



IBM Software Group

IBM® WebSphere® Application Server V6

Application Management Overview



@business on demand.

© 2004 IBM Corporation
Updated January 25, 2005

This presentation will focus on the basics of application management in WebSphere Application Server version 6.

Goals

- Provide an high level overview of Application Management, Application Repository and new V6 concept of System Application



The goal of this presentation is to provide overview of application management and some new V6 concept of System Applications.

Agenda

- Overview
- Architecture / Big-Picture
- System Application

The agenda covers an overview followed by big picture and in the end discuss the System Application concept.

Section

Overview

This section will discuss the overview.

Concepts in Application Management

- Application Installation
- Application Management
- Operational Control
 - ▶ start/stop application
 - ▶ view/edit configuration information
- Application Reinstall/update
- Application Monitoring



Application Installation - involves validation of the application archive, collection of configuration information from the end-user, and finally registration of the application in the WebSphere Application Server cell.

Application management is managing the application after it has been installed, and also while installing – that is, entering the binding information for the EJB references and the resources, and the Classloader information, including shared libraries and so on.

Application Management also includes transferring application configuration information and business logic to all the servers that the application runs on in a multi-node environment. The application should be ready to run once it is installed on the WebSphere Application Server cell.

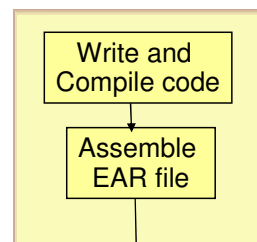
Operational Control includes starting and stopping of an application, viewing and editing configuration information and so on.

Application Reinstall and Update allows administrators to configure and install newer versions of the application with or without interruption in service.

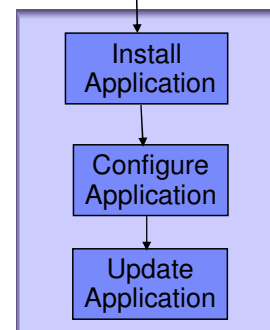
Application Monitoring is used to track the status of individual application components - for example, using the Tivoli® Performance Viewer to monitor the performance of the running application.

J2EE Deployment Cycle Model

- Write and compile Java™ 2 Enterprise Edition (J2EE) code
- Populate Deployment Descriptors and package EAR file
- Install the EAR
- Configure application
 - ▶ During and after installation
 - ▶ Bindings, Deployment Target Information, etc
- Update Application



Rational®
Tools
and
AST



Administrative
Clients



The developer's tasks should focus on developing code, but there are many other responsibilities that are the result of the current J2EE deployment model. For example, packaging code for distribution should be a simple step, aided by tools - but in reality, it is just one more skill that the developer must maintain, one more set of files that needs to be updated.

In this slide a differentiation is made between the roles of a developer and an administrator, and the different tools that are available in WebSphere Application Server for these roles.

For a developer, there are Rational tools - that is, IBM Rational Application Developer, and Application Server Toolkit. The Application Server Toolkit is IBM's assembly tool which is based on Eclipse. You can write and compile your J2EE applications using the Rational tool, you can assemble the enterprise application, that is, populate the deployment descriptors and package the EAR file using the application server toolkit. Once you are done with that, and you have the enterprise application ready for installation, you can move over to the Administrative Clients. That can be either the administrative console, the wsadmin command line utility, or a pure Java client that uses the JMX programming model. The configuration of the application, which includes binding information and deployment target information, may be configured during, or after installation.

Once you have your application up and running, at some point in the future, you might want to update the application. It is in this application update step that some major changes have been made in version 6. The rest of it is fairly similar to version 5, except, of course, the addition of Rational Application Developer tools and J2EE is now at the 1.4 level.

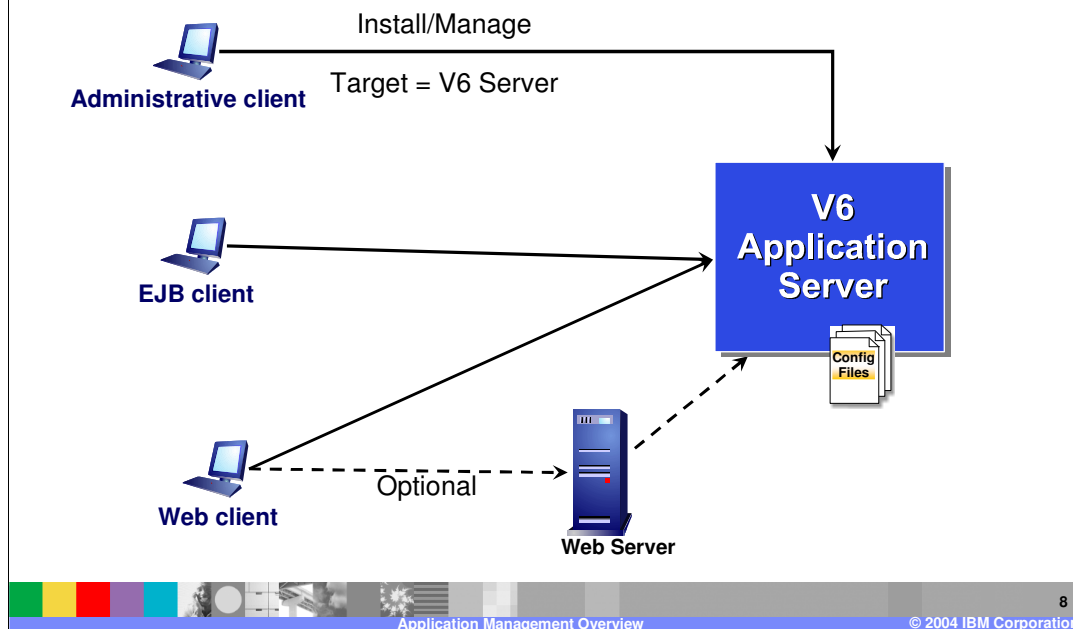
Section

Architecture / Big-Picture



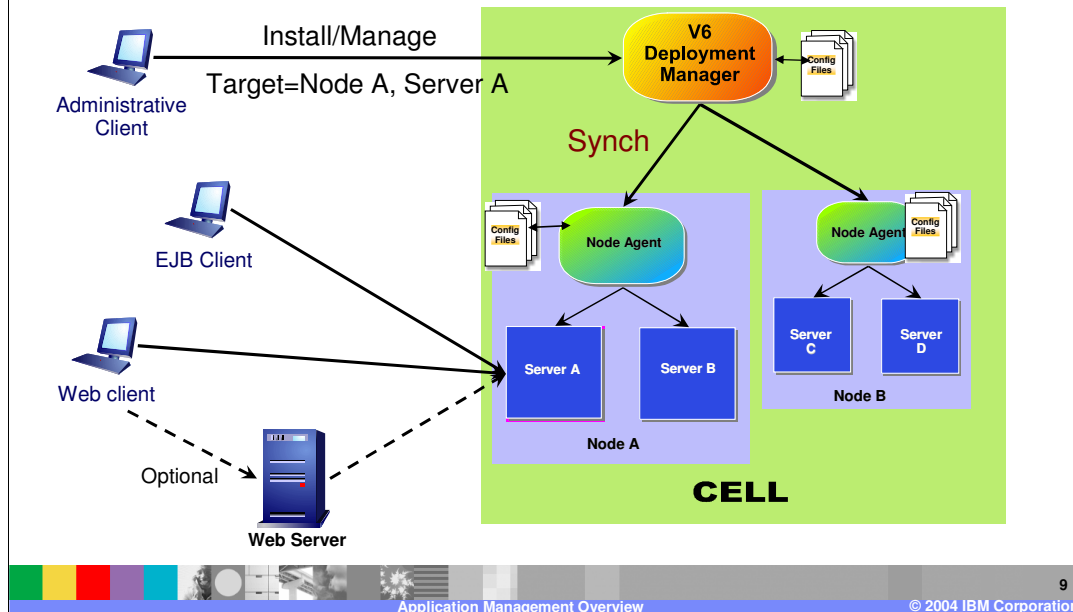
This section will discuss the application architecture and big picture.

Express: Application – End to End



This is a view of how to install and manage an application on WebSphere Application Server Express, which is IBM's single, stand-alone Application Server. Shown here is the version 6 Application Server and the XML configuration files. Any Application Server client, such as the Administrative Console, wsadmin, or a custom MBean client, can be used to install an application under the version 6 Application Server. Once you have the application installed on the Application Server, then you can use the application clients to access the application.

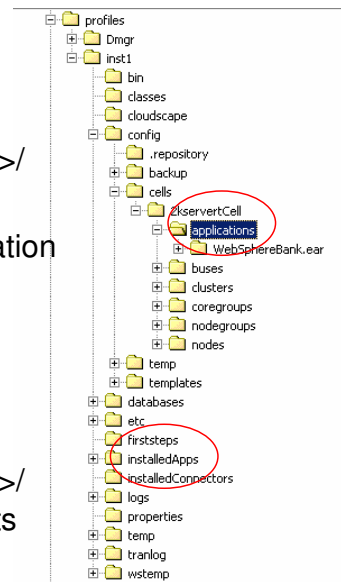
Cell: Application – End to End



The Network Deployment picture is different, with the Deployment Manager and the Node Agents. All the administration is done through the Deployment Manager. You install your application by connecting the administrative client to the Deployment Manager, and the nodes where the application is expected to run, pull the configuration from Deployment Manager. Your EJB and Web clients, like in the case of WebSphere Application Server Express, would be directly connecting to the application server.

Application Repository

- EAR file
 - ▶ Stored in
<WAS_Profile>/config/cells/<cellname>/
applications/appName.ear/
 - ▶ Extracted to the install destination location
on the various nodes
 - e.g., <WAS_Profile>/installedApps
- Application metadata
 - ▶ Extracted at
<WAS_Profile>/config/cells/<cellname>/
applications/appName.ear/deployments
 - ▶ Includes deployment.xml
 - Contains deployment attributes



The enterprise application, or EAR file, is stored under profiles\profile name\config\cells\cell name\application. The application is also extracted to the install destination location on the various nodes. By default, the location where it is extracted, is the installedApps directory. The metadata, that is your deployment descriptor files, is extracted under config\cells\cell name\application\applicationName\Deployments. In this folder would be a file called deployment.xml, which contains deployment attributes, such as module to deployment target relations, Classloader settings and so on.

J2EE Support

- J2EE 1.2, J2EE 1.3 and J2EE 1.4 supported
 - ▶ J2EE 1.4 EAR files can contain J2EE 1.2 and J2EE 1.3 modules
- Stub Generation
 - ▶ Packaging deployment code with clients (ejbdeploy)
 - Client view jar contains remote interfaces and stubs
 - EJB implementation jar contains the bean and ties
 - ▶ WebSphere Application Server does not require this structure, but can generate it with tools and exploit it at deployment
- Application Deployment API (JSR 88)
 - ▶ J2EE 1.4 deployment model
 - ▶ Alternative to administrative clients (Administrative Console, wsadmin, custom)



J2EE 1.2, 1.3, and 1.4 are supported as part of the downward compatibility requirements of the J2EE 1.4 specification.

Stub generation is actually not new in version 6. The ejbdeploy tool creates an EJB jar file and a client view jar file. This client view jar file will contain the remote interfaces and the stubs. The implementation jar file will only contain the bean and the ties. The client view jar file would be referenced by the EJB implementation jar file, as well as any EJB client jars. This structure is not really required by WebSphere Application Server, but the tools can create it, and WebSphere Application Server can exploit it during deployment.

The third bullet is about JSR 88, which is a new application deployment API that is part of the J2EE 1.4 specification.

JSR-88 (Application Deployment API) is a contract between a tool vendor and platform. It was the only deployment vehicle for Component Test Suite 1.4. It provides yet another deployment model for WebSphere Application Server in addition to wsadmin, Administrative Console, MBean.

Any of the non-J2EE functionality, such as Programming Model Extensions, cannot be done using JSR 88. The JSR 88 specification does not have extensibility. It is therefore not a recommended deployment tool. Instead, it is recommended that you use the administrative clients for your application deployment.

Section

System Applications



This section will discuss the application architecture and big picture.

System Applications

- New concept in WebSphere Application Server V6
- These are J2EE Applications that are integral part of WebSphere
 - ▶ Example: Special applications like Administrative Console, File Transfer
- Receives special treatment by WebSphere System Administration
 - ▶ Part of WebSphere product binaries and share among all Profiles
 - Can be updated by PTF Installer
 - ▶ Not subject to user manipulation - prevent accidental removal, downtime, update

The System Applications are those applications that are part of WebSphere, but not part of the actual application server. WebSphere is built from multiple application servers, and in the interest of performance and simplicity, those functions that are not required on every application server are implemented as Enterprise Applications. System Management is a prime example. While the ability to control resources is needed in every place that those resources can run, the user interface is only needed in one place – in front of the user!

AdminConsole.ear is the enterprise application that is responsible for the graphical user interface between the Administrator and the administrated. Filetransfer.ear is the mechanism that allows remotely installing applications, and synchronizing repository information from the deployment manager to each of the nodes. WebSphere will still function if these applications are removed, but this should happen only in very limited scenarios. If the Administrative Console application is removed, then system management is limited to the command line interface (or other JMX custom application).

Management of System Applications

- WebSphere V6 maintains a special registry of system applications
 - ▶ Started when the server starts up
- Stand-alone Application Server Configuration
 - ▶ All profiles share the application binaries for system applications
- Network Deployment Cell environment
 - ▶ System application running on a node will match the WebSphere product version on that node



In single server (base) configuration when multiple configuration instances (wsinstances) are created for a given WebSphere installation all of them should share the application binaries for system applications.

In an ND environment the system application running on a node should match the WebSphere product version on that node. It is not possible to store a single master copy of system application in WebSphere master repository on Deployment Manager that will serve different nodes at different versions. Therefore, configuration synchronization mechanism which is used to deliver new or updated applications to individual nodes in ND can not be used to manage system applications.

Due to these design considerations, a system application will have its application binaries and WebSphere-specific deployment metadata collocated with WebSphere product binaries.

An application can be defined as a system application when it is installed using the AppManagement. installApplication interface. Since system applications are generally installed and uninstalled by WebSphere Application Server product installation code, the needed system application definition parameters will be supplied by WebSphere Application Server product installation. The lifecycle of system applications, unlike customer applications, is tied closely to the WebSphere product lifecycle. The system applications are typically delivered for a specific release of WebSphere product and therefore should be installed, updated or uninstalled with the corresponding WebSphere product instance. System Apps will not be exposed as MBeans as they will not be started/stopped by customer actions

Section

Summary and Reference

This section will review what was covered.

Summary

- Application Management uses JMX-based System management component to manage applications
- wsadmin and Administrative Console can be used in the Application Management tasks
 - ▶ Such as: installation, configuration, etc.
- Special System Application are part of V6



In version 6, as in version 5, WebSphere Application Server uses JMX based system management to manage applications within WebSphere Application Server. You can use the Administrative Console, or wsadmin for your application management tasks, such as, installation and configuration.

Trademarks, Copyrights, and Disclaimers

The following terms are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both:

IBM	CICS	IMS	MQSeries	Tivoli
IBM (logo)	Cloudscape	Informix	OS/390	WebSphere
eIogo business	DB2	iSeries	OS/400	xSeries
AIX	DB2 Universal Database	Lotus	pSeries	zSeries

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 registered trademarks of Microsoft Corporation in the United States, other countries, or both.

Intel, ActionMedia, LANDesk, MMX, Pentium and ProShare 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.

Linux is a registered trademark of Linus Torvalds.

Other company, product and service names may be trademarks or service marks of others.

Product data has been reviewed for accuracy as of the date of initial publication. Product data is subject to change without notice. This document could include technical inaccuracies or typographical errors. IBM may make improvements and/or changes in the product(s) and/or program(s) described herein at any time without notice. Any statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only. References in this document to IBM products, programs, or services does not imply that IBM intends to make such products, programs or services available in all countries in which IBM operates or does business. Any reference to an IBM Program Product in this document is not intended to state or imply that only that program product may be used. Any functionally equivalent program, that does not infringe IBM's intellectual property rights, may be used instead.

Information is provided "AS IS" without warranty of any kind. THE INFORMATION PROVIDED IN THIS DOCUMENT IS DISTRIBUTED "AS IS" WITHOUT ANY WARRANTY, EITHER EXPRESS OR IMPLIED. IBM EXPRESSLY DISCLAIMS ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NONINFRINGEMENT. IBM shall have no responsibility to update this information. IBM products are warranted, if at all, according to the terms and conditions of the agreements (e.g., IBM Customer Agreement, Statement of Limited Warranty, International Program License Agreement, etc.) under which they are provided. Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products in connection with this publication and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. IBM makes no representations or warranties, express or implied, regarding non-IBM products and services.

The provision of the information contained herein is not intended to, and does not, grant any right or license under any IBM patents or copyrights. Inquiries regarding patent or copyright licenses should be made, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. All customer examples described are presented as illustrations of how those customers have used IBM products and the results they may have achieved. The actual throughput or performance that any user will experience will vary depending upon considerations such as the amount of multiprocessing in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput or performance improvements equivalent to the ratios stated here.

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

Note to U.S. Government Users - Documentation related to restricted rights-Use, duplication or disclosure is subject to restrictions set forth in GSA ADP Schedule Contract and IBM Corp.

