



IBM Software Group

# IBM® WebSphere® Application Server V6

## *WebSphere Rapid Deployment Deployment Automation*



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This presentation will focus on deployment automation, a feature of WebSphere Rapid Deployment, which is new to WebSphere Application Server V6. It allows developers an easier and faster way to package, deploy, and install applications on WebSphere Application Server.

## Goals

- Understand WebSphere Rapid Deployment
- Learn about the Deployment Automation Feature



The goals of this presentation are to understand WebSphere Rapid Deployment and how to use the Deployment Automation feature.

## Agenda

- WebSphere Rapid Deployment Overview
  - ▶ Deployment Automation Details
- Setting up and using WRD for Deployment Automation
- Usage Scenarios
- Summary



This presentation will cover an overview of deployment automation in general terms and in detail. It will also show how you can setup and start deployment automation and realize the benefits it provides. This presentation concludes with usage scenarios to show you working examples of how to use this feature.

## Section

# ***WebSphere Rapid Deployment (WRD) Overview – Deployment Automation***



This section will discuss an overview of deployment automation.

## WRD: Deployment Automation

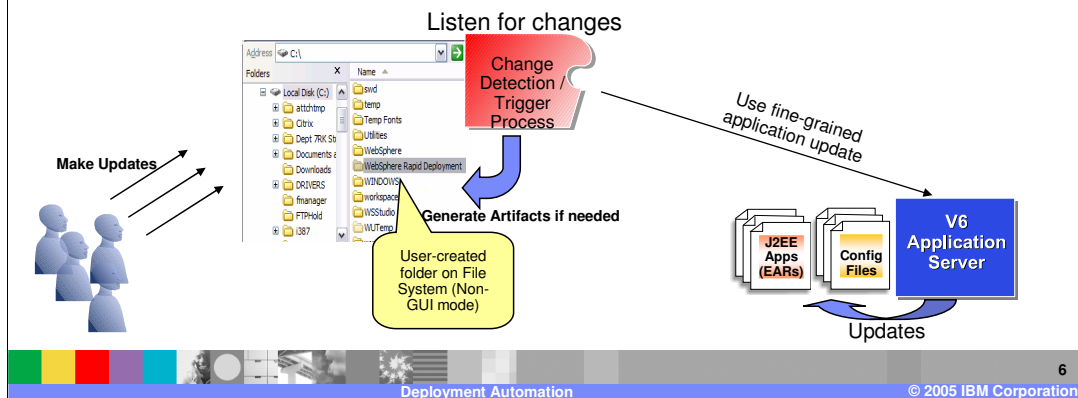
- Enable automatic installation of applications and modules onto a running WebSphere Server - local or remote servers
- Free form application development (initially only available in non-GUI mode)
  - ▶ Enables a “Hot Directory” concept for “file copy” and “Notepad” development and deployment
  - ▶ Constructs a well-formed EAR file from individual artifacts
  - ▶ Makes key decisions about default settings
- Support deployment of fine-grained application changes
- Goal of minimal application impact



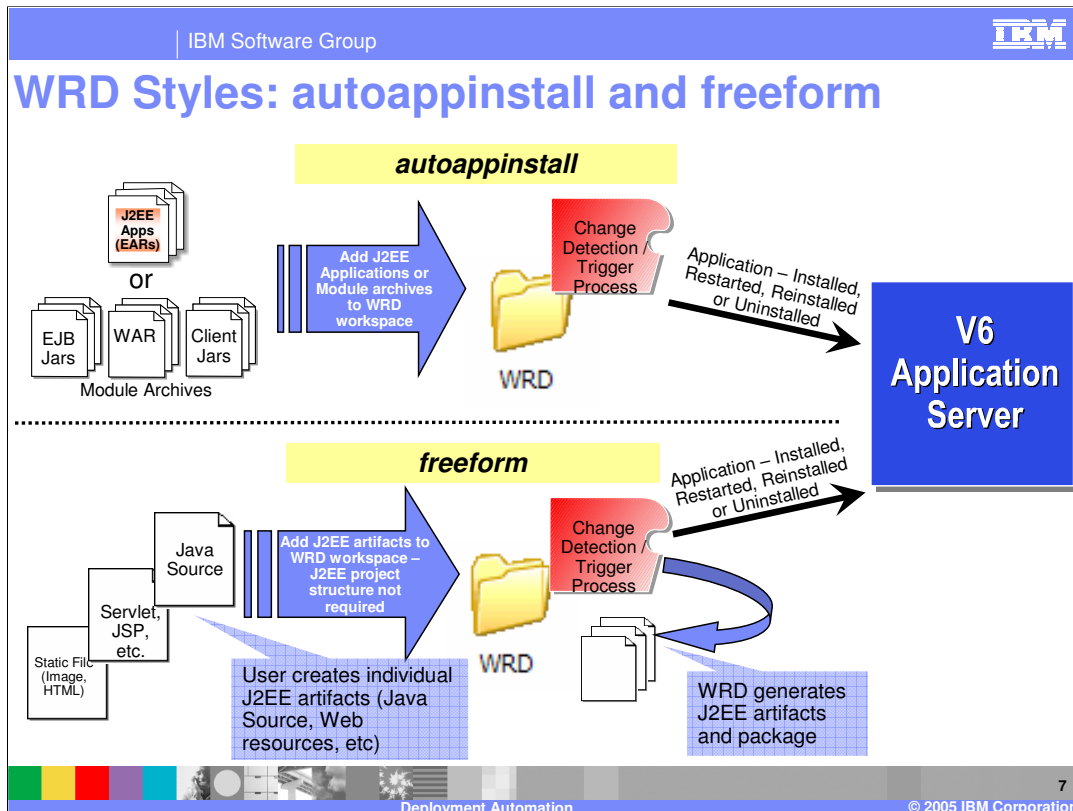
Deployment automation is the notion that the system monitors changes being made by a user and automatically ensures that those changes are reflected in a running copy of an application on WebSphere Application Server. In order to do this, the system will make decisions about default settings necessary to minimize the interaction required by the user. This monitoring takes place in the form of an actively monitored folder on the file system. As an example, the user of the system can place fully composed applications (EARs), application modules (WARs, EJB Jars), or application artifacts (Java™ source files, java class files, images, XML, HTML, etc) into a configurable location on their file system and WRD will automatically detect the addition or modification of those parts and perform any necessary steps to produce a running application on WebSphere Application Server. WRD does this in a manner that is as efficient as possible, only performing the minimum number of steps required for the detected change.

## WRD: Change Detection/Triggering Process

- Monitors the file system for changes in the WRD user workspace
- Drives processing operations based on the detection of change in artifacts of the application and style chosen for automation
  - ▶ Generates new application artifacts from existing artifacts
  - ▶ Drives deployment to the targeted WebSphere Application Server



In WRD, the deployment automation capability is provided by a collection of Eclipse incremental builders applied to the set of projects in an Eclipse workspace. The collection of builders can be applied to a project(s) in a way that combines to provide a particular behavior. Not all builders are applicable to all projects. The required set of builders and the appropriate order is determined by the set of artifacts that are expected in the source project and the required outcome. In WRD, this notion is called a Rapid Deployment Style. Styles are the mechanism exposed to a user to allow them to configure which WRD behaviors should be applied to their project. Essentially deployment automation is achieved by using a style to configure an appropriate set of builders into an eclipse project. The set of builders then collaborate to automate the construction and activation of an application onto a WebSphere Application Server.



WRD could be used to create a style whose purpose is to automate the installation, modification, and uninstallation of Java™ 2 Enterprise Edition (J2EE) compliant applications or modules. Instead of the customer taking an EAR file and using wsadmin or the Administration console to install that application through a multi-step wizard, WRD could be used to create a monitored directory in which the customer simply places the EAR. Upon placing the EAR in the directory, WRD would detect the addition of the new file. The builders configured by the style, in this case autoappinstall, would detect that the new part was an EAR, expand it into the installedApps folder of the local WebSphere installation, and install that application into the server using the standard WebSphere Application Management APIs (WAMA). If the customer placed a new copy of the same EAR in the directory, WRD would detect the modification, re-expand the EAR, and either call the reinstall APIs provided by WAMA, or simply restart the application using the standard WebSphere JMX APIs. Which path is taken can be determined by an activation builder based on the change that was detected. If the customer then deleted the EAR file from the directory, WRD would detect the deletion, stop the application, uninstall it using the WAMA, and then remove the expanded files. WRD would also, in addition to handling EAR files, consume individual J2EE modules (WARs, EJB Jars, RARs) and construct EARs as part of its execution.

WRD could also be used to reduce the complexity of application construction. In this scenario, instead of providing a fully-constructed J2EE application, you would place in a directory the individual parts of the application, such as Java Source files that represent Servlets or EJBs, static resources, XML files, etc. WRD could then be configured to construct a J2EE-compliant application and deploy that application on a target server. This style is called free form.

## Section

# ***Setting up Deployment Automation***

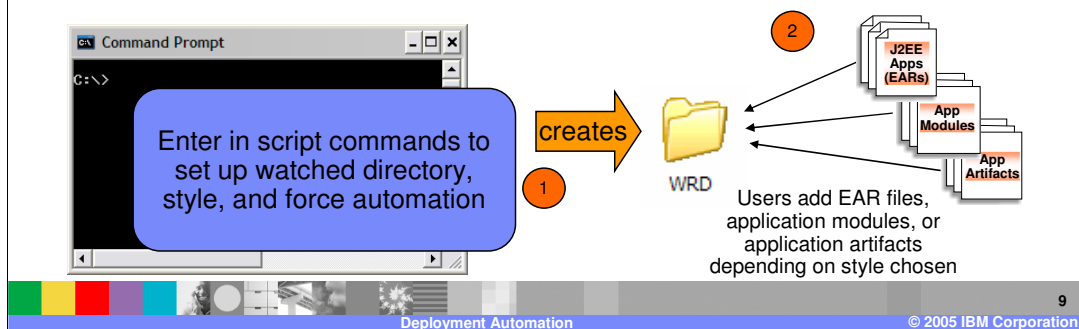


In this section you will see how you can set up and use deployment automation.



## Setting up Deployment Automation

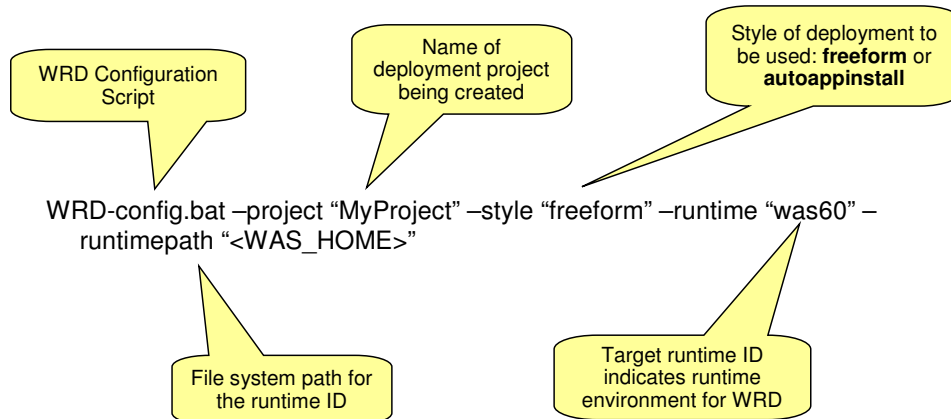
- Uses the Eclipse framework
- No Graphical User Interface
- Set of command line scripts
  - ▶ Tool included under the <WebSphere\_Profile>\bin directory
    - Actual implementation is stored under <WebSphere\_Root>\deploytool directory
  - ▶ Two steps to using WRD
    - Configure the WRD Project (Name of project, style of project)
    - Enable WRD (Start monitoring designated project)



You can run the rapid deployment tool from a command-line to create, configure and launch rapid deployment projects using the IBM WebSphere Application Server V6.0 run-time environment. This rapid deployment tool is supported in a non-graphical user interface mode that runs from a command line. To run the deployment automation you will need WebSphere Application Server V6 installed. The tool will be located in your WebSphere profile bin directory. There are two steps to working with deployment automation. The first is to configure the workspace itself with your chosen style, preferences, etc. The second, and final step, is to launch the deployment automation session.

## Configuring a WRD Project

- Configuring WRD
  - Set the WORKSPACE
    - Windows™: set WORKSPACE=C:\<directory where WRD project will run>
  - To configure a new WRD project enter the following at a command line under the <WebSphere\_Profile>\bin directory.



Configuring a WRD Project is the first step in a two step process to use WRD deployment automation. The first thing you need to do is specify the location on your file system that will host the rapid deployment activity. This location will serve as your workspace root, and all your rapid deployment projects will reside here. To complete this, define an environment variable called WORKSPACE. Next you will configure the WRD project by invoking the script WRD-config from the WebSphere profile bin directory. The mandatory parameters for the script are the name of the project and the style you want to use. In the chart above, you are provided an example of configuring a WRD project with the name MyProject using the style free form. On the next page you will see the additional parameters that can be used when configuring and running a WRD deployment automation project.

## WRD Configuration Parameters

### Required Parameters

- ▶ Project: Holds the name of the deployment project
- ▶ Style: Style of deployment to be used
  - autoappinstall
  - freeform



Optional Parameters

rebuild	Issues a clean and a rebuild
configure	Prompts configuration
runtime	Target runtime ID
runtimePath	Target runtime location
deconfigure	Prompts deconfiguration
configData	External configuration file
configPath	Configuration file location
listStyles	Displays available deployment styles
listServers	Displays available runtime server target
properties	Displays workspace properties
earExportPath	EAR export path
buildMode	Disables console output
monitor	Displays log output to the console
usage	Displays the program usage

As stated earlier the required parameters for configuring WRD rapid deployment project are the name of the project and the style you want to use. There are other parameters available and the table above lists each one and a brief description. For more detailed information on each one and a usage example, consult the Information Center.

## Running WRD

- After WRD is configured, invoke .bat/.sh script to enable monitoring of specified directory

```
<profile_home>\bin> WRD.bat
```

- Additional parameters when running
  - ▶ -monitor: Run WRD with console output
  - ▶ -batch: Runs a build of WRD workspace and then shuts down



After you have configured the workspace to contain an automatic application installation or freeform project, you will then launch a rapid deployment session. To run WRD after the configuration is complete is quite simple. Just invoke the WRD.bat script for Windows and WRD.sh script for Unix/Linux operating systems.

If you chose automatic application install as your project, once started it will start listening for your EAR or module files. If you place EAR files in the automatic application installation project, the EAR file is automatically deployed to the server. If you delete EAR files from the automatic application installation project, then the application is uninstalled from the server. If you place a new copy of the same EAR in the automatic application installation project, then the application is either reinstalled or the server restarts to pick up the modifications. If you place module files, a supporting EAR wrapper is generated, and then that EAR file is deployed to the server.

If your style of choice is free form you can drop or create J2EE artifacts or fully-composed J2EE modules. As artifacts are introduced or modified in the free-form project, the necessary J2EE project structures are dynamically generated in the workspace. The J2EE project structures include an enterprise application project, a Web module project, an EJB module project, an EJB client jar project and a utility Java project. For each free-form project configuration, there will be at most one of each of these J2EE project structures configured. From a J2EE development perspective, the free-form project supports a single J2EE application that contains two modules: a web module and an EJB jar module.

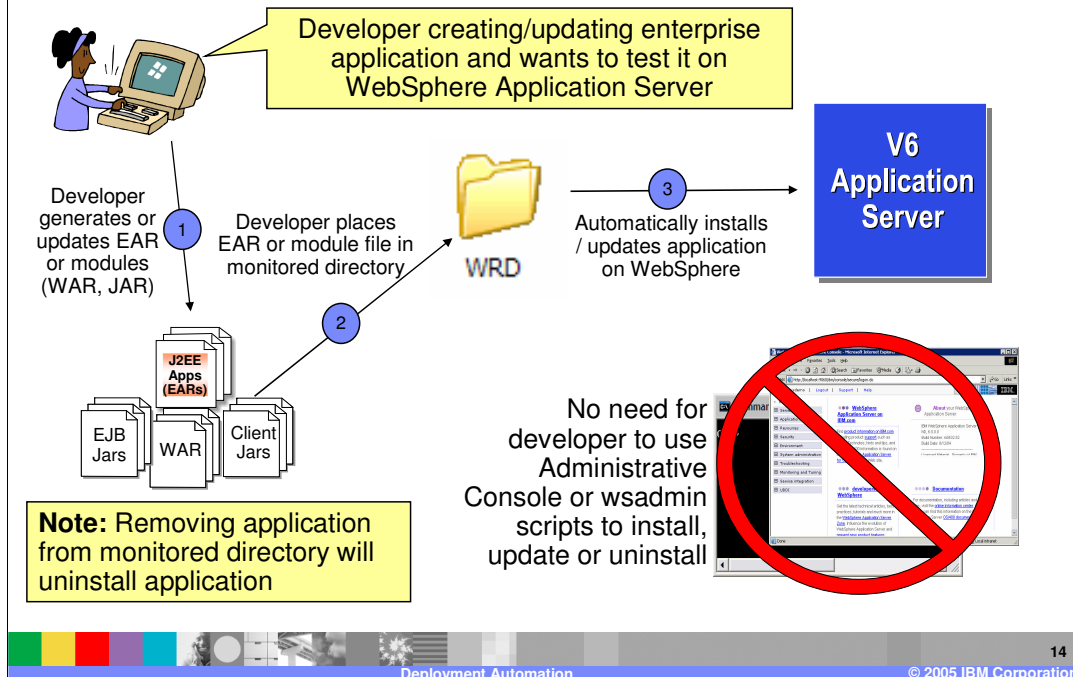
There are also a couple of parameters that can be specified when running a WRD session. Monitor and batch. You would specify `-monitor` if you want to monitor the rapid deployment activity and run your rapid deployment session with console output. You can run the rapid deployment session in batch mode as well by specifying `-batch`. Batch mode runs a build of rapid deployment workspace and then shuts down.

## Section

# *Usage Scenarios*

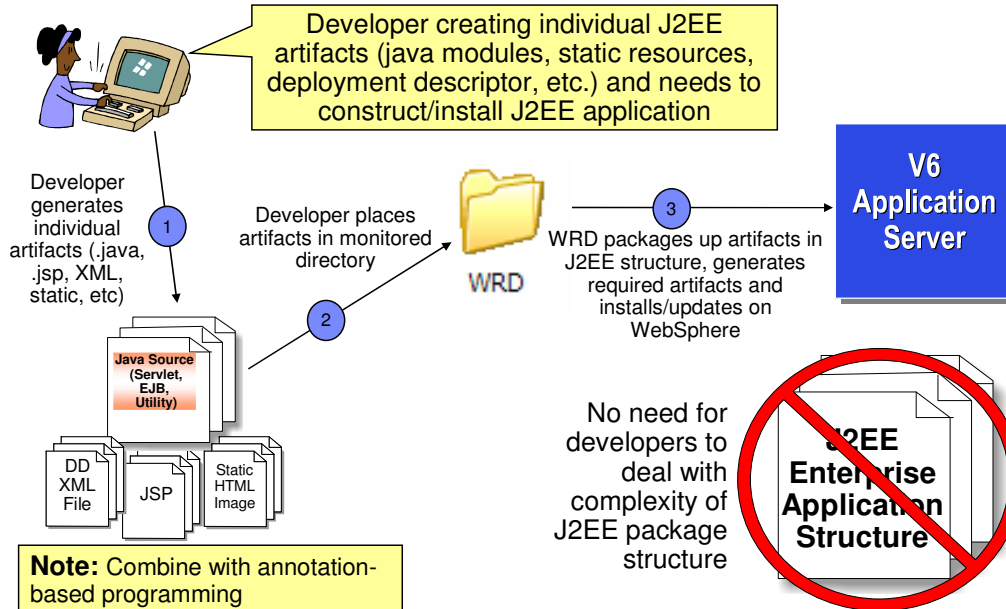
In this section, you will be presented with two different usage scenarios.

## Scenario: Using autoappinstall Style



In this first scenario, the developer needs an easy and fast way to deploy their application to a WebSphere Application Server for testing purposes. First the user will export their EAR file or modules for that EAR (WAR, EJB JAR, etc). The developer would then place those files in a configured WRD directory that uses the autoappinstall style. By placing those fully-formed J2EE application files in the monitored directory, the addition of the files would be detected, and, if necessary, WRD will construct a J2EE application that can be deployed and installed on WebSphere Application Server. If the developers decides to change/update the files the change will be detected and WRD will send an update request to the WebSphere. If the file is removed an uninstall application operation will be sent to WebSphere Application Server.

## Scenario: Using freeform Style



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Deployment Automation

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Free from style allows the developer the freedom of not having to understand the structure of a J2EE application. In this scenario the developer places a single Java artifact, like a servlet, into the monitored directory that is configured to use the free form style of WRD deployment automation. The addition of the file will be detected and a fully-formed J2EE application will be constructed. After the construction of the application is complete, the application will then be deployed and installed on the target WebSphere Application Server. Just like the autoappinstall style, any changes/deletions of files in the monitored directory will cause WRD to send the appropriate command to WebSphere Application Server to perform a specified function. For example, removing a single servlet will cause the WAR module of the J2EE application to be updated. In WebSphere Application Server V6 it will use a new function called fine-grained application update to perform this, meaning it will only update the WAR file and not require the application to be restarted.

## Section

# *Summary*



## Summary

- Deployment automation
  - ▶ Overview
  - ▶ Technical details
  - ▶ How to use
- Usage Scenarios



In this presentation you learned what is deployment automation and how to set it up. You were also provided usage scenarios using each of the styles of deployment automation to reinforce the concepts.

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