment that are calling V6.1 Application Servers.



The last step is to migrate the J2EE client using the clientUpgrade command.



To migrate a V5 Deployment manager, you should first stop it. The WASPreUpgrade will attempt to stop the Deployment Manager if it is running.

Next, create a V6.1 profile for the Deployment Manager. Note that you should make sure the cell name matches the cell name for the V5 cell.

Next, run the WASPostUpgrade command. This modifies the V6.1 Deployment Manager profile. Consult the output log for any errors. The log resides in the profile logs directory.

The V5 Deployment Manager is disabled from starting. If circumstances dictate that you must start the V5 Deployment Manager , you can re-enable the operation by running a wsadmin script migrationDisablementReversal.jacl from the previous deployment manager's bin directory.



To migrate a V5 node in a cell, the V6.1 Deployment Manager must be running, while the node agent and servers must be stopped.

Run WASPreUpgrade command which copies the configuration to the backup directory.

- Next, create an Application Server profile and ensure that the node name is the same as the V5 node name.
- Next, run WASPostUpgrade, which first transforms the information in the backup directory into the V6.1 node profile. The V6.1 Deployment Manager is contacted and some of this information is transferred there. Analyze the output log in the node profile logs directory for any errors or warnings.
- Start the nodeagent using the startNode command from the V6.1 node profile. The nodeagent will synchronize with the Deployment Manager and the node migration is complete. You can then start the application servers and test the applications.



The only naming restrictions involve migrating nodes and deployment managers.

When migrating the deployment manager, the cell name in the V6.1 profile must match the cell name of the V5 deployment manager. When migrating a V6/V5 node in a cell, the node name in the V6.1 profile must match the node name of the V6/V5 node.

There are no naming restrictions when migrating stand-alone nodes. There are no restrictions on how you may assign port numbers.



- Applications are copied to the new profile unless –includeApps=false is specified on the WASPostUpgrade command. Standard sample applications that are installed as WebSphere samples are always excluded from copying.

- All server settings are copied.

- All resources are copied. Note that some resources are considered deprecated. V5 JMS resources are copied, but you must navigate to the V5 JMS resources, which are distinctly identified from V6.1 JMS resources.



The next section discusses migrating Web server plug-ins.



If a node configuration relies on a Web server, that Web server must be upgraded to a supported level. That upgrade is a manual installation of the new Web server and installation of the V6.1 Web server Plug-in files. The upgrade must happen before any WebSphere Application Server V6.1 node is tested. The alternative is that the HTTP request will not be routed to the V6.1 application server.

After migrating the Web server and Plug-in files, the Plug-in configuration file, plugincfg.xml, must be regenerated and copied after each node migration.



The next section discusses script migration.



There are a few changes to be aware of that are required for your existing scripts when moving to WebSphere Application Server Version 6. These changes are assisted by the compatibility mode provided by WASPostUpgrade command . During migration, the default is to migrate using compatibility mode. If this option is taken, then the old object types are migrated into the new configuration; all existing scripts will run unchanged.

The following changes can be made with script compatibility support.

- HTTP transports: the new architecture for V6 uses the new channel framework. HTTP definitions are mapped on top of this support. When compatibility mode is chosen, the old HTTPTransport objects are migrated and mapped onto the channel architecture. Existing scripts can modify these objects and will run unchanged.
- **Process definition**: The name of this object is changed from processDef to processDefs. You can mitigate this change by using the compatibility mode mapping provided by the migration tools. The change to scripts to use the new location is as follows:

Old example:

Using Jacl: set processDef [\$AdminConfig list JavaProcessDef \$server1] set processDef [\$AdminConfig showAttribute \$server1 processDefinition] Using Jython: processDef = AdminConfig.list('JavaProcessDef', server1) print processDef

New example. Identify the process definition belonging to this server and assign it to the processDefs variable: Using Jacl: set processDefs [\$AdminConfig list JavaProcessDef \$server1] set processDefs [\$AdminConfig showAttribute \$server1 processDefinitions] Using Jython: processDefs = AdminConfig.list('JavaProcessDef', server1) print processDefs



This section discusses mixed version cell environment limitations.



- A mixed version cell is a topology where different nodes from different releases exist together.
- V6.1 Enables customers to add a new V5 or V6 Application Server to a mixed V5 and V6 release cell
- Support will be provided for a Deployment Manager (Dmgr) profile that has mixed Releases of nodes in the cell (5.0, 5.1, 6.0 or 6.1).
- V6.0.0 and V6.0.1 will not be supported in a Mixed node environment, so your V6.0 nodes should be at the V6.0.2 level. Migration support will still migrate these nodes during DMgr migration but will issue a warning message that the nodes cannot be managed by the V6.1 DMgr.

Some restrictions were removed in V6.1				
	What is to be added to the Mixed Release Cell	Supported in v6	Supported in v6.02	Supported in v6.1
Adding	V6.0.2 Node	Yes	Yes	Yes
Nodes	V5 Node	No	No	No
Adding	V6.0.2 Servers in V6.0.2 Node	Yes	Yes	Yes
Servers	V5 Servers in V5 Node	No	Yes	Yes <sup>1</sup>
Adding	V5 Server in V5 only Cluster	No	Yes	Yes <sup>1</sup>
Cluster	V5 Server in V6 only Cluster	No	No	No
Members	V6 Server in V5 only Cluster	No	No	No
	V5 Server in mixed (V5 and V6) Cluster	No	Yes	Yes 1,2
	V6 Server in mixed (V5 and V6) Cluster	Yes	Yes	Yes 1,2

Some of the restrictions for a mixed release environment were relaxed in V6.0.2 and V6.1, and you can now add a new V5 cluster member to a pre-existing mixed cluster, or cluster containing only V5 members.

However, the ability to add V5 nodes into a V6.1 cell is still not supported. A node must be at version 6.0.2 or later to be federated into a V6.1 cell.

In Summary:

•V5 nodes can only be added to a V6 cell through migration.

- Creation of a V5 server in a V6-only cluster is not supported.
- Similarly, creation of a V6 server in a V5-only cluster is not supported.



WebSphere Application Server version 6.1 supports JMX 1.2. It offers JMX interoperability between 6.1 and back level nodes at Version 5 or at Version 6.0.2 and later

Interoperability with Version 6.0.0 or 6.0.1 nodes is not supported

Version 6.0 supports JMX 1.2 and WebSphere Application Server version 5 supports JMX 1.1

Interoperability between Version 6.1 or 6.0.2 nodes with 5 nodes is supported only with the SOAP connector

Note: The JMX V1.2 specification is compatible with the earlier JMX V1.0 specification. However, you might need to migrate custom MBeans that are supplied by products other than the Application Server from Version 5 to Version 6. The primary concern for these custom MBeans is related to the values that are used in key properties of the JMX ObjectName class for the MBean. The open source mx4j implementation more stringently enforces property validation according to the JMX 1.2 specification. Test the custom MBeans that you deployed in Version 5 in Version 6, to ensure compatibility. Full details of the JMX V1.2 specification changes from the JMX V1.0 specification are available in the JMX 1.2 specification.



The next section summarizes the presentation.



This presentation has shown you that the WebSphere Application Server V6.1 product offers a great deal of application compatibility so that most applications will migrate to V6.1 with very little effort. Applications can be migrated using automated migration utilities and thus allow rapid migration with a minimum of effort. The migration utilities allow a staged migration of Network Deployment cells such that nodes can be migrated one at a time as time permits allowing a more controlled migration with minimum downtime. Additionally mixed node and coexistence of V5/V6 are supported for 6.1.

This presentation has shown you how WebSphere Application Server Version 6.1 migration leverages the existing environment and applications and changes them to be compatible with the WebSphere Application Server Version 6.1 environment. Existing application components and configuration settings are applied to the Version 6.1 environment during the migration process.



Additional references include the V6.1 Information Center and various IBM Redbooks covering WebSphere Application Server and migration topics.

## References









WebSphere V6.1 ships and supports Derby v10.1 which is the open source follow on release of Cloudscape V5.1.

Cloudscape migration from one release to the next used to be (prior to Derby) as simple as appending "upgrade=true" to the database (or add the "upgrade=true" as a connection attribute). This Cloudscape migration story has changed, however, and a manual/explicit migration is needed to move database instances from Cloudscape V5.1 to Derbyv10.1

WebSphere plans to ship a batch/shell file that users and migration tool can call to do the migration. The migration script will be called migratedb.bat/sh and will be located in WebSphere\_HOME/derby/migration/bin. The migration script will take two parameters <new database name> and <old database name>.



If a function is deprecated, IBM intends to remove it in a later release of the product. Generally, IBM will not remove a function/feature until at least two major releases or three full years (whichever is longer) after the release in which it is deprecated. In rare cases, it might become necessary to remove functions/features sooner.



The next screens show migration commands and some examples.

IBM Software Group			IBM		
NASPreUpgrade command syntax					
WASPreUpgrade <backupdirectoryname> <currentwebspheredirectory> [-traceString <trace_spec> [-traceFile <file_name>]] <options></options></file_name></trace_spec></currentwebspheredirectory></backupdirectoryname>					
Required Parameters					
-backupDirectoryName	output backup dire	ectory			
-currentWebSphereDirectory Current installation		1			
Optional Parameters					
-traceString <trace_spec> [-traceFile <file_name>] Used to gather trace information</file_name></trace_spec>					
Value of traceString is "*=all=enabled" with quotation marks					
Example: WASPreUpgrade C:\WASV5_backup C:\Websphere\Appserver					
Migrating to V6.1 © 2006 IBM Corporat					

The first two parameters are required and positional; the others are optional. The example given would also be the same for V6.

WASPreUpgrade backupDirectoryName currentWebSphereDirectory

[-traceString <trace\_spec> [-traceFile

<file\_name>]]

The first two parameters are required and positional. The others are optional.

backupDirectoryName - The name of the directory in which to store the saved configuration and files. The directory is created if it does not already exist. This is a required parameter.

currentWebSphereDirectory - The name of the root directory for the current WebSphere Application Server instance. On Distributed this is the install Root, on iSeries it is the userRoot. This can be any of the <u>version-offering combinations</u> listed in the first column of the table. This is a required parameter.

[-traceString <trace\_spec> [-traceFile <file\_name>]] - These optional parameters are used to gather trace information for use by IBM service personnel. The value of the traceString parameter is "\*=all=enabled"and must be specified with quotation marks to be processed correctly.

Example:

WASPreUpgrade c:\WAS6Backup c:\WebSphere\WAS6.0

For more information, see the WebSphere V6.1 Information Center for more options and details regarding the WASPreUpgrade command.

IBM Software Group	IBM					
WASPostUpgrade command syntax						
WASPostUpgrade backupDirect	PostUpgrade backupDirectoryName(-oldProfile <profile name="">][]</profile>					
Required Parameters						
backupDirectoryName	output of WASPreUpgrade					
Optional Parameters						
-oldProfile <profile name=""></profile>	A profile in V6.0 and an instance name in V5					
-profileName <profile name=""></profile>	V6.1 profile name					
-portBlock <startingportnumber></startingportnumber>	starting seed to create new ports					
-backupConfig <true false></true false>	true/false decision to backup the new install config					
-replacePorts <false true></false true>	true/false decision to add or replace virtual host ports					
-includeApps <true false></true false>	true/false decision to migrate applications					
-scriptsCompatibility <true false></true false>	true/false decision to migrate definitions in configuration					
-appInstallParameters - <"wsadmin parameters">	Parameters passed to wsadmin during installation of the application during migration					
-traceString <trace_spec> [-traceFile <file_name>]</file_name></trace_spec>	Used to gather trace information					
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WASPostUpgrade backupDirectoryName [-oldProfile <profile name>][.....]

## Example:

WASPostUpgrade c:\WAS6Backup -oldProfile Stand-aloneProfile -profileName StandaloneProfile

For more information, see the WebSphere V6.1 Information Center for more options and detail regarding the WASPostUpgrade command.



The first example shows the most simple case using the defaults. If you omit the – profileName option, the default profile is used.

The second example omits copying applications. This means just server configurations and resources are copied.



Use the following parameters: *app\_server\_root*/bin/wsadmin -instance instance -conntype NONE -f *profile\_root*/bin/migrationDisablementReversal.jacl

To restore the Version 5.1 default deployment manager, for example, you might use the following command:/QIBM/ProdData/WebAS51/ND/bin/wsadmin -instance default - conntype NONE -f

/QIBM/UserData/WebAS51/ND/default/bin/migrationDisablementReversal.jacl