



Installing your application serving environment

Note

Before using this information, be sure to read the general information under “Notices” on page 221.

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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 919-254-5250.

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.

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Changes to serve you more quickly

Print sections directly from the information center navigation

PDF books are provided as a convenience format for easy printing, reading, and offline use. The information center is the official delivery format for IBM WebSphere Application Server documentation. If you use the PDF books primarily for convenient printing, it is now easier to print various parts of the information center as needed, quickly and directly from the information center navigation tree.

To print a section of the information center navigation:

1. Hover your cursor over an entry in the information center navigation until the **Open Quick Menu** icon is displayed beside the entry.
2. Right-click the icon to display a menu for printing or searching your selected section of the navigation tree.
3. If you select **Print this topic and subtopics** from the menu, the selected section is launched in a separate browser window as one HTML file. The HTML file includes each of the topics in the section, with a table of contents at the top.
4. Print the HTML file.

For performance reasons, the number of topics you can print at one time is limited. You are notified if your selection contains too many topics. If the current limit is too restrictive, use the feedback link to suggest a preferable limit. The feedback link is available at the end of most information center pages.

Under construction!

The Information Development Team for IBM WebSphere Application Server is changing its PDF book delivery strategy to respond better to user needs. The intention is to deliver the content to you in PDF format more frequently. During a temporary transition phase, you might experience broken links. During the transition phase, expect the following link behavior:

- Links to Web addresses beginning with `http://` work
- Links that refer to specific page numbers within the same PDF book work
- The remaining links will *not* work. You receive an error message when you click them

Thanks for your patience, in the short term, to facilitate the transition to more frequent PDF book updates.

Chapter 1. What is new for installers

Installation is now easier, more consistent, and a more functionally rich experience across platforms, installable components, and types of installations.

- “Installing Express” on page 79

Language support has been modularized into language packs for the administrative console and application server runtime components. This allows you to update your current language packs or add new language packs released by IBM using the Update Installer. The language pack design also allows you to defer installing non-English language packs for these two components if you want to save disk space.

- Chapter 9, “Installing maintenance packages,” on page 163

The V7.0 Update Installer supports multiple releases. The V7.0 Update Installer is also compatible with earlier releases; it works with V6.0.2.21 and newer maintenance and any maintenance for V6.1.0.x and V7.0 releases. This allows a single instance of the Update Installer to apply maintenance to more than one version of the application server. For V6.0.2.19 and previous releases, apply maintenance with the V6.0.2.x Update Installer.

The Update Installer has a file permission verification feature. This feature saves time and allows you to resolve potential file permission problems for Application Server maintenance before you install it.

The Update Installer can update language packs to add new languages. The Update Installer supports updates for DMZ Secure Proxy Server.

The Update Installer is available in .tar format on Unix type operating systems.

When installing the Update Installer, you can choose to create or not create start menu shortcuts.

- “Non-root installation” on page 97

A major enhancement to non-root support for the application server is the ability to verify and set file permissions. Users can now verify adequate file permissions before installing the product, and can use a utility to change ownership to another user for the file system after installation for future operations on that product. * IBM HTTP Server and the Web server plug-ins installers now install a private copy of IBM Global Security Kit (GSKit) which allows both root and non-root users to enable SSL support.

- Chapter 10, “Uninstalling the product,” on page 203

The uninstaller for WebSphere Application Server is now able to detect other products which extend the application server and have claimed a dependency on the application server. If you have installed other products which extend the application server, then you will be unable to uninstall the application server before uninstalling the other products. Products which extend the application server are feature packs and other products which rely on the application server runtime environment.

Chapter 2. How do I install an application serving environment?

Follow these shortcuts to get started quickly with popular tasks.

When you visit a task in the information center, look for the **IBM Suggests** feature at the bottom of the page. Use it to find available tutorials, demonstrations, presentations, developerWorks® articles, Redbooks®, support documents, and more.

Review the software and hardware prerequisites

Plan your installation of WebSphere® Application Server

Prepare your operating system for installation

Install the product

Install available maintenance

Take your first steps in using the product

Chapter 3. Task overview: Installing

Use this high-level procedure to install and customize IBM® WebSphere Application Server components.

Before you begin

Obtain the product code for distributed platforms in one of the following ways:

- From the product disc
- From the Passport Advantage® site, where licensed customers can download installation images
- From the Trial download page on the Support site, where you can download a packed installation file

Trial downloads are available for WebSphere Application Server - Express, Rational® Application Developer, IBM HTTP Server, Web server plug-ins for WebSphere Application Server, and WebSphere Application Client.

The Trial download for Rational Application Developer is available at <http://www.ibm.com/developerworks/downloads/r/rad/>.

Trial downloads are available at no cost and provide the same product code as purchased products. The only difference is that the time period for which a trial installation works is limited. To continue using a trial installation after the limit is reached, you must purchase a license and upgrade to the full product. See “Upgrading the Express trial to the Express product” on page 89.

The launchpad application is available on the product disc and on downloaded installation images, including trials. The launchpad is the recommended method of installation. See “Using the launchpad to start the installation” on page 7 for more information about the launchpad.

About this task

Perform the following procedure to learn about and to create a running version of the product components on your machine. Plan to read through the major topics in the Welcome, Learn about, and Product overview sections of the information center before beginning the installation.

If you are planning to migrate from an earlier version, you can install the WebSphere Application Server product before migrating.

1. Review the installation solution diagrams to help you plan a design for your application serving topology.

Use the diagrams to identify and select your installation path. See Chapter 4, “Planning the installation,” on page 35 for more information.

Before you start installing products with the launchpad, verify that your operating system is supported and that you have installed all of the prerequisite patches.

Administrative security is a selectable installation option that is enabled by default. Plan to record your administrative user ID and password so that you can use the administrative console and start and stop application servers.

2. Prepare your operating platform for installation.

Use the information in Chapter 5, “Preparing the operating system for product installation,” on page 47 to verify that your operating system is able to run the WebSphere Application Server products.

After preparing your operating system, you are ready to install the WebSphere Application Server products.

3. Install your WebSphere Application Server product.

See Chapter 6, “Installing the product and additional software,” on page 75 for specific installation procedures for installing a component.

Continue to follow this procedure if you are installing one of the components from the product package so that you install the most current maintenance and configure the product.

4. Install the most current product fixes, as described in Chapter 9, “Installing maintenance packages,” on page 163. The list of recommended updates is maintained on the Support site.

5. Configure the product after installation.

See Chapter 7, “Configuring the product after installation,” on page 115.

You can use the Profile Management Tool to configure additional application server runtime environments, called *profiles*.

The installation wizard uses the Profile Management Tool in silent mode to create and configure profiles.

See the documentation for creating profiles for more information.

6. Optional: Consider migrating a previous installation to Version 7.0.

You can migrate the configuration and applications from a previous installation of another version of WebSphere Application Server. Version 7.0 has a utility to help you perform the migration.

Results

You can install the WebSphere Application Server - Express product.

Hardware and software requirements

The official statements of support for WebSphere Application Server products are provided online at the Supported hardware and software Web page.

See Supported hardware and software Web page for the complete up-to-date listings on what is supported.

If there is a conflict between the information provided in the information center and the information on the Supported hardware and software pages, the information at the Web site takes precedence. Prerequisites information in the information center is provided as a convenience only.

Required disk space

Disk space requirements vary by operating system and hardware platform. See the following topics for information about required disk space and how to prepare your operating system for installation:

- **AIX** “Preparing AIX systems for installation” on page 47
- **HP-UX** “Preparing HP-UX systems for installation” on page 52
- **Linux** “Preparing Linux systems for installation” on page 57
- **Solaris** “Preparing Solaris systems for installation” on page 67
- **Windows** “Preparing Windows systems for installation” on page 71

Space is also required for the installable components in the secondary packet of the product package. Refer to the documentation for each installable component to determine exact space requirements.

Supported operating systems

As mentioned, the official statements of support for operating systems are on the Supported hardware and software site.

The installation programs for WebSphere Application Server products verify that a supported operating system is installed. The verification includes checking for required patches with the prereqChecker application.

Although the Installation wizard checks for prerequisite operating system patches, review the prerequisites on the Supported hardware and software Web site if you have not already done so.

Always consult the Supported hardware and software Web site to determine whether your operating system is supported when you receive a message from the prereqChecker program. In some cases, the Web site will be more current than the prereq checker on a product disc. For example, IBM often declares support for new versions of operating systems for a product that is already released. The prereqChecker might issue a message when, in fact, a new version of an operating system is supported.

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.

If you get an error from the prereqChecker program, you can continue the installation. PrereqChecker errors do not prevent you from installing. The messages are notifications of potential problems that you can ignore if the Web site lists your operating system as supported.

Refer to the product documentation for non-IBM prerequisite and corequisite products, such as browsers, to learn how to migrate to supported versions.

Supported languages

The WebSphere Application Server Version 7 distributed product is supported on these native languages:

- Brazilian-Portuguese
- Czech
- English
- French
- German
- Hungarian
- Italian
- Japanese
- Korean
- Polish
- Russian
- Spanish
- Simplified Chinese
- Traditional Chinese

Using the launchpad to start the installation

The launchpad console is the starting point for installing IBM WebSphere Application Server - Express.

Before you begin

The launchpad is a Web application. Before using the launchpad, you must have a supported Web browser. The launchpad supports the following browsers:

- **AIX** Mozilla Firefox, Version 1.5 or later
- **HP-UX** **Linux** **Solaris** Mozilla Firefox, Version 2.0 or later
- Internet Explorer, Version 6.0 Service Pack 2 or later

Install a supported Web browser if one is not installed.

- **AIX** **HP-UX** **Linux** **Solaris** Install a browser such as Mozilla Firefox.

1. Download Mozilla Firefox from the following location: <http://www.mozilla.org/products/firefox/>.
- **Windows** Install a browser for the Windows® operating system.
 - Download Internet Explorer from the following location: <http://www.microsoft.com/windows/ie/default.msp>
 - Download Mozilla Firefox from the following location: <http://www.mozilla.org/products/firefox/>.

Note: You cannot run the launchpad remotely to install a product. Only local use of the launchpad is supported.

About this task

The launchpad identifies components on the product disc or image that you can install (launch).

WebSphere Application Server is an integrated platform that contains an Application Server, a set of Web development tools, a Web server, and additional supporting software and documentation. The launchpad is the single point of reference for installing the entire application server environment. If you click a link that points to an installation wizard on another disc or image, then you are prompted to insert that disc or browse to that image. For example, IBM HTTP Server, Web server plug-ins, and Application Client for WebSphere Application Server are on the supplements discs. If you click a link to launch those products, you must insert the supplements discs in the disc drive or point the installer to the supplements images to install the product from the launchpad.

If you click **Launch the installation wizard for WebSphere Application Server - Express**, the Express installation wizard on the Express product disc or image is displayed.

Links in the navigation frame of the launchpad enable you to perform the following actions:

- View the Welcome page
- View the Installation diagrams
- Launch the installation wizard for WebSphere Application Server - Express
- Launch the installation wizard for IBM HTTP Server
- Launch the installation wizard for Web server plug-ins
- Launch the installation wizard for Application Clients
- Launch the installation wizard for IBM Update Installer for WebSphere Software Installation
- View the IBM WebSphere Installation Factory page
- Launch the installation wizard for IBM Tivoli® Composite Application Manager for WebSphere Application Server
- Launch the installation wizard for the IBM Support Assistant Workbench on Windows or Linux® Intel® operating systems
- Launch the installation wizard for the IBM Support Assistant Agent on AIX®, Linux, Windows, or Solaris operating systems

Note: IBM HTTP Server, Web server plug-ins, and Application Client for WebSphere Application Server are now contained on the supplements discs. These discs are required to install these products from the launchpad.

There is no launchpad for the discs in the secondary packet such as the DB2® product disc.

1. Start the launchpad.

The launchpad program is available in the root directory of the product disc or the downloaded installation image. You can start the launchpad manually using a fully qualified command instead of changing directories to the disc and running the command locally from the root directory:

- **AIX** **HP-UX** **Linux** **Solaris** Mount the disc drive if necessary. This procedure varies per platform. See “Mounting disc drives on operating systems such as AIX or Linux” on page 107.
 - Open a shell window and issue a fully qualified command to start the launchpad:
 - **AIX** **HP-UX** **Linux** **Solaris** `./llaunchpad.sh`
 - **Windows** `llaunchpad.exe`
2. The launchpad opens in the language of the locale setting of the machine. If necessary, select the desired language from the **Language selection** list.
 3. Use the launchpad to access the product overview, the readme file, and the installation guide. Each launchpad panel for an installable component includes a link to the component installation program and to component documentation for installation and configuration. For example, links on the WebSphere Application Server - Express panel enable you to:
 - Launch the installation wizard.
 - View the product overview.
 - View the installation guide.
 - View the readme file.
 4. Click **Launch the installation wizard for ...** to launch the installation wizard for the installable component that you select.

Results

This procedure results in using the launchpad to start the installation and to access information through a browser.

Troubleshooting

To use the launchpad application to install products from a network share, the contents of the product disc and supplements discs must be copied into separate directories. The launchpad application uses the `~/launchpad/diskinfo/thisDisk.properties` file to identify the correct location for the install files.

If you can start the launchpad, but clicking a link does not resolve to a page in the launchpad, you might have the media for the wrong operating system in the disc drive. Check the validity of the media.

Use the following procedure to correct any error that is preventing the launchpad from displaying. Then, try to start the launchpad again:

1. If the product disc is no longer accessible, insert the disc.
2. **AIX** **HP-UX** **Linux** **Solaris** Mount the drive as necessary on platforms such as AIX or Linux.
3. Enable the JavaScript™ function in your browser.
 - Mozilla Firefox: Click **Tools** → **Options** → **Content**:
 - Select **Enable Java**.
 - Select **Enable JavaScript**.
 - Click **Advanced** and allow scripts to ... (Select all boxes.)
 - Windows** Internet Explorer: Click **Tools** → **Internet Options** → **Security** → **Custom Level for Internet** → **Scripting** → **Active scripting** → **Enable**.
4. Restart the launchpad by issuing the following command:
 - **AIX** **HP-UX** **Linux** **Solaris** `./llaunchpad.sh`
 - **Windows** `llaunchpad.exe`

If the launchpad links still do not work after following this procedure, launch the programs directly.

What to do next

Go to Chapter 6, “Installing the product and additional software,” on page 75 to continue installing your application serving environment.

install command

The **install** command installs the product and most of the components in the product. When you install the product, the installer program installs the core product files and creates zero, one, or two profiles, depending on the product that you are installing and your installation selections. A silent parameter runs the Installation wizard in silent mode without displaying the graphical user interface.

Purpose

This topic describes the command-line syntax for the install command. Start the install command module from the command line to install the product.

Before you begin installing the product

Prepare the operating system for installation. Follow the procedure in Chapter 3, “Task overview: Installing,” on page 5 to get started.

The command file resides in the root directory of the component on the product disk.

In an effort to simplify your task environment, WebSphere Application Server has adopted a common install engine for WebSphere software components in the product package. The install command starts the installation program in almost all components in the product package:

- `AIX` `HP-UX` `Linux` `Solaris` `install`
- `Windows` `install.exe`

If the command or an alternative command is not applicable for a component on a particular operating system, the N/A abbreviation is displayed in the following table. A command is not applicable if the component cannot be installed on the operating system.

Table 1. . Component installation commands by operating system

Operating System	WebSphere Application Server	Application Client	IBM HTTP Server	Web Server Plug-ins	Update Installer (UPDI)
AIX	install	install	install	install	install
HP-UX	install	install	install	install	install
Linux	install	install	install	install	install
Solaris	install	install	install	install	install
Windows	install	install	install	install	install

Parameters and syntax

This section describes the command that starts the Installation wizard.

- Issue the install command to start the Installation wizard and display the graphical user interface:
`component_disc_directory/install`
- Issue the install -silent command to start the Installation wizard in silent mode, without the graphical user interface:
`component_disc_directory/install -options "response_file_name" -silent`

Use the following install command options to install a new installation, add a feature to an existing installation, upgrade a trial or the Express product, or configure an existing WebSphere Application Server - Express product by creating a profile.

Use the following table to determine valid values for each option.

Table 2. Install command option values table

Option Name (-OPT)	WebSphere Application Server - Express	
	Values	Default
allowNonRootSilentInstall	"true false"	Commented
disableOSPreqChecking	"true false"	Commented
disableNonBlockingPreqChecking	"true false"	Commented
checkFilePermissions	"true false"	Commented
feature	"noFeature samplesSelected languagepack.console.all languagepack.server.all"	"samplesSelected"
installLocation	Any valid directory path	<i>app_server_root</i> directories for root and non-root installers
installType	"installNew addFeature upgrade createProfile"	"installNew"
profileType	"standAlone" "none"	"none"
silentInstallLicenseAcceptance	"true false"	"false"
traceFormat	ALL text XML	Commented
traceLevel	OFF SEVERE WARNING INFO CONFIG FINE FINER FINEST	Commented
PROF_adminUserName	Any valid user ID.	"ADMIN_USER_NAME"
PROF_adminPassword	Any valid user password.	"ADMIN_PASSWORD"
PROF_cellName	A string with valid characters	Commented
PROF_defaultPorts	Commented Uncommented	Commented
PROF_enableAdminSecurity	"true false"	"true"
PROF_hostName	Any valid host name.	Commented
PROF_isDefault	Commented Uncommented	Commented
PROF_nodeName	Any valid and unique node name.	Commented
PROF_omitAction	Name of a configuration action.	Commented
PROF_portsFile	Any valid file path to a valid ports file.	Commented
PROF_profileName	Any valid profile name string.	Commented
PROF_profilePath	Any valid file path. See the description of <i>profile_root</i> in "Directory conventions" on page 31 for default values.	Commented
PROF_serverName	Any application server name, such as server1.	Commented
PROF_startingPort	Any valid port number.	Commented
PROF_validatePorts	Commented Uncommented	Commented
PROF_webServerCheck	"true false"	Commented
PROF_webServerHostname	A valid host name of the system with the Web server.	Commented

Table 2. Install command option values table (continued)

Option Name (-OPT)	WebSphere Application Server - Express	
	Values	Default
PROF_webServerInstallPath	Any valid directory path to the Web server.	Commented
PROF_webServerName	A valid name of a valid Web server.	Commented
PROF_webServerOS	linux windows aix hp solaris os390 i5os	Commented
PROF_webServerPluginPath	Any valid directory path to the Web server plug-ins.	Commented
PROF_webServerPort	A valid port to access the Web server.	Commented
PROF_webServerType	IHS IIS SUNJAVASYSTEM DOMINO APACHE HTTPSERVER_ZOS	Commented
PROF_winserviceAccountType	<i>specified user</i> localsystem	Commented
PROF_winserviceCheck	"true false"	Commented
PROF_winserviceStartupType	manual automatic disabled	Commented
PROF_winservicePassword	The password of the valid <i>specified user</i>	Commented
PROF_winserviceUserName	The name of the valid <i>specified user</i>	Commented

See the following descriptions for more information about each option.

Option descriptions

Use the following information to learn the purpose of an option and to determine which options to use for profile creation.

allowNonRootSilentInstall

Change this option to "true" to allow a non-root or non-administrator installer ID to install the product. A "true" value indicates that you accept the limitations associated with installing as a non-root user. If the value is "false", a non-root user cannot install the product.

See "Non-root installation" on page 97 for more information.

feature

Change the selection state of the features.

Valid values are:

samplesSelected

Installs the sample applications.

noFeature

Indicates that the feature is not selected for installation.

languagepack.console.all

Installs all language packs for the administrative console.

languagepack.server.all

Installs all language packs for the runtime environment.

installLocation

Change the installation location of the product. Specify any valid directory.

Windows Enclose directory names with spaces in double-quotes.

The default values vary per operating system. Separate default locations exist for non-administrator or non-root installer IDs. See the description of *app_server_root* directories for root and non-root installers in “Directory conventions” on page 31.

installType

Change the *installType* option to control the type of installation. The default is to install a new copy of WebSphere Application Server. Each operation type requires a separate invocation of the *install* command.

Valid values include:

installNew

This default value installs a new copy of the core product files.

addFeature

Adds features to an existing installation in an *incremental* installation.

Each WebSphere Application Server product has several features including sample applications, language packs for the administrative console, and language packs for the run time. If a feature is already installed, set the feature option to false. To install a new feature, set the feature to true.

upgrade

Upgrade a trial edition to a licensed version. Or upgrade the Express product to the base WebSphere Application Server product.

createProfile

Create a profile in an existing installation.

Set the *installLocation* option to your existing installation root directory.

Set the appropriate profile options for the type of profile that you are creating. Profile options are described by profile type in a later section in this topic.

profileType

Indicate the type of profile to create.

Valid values include:

- Application server
Create a stand-alone application server profile.
- Management
For a base application server topology an administrative agent is provided.
For a Network Deployment topology the deployment manager is provided for tightly coupled management, or a job manager is provided for a more loosely coupled management of multiple base application servers.
- Cell
Create a cell with two profiles: a deployment manager and an application server node that is already federated into the deployment manager cell.
- Custom
Create a profile with an empty node. You must federate this node to use it.
- None
Do not create a profile at this time. However, you will have to manually create a profile after installation in order for the product to be functional.
- Secure proxy
Create a secure proxy server to take requests from the internet and forward them to application servers. The secure proxy server resides in the DMZ.

silentInstallLicenseAcceptance

By changing the `silentInstallLicenseAcceptance` property in a silent response file to "true", you agree that you have reviewed and agree to the terms of the IBM International Program License Agreement accompanying the program, which is located in the *mount point or disc_drive/WAS/lafiles* directory.

If you do not agree to these terms, do not change the value or otherwise download, install, copy, access, or use the program and promptly return the program and proof of entitlement to the party from whom you acquired it to obtain a refund of the amount you paid.

traceFormat

Control the trace file output.

traceLevel

Control the amount of trace information collected.

PROF_adminPassword

Select the password for the administrative user ID.

Set the `PROF_enableAdminSecurity` option to true to use this option.

PROF_adminUserName

Select the administrative user ID.

Set the `PROF_enableAdminSecurity` option to true to use this option.

Note: Write down the user name and password. You cannot log onto the administrative console without it. You cannot use WebSphere Application Server at all unless you know the ID and password.

PROF_cellName

Specify a unique cell name for the profile.

The cell name must be unique within the WebSphere Application Server environment.

Even though you might plan to federate a stand-alone application server at some time, specify a unique cell name for the profile that is not the cell name of the deployment manager.

PROF_defaultPorts

Uncomment the option to use the default WebSphere Application Server port settings.

Do not use this parameter with the `PROF_portsFile` option or the `PROF_startingPort` option.

PROF_enableAdminSecurity

Choose whether to enable administrative security during the installation process.

Set the `createProfile` option to true.

Set the `installLocation` option to your existing installation root directory.

Set the `profileType` option.

Set other appropriate profile options (`PROF_` options) for your type of profile.

If `profileType="custom"` or `profileType="none"`, set this option to false.

Valid values are:

true

Administrative security is enabled. You must specify a user name and a password.

Note: Write down the user name and password. You cannot log onto the administrative console without it. You cannot use WebSphere Application Server at all unless you know the ID and password.

false

Administrative security is not enabled.

PROF_hostName

Specify the host name of the machine where the profile is to reside.

The host name is the domain name system (DNS) name (short or long) or the IP address of this computer.

PROF_isDefault

Set a default profile.

The default profile is the default target for commands issued against an anonymous profile, such as commands issued from the *app_server_root/bin* directory.

Issuing a command from the bin directory of another profile sets the command window to address the other profile, and not the default profile. Opening a new command window targets anonymous commands to the default profile again.

PROF_nodeName

Specify a unique node name for the profile.

The node name must be unique within the WebSphere Application Server environment.

PROF_omitAction

Omit the specified configuration action.

PROF_portsFile

Specify the path to a property file containing the desired port values.

Valid values are a valid file path default WebSphere Application Server port settings.

Do not use this parameter with the PROF_defaultPorts option or the PROF_startingPort option.

PROF_profileName

Set the profile name.

Specify the name of the profile. The profile name must be unique for this WebSphere Application Server installation or for the cell to which it might belong at some time.

Valid values are a string with valid characters.

PROF_profilePath

Specify the fully qualified file path to the *profile_root* directory.

Specify a valid directory to contain the files that define the run-time profile environment, such as commands, configuration files, and log files.

Windows If the directory contains spaces, enclose the path in double-quotes.

Valid values are a valid directory path.

PROF_serverName

Specify the server name for the stand-alone application server profile, for the deployment manager, or for the federated application server that is part of the cell profile.

Each stand-alone application server profile or each federated application server profile can have a server named server1, for example. Server names have to be unique within a profile, but not within a cell or within an installation.

PROF_startingPort

Specify the starting port number for generating all ports for the profile. If not specified, the profile uses default ports specified in the serverindex.xml file.

Do not use this parameter with the PROF_portsFile option.

PROF_validatePorts

Uncomment the option to validate that no conflicts exist within the selected ports.

PROF_webServerCheck

Specify whether you wish to define a Web server definition.

PROF_webServerHostname

Specify the host name of the system with the Web server.

Requires the PROF_webServerCheck option.

PROF_webServerInstallPath

Specify the local or remote installation path of the Web server.

Requires the PROF_webServerCheck option.

PROF_webServerName

Specify the name of the Web server.

Requires the PROF_webServerCheck option.

PROF_webServerOS

Specify the operating system of the system where the Web server runs.

Requires the PROF_webServerCheck option.

PROF_webServerPluginPath

Specify the path to the Web server plug-in for the Web server.

Requires the PROF_webServerCheck option.

PROF_webServerPort

Specify the access port of the Web server, such as port 80.

Requires the PROF_webServerCheck option.

PROF_webServerType

Specify the type of web server.

Requires the PROF_webServerCheck option.

PROF_winserviceAccountType

Specify the type of windows service to create.

Requires the PROF_winserviceCheck option.

PROF_winserviceCheck

Choose whether to run the server process as a Windows service.

PROF_winserviceStartupType

Specify the start up method for the windows service.

Requires the PROF_winserviceCheck option.

PROF_PROF_winservicePassword

Specify the password for the windows service.

Requires the PROF_winserviceCheck option.

PROF_PROF_winserviceUserName

Specify the user name for the windows service.

Requires the PROF_winserviceCheck option.

Examples of installing the product**Install WebSphere Application Server - Express with the Installation wizard user interface**

```
install
```

See Chapter 6, “Installing the product and additional software,” on page 75 for more information about installing with the Installation wizard.

Install WebSphere Application Server - Express from the command line

```
install -options /tmp/was/my_response_file.txt -silent
```

Install WebSphere Application Server - Express from the command line without the user interface

```
install -options /tmp/was/my_response_file.txt
```

The command installs the product with these particulars:

Response file location

```
/tmp/was/my_response_file.txt
```

Root installation

```
-OPT allowNonRootSilentInstall="false"
```

Install features

```
-OPT feature="samplesSelected"
```

Installation root directory

```
-OPT installLocation="app_server_root"
```

Install a new installation of the product

```
-OPT installType="installNew"
```

Type of profile created during installation

```
-OPT profileType="standAlone"
```

Accept IBM licensing agreement

```
-OPT silentInstallLicenseAcceptance="true"
```

Specify a cell name

```
-OPT PROF_cellName="my_cell1"
```

Use the default ports for the stand-alone application server

```
-OPT PROF_defaultPorts=
```

Specify the host name (IP address in this case)

```
-OPT PROF_hostName="5.55.555.555"
```

Identify the file path for profiles

```
-OPT PROF_profilePath="profile_root"
```

Name the application server

```
-OPT PROF_serverName="my_server1"
```

Let the installer program assign non-conflicting ports

```
-OPT PROF_validatePorts=
```

Install a Web server definition

```
-OPT PROF_webServerCheck="true"
```

Identify the location of the Web server and the plug-ins

```
-OPT PROF_webServerHostname="5.55.555.555"  
-OPT PROF_webServerInstallPath="Web_server_root"  
-OPT PROF_webServerName="my_ihs_web_server1"  
-OPT PROF_webServerOS="linux"  
-OPT PROF_webServerPluginPath="plugins_root"  
-OPT PROF_webServerPort="80"  
-OPT PROF_webServerType="IHS"
```

Content of /tmp/was/my_response_file.txt

```

-OPT allowNonRootSilentInstall="false"
-OPT feature="samplesSelected"
-OPT installLocation="app_server_root"
-OPT installType="installNew"
-OPT profileType="standAlone"
-OPT silentInstallLicenseAcceptance="true"
-OPT traceFormat=ALL
-OPT traceLevel=INFO
-OPT PROF_cellName="exp_cell1"
-OPT PROF_defaultPorts=
-OPT PROF_hostName="5.55.555.555"
-OPT PROF_isDefault=
-OPT PROF_nodeName="expnode1_node"
-OPT PROF_profileName="my_default"
-OPT PROF_profilePath="profile_root"
-OPT PROF_serverName="my_server1"
-OPT PROF_validatePorts=
-OPT PROF_webServerCheck="true"
-OPT PROF_webServerHostname="5.55.555.555"
-OPT PROF_webServerInstallPath="Web_server_root"
-OPT PROF_webServerName="my_ihs_web_server1"
-OPT PROF_webServerOS="linux"
-OPT PROF_webServerPluginPath="plugins_root"
-OPT PROF_webServerPort="80"
-OPT PROF_webServerType="IHS"

```

See “Installing silently” on page 91 for more information about using the installation wizard in silent mode, without the graphical user interface.

Logging

Examine the `app_server_root/logs/install/log.txt` file to verify that there were no file system or other unusual errors while installing. If there are problems, correct them, and reinstall the product.

WebSphere Application Server uses return codes to indicate the results of an installation operation:

- 0 Success
- 1 Failed
- 2 Partial success
- 3 Reserved
- 4 License not accepted
- 5 PrereqCheck failed
- 6 Upgrade not supported

Return codes are in use in the following components on the following operating systems.

Table 3. Return code applicability

Operating System	WebSphere Application Server	Application Client	IBM HTTP Server	Web Server Plug-ins	Edge Components	Update Installer (UPDI)
AIX, HP-UX, Linux, and Solaris	Yes	Yes	Yes	Yes	Yes	Yes

Windows ISMP does not set exit codes on Windows due to a limitation. Consult the install log to determine success or failure.

Partial success means that some portion of the installation failed but the installation is still at least partially usable. The failure is recoverable. Once recovered, the installation is completely usable. Consult the log to determine the exact failure and what, if any, corrective action can be taken.

Product version information

The WebSphere Application Server product contains structural differences from previous versions.

The `properties/version` directory in the `app_server_root` contains important data about the product and its installed components, such as the build version and build date. This information is included in `WAS.product` and `[component].component` files.

Run the `historyInfo` command to create a report about installed maintenance packages. The `historyInfo` command creates a report on the console and also creates tracking files in the `app_server_root/properties/version/history` directory.

Time-stamped, detailed logs record each update process in the `properties/version/log` directory of the `app_server_root`.

This topic describes the XML data files that store product information for WebSphere Application Server products. By default, the document type declarations (DTDs) for these files are in the `properties/version/dtd` folder of the `app_server_root`, or the server root directory. See the “Product version information” section for more information.

This topic includes the following sections:

- “Product information files”
- “Reports” on page 20
- “Logs and component backups” on page 21
- “Directory locations” on page 22
- “Operational description” on page 22
- “Data dictionary” on page 23

Product information files

XML files 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="7.0"/>
```

The following XML files in the `properties/version` directory represent installed items and installation events such as product edition, version, component, and build information.

WAS.product

One file whose existence indicates the particular WebSphere Application Server product that is installed. The type of product installed is indicated by the `<id>` tag. Data in the file indicates the version, build date, and build level.

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="08/31/08" build-version="a0838.07"
  name="activity" spec-version="7.0.0.0"/>
```

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.

ptf-id.ptf

Any number of maintenance package files that each indicate the presence of an installed refresh pack, fix pack, or interim fix.

XML files in the properties/version/history directory that store version history information files:The following XML files in the properties/version/history directory describe refresh packs, fix packs, and interim fixes 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.

xxxmaintenance_package_identifierxxx.ptfDriver

A driver file has useful information about the entire contents of an interim fix or fix pack.

xxxmaintenance_package_identifierxxx.ptfApplied

The applied file has relevant information about the interim fixes or fix packs that are currently applied.

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.

Reports

WebSphere Application Server provides the ability to generate **Version** reports and History reports from the data in the files. The following report-generation scripts are available in the *app_server_root* bin directory.

Product version reports

The following report generation scripts extract data from XML data files in the properties/version folder:

- **versionInfo** command
Lets you use parameters to create a version report on platforms such as AIX or Linux, or on Windows platforms.
- **genVersionReport** command
Generates the versionReport.html report file in the bin directory on platforms such as AIX or Linux, or on Windows platforms. The report includes the list of components and installed and uninstalled maintenance packages.

Product history reports

The following report generation scripts extract data from XML data files in the properties/version/history folder:

- **historyInfo** command

Lets you use parameters to create a history report on platforms such as AIX or Linux, or on Windows platforms.

- `genHistoryReport` command

Generates the `historyReport.html` report file in the `bin` directory on platforms such as AIX or Linux, or on Windows platforms. The report includes the list of components and a history of installed and uninstalled maintenance packages.

Logs and component backups

WebSphere Application Server products use two other directories when performing update operations, for logging and backups:

`app_server_root/logs/update`

The logs directory for product updates.

The location of log files that describe events that occur during the use of the update installer program.

`app_server_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: `20050324_211832` is 24-Mar-2004, 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, the Update installer program creates these logs: `app_server_root/logs/update/20050324_211832_apar6789c_install.log` and `app_server_root/logs/update/20050324_211912_apar6789c_uninstall.log`

Interim fix component log file names

`timeStamp_fixId_componentName_operation.log`

For example, the update installer program creates these logs: `app_server_root/logs/update/20050324_211832_apar6789c_ras_install.log` and `app_server_root/logs/update/20050324_211912_apar6789c_ras_uninstall.log`

Fix pack log file names

`timeStamp_ptfId_operation.log`

For example, the update installer program creates these logs: `app_server_root/logs/update/20050924_211832_was60_fp1_install.log` and `app_server_root/logs/update/20050924_211912_was60_fp1_uninstall.log`

Fix pack component log file names

`timeStamp_ptfId_componentName_operation.log`

For example, prior to Fix Pack 2: `properties/version/log/20050324_211832_was50_fp1_ras_install.log` and `properties/version/log/20030325_211912_was50_fp1_ras_uninstall.log` The update installer program creates these logs: `app_server_root/logs/update/20050324_211832_was60_fp1_ras_install.log` and `app_server_root/logs/update/20030325_211912_was60_fp1_ras_uninstall.log`

Backup JAR file names

`timeStamp_ptfld_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.

Directory locations

Product information files are located relative to the WebSphere Application Server product `app_server_root`, or the server root directory.

Default file paths are:

Version directory

`app_server_root/properties/version`

History directory

`app_server_root/properties/version/history`

Updates log directory

The update installer program stores log files in the `app_server_root/logs/update` directory.

Updates backup directory

`app_server_root/properties/version/backup`

DTD directory

`app_server_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 removes an interim fix file from the version directory when it uninstalls the corresponding fix.
- A WebSphere Application Server product adds a file with an extension of `.ptf` to the version directory to indicate that a refresh pack, a fix pack, or an interim fix is currently installed.
- A WebSphere Application Server product removes a file with an extension of `.ptf` from the version directory when it uninstalls the corresponding refresh pack, a fix pack, or an interim fix.
- A WebSphere Application Server product adds a driver file with an extension of `.ptfDriver` to the version/history directory when you run the `historyInfo` command. A fix pack driver file contains defining information for a fix pack.
- A WebSphere Application Server product adds a fix pack applied file with an extension of `.ptfApplied` to the version/history directory when you run the `historyInfo` command. 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 a maintenance package.

- A WebSphere Application Server product writes a line about a parent event for each refresh pack, a fix pack, or interim fix 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, fix pack, or refresh 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, fix pack, or refresh pack.
- A WebSphere Application Server product stores one log file in the logs/update directory as it installs or uninstalls an interim fix, fix pack, or refresh 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/WAS.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.

Type Family: update

File Types: ptf
 ptf-applied

File Type: ptf

Persistence: *versionDir/id.ptf*

Elements: id string required
 short-description string required
 build-version string required
 build-date date required
 component-name complex min=1, max=unbounded

Type Detail:

A ptf file denotes the presence of some portion of a specific refresh pack, fix pack, or interim fix.

The id of the refresh pack, fix pack, or interim fix is embedded in the fix pack file name.

A ptf file contains a listing of component updates.

When installing a refresh pack, fix pack, or interim fix, you can omit certain potential component updates, but only when the corresponding component is not installed.

Examine a separate application file to determine the components that a particular refresh pack, fix pack, or interim fix updates.

A refresh pack or fix pack can include updates for a number of interim fixes.

Element Detail:

ptf.id	The ID of the fix pack.
ptf.short-description	A short 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-name	A list of components.

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 refresh pack, fix pack, or interim fix as specified by the ID.

Element Detail:

ptf-applied.ptf-id	The ID of the refresh pack, fix pack, or interim fix for which applies 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]
	log-name	anyURL	required
	backup-name	anyURL	required
	time-stamp	date	required

Type Detail:

An applied instance is present to indicate the application of an update for a particular interim fix, fix pack, or refresh pack to a particular component.

(The particular interim fix, fix pack, or refresh pack is specified by the applied 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.log-name	The name of the log file that was generated by this application.
component-applied.backup-name	The name of the backup file that was generated by this application.
component-applied.time-stamp	The time of this application (the ending time of the corresponding update event).

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 refresh pack, fix pack, and interim fix 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]
	primary-content	anyURI	required	
	update-action	enum	required	[enumEventAction]
	log-name	anyURI	required	
	backup-name	anyURI	required	
	start-time-stamp	dateTime	required	
	result	string	required	
	update-event	complex	optional	

Type Detail:

An update event denotes a single update action, applying to either a fix, a fix pack, a refresh pack, or a component, according to the set event type.

Element Detail:

update-event.event-type	The type of this event, either a refresh pack, fix pack, or an interim fix 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, fix pack, or refresh pack of this event.
update-event.id	The ID of the interim fix, fix pack, refresh pack, or component that was updated, interpreted according to the type of the event.
update-event.update-type	The type of update for an update event.
update-event.update-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.result	The result of the 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.

Type Detail:

An event type instance specifies the type of an update event, which is either a refresh pack, fix pack, or interim fix (ptf) event or a component event. The interpretation of particular event elements depends on the set event type.

Value Detail:

EventType.ptf Specifies that an event is for a refresh pack, fix pack, or interim fix update.

EventType.component Specifies that an event is for a component update.

Enum Type: update-action

Values: 0 Install
1 Uninstall

Type Detail:

An event action instance specified the operation performed by an update, which can be an install or uninstall operation.

Value Detail:

enumEventAction.install Specifies that an event is an install operation.

enumEventAction.uninstall Specifies that an event is an uninstall operation.

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:

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.

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.

Installation: Resources for learning

Use the following links to find relevant supplemental information about installation and customization. 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 in 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.

One important link is:

How to buy WebSphere Application Server software

This IBM Web site describes pricing and technical details. If you have already purchased the software, view links to additional information about:

- Planning, business scenarios, and IT architecture
- Programming instructions and examples
- Programming specifications
- Administration
- Support

Planning, business scenarios, and IT architecture

- Supported hardware and software

The official site for determining product prerequisites for hardware and software 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 maintenance packages, 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.

- WebSphere Application Server Edge components library and information centers Web site

The information center for WebSphere Application Server Edge components contains complete documentation for the Caching Proxy and the Load Balancer.

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 documents that are related to WebSphere Application Server.

Programming specifications

- Java EE information

For more information about Java Platform, Enterprise Edition specifications, visit the Sun site.

Administration

- WebSphere technical library on developerWorks

The WebSphere library includes a wide range of content, including technical articles, downloads, product documentation, and tutorials

- The IBM Terminology Web site

The IBM Terminology Web site consolidates the terminology from many IBM products in one convenient location. In addition to base computer terminology, terms and definitions from IBM brands and product families are included and explained.

Support

- Steps to getting support for WebSphere Application Server

Whether you are a new user looking for basic information, or an experienced user looking for a specific workaround, you can benefit immediately from IBM's extensive Web-based support. Download fixes, search on keywords, find how-to information, and possibly solve a problem -- all before contacting IBM Software Support directly.

- Support page for WebSphere Application Server

Take advantage of the Web-based Support and Service resources from WebSphere Application Server to quickly find answers to your technical questions. Easily access the latest recommended product maintenance, find workarounds to technical problems, or register to receive e-mail from IBM Support.

- IBM Software Support portal

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 and search by product category, or by product name. If you are experiencing problems specific to WebSphere Application Server, for example, click **WebSphere Application Server** or **WebSphere Application Server for z/OS®** in the product list. The WebSphere Application Server Support page displays.

- Adobe® Acrobat Web site

This Adobe Web site offers a free download of the Adobe Acrobat Reader product.

Directory conventions

References in product information to *app_server_root*, *profile_root*, and other directories infer specific default directory locations. This topic describes the conventions in use for WebSphere Application Server.

Default product locations (distributed)

The following file paths are default locations. You can install the product and other components or create profiles in any directory where you have write access. Multiple installations of WebSphere Application Server - Express products or components require multiple locations. Default values for installation actions by root and non-root users are given. If no non-root values are specified, then the default directory values are applicable to both root and non-root users.

app_client_root

The following list shows default installation root directories for the WebSphere Application Client.

User	Directory
Root	<p>AIX /usr/IBM/WebSphere/AppClient (Java EE Application client only)</p> <p>HP-UX Linux Solaris /opt/IBM/WebSphere/AppClient (Java EE Application client only)</p> <p>Windows C:\Program Files\IBM\WebSphere\AppClient</p>
Non-root	<p>AIX HP-UX Linux Solaris <i>user_home</i>/IBM/WebSphere/AppServer/AppClient (Java EE Application client only)</p> <p>Windows C:\IBM\WebSphere\AppClient</p>

app_server_root

The following list shows the default installation directories for WebSphere Application Server - Express.

User	Directory
Root	<p>AIX /usr/IBM/WebSphere/AppServer</p> <p>HP-UX Linux Solaris /opt/IBM/WebSphere/AppServer</p> <p>Windows C:\Program Files\IBM\WebSphere\AppServer</p>
Non-root	<p>AIX HP-UX Linux Solaris <i>user_home</i>/IBM/WebSphere/AppServer</p> <p>Windows C:\IBM\WebSphere\AppServer</p>

cip_app_server_root

A *customized installation package* (CIP) is an installation package created with IBM WebSphere Installation Factory that contains a WebSphere Application Server - Express product bundled with one or more maintenance packages, an optional configuration archive, one or more optional enterprise archive files, and other optional files and scripts.

The following list shows the default installation root directories for a CIP where *cip_uid* is the CIP unique ID generated during creation of the build definition file.

User	Directory
Root	<p>AIX /usr/IBM/WebSphere/AppServer/cip/cip_uid</p> <p>HP-UX Linux Solaris /opt/IBM/WebSphere/AppServer/cip/cip_uid</p> <p>Windows C:\Program Files\IBM\WebSphere\AppServer\cip\cip_uid</p>
Non-root	<p>AIX HP-UX Linux Solaris user_home/IBM/WebSphere/AppServer/cip/cip_uid</p> <p>Windows C:\IBM\WebSphere\AppServer\cip\cip_uid</p>

component_root

The component installation root directory is any installation root directory described in this topic. Some programs are for use across multiple components. In particular, the Update Installer for WebSphere Software is for use with WebSphere Application Server - Express, Web server plug-ins, the Application Client, and the IBM HTTP Server. All of these components are part of the product package.

gskit_root

IBM Global Security Kit (GSKit) can now be installed by any user. GSKit is installed locally inside the installing product's directory structure and is no longer installed in a global location on the target system. The following list shows the default installation root directory for Version 7 of the GSKit, where *product_root* is the root directory of the product that is installing GSKit, for example IBM HTTP Server or the Web server plug-in.

Directory
<p>AIX HP-UX Linux Solaris product_root/gsk7</p> <p>Windows product_root\gsk7</p>

if_root This directory represents the root directory of the IBM WebSphere Installation Factory. Because you can download and unpack the Installation Factory to any directory on the file system to which you have write access, this directory's location varies by user. IBM WebSphere Installation Factory is an Eclipse-based tool which creates installation packages for installing WebSphere Application Server in a reliable and repeatable way, tailored to your specific needs.

iip_root

This directory represents the root directory of an *integrated installation package* (IIP) produced by the IBM WebSphere Installation Factory. Because you can create and save an IIP to any directory on the file system to which you have write access, this directory's location varies by user. An IIP is an aggregated installation package that can include one or more generally available installation packages, one or more customized installation packages (CIPs), and other user-specified files and directories.

profile_root

The following list shows the default directory for a profile named *profile_name* on each distributed operating system.

User	Directory
Root	<p>AIX /usr/IBM/WebSphere/AppServer/profiles/profile_name</p> <p>HP-UX Linux Solaris /opt/IBM/WebSphere/AppServer/profiles/profile_name</p> <p>Windows C:\Program Files\IBM\WebSphere\AppServer\profiles\profile_name</p>

User	Directory
Non-root	<div style="display: flex; justify-content: space-around; margin-bottom: 5px;"> AIX HP-UX Linux Solaris </div> <code>user_home/IBM/WebSphere/AppServer/profiles/</code> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> Windows C:\IBM\WebSphere\AppServer\profiles\ </div>

plugins_root

The following default installation root is for the Web server plug-ins for WebSphere Application Server.

User	Directory
Root	<div style="display: flex; justify-content: space-between; margin-bottom: 5px;"> AIX /usr/IBM/WebSphere/Plugins </div> <div style="display: flex; justify-content: space-around; margin-bottom: 5px;"> HP-UX Linux Solaris </div> /opt/IBM/WebSphere/Plugins <div style="display: flex; justify-content: space-between; margin-top: 5px;"> Windows C:\Program Files\IBM\WebSphere\Plugins </div>
Non-root	<div style="display: flex; justify-content: space-around; margin-bottom: 5px;"> AIX HP-UX Linux Solaris </div> <code>user_home/IBM/WebSphere/Plugins</code> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> Windows C:\IBM\WebSphere\Plugins </div>

updi_root

The following list shows the default installation root directories for the Update Installer for WebSphere Software.

User	Directory
Root	<div style="display: flex; justify-content: space-between; margin-bottom: 5px;"> AIX /usr/IBM/WebSphere/UpdateInstaller </div> <div style="display: flex; justify-content: space-around; margin-bottom: 5px;"> HP-UX Linux Solaris </div> /opt/IBM/WebSphere/UpdateInstaller <div style="display: flex; justify-content: space-between; margin-top: 5px;"> Windows C:\Program Files\IBM\WebSphere\UpdateInstaller </div>
Non-root	<div style="display: flex; justify-content: space-around; margin-bottom: 5px;"> AIX HP-UX Linux Solaris </div> <code>user_home/IBM/WebSphere/UpdateInstaller</code> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> Windows C:\IBM\WebSphere\UpdateInstaller </div>

web_server_root

The following default installation root directories are for the IBM HTTP Server.

User	Directory
Root	<div style="display: flex; justify-content: space-between; margin-bottom: 5px;"> AIX /usr/IBM/HTTPServer </div> <div style="display: flex; justify-content: space-around; margin-bottom: 5px;"> HP-UX Linux Solaris </div> /opt/IBM/HTTPServer <div style="display: flex; justify-content: space-between; margin-top: 5px;"> Windows C:\Program Files\IBM\HTTPServer </div>
Non-root	<div style="display: flex; justify-content: space-around; margin-bottom: 5px;"> AIX HP-UX Linux Solaris </div> <code>user_home/IBM/HTTPServer</code> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> Windows C:\IBM\HTTPServer </div>

Chapter 4. Planning the installation

Installation scenarios describe the products to install and the basic installation steps. This topic provides common installation scenarios for a WebSphere Application Server product.

Before you begin

Determine what components you want to use for your Web serving environment. The installation scenarios can help you to understand the capabilities of your WebSphere Application Server product. Knowing what you can do with the product might influence how you install the product and other components.

About this task

The installation scenarios use topology diagrams and descriptions to show what components to install for a given topology. The scenarios also have installation steps that link to specific procedures for installing a component, running a command, or using a tool.

Review the scenarios to determine which topology best fits your needs. The diagrams and their accompanying procedures can serve as a roadmap for installing a similar topology.

In addition to product installation diagrams for the installable components, this topic also links to a roadmap for using the Profile Management Tool. The Profile Management Tool creates runtime environments for application server processes.

1. **Diagrams:** Review the installation scenarios for the WebSphere Application Server - Express product, as described in "Planning to install WebSphere Application Server" on page 36.
2. **Diagrams:** Review the installation scenarios for the Web server plug-ins for WebSphere Application Server, as described in the topic "Selecting a Web server topology diagram and roadmap".
3. **Diagram:** Review the installation scenarios for the Application Client, as described in "Planning to install WebSphere Application Client" on page 41.
4. **Optional:** Review interoperability and coexistence diagrams to know what is possible with the current version.

WebSphere Application Server can 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, running on separate machines. *Coexistence* describes multiple versions or instances running on the same machine at the same time.

Interoperability support enhances migration scenarios with more configuration options. Interoperating is often more convenient or practical during the migration of a configuration from an earlier WebSphere Application Server version to a later one. Some machines can have the earlier product version and other machines can have the later version. An environment of machines and application components at different software version levels can involve both interoperability and coexistence.

It is often impractical, or even physically impossible, to migrate all of 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. See the migration documentation for more information.

5. **Optional:** Consider performance when designing your network, as described in the documentation for Queuing network.

Results

Following this procedure results in reviewing installation scenarios to identify specific steps to follow when installing more than one component.

What to do next

After determining an appropriate installation scenario, install the necessary components and configure the products for the system that you selected.

Planning to install WebSphere Application Server

Consider common installation scenarios for the product to determine how to install your application serving environment. This topic links to procedures for installing each scenario.

Before you begin

IBM WebSphere Application Server Express is an integrated platform that contains an application server, Web development tools, a Web server, and additional supporting software and documentation.

The installation of the application server product typically performs two actions. First the installation process installs a shared set of core product files. Second, the installation process optionally creates a *profile*, which is a separate data partition that includes the files that define a runtime environment for an application server process, such as an application server.

A running application server process can create, read, update, or delete the configuration files, data files, and log files in its profile. The application server process can access the core product files, which include command files and other shared product binary files. However, most core product or system files are updated only by installing fix packs, interim fixes, or products that extend the product.

During installation, you can choose to create an *application server profile*, a *management profile*, or a *custom profile*. The installer also has an option not to create a profile during installation. However, at least one profile must exist to have a functioning application server environment. After installation, you can use the Profile Management Tool or the `manageprofiles` command to create profiles.

You must first prepare your operating system for installation before installing any of the below topologies. See Chapter 5, “Preparing the operating system for product installation,” on page 47 for more information.

Scenarios for installation

The following information describes scenarios for installing the product in various topologies on one or more machines.

Topologies for a stand-alone application server

Each stand-alone application server runs independently of other application servers.

The following application server topologies are described in this topic.

- **Scenario 1:** Single-machine installation of a stand-alone application server
- **Scenario 2:** Single-machine installation of a stand-alone application server and a Web server
- **Scenario 3:** Two-machine installation of a stand-alone application server and a Web server
- **Scenario 4:** Two-machine installation of multiple stand-alone application servers and Web servers
- **Scenario 5:** Flexible administration of a two-machine installation of multiple stand-alone application servers and Web servers

Some scenarios are more typical in production environments. For example, Scenario 1 supports a lighter workload than Scenario 3 or Scenario 4. However, Scenario 1 is a fully functional environment. Scenarios 3 - 5 are typical production environments for a stand-alone application server.

Solution Installation Diagrams

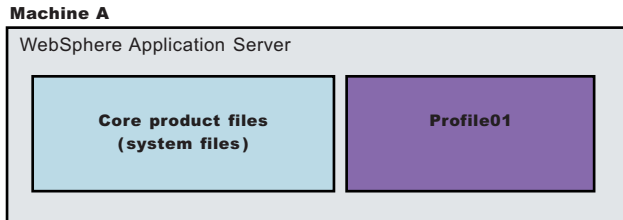
Each of the following scenarios includes a diagram and a list of detailed installation steps.

- **Scenario 1:** Install a stand-alone application server on a single machine.

Install WebSphere Application Server Express by itself on a single machine and create a stand-alone application server profile. Each stand-alone application server profile includes a server1 application server process. Each profile defines a separate stand-alone application server that has its own administrative interface.

You can use the Profile Management Tool or the manageprofiles command to create profiles after installation.

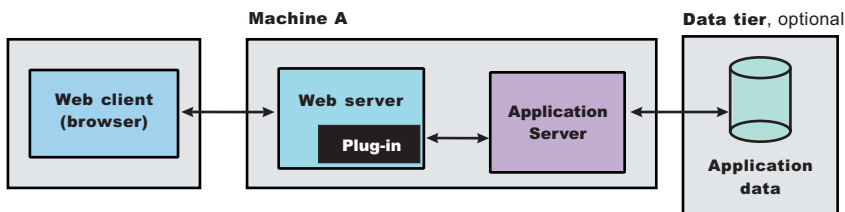
In this scenario, the application server uses its internal HTTP transport chain for communication instead of using a separate web server (on a separate machine) to possibly offload some processing.



Step	Task
1	Install WebSphere Application Server Express. Create an application server profile during the installation.

- **Scenario 2:** Install a stand-alone application server and a Web server on a single machine.

Installing a Web server, such as IBM HTTP Server, on the same machine as the application server provides more configuration options. Installing a Web server plug-in enables the Web server to communicate with the application server. This installation scenario supports rigorous testing environments or production environments that do not require a firewall. However, this scenario is not a typical production environment. When everything is on one machine, neither the Web server or the application server will run as fast as if they were on separate machines because they are both competing for the same CPU resources.

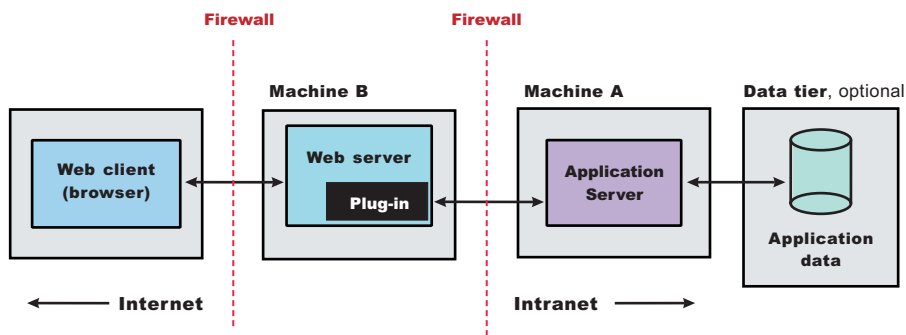


Step	Task
1	Install WebSphere Application Server Express . Create an application server profile during the installation.
2	Install the IBM HTTP Server or another supported Web server. While installing IBM HTTP Server, use its installation wizard to install the Web server plug-ins. After installing IBM HTTP Server, proceed to step 4.

Step	Task
3	If you use another supported Web server or an existing installation of IBM HTTP Server, use the Plug-ins installation wizard to install the Web server plug-ins and configure the Web server. Because the Web server and the application server are on the same machine, the Plug-ins installation wizard creates a Web server definition and you can skip step 4.
4	Create a Web server definition using the administrative console. Click Servers > Web servers > New and complete the steps in the Create new Web server definition wizard.

- **Scenario 3:** Install a stand-alone application server and a Web server on separate machines.

In the typical production environment, the application server on one machine communicates with a Web server on a separate (remote) machine through the Web server plug-in. After creating a profile and installing a dedicated Web server, use the Plug-ins installation wizard to install a plug-in and to update the Web server configuration file. The Web server can then communicate with the application server. Optional firewalls can provide additional security for the application server machine.



Step	Machine	Task
1	A	Install WebSphere Application Server Express. Create an application server profile during the installation.
2	B	Install IBM HTTP Server or another supported Web server on Machine B. While installing IBM HTTP Server, use its installation wizard to install the Web server plug-ins.
3	B	If you use another supported Web server or an existing installation of IBM HTTP Server, use the Plug-ins installation wizard to install the Web server plug-ins and configure the Web server on Machine B. The Plug-ins installation wizard creates a <code>configureWeb_server_name</code> script in the <code>plugins_root/bin</code> directory on Machine B.
4	B	Copy the <code>configureWeb_server_name</code> script on Machine B to the <code>app_server_root/profile_name/bin</code> directory on Machine A.
5	A	Run the <code>configureWeb_server_name</code> script on Machine A to create a Web server definition in the administrative console. You can then use the administrative console to manage the Web server.
6	A	Propagate the <code>plugin-cfg.xml</code> file on Machine A from the application server to the Web server using the administrative console. <ol style="list-style-type: none"> 1. Click Servers > Web servers. 2. On the Web servers page, place a check mark beside the Web server for which you want to propagate a plug-in, and click Propagate Plug-in. <p>Web servers other than IBM HTTP Server require manual propagation.</p>

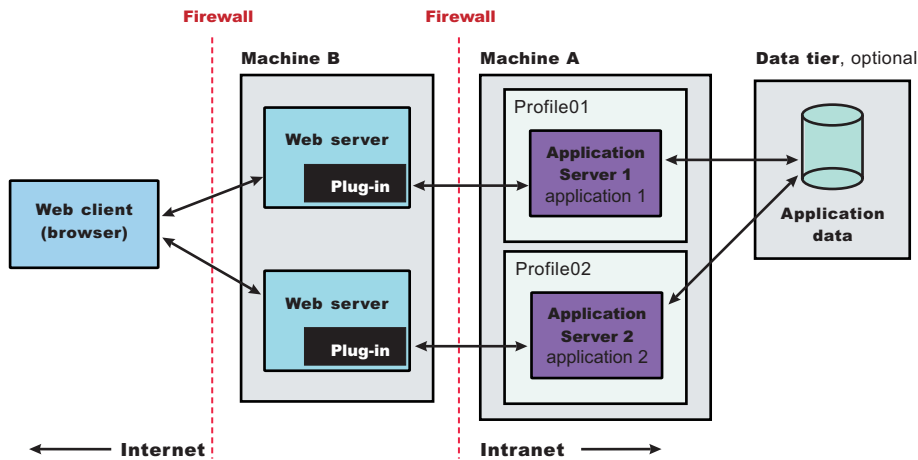
- **Scenario 4:** Install multiple stand-alone application servers on one machine and one or more Web servers on a separate machine.

The Profile Management Tool can create a deployment manager profile, an application server profile, or a custom profile. After creating a profile and installing a dedicated Web server, use the Plug-ins

installation wizard to install a plug-in and to update the Web server configuration file. The Web server can then communicate with the application server. In this configuration, this process must be done for each profile and Web server combination.

This topology lets each profile have unique applications, configuration settings, data, and log files, while sharing the same set of core product files. Creating multiple profiles creates multiple application server environments that you can dedicate to different purposes. For example, each application server on a Web site can serve a different application. In another example, each application server can be a separate test environment that you assign to a programmer or a development team.

Another feature of having multiple profiles is enhanced serviceability. For example, when a fix pack updates the system files, all application servers begin using the updated core product files.

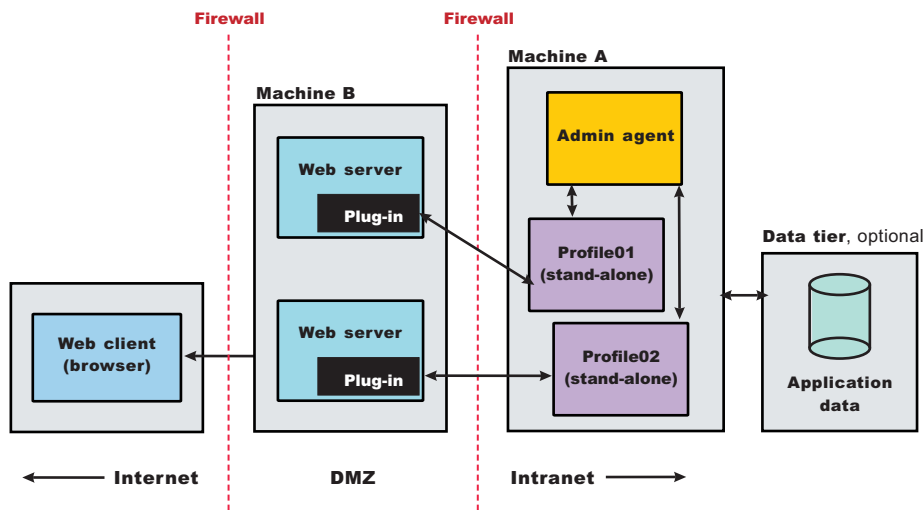


Step	Machine	Task
1	A	Install WebSphere Application Server Express. Create an application server profile during the installation.
2	B	Install IBM HTTP Server or another supported Web server on Machine B. While installing IBM HTTP Server, use its installation wizard to install the Web server plug-ins.
3	B	If you use another supported Web server or an existing installation of IBM HTTP Server, use the Plug-ins installation wizard to install the Web server plug-ins and configure the Web server on Machine B. The Plug-ins installation wizard creates a script named <code>configureWeb_server_name</code> in the <code>plugins_root/bin</code> directory on Machine B.
4	B	Copy the <code>configureWeb_server_name</code> script on Machine B to the <code>app_server_root/profile_name/bin</code> directory on Machine A.
5	A	Run the <code>configureWeb_server_name</code> script on Machine A to create a Web server definition in the administrative console. You can then use the administrative console to manage the Web server.
6	A	Propagate the <code>plugin-cfg.xml</code> file on Machine A from the application server to the Web server using the administrative console. 1. Click Servers → Web servers . 2. On the Web servers page, place a check mark beside the Web server for which you want to propagate a plug-in, and click Propagate Plug-in . Web servers other than IBM HTTP Server require manual propagation.
7	A	Create subsequent application server profiles using the Profile Management Tool or the <code>manageprofiles</code> command on Machine A.
8	B	Install subsequent IBM HTTP Servers or other supported Web servers on Machine B. While installing an IBM HTTP Server, use its installation wizard to install the Web server plug-ins.

Step	Machine	Task
9	A - B	Repeat steps 4 - 6 to configure the second web server on Machine B with your newly-added application server (Profile 02). Each application server profile is now directly associated with its own Web server.

- **Scenario 5:** Install an administrative agent and multiple registered application servers and multiple Web servers on separate machines.

The application servers on one machine communicate with a Web server on a separate (remote) machine through the Web server plug-in. The application servers are registered with the administrative agent. The administrative agent provides a single location from which to administer the nodes registered to it. Optional firewalls can provide additional security for the application server machine.



Step	Machine	Task
1	A	Install WebSphere Application Server Express. Create an application server profile during the installation.
2	A	Create a management profile using the Profile Management Tool or the manageprofiles command and select the administrative agent server type option.
3	A	Register the application server with the administrative agent by running the registerNode command in the bin directory of the administrative agent profile, <i>app_server_root/profile_name/bin</i> .
4	B	Install IBM HTTP Server or another supported Web server on Machine B. While installing IBM HTTP Server, use its installation wizard to install the Web server plug-ins.
5	B	If you use another supported Web server or an existing installation of IBM HTTP Server, use the Plug-ins installation wizard to install the Web server plug-ins and configure the Web server on Machine B. The Plug-ins installation wizard creates a script named <i>configureWeb_server_name</i> in the <i>plugins_root/bin</i> directory on Machine B.
6	B	Copy the <i>configureWeb_server_name</i> script on Machine B to the <i>app_server_root/profile_name/bin</i> directory on Machine A.
7	A	Run the <i>configureWeb_server_name</i> script on Machine A to create a Web server definition in the administrative console. You can then use the administrative console to manage the Web server.

Step	Machine	Task
8	A	Propagate the plugin-cfg.xml file on Machine A from the application server to the Web server using the administrative console. 1. Click Servers → Web servers . 2. On the Web servers page, place a check mark beside the Web server for which you want to propagate a plug-in, and click Propagate Plug-in . Web servers other than IBM HTTP Server require manual propagation.
9	A	Create subsequent application server profiles using the Profile Management Tool or the manageprofiles command on Machine A.
10	A	Register the new application server with the administrative agent by running the registerNode command in the bin directory of the administrative agent profile, <i>app_server_root/profile_name/bin</i> .
11	B	Install subsequent IBM HTTP Servers or other supported Web servers on Machine B. While installing an IBM HTTP Server, use its installation wizard to install the Web server plug-ins.
12	A - B	Repeat steps 6 - 8 to configure the second web server on Machine B with your newly-added application server (Profile 02). Each application server profile is now directly associated with its own Web server.

Results

You have reviewed many of the most common installation scenarios to find a possible match for the topology that you intend to install.

What to do next

See the IBM HTTP Server and Web server plug-in documentation for more information on installing those products.

Planning to install WebSphere Application Client

Examine typical topologies and uses for WebSphere Application Client to determine how you might use this technology.

Before you begin

This topic is one in a series of topics described in Chapter 4, “Planning the installation,” on page 35. Consider all of the planning scenarios that are mentioned in the parent article to determine the best approach to installing your e-business network. This topic describes installing and using the WebSphere Application Server Clients.

About this task

In a traditional client server environment, the client requests a service and the server fulfills the request. Multiple clients use a single server. Clients can also access several different servers. This model persists for Java clients except that now these requests use a client runtime environment.

In this model, the client application requires a servlet to communicate with the enterprise bean, and the servlet must reside on the same machine as the application server.

The Application Client for WebSphere Application Server consists of the following models:

- ActiveX application client
- Applet client
- Java Platform, Enterprise Edition (Java EE) application client
- Pluggable and thin application clients

The following graphic shows a topology for installing the Application Client and using client applications:

The example shows two types of application clients installed in a topology that uses client applications to access applications and data on Machine A:

- The ActiveX application client on Machine B is a Windows only client that uses the Java Native Interface (JNI) architecture to programmatically access the Java virtual machine (JVM) API. The JVM code exists in the same process space as the ActiveX application (Visual Basic, VBScript, or Active Server Pages (ASP) files) and remains attached to the process until that process terminates.
- The J2EE application client on Machine C is a Java application program that accesses enterprise beans, Java Database Connectivity (JDBC) APIs, and Java Message Service message queues. The application program must configure the execution environment of the Java EE application client and use the Java Naming and Directory Interface (JNDI) name space to access resources.

Use the following procedure as a example of installing the Application Client.

1. Install the WebSphere Application Server product from your product disc on Machine A to establish the core product files.
2. Use the Profile Management Tool to create the additional stand-alone application server profile.
3. Use the administrative console of each application server to deploy any user applications.
4. Use the administrative console of each application server to create a Web server configuration for the Web server.
5. Use the administrative console of each application server to regenerate each plugin-cfg.xml file in the local Web server configuration.
6. Optional: Install the IBM HTTP Server from the product disc on Machine A.
7. Optional: Use the Plug-ins installation wizard to install the plug-in for IBM HTTP Server on Machine A. The wizard automatically configures the HTTP Server to communicate with the first application server.
8. Install the Application Client package from the product disc.

The diagram shows two different types of application clients on two different operating systems. Although this example shows two application clients, you do not have to install two application clients to have a working system. Each application client is fully functional and works independently of the other.

Optionally install the Application Client from your product disc on Machine B.

- a. Select the Custom installation type.
- b. Select the ActiveX to EJB Bridge feature.
- c. Select to add the Java run time to the system path.
- d. Select the Java run time as the default JRE, which adds the Java runtime path to the beginning of the system path.

Optionally install the Application Client from your product disc on Machine C.

- a. Select the Custom install type.
- b. Select the Java EE application client feature.

Results

This topic can help you plan runtime environments for client applications.

Queuing network

WebSphere Application Server contains interrelated components that must be harmoniously tuned to support the custom needs of your end-to-end e-business application. These adjustments help the system achieve maximum throughput while maintaining the overall stability of the system.

This group of interconnected components is known as a queuing network. These queues or components include the network, Web server, Web container, EJB container, data source, and possibly a connection manager to a custom back-end system. Each of these resources represents a queue of requests waiting to use that resource.

Various queue settings include the following. Consult the associated topics in the information center.

- IBM HTTP Server: MaxClients for operating systems such as AIX or Linux and ThreadsPerChild for Windows NT and Windows 2000 systems
- Web container: **Maximum size** , **MaxKeepAliveConnections**, and **MaxKeepAliveRequests**.
- **Tuning Object Request Brokers**.
- Data source **connection pooling** and **statement cache size** .

Most of the queues that make up the queuing network are closed queues. A closed queue places a limit on the maximum number of requests present in the queue, while an open queue has no limit. A closed queue supports tight management of system resources. For example, the Web container thread pool setting controls the size of the Web container queue. If the average servlet running in a Web container creates 10 MB of objects during each request, a value of 100 for thread pools limits the memory consumed by the Web container to 1 GB.

In a closed queue, requests can be active or waiting. An active request is doing work or waiting for a response from a downstream queue. For example, an active request in the Web server is doing work, such as retrieving static HTML, or waiting for a request to complete in the Web container. A waiting request is waiting to become active. The request remains in the waiting state until one of the active requests leaves the queue.

All Web servers supported by WebSphere Application Server are closed queues, as are WebSphere Application Server data sources. You can configure Web containers as open or closed queues. In general, it is best to make them closed queues. EJB containers can be open or closed queues. If there are no threads available in the pool, a new one is created for the duration of the request.

If enterprise beans are called by servlets, the Web container limits the number of total concurrent requests into an EJB container, because the Web container also has a limit. The Web container limits the number of total concurrent requests only if enterprise beans are called from the servlet thread of execution. Nothing prevents you from creating threads and bombarding the EJB container with requests. Therefore, servlets should not create their own work threads.

Queuing and clustering considerations

Cloning application servers to create a cluster can be a valuable asset in configuring highly scalable production environments, especially when the application is experiencing bottlenecks that are preventing full CPU utilization of symmetric multiprocessing (SMP) servers.

When adjusting the WebSphere Application Server system queues in clustered configurations, remember that when a server is added to a cluster, the server downstream receives twice the load.

Two servlet engines are located between a Web server and a data source. It is assumed that the Web server, servlet engines and data source, but not the database, are all running on a single SMP server. Given these constraints, the following queue considerations must be made:

- Double the Web server queue settings to ensure ample work is distributed to each Web container.
- Reduce the Web container thread pools to avoid saturating a system resource like CPU or another resource that the servlets are using.

- Reduce the data source to avoid saturating the database server.
- Reduce Java heap parameters for each instance of the application server. For versions of the Java virtual machine (JVM) shipped with WebSphere Application Server, it is crucial that the heap from all JVMs remain in physical memory. For example, if a cluster of four JVMs is running on a system, enough physical memory must be available for all four heaps.

Queue configuration best practices

A methodology exists for configuring the WebSphere Application Server queues. Moving the database server onto another machine or providing more powerful resources, for example a faster set of CPUs with more memory, can dramatically change the dynamics of your system.

There are four tips for queuing:

- **Minimize the number of requests in WebSphere Application Server queues.**

In general, requests wait in the network in front of the Web server, rather than waiting in WebSphere Application Server. This configuration only supports those requests that are ready for processing to enter the queuing network. Specify that the queues furthest upstream or closest to the client are slightly larger, and queues further downstream or furthest from the client are progressively smaller.

Queues in the queuing network become progressively smaller as work flows downstream. When 200 client requests arrive at the Web server, 125 requests remain queued in the network because the Web server is set to handle 75 concurrent clients. As the 75 requests pass from the Web server to the Web container, 25 requests remain queued in the Web server and the remaining 50 are handled by the Web container. This process progresses through the data source until 25 user requests arrive at the final destination, the database server. Because there is work waiting to enter a component at each point upstream, no component in this system must wait for work to arrive. The bulk of the requests wait in the network, outside of WebSphere Application Server. This type of configuration adds stability, because no component is overloaded.

- **Draw throughput curves to determine when the system capabilities are maximized.**

You can use a test case that represents the full spirit of the production application by either exercising all meaningful code paths or using the production application. Run a set of experiments to determine when the system capabilities are fully stressed or when it has reached the saturation point. Conduct these tests after most of the bottlenecks are removed from the application. The goal of these tests is to drive CPUs to near 100% utilization. For maximum concurrency through the system, start the initial baseline experiment with large queues. For example, start the first experiment with a queue size of 100 at each of the servers in the queuing network: Web server, Web container and data source. Begin a series of experiments to plot a throughput curve, increasing the concurrent user load after each experiment. For example, perform experiments with one user, two users, five, 10, 25, 50, 100, 150 and 200 users. After each run, record the throughput requests per second, and response times in seconds per request. The curve resulting from the baseline experiments resembles the following typical throughput curve shown as follows:

The WebSphere Application Server throughput is a function of the number of concurrent requests present in the total system. Section A, the light load zone, shows that the number of concurrent user requests increases, the throughput increases almost linearly with the number of requests. At light loads, concurrent requests face very little congestion within the WebSphere Application Server system queues. At some point, congestion starts to develop and throughput increases at a much lower rate until it reaches a saturation point that represents the maximum throughput value, as determined by some bottleneck in the WebSphere Application Server system. The most manageable type of bottleneck occurs when the WebSphere Application Server machine CPUs become fully utilized because adding CPUs or more powerful CPUs fixes the bottleneck.

In the heavy load zone or Section B, as the concurrent client load increases, throughput remains relatively constant. However, the response time increases proportionally to the user load. That is, if the user load is doubled in the heavy load zone, the response time doubles. At some point, represented by

Section C, the buckle zone, one of the system components becomes exhausted. At this point, throughput starts to degrade. For example, the system might enter the buckle zone when the network connections at the Web server exhaust the limits of the network adapter or if the requests exceed operating system limits for file handles.

If the saturation point is reached by driving CPU utilization close to 100%, you can move on to the next step. If the saturation CPU occurs before system utilization reaches 100%, it is likely that another bottleneck is being aggravated by the application. For example, the application might be creating Java objects causing excessive garbage collection bottlenecks in the Java code.

There are two ways to manage application bottlenecks: remove the bottleneck or clone the bottleneck. The best way to manage a bottleneck is to remove it. You can use a Java-based application profiler, such as Rational Application Developer, Performance Trace Data Visualizer (PTDV), Borland's Optimizeit, JProbe or Jinsight to examine overall object utilization.

- **Decrease queue sizes while moving downstream from the client.**

The number of concurrent users at the throughput saturation point represents the maximum concurrency of the application. For example, if the application saturates WebSphere Application Server at 50 users, using 48 users might produce the best combination of throughput and response time. This value is called the Max Application Concurrency value. Max Application Concurrency becomes the preferred value for adjusting the WebSphere Application Server system queues. Remember, it is desirable for most users to wait in the network; therefore, queue sizes should decrease when moving downstream farther from the client. For example, given a Max Application Concurrency value of 48, start with system queues at the following values: Web server 75, Web container 50, data source 45. Perform a set of additional experiments adjusting these values slightly higher and lower to find the best settings.

To help determine the number of concurrent users, view the Servlet Engine Thread Pool and Concurrently Active Threads metric in the Tivoli Performance Viewer.

- **Adjust queue settings to correspond to access patterns.**

In many cases, only a fraction of the requests passing through one queue enters the next queue downstream. In a site with many static pages, a number of requests are fulfilled at the Web server and are not passed to the Web container. In this circumstance, the Web server queue can be significantly larger than the Web container queue. In the previous example, the Web server queue was set to 75, rather than closer to the value of Max Application Concurrency. You can make similar adjustments when different components have different execution times.

For example, in an application that spends 90% of its time in a complex servlet and only 10% of its time making a short JDBC query, on average 10% of the servlets are using database connections at any time, so the database connection queue can be significantly smaller than the Web container queue. Conversely, if the majority of servlet execution time is spent making a complex query to a database, consider increasing the queue values at both the Web container and the data source. Always monitor the CPU and memory utilization for both the WebSphere Application Server and the database servers to verify that the CPU or memory are not saturating.

Chapter 5. Preparing the operating system for product installation

You must prepare your operating platform before installing a WebSphere Application Server product. Links in this topic go to information on configuring supported operating systems. Select your operating system to view the corresponding procedure.

Before you begin

Before preparing the installation environment, read “Planning to install WebSphere Application Server” on page 36.

About this task

Before installing the product, you must install the necessary prerequisites for your operating system. This will prepare your system for the install. Use the links below to go to the procedure for your operating platform.

Prepare your operating system for installation.
Select the appropriate procedure:

- **AIX** “Preparing AIX systems for installation”
- **HP-UX** “Preparing HP-UX systems for installation” on page 52
- **Linux** “Preparing Linux systems for installation” on page 57
- **Solaris** “Preparing Solaris systems for installation” on page 67
- **Windows** “Preparing Windows systems for installation” on page 71

Results

Your operating system is configured for installation.

What to do next

Install the product as described in Chapter 6, “Installing the product and additional software,” on page 75.

Preparing AIX systems for installation

This topic describes how to prepare an AIX system for the installation of IBM WebSphere Application Server products.

Before you begin

The installation uses an InstallShield MultiPlatform (ISMP) wizard. You can use the graphical interface of the wizard. You can also use the wizard in silent mode.

Note: WebSphere Application Server prevents users from installing to a non-empty directory. If WebSphere Application Server is installed to a directory with a *lost+found* sub-directory, you will be prompted to use an empty directory. If you still want to install to this directory, then you can delete the *lost+found* directory. However, the next time *fsck* is executed, the *lost+found* directory will be created. This should not have any effect on an existing install, however during uninstall this directory will not be removed.

Note: There are known issues with using Cygwin/X to run Eclipse-based applications on remote AIX machines. This affects your use of the Profile Management tool and the Installation Factory. With Cygwin/X on remote AIX, for example, a splash screen for the Profile Management tool appears but the Profile Management tool never actually comes up. For details of existing Bugzilla reports on these issues, see the information at https://bugs.eclipse.org/bugs/show_bug.cgi?id=36806. If a different X server (such as Hummingbird Exceed[®]) is used, these problems do not occur.

About this task

Preparing the operating system involves such changes as allocating disk space and installing patches to the operating system. IBM tests WebSphere Application Server products on each operating system platform. Such tests verify whether an operating system change is required for WebSphere Application Server products to run correctly. Without the required changes, WebSphere Application Server products do not run correctly.

1. Log on to the operating system.

You can log on as root or as a non-root installer.

Select a umask that allows the owner to read/write to the files, and allows others to access them according to the prevailing system policy. For root, a umask of 022 is recommended. For non-root users a umask of 002 or 022 can be used, depending on whether the users share the group. To verify the umask setting, issue the following command:

```
umask
```

To set the umask setting to 022, issue the following command:

```
umask 022
```

2. Stop all WebSphere Application Server-related Java processes on the machine where you are installing the product.
3. Stop any Web server process such as the IBM HTTP Server.
4. The application server product contains IBM Software Development Kit (SDK) Version 6. Review the following SDK 6 requirements.
 - You must run AIX v5.3 Maintenance Package AIX 5300-07 or later, or AIX v6.1, for SDK 6 to operate properly.

To test whether this Java SDK is supported on a specific System p[™] system, at the system prompt type:

```
lscfg -p | fgrep Architecture
```

You should receive the reply: Model Architecture: chrp. Only Common Hardware Reference Platform (chrp) systems are supported.
 - The environment variable LDR_CNTRL=MAXDATA is not supported for 64-bit processes. Only use LDR_CNTRL=MAXDATA on 32-bit processes.
 - If you are using one of the supported non-UTF8 CJK locales, you must install one of the following filesets. The installation images are available on the AIX base discs; updates are available from the Fix Central web site.
 - X11.fnt.ucs.ttf (for ja_JP or Ja_JP)
 - X11.fnt.ucs.ttf_CN (for zh_CN or Zh_CN)
 - X11.fnt.ucs.ttf_KR (for ko_KR)
 - X11.fnt.ucs.ttf_TW (for zh_TW or Zh_TW)
5. Use the System Management Interface Tool (SMIT) to display packages that are installed to determine whether you must update packages that are described in the following steps.
6. Download the most current version of the INFOZIP product to avoid problems with zipped files. Although zipped files are primarily used in the service stream, prepare your AIX operating system by downloading a current version of the INFOZIP package from the <http://www.info-zip.org> Web site.
7. Provide adequate disk space.

With the JFS file system on AIX, you can allocate expansion space for directories. If the Installation wizard does not have enough space, ISMP issues a system call for more space that increases the space allocation dynamically. The message you might see when this occurs for the /usr directory is similar to the following example:

NOTE: The following file systems will be expanded during the installation:
/usr

Attention:

The Express product requires the following disk space:

Table 4. Estimated disk space

Directory	Description	Disk space after installation
The /usr/IBM/WebSphere/AppServer directory before creating profiles	The installation root directory includes the core product files. This size includes the Sample applications. This size includes space for the default application server profile for the server1 process. The requirement does not include space for applications that you might install.	930 MB
The /tmp directory	The temporary directory is the working directory for the installation program.	100 MB
Total disk space requirement before creating profiles	This amount is the total space requirement when installing the product from the disc.	1030 MB

Table 5. Estimated profile disk space

Profile	Description	Disk space after installation
Application server profile with Samples	This size does not include space for applications that you might develop and install.	200 MB

Manually verify that the required space for creating a profile is available on AIX. A known problem in the underlying InstallShield MultiPlatform (ISMP) code prevents proper space checking on AIX systems at the time that the product disc was created.

The IBM HTTP Server product requires the following space.

Table 6. IBM HTTP Server estimated disk space

Directory	Disk space after installation
<ul style="list-style-type: none"> • IBM HTTP Server /usr/IBM/HTTPServer • IBM Global Security Kit (GSKit) /usr/ibm/gsk7 Note: The runtime module is gskkm.rte. • The Web server plug-ins for WebSphere Application Server /usr/IBM/WebSphere/plugins 	763 MB

The following space is required for the WebSphere Application Server Clients.

Table 7. Application Client estimated disk space

Directory	Description	Disk space after installation
app_client_root	The amount of space required to install the application clients is actually less than 150 MB. The amount of space depends on the clients that you install as features.	150 MB

The following space is required for the Update Installer.

Table 8. Update Installer estimated disk space

Directory	Description	Disk space after installation
Default directory: /usr/IBM/WebSphere/ UpdateInstaller	The installation wizard for each component displays required space on the confirmation panel before you install the product files and selected features. The installation wizard also warns you if you do not have enough space to install the product.	200 MB

The installation wizard for each component displays required space on the confirmation panel before you install the product files and selected features. The installation wizard also warns you if you do not have enough space to install the product.

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

8. Unmount file systems with broken links to avoid java.lang.NullPointerException errors.

Unmount file systems with broken links before installing.

Installation 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
```

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.

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 Supported hardware and software 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.

10. Verify the system `cp` command when using `emacs` or other freeware.

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

- a. Type which cp at the command prompt before running the installation program for the WebSphere Application Server product.
- b. Remove the freeware directory from your PATH if the resulting directory output includes freeware. For example, assume that the output is similar to the following message: `.../freeware/bin/cp`. If so, remove the directory from the PATH.
- c. Install the WebSphere Application Server 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 `app_server_root/java` directory.

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

11. Verify that the Java SDK on the installation image disc is functioning correctly, if you created your own disc.

For example, you might have downloaded an installation image from Passport Advantage, or you might have copied an installation image onto a backup disc. In either case, perform the following steps to verify that the disc contains a valid Java software development kit (SDK).

- a. Change directories to the `/JDK/jre.pak/repository/package.java.jre/java/jre/bin` directory on the product disc. For example:

```
cd /JDK/jre.pak/repository/package.java.jre/java/jre/bin
```

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

```
./java -version
```

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

12. Optional: Install the Mozilla Firefox browser if it is not already installed. The Mozilla Firefox browser supports the launchpad console. Follow the instructions for installing Firefox version 1.5 or above on AIX.

- a. Download the latest supported version of Mozilla Firefox (1.5 or later) for AIX. Download Mozilla for AIX from the following location: Web browsers for AIX.

Download the installp image and install it from smit.

13. Optional: Export the location of the supported browser.

Export the location of the supported browser using a command that identifies the actual location of the browser.

For example, if the Mozilla Firefox package is in the `bin/firefox` directory, use the following command:

```
EXPORT BROWSER=/usr/bin/firefox
```

14. **Silent installation only:** Make an allowance for a known ISMP problem that causes a call to the Xwindows service during a silent installation.

The DISPLAY environment variable on your AIX machine might point to an X server that is not logged in. Two common scenarios can cause this to occur:

- Your AIX machine has an X server running, but the X server is stuck at the graphical login screen because you have not yet logged in.
- Your AIX machine is configured to display X Windows applications on a remote X server that is not logged in.

A silent installation can hang in either case as ISMP calls Xwindows services.

Two solutions exist:

- Login to the local X server through the graphical user interface before beginning the silent installation.
- Export the DISPLAY environment variable to point to null or blank.

```
EXPORT DISPLAY=null
```

15. Optional: **Preparing a Workload Partition (WPAR):** If you are going to install the application server product on a WPAR on AIX 6.1, then you must make sure that the WPAR has private and writable versions of the /usr and /opt file systems. If you do not have this type of WPAR, then create a new WPAR using the following steps:

- a. Choose a name for the WPAR that maps to an IP address for your network, or add an entry for the new WPAR in the /etc/hosts file. Make sure you know the subnet IP address as well.
- b. Use the following command to create the WPAR:

```
mkwpar -n <wpar_name> -h <host_name> -N netmask=<A.B.C.D> address=<A.B.C.D> -r -l
```

Note: The -l parameter creates private and writable versions of the /usr and /opt file systems.

Results

This procedure results in preparing the operating system for installing the product.

What to do next

After verifying prerequisites, verifying the product disc, and setting your installation goals, you can start installing. Use one of the following installation procedures:

Install the Express product on your operating system.

- Perform an installation using the graphical user interface.

The typical installation installs all of the features. The features include the core product files (required), the Javadoc (optional), and the Sample applications (optional).

See “Installing Express” on page 79.

- Perform a silent installation.

A silent installation requires you to edit the example response file to contain all of your installation choices. After creating a valid response file, issue the install command with the silent parameter from a command window.

See “Installing silently” on page 91.

- Install additional features to an existing product.

After using a custom installation to omit one or both of the optional features, you can install the product again to add the features. Select a missing feature to install it.

See “Installing additional features on an existing Express product” on page 84.

- Upgrade the Express trial to the Express product.

After installing a trial, you can install the actual product to upgrade the trial to the real product.

See “Upgrading the Express trial to the Express product” on page 89.

Preparing HP-UX systems for installation

This topic describes how to prepare an HP-UX system for the installation of IBM WebSphere Application Server products.

Before you begin

The installation uses an InstallShield MultiPlatform (ISMP) wizard. You can use the graphical interface of the wizard. You can also use the wizard in silent mode.

Note: There are known issues with using Cygwin/X to run Eclipse-based applications on remote HP-UX machines. This affects your use of the Profile Management tool and the Installation Factory. With Cygwin/X on remote HP-UX, for example, the Profile Management tool’s welcome panel appears

but no keyboard or mouse input is accepted. For details of existing Bugzilla reports on these issues, see the information at https://bugs.eclipse.org/bugs/show_bug.cgi?id=97808. If a different X server (such as Hummingbird Exceed[®]) is used, these problems do not occur.

About this task

Preparing the operating system involves such changes as allocating disk space and installing patches to the operating system. IBM tests WebSphere Application Server products on each operating system platform. Such tests verify whether an operating system change is required for WebSphere Application Server products to run correctly. Without the required changes, WebSphere Application Server products do not run correctly.

1. Log on to the operating system.

You can log on as root or as a non-root installer.

Select a umask that allows the owner to read/write to the files, and allows others to access them according to the prevailing system policy. For root, a umask of 022 is recommended. For non-root users a umask of 002 or 022 can be used, depending on whether the users share the group. To verify the umask setting, issue the following command:

```
umask
```

To set the umask setting to 022, issue the following command:

```
umask 022
```

2. Optional: Download and install the Mozilla Firefox Web browser so that you can use the launchpad application on the product disc.

If you do not have the Mozilla Web browser, download and install the browser from Web Browsers for HP-UX.

3. Optional: Export the location of the supported browser.

Export the location of the supported browser using a command that identifies the actual location of the browser.

If the Mozilla Firefox package is in the /opt/bin/mozilla directory, for example, use the following command:

```
export BROWSER=/opt/bin/firefox
```

4. Stop all WebSphere Application Server-related Java processes on the machine where you are installing the product.
5. Stop any Web server process such as the IBM HTTP Server.
6. Provide adequate disk space.

Attention:

The Express product requires the following disk space:

Table 9. Estimated disk space

Directory	Description	Disk space after installation
The /opt/IBM/WebSphere/AppServer directory before creating profiles	The installation root directory includes the core product files. This size includes the Sample applications. This size includes space for the default application server profile for the server1 process. The requirement does not include space for applications that you might install.	980 MB
The /tmp directory	The temporary directory is the working directory for the installation program.	100 MB
Total disk space requirement before creating profiles	This amount is the total space requirement when installing the product from the disc.	1080 MB

Table 10. Estimated profile disk space

Profile	Description	Disk space after installation
Application server profile with Samples	This size does not include space for applications that you might develop and install.	200 MB

The IBM HTTP Server product requires the following space.

Table 11. IBM HTTP Server estimated disk space

Directory	Disk space after installation
<ul style="list-style-type: none"> • IBM HTTP Server /opt/IBM/HTTPServer • IBM Global Security Kit (GSKit) /opt/ibm/gsk7 Note: The runtime module is gsk7bas for HP-UX platforms. • The Web server plug-ins for WebSphere Application Server /opt/IBM/WebSphere/plugins 	763 MB

The IBM WebSphere Application Server Clients product requires the following space.

Table 12. Application Client estimated disk space

Directory	Description	Disk space after installation
app_client_root	The amount of space required to install the application clients is actually less than 150 MB. The amount of space depends on the clients that you install as features.	150 MB

The following space is required for the Update Installer.

Table 13. Update Installer estimated disk space

Directory	Description	Disk space after installation
Default directory: /opt/IBM/WebSphere/UpdateInstaller	The installation wizard for each component displays required space on the confirmation panel before you install the product files and selected features. The installation wizard also warns you if you do not have enough space to install the product.	200 MB

The installation wizard for each component displays required space on the confirmation panel before you install the product files and selected features. The installation wizard also warns you if you do not have enough space to install the product.

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

7. Set kernel values to support Application Server. Several HP-UX kernel values are typically too small for the product.

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 with the `/usr/sbin/sam` command.
 - 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, so the SAM utility can set values greater than 2048:
 - 1) Open the `/usr/conf/master.d/core-hpux` file 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) Click **Kernel Configuration > Configurable Parameters**.
 - 3) For each of the parameters in the following table, perform this procedure:
 - a) Highlight the parameter to change.
 - b) Click **Actions > Modify Configurable Parameter**.
 - c) Type the new value in the **Formula/Value** field.
 - d) Click **OK**.

Change typical kernel settings for running WebSphere Application Server in the order shown in the following table:

Parameter	Value
swchunk	8192
shmseg	512
maxdsiz	3221225472
maxdsiz_64bit	64424509440
maxfiles_lim	10000 (Change this one before maxfiles.)
maxfiles	8192
semume	512
semmsl	3072
msgssz	512 (Change this one before msgmax)
nkthread	10000
max_thread_proc	4096
nproc	8192 (Change this one before maxuprc)
maxuprc	4096
nflocks	11585
ninode	8110
msgmap	13109
msgseg	32767 (Change this one before msgmax)
msgmnb	65535 (0x10000) (Change this one before msgmax)
msgmnb	131070 (when running multiple profiles on the same system)
msgmax	65535 (0x10000)
msgmax	131070 (when running multiple profiles on the same system)
msgmni	4634
semms	11586
semmni	8192
semmnu	8180
shmmax	185513715302
shmmni	8192

Parameter	Value
STRMSGSZ	65535
dbc_max_pc	10
nstrpty	60
cmc_plat_poll	15
msgtql	13107

When WebSphere Application Server and IBM DB2 are on the same machine, some kernel values are higher than those shown in the preceding table.

See the Recommended HP-UX kernel configuration parameters for DB2 V8 Web page for more information.

- e. Click **Actions > Process New Kernel**.
- f. Click **Yes** on the information window to confirm your decision to restart the machine.
Follow the 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 the public locales that are 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
```

8. 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 Supported hardware and software Web site if you have not done so already. Refer to the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

- If you encounter the following error in the system out or installation log during the installation of the application server or IBM WebSphere Installation Factory, then you are missing a required linker patch:

```
/usr/lib/dld.sl: Can't find path for shared library: libjli.sl
```

Apply the following linker patch for your operating system version:

Table 14.

Operating system version	Patch
HP 11.11:	PHSS_35385
HP 11.23:	PHSS_37201
HP 11.31:	PHSS_37202

9. Verify the system cp command when using emacs or other freeware.
If you have emacs or other freeware installed on your operating system, verify that the system cp command is used.
 - a. Type which cp at the command prompt before running the installation program for the WebSphere Application Server product.
 - b. Remove the freeware directory from your PATH if the resulting directory output includes freeware. For example, assume that the output is similar to the following message: ../freeware/bin/cp. If so, remove the directory from the PATH.
 - c. Install the WebSphere Application Server 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 *app_server_root/java* directory.

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

10. Verify that the Java SDK on the installation image disc is functioning correctly, if you created your own disc.

For example, you might have downloaded an installation image from Passport Advantage, or you might have copied an installation image onto a backup disc. In either case, perform the following steps to verify that the disc contains a valid Java software development kit (SDK).

- a. Change directories to the `/JDK/jre.pak/repository/package.java.jre/java/jre/bin` directory on the product disc. For example:

```
cd /JDK/jre.pak/repository/package.java.jre/java/jre/bin
```

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

```
./java -version
```

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

Results

This procedure results in preparing the operating system for installing the product.

What to do next

After verifying prerequisites, verifying the product disc, and setting your installation goals, you can start installing. Use one of the following links to open the installation procedure that you require.

Install the Express product on your operating system.

- Perform an installation using the graphical user interface.

The typical installation installs all of the features. The features include the core product files (required), the Javadoc (optional), and the Sample applications (optional).

See “Installing Express” on page 79.

- Perform a silent installation.

A silent installation requires you to edit the example response file to contain all of your installation choices. After creating a valid response file, issue the install command with the silent parameter from a command window.

See “Installing silently” on page 91.

- Install additional features to an existing product.

After using a custom installation to omit one or both of the optional features, you can install the product again to add the features. Select a missing feature to install it.

See “Installing additional features on an existing Express product” on page 84.

- Upgrade the Express trial to the Express product.

After installing a trial, you can install the actual product to upgrade the trial to the real product.

See “Upgrading the Express trial to the Express product” on page 89.

Preparing Linux systems for installation

This topic describes how to prepare a Linux system for installing WebSphere Application Server.

Before you begin

The installation uses an InstallShield MultiPlatform (ISMP) wizard. You can use the graphical interface of the wizard. You can also use the wizard in silent mode.

About this task

Preparing the operating system involves such changes as allocating disk space and installing patches to the operating system. IBM tests WebSphere Application Server products on each operating system platform. Such tests verify whether an operating system change is required for WebSphere Application Server products to run correctly. Without the required changes, WebSphere Application Server products do not run correctly.

While this topic lists many steps that are common to all Linux distributions, specific Linux distributions might require additional steps. Complete all common steps, as well as any additional steps that are required for your distribution. If your distribution is not listed in this topic, but is supported by WebSphere Application Server, check for any post-release technical notes that are available for your operating system at the product support site at <http://www.ibm.com/software/webservers/appserv/was/support/>. If a technical note is not available for your distribution, additional steps might not be required.

When additional steps are required, it is typically because a default installation of the distribution does not provide required libraries or operating system features. If you install WebSphere Application Server on a customized Linux installation that has installed packages which differ significantly from the packages provided by a default installation of the distribution, ensure that your customized installation has the packages required for WebSphere Application Server to run. WebSphere Application Server does not maintain lists of the packages required for each Linux distribution or for updates to each distribution.

For WebSphere Application Server to run adequately, your Linux installation must have the following items:

- Kernel and C runtime library
- Current[®] and all compatibility versions of the C++ runtime library
- X Windows libraries and runtime
- GTK runtime libraries

1. Log on to the operating system.

You can log on as root or as a non-root installer.

Select a umask that allows the owner to read/write to the files, and allows others to access them according to the prevailing system policy. For root, a umask of 022 is recommended. For non-root users a umask of 002 or 022 can be used, depending on whether the users share the group. To verify the umask setting, issue the following command:

```
umask
```

To set the umask setting to 022, issue the following command:

```
umask 022
```

2. Download and install the Mozilla Firefox Web browser so that you can use the launchpad application on the product disc and the Gnome and KDE shortcut menu entries for WebSphere Application Server - Express.

If you do not have the Firefox browser, download and install the browser from <http://www.mozilla.org/products/firefox/>.

Note: It might be necessary to run `>firefox &url` from directories other than the one where Firefox is installed, so ensure that Firefox is in the path. You can add a symbolic link to the `/opt/bin` directory by entering:

```
>ln -s /locationToFirefox/firefox firefox
```

3. Optional: Export the location of the supported browser.

Export the location of the supported browser using a command that identifies the actual location of the browser.

If the Mozilla Firefox package is in the /opt/bin/mozilla directory, for example, use the following command:

```
export BROWSER=/opt/bin/firefox
```

4. Stop all WebSphere Application Server-related Java processes on the machine where you are installing the product.
5. Stop any Web server process such as the IBM HTTP Server.
6. Provide adequate disk space.

Attention:

The Express product requires the following disk space:

Table 15. Estimated disk space

Directory	Description	Disk space after installation
The /opt/IBM/WebSphere/AppServer directory before creating profiles	The installation root directory includes the core product files. This size includes the Sample applications. This size includes space for the default application server profile for the server1 process. The requirement does not include space for applications that you might install.	930 MB
The /tmp directory	The temporary directory is the working directory for the installation program.	100 MB
Total disk space requirement before creating profiles	This amount is the total space requirement when installing the product from the disc.	1030 MB

Table 16. Estimated profile disk space

Profile	Description	Disk space after installation
Application server profile with Samples	This size does not include space for applications that you might develop and install.	200 MB

The IBM HTTP Server product requires the following space:

Table 17. IBM HTTP Server estimated disk space

Directory	Disk space after installation
<ul style="list-style-type: none"> • IBM HTTP Server /opt/IBM/HTTPServer • IBM Global Security Kit (GSKit) /opt/ibm/gsk7 Note: The GSKit runtime module is gsk7bas.i386.rpm for Linux distributed platforms and gsk7bas.s390.rpm for Linux for System z™ platforms. • The Web server plug-ins for WebSphere Application Server /opt/IBM/WebSphere/plugins 	763 MB

The IBM WebSphere Application Server Clients product requires the following space:

Table 18. Application Client estimated disk space

Directory	Description	Disk space after installation
app_client_root	The amount of space required to install the application clients is actually less than 150 MB. The amount of space depends on the clients that you install as features.	150 MB

The Update Installer requires the following space:

Table 19. Update Installer estimated disk space

Directory	Description	Disk space after installation
Default directory: /opt/IBM/WebSphere/ UpdateInstaller	The installation wizard for each component displays required space on the confirmation panel before you install the product files and selected features. The installation wizard also warns you if you do not have enough space to install the product.	200 MB

The installation wizard for each component displays required space on the confirmation panel before you install the product files and selected features. The installation wizard also warns you if you do not have enough space to install the product.

7. 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 Supported hardware and software Web site if you have not done so already.

Refer to the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

8. Increase the ulimit setting in the bash command shell profile to prevent addNode and importWasprofile problems.

The addNode command script can fail when adding a node, or the importWasprofile command can fail when importing a configuration archive. The importWasprofile command might fail during the installation of a customized installation package (CIP) when the CIP includes a customized profile.

Set a higher ulimit setting for the kernel in the bash shell profile script, which is loaded at login time for the session.

Set the ulimit on your Linux command shells by adding the command to your shell profile script. The shell profile script is usually found under your home directory:

- a. `cd ~`
- b. `vi .bashrc`
- c. `ulimit -n 8192`

See <http://www.ibm.com/support/docview.wss?uid=swg21223909> for more information.

9. Restore the original copy of the etc/issue file if the file is modified.

The prereqChecker program in the installation wizard uses the file to verify the version of the operating system. If you cannot restore the original version, ignore the Operating System Level Check message about the operating system being unsupported. The installation can continue successfully despite the warning.

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

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

- a. Type which cp at the command prompt before running the installation program for the WebSphere Application Server product.
- b. Remove the freeware directory from your PATH if the resulting directory output includes freeware. For example, assume that the output is similar to the following message: `.../freeware/bin/cp`. If so, remove the directory from the PATH.
- c. Install the WebSphere Application Server 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 `app_server_root/java` directory.

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

11. Complete any distribution-specific set up.

Complete the steps for your distribution:

- Red Hat Enterprise Linux 5
- Red Hat Enterprise Linux 4
- SuSE Linux Enterprise Server 9

If you are using a supported distribution other than those listed above, examine the WebSphere Application Server support site for any technical notes that are published for your distribution. If technical notes have been published, apply the fixes.

12. Verify that the Java SDK on the installation image disc is functioning correctly, if you created your own disc.

For example, you might have downloaded an installation image from Passport Advantage, or you might have copied an installation image onto a backup disc. In either case, perform the following steps to verify that the disc contains a valid Java software development kit (SDK).

- a. Change directories to the `/JDK/jre.pak/repository/package.java.jre/java/jre/bin` directory on the product disc. For example:

```
cd /JDK/jre.pak/repository/package.java.jre/java/jre/bin
```

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

```
./java -version
```

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

Results

This procedure results in preparing the operating system for installing the product.

What to do next

After verifying prerequisites, verifying the product disc, and setting your installation goals, you can start installing. Use one of the following links to open the installation procedure that you require.

Install the Express product on your operating system.

- Perform an installation using the graphical user interface.

The typical installation installs all of the features. The features include the core product files (required), the Javadoc (optional), and the Sample applications (optional).

See “Installing Express” on page 79.

- Perform a silent installation.

A silent installation requires you to edit the example response file to contain all of your installation choices. After creating a valid response file, issue the install command with the silent parameter from a command window.

See “Installing silently” on page 91.

- Install additional features to an existing product.

After using a custom installation to omit one or both of the optional features, you can install the product again to add the features. Select a missing feature to install it.

See “Installing additional features on an existing Express product” on page 84.

- Upgrade the Express trial to the Express product.

After installing a trial, you can install the actual product to upgrade the trial to the real product.

See “Upgrading the Express trial to the Express product” on page 89.

Preparing Red Hat Enterprise Linux 5 for installation

You must complete additional steps to prepare a Red Hat Enterprise Linux Version 5 system for a WebSphere Application Server installation.

Before you begin

Complete steps 1-10 in “Preparing Linux systems for installation” on page 57. Those steps are common to any Linux system.

About this task

In addition to the common steps required for installing any Linux system, a few system specific steps are required for Red Hat Enterprise Linux Version 5.

Verify that the prerequisite packages are installed. A Linux package registration limitation prevents the prerequisites checker program from examining prerequisite packages on Linux systems. See “Installing and verifying Linux packages” on page 66 for more information.

SELinux considerations

You should consider the following points if you have enabled Security-Enhanced Linux (SELinux) on your Red Hat Enterprise Linux Version 5 operating system.

- If SELinux is enabled and enforced while you are installing the product from the CD, then you must mount the CD with the following option:
`-o context=system_u:object_r:textrel_shlib_t`
- If you enable SELinux after installing the product while SELinux was disabled, then the file labels will be reset when the system is rebooted. In this case, you must run the `relabel_was.sh` script located in `app_server_root/properties/version/nif/config/script` to relabel the product runtime files. Note that running the `relabel_was.sh` command is not necessary if you made security mode changes with the command `setenforce`, which does not require a system reboot.

1. Install packages for all hardware platforms.

Install the following packages on any hardware platform:

compat-libstdc++-33-3.2.3-61

Required for C++ runtime compatibility. Used by such components as GSKit, the Java 2 Software Development Kit (SDK), and the Web server plug-ins.

compat-db-4.2.52-5.1

Required by IBM HTTP Server. Some of the modules use the libraries contained within this package.

libXp-1.0.0-8

Required by the Java 2 SDK to provide printing functions for graphical user interfaces. Without this package, Swing-based applications and AWT-based applications, such as InstallShield for Multiplatforms (ISMP), cannot instantiate.

libXmu-1.0.2-5

libXtst-1.0.1-3.1

pam-0.99.6.2-3.26.el5

rpm-build-4.4.2-37.architecture.el5 or later

Required by ISMP to properly register products within the RPM database.

elfutils-0.125-3.el5

elfutils-libs-0.125-3.el5

These packages are part of the Red Hat Enterprise Linux 5 operating system, but might not be installed by default. You can also install a later release of any of these packages if Red Hat provides new packages as errata.

2. Select packages for hardware platforms that are capable of running both 32-bit and 64-bit applications.

Hardware platforms capable of running both 32-bit and 64-bit applications include Opteron, EM64T, iSeries®, pSeries® (PowerPC®), and zSeries® (64-bit) machines.

By default, RHEL 5 only installs 64-bit runtime support on these platforms. However, various applications included with WebSphere Application Server Version 6.x products and packages also require the 32-bit runtime support. Therefore, you must install the 32-bit runtime support.

Install the following required 32-bit packages by selecting to customize the packages during the RHEL 5 installation. Or, customize packages on an existing RHEL 5 system by issuing the `system-config-packages` command from a graphical terminal.

Install the Compatibility Architecture Support under the System category. Optionally install the Compatibility Architecture Development Support under the Development category if you intend to build C or C++ libraries for use with both 32-bit and 64-bit applications.

Platforms that support both 32-bit and 64-bit applications require both the 32-bit and 64-bit versions of the following packages:

- **compat-libstdc++-33-3.2.3-61**
- **compat-db-4.2.52-5.1**
- **libXp-1.0.0-8**
- **libXmu-1.0.2-5**
- **libXtst-1.0.1-3.1**
- **pam-0.99.6.2-3.26.el5**

Run the `rpm -qa | grep package_name` command to verify that you have both versions of each package. Substitute the name of each package for the *package_name* variable.

Installed packages are displayed in the reply to the command. If you do not get two replies for each package, you have only one version of the package installed. You must then install the missing package.

3. Install additional packages for specific platforms.

In addition to the packages that are common to all platforms, install the following packages on hardware platforms capable of running both 32-bit and 64-bit applications before installing WebSphere Application Server products and packages.

x86 platforms and Opteron or EM64T platforms: compat-libstdc++-296-2.96-138

The `compat-libstdc++` package is required for C++ runtime compatibility. The package is used by such components as GSKit, the Java 2 SDK, and the Web server plug-ins.

z/Series platforms: compat-libstdc++-295-2.95.3-85

The `compat-libstdc++` package is required for C++ runtime compatibility. The package is used by such components as GSKit, the Java 2 SDK, and the Web server plug-ins.

Install both the 32-bit version and the 64-bit version of the package on 64-bit z/Series hardware platforms.

Results

If you do not install all of the required packages, the Installation wizard cannot start. Error messages indicate missing libraries, the inability to load graphical interfaces, or other errors that occur during the installation.

What to do next

After you complete the steps in this topic, proceed to the final step in “Preparing Linux systems for installation” on page 57.

Preparing Red Hat Enterprise Linux 4 for installation

You must complete additional steps to prepare a Red Hat Enterprise Linux Version 4 system for a WebSphere Application Server installation.

Before you begin

Complete steps 1-10 in “Preparing Linux systems for installation” on page 57. Those steps are common to any Linux system.

About this task

In addition to the common steps required for installing any Linux system, a few system specific steps are required for Red Hat Enterprise Linux Version 4.

Verify that the prerequisite packages are installed. A Linux package registration limitation prevents the prerequisites checker program from examining prerequisite packages on Linux systems. See “Installing and verifying Linux packages” on page 66 for more information.

1. Install packages for all hardware platforms.

Install the following packages on any hardware platform:

compat-libstdc++-33-3.2.3-47.3

Required for C++ runtime compatibility. Used by such components as GSKit, the Java 2 Software Development Kit (SDK), and the Web server plug-ins.

compat-db-4.1.25-9

Required by IBM HTTP Server. Some of the modules use the libraries contained within this package.

xorg-x11-deprecated-libs-6.8.1 or xorg-x11-deprecated-libs-6.8.2

Required by the Java 2 SDK to provide printing functions for graphical user interfaces. Without this package, Swing-based applications and AWT-based applications, such as InstallShield for Multiplatforms (ISMP), cannot instantiate.

rpm-build-4.3.3-7_nonptl

Required by ISMP to properly register products within the RPM database.

These packages are part of the Red Hat Enterprise Linux 4 operating system, but are not installed by default. You can also install a later release of any of these packages if Red Hat provides new packages as errata.

2. Select packages for hardware platforms that are capable of running both 32-bit and 64-bit applications.

Hardware platforms capable of running both 32-bit and 64-bit applications include Opteron, EM64T, iSeries, pSeries (PowerPC), and zSeries (64-bit) machines.

By default, RHEL 4 only installs 64-bit runtime support on these platforms. However, various applications included with WebSphere Application Server Version 6.x products and packages also require the 32-bit runtime support. Therefore, you must install the 32-bit runtime support.

Install the following required 32-bit packages by selecting to customize the packages during the RHEL 4 installation. Or, customize packages on an existing RHEL 4 system by issuing the `system-config-packages` command from a graphical terminal.

Install the Compatibility Architecture Support under the System category. Optionally install the Compatibility Architecture Development Support under the Development category if you intend to build C or C++ libraries for use with both 32-bit and 64-bit applications.

Platforms that support both 32-bit and 64-bit applications require both the 32-bit and 64-bit versions of the following packages:

- **compat-libstdc++-33-3.2.3-47.3**
- **compat-db-4.1.25-9**
- **xorg-x11-deprecated-libs-6.8.1 or xorg-x11-deprecated-libs-6.8.2**

Run the `rpm -qa | grep package_name` command to verify that you have both versions of each package. Substitute the name of each package for the `package_name` variable.

Installed packages are displayed in the reply to the command. If you do not get two replies for each package, you have only one version of the package installed. You must then install the missing package.

3. Install additional packages for specific platforms.

In addition to the packages that are common to all platforms, install the following packages on hardware platforms capable of running both 32-bit and 64-bit applications before installing WebSphere Application Server products and packages.

x86 platforms and Opteron or EM64T platforms: compat-libstdc++-296-2.96-132.7.2

The compat-libstdc++-296-2.96-132.7.2 package is required for C++ runtime compatibility. The package is used by such components as GSKit, the Java 2 SDK, and the Web server plug-ins.

z/Series platforms: compat-libstdc++-295-2.95.3-81

The compat-libstdc++-295-2.95.3-81 package is required for C++ runtime compatibility. The package is used by such components as GsKit, the Java 2 SDK, and the Web server plug-ins.

Install both the 32-bit version and the 64-bit version of the package on 64-bit z/Series hardware platforms.

Results

If you do not install all of the required packages, the Installation wizard cannot start. Error messages indicate missing libraries, the inability to load graphical interfaces, or other errors that occur during the installation.

What to do next

After you complete the steps in this topic, proceed to the final step in “Preparing Linux systems for installation” on page 57.

Preparing SuSE Linux Enterprise Server 9 for installation

You must complete additional steps to prepare a SuSE Linux Enterprise Server Version 9 system for a WebSphere Application Server installation.

Before you begin

Complete steps 1-10 in “Preparing Linux systems for installation” on page 57. Those steps are common to any Linux system.

About this task

In addition to the common steps required for installing any Linux system, an additional step is required for SuSE Linux Enterprise Server Version 9.

SLES 9 SP1 is the officially supported platform for PowerPC 64-bit machines.

A known problem in the SLES 9 GA kernel (LTC 9288) is documented in the SDK guide for the 142SR1a release. The problem results in a 64-bit WebSphere Application Server hang indicated by the following error messages:

```
00000014 RecoveryManag A WTRN0028I: Transaction service recovering 0 transactions.
0000000a ResourceMgrIm I WSVR0049I: Binding DefaultTimerManager as tm/default
0000000a WorkAreaServi A ACWA0002I: WorkArea service not enabled on dmgr.
0000000a AppProfileCom I ACIN0007I: The application profiling service started successfully.
0000000a CacheServiceI I DYNA0048I: WebSphere Dynamic Cache initialized successfully.
00000015 LogAdapter E DCSV9416E: An internal error occurred.
Exception is Clock not changed in 10002 rounds.
00000015 LogAdapter E DCSV9416E: An internal error occurred.
Exception is Clock not changed in 10002 rounds.
```

Apply SLES 9 SP1 on PowerPC 64-bit platforms to avoid this problem.

On SLES9/AMD64 systems, install the following 32-bit libraries are required by the SDK.

- XFree86-libs-32bit-9
- glibc-32bit-9
- glib-32bit-9
- gtk-32bit-9

Results

If you do not install all of the required packages, the known problem might occur.

What to do next

After you complete the step in this topic, proceed to the final step in “Preparing Linux systems for installation” on page 57.

Installing and verifying Linux packages

This topic describes how to query a Linux system to verify that a package is installed. The topic also describes how to install a missing package from an operating system CD.

Before you begin

Install the Linux operating system before using this procedure.

About this task

Use the following procedure to install and verify prerequisite libraries (packages) that WebSphere Application Server products require on Linux systems.

Assume that your Linux operating system requires the `compat-libstdc++-33-3.2.3-47.3` package and that there are two versions of the package. One version is for 32-bit platforms and the other is for 64-bit platforms. This procedure shows how to query the operating system to see if the packages are installed, find the missing packages on the operating system disc, and install the packages.

This example uses Red Hat Enterprise Linux (RHEL) on a PowerPC 64-bit hardware platform. The example assumes that RHEL requires both the 32-bit version and the 64-bit version of the `compat-libstdc++-33-3.2.3-47.3` package.

1. Query the operating system to determine if the packages are already installed.

```
rpm -qa | grep compat-libstdc++-33-3.2.3-
```

In this example, the operating system did not find any matching packages so a blank line is displayed.

You can also search without the `grep` argument to see an explicit message about the file:

```
rpm -q compat-libstdc++-33-3.2.3-
```

The operating system returns the following message:

```
package compat-libstdc++-33-3.2.3- is not installed
```

2. Find all related packages on the operating system media to get the fully qualified locations.

This example assumes that the operating system media is a compact disc mounted at `/media/cdrom`. Your CD-ROM device might be at a different location, such as `/media/cdrecorder`, for example.

```
find /media/cdrom -name compat-libstdc++-33-3.2.3-*
```

In this example, the operating system finds two matching package names. One package is the 32-bit version and the other is the 64-bit version.

```
/media/cdrom/RedHat/RPMS/compat-libstdc++-33-3.2.3-47.3.ppc.rpm  
/media/cdrom/RedHat/RPMS/compat-libstdc++-33-3.2.3-47.3.ppc64.rpm
```

3. Install the first missing package:

```
rpm -ivh /media/cdrom/RedHat/RPMS/compat-libstdc++-33-3.2.3-47.3.ppc.rpm
```

4. Install the second missing package:

```
rpm -ivh /media/cdrom/RedHat/RPMS/compat-libstdc++-33-3.2.3-47.3.ppc64.rpm
```

5. Optional: **Alternative method to find and install packages in one command:** Use the following command to find packages and to install all packages that are found.

Find the packages as described in the earlier step to verify that the following command installs only the packages that you intend to install.

```
find /media/cdrom -name compat-libstdc++-33-3.2.3-* | xargs rpm -ivh
```

This single command installs both packages.

6. Optional: **Alternative command to update existing packages:** Use the following command to find and install missing packages or to find and update existing packages:

```
find /media/cdrom -name compat-libstdc++-33-3.2.3-* | xargs rpm -Uvh
```

This single command installs a package when the package is not installed. This command updates a package to a newer version when the package is installed.

What to do next

Required packages vary per operating system. See “Preparing Linux systems for installation” on page 57 for a list of required packages for each Linux operating system.

Preparing Solaris systems for installation

This topic describes how to prepare Solaris systems for the installation of IBM WebSphere Application Server products.

Before you begin

The installation uses an InstallShield MultiPlatform (ISMP) wizard. You can use the graphical interface of the wizard. You can also use the wizard in silent mode.

Note: There are known issues with using Cygwin/X to run Eclipse-based applications on remote Solaris machines. This affects your use of the Profile Management tool and the Installation Factory. With Cygwin/X on remote Solaris, for example, the Profile Management tool's welcome panel appears but no keyboard or mouse input is accepted. For details of existing Bugzilla reports on these issues, see the information at https://bugs.eclipse.org/bugs/show_bug.cgi?id=97808. If a different X server (such as Hummingbird Exceed[®]) is used, these problems do not occur.

About this task

Preparing the operating system involves such changes as allocating disk space and installing patches to the operating system. IBM tests WebSphere Application Server products on each operating system platform. Such tests verify whether an operating system change is required for WebSphere Application Server products to run correctly. Without the required changes, WebSphere Application Server products do not run correctly.

1. Log on to the operating system.

You can log on as root or as a non-root installer.

Select a umask that allows the owner to read/write to the files, and allows others to access them according to the prevailing system policy. For root, a umask of 022 is recommended. For non-root users a umask of 002 or 022 can be used, depending on whether the users share the group. To verify the umask setting, issue the following command:

```
umask
```

To set the umask setting to 022, issue the following command:

umask 022

2. Select the **Entire Group** option on the Select Solaris Software Group panel.
3. Optional: Download and install the Mozilla Firefox Web browser so that you can use the launchpad application on the product disc.

If you do not have the Mozilla Web browser, download and install the browser from <http://www.mozilla.org/products/firefox>.

4. Optional: Export the location of the supported browser.

Export the location of the supported browser using a command that identifies the actual location of the browser.

If the Mozilla Firefox package is in the /opt/bin/mozilla directory, for example, use the following command:

```
export BROWSER=/opt/bin/firefox
```

5. Optional: Configure Hummingbird Exceed to disable Automatic Font Substitution.

Font changes occur when using the Hummingbird Exceed package and invoke the Profile Management tool. When you use the Hummingbird Exceed package to connect to a machine running the Solaris operating system, and then invoke the Profile Management tool, some font sizes and styles display differently than when doing the same operation from the native Solaris display.

The font sizes and style changes are based on the font selections in the bundled Java SE Runtime Environment 6 (JRE 6).

To prevent the various font changes, configure Hummingbird Exceed to disable Automatic Font Substitution:

- a. From the Hummingbird Exceed user interface, click **Xconfig > Font > Font Database > Disable (Automatic Font Substitution)**.
 - b. Click **OK**.
 - c. Restart the Hummingbird Exceed package.
6. Stop all WebSphere Application Server-related Java processes on the machine where you are installing the product.
 7. Stop any Web server process such as the IBM HTTP Server.
 8. Provide adequate disk space.

Attention:

The Express product requires the following disk space:

Table 20. Estimated disk space

Directory	Description	Disk space after installation
The /opt/IBM/WebSphere/AppServer directory before creating profiles	The installation root directory includes the core product files. This size includes the Sample applications. This size includes space for the default application server profile for the server1 process. The requirement does not include space for applications that you might install.	930 MB
The /tmp directory	The temporary directory is the working directory for the installation program.	100 MB
Total disk space requirement before creating profiles	This amount is the total space requirement when installing the product from the disc.	1030 MB

Table 21. Estimated profile disk space

Directory	Description	Disk space after installation
Application server profile with Samples	This size does not include space for applications that you might develop and install.	200 MB

The IBM HTTP Server product requires the following space:

Table 22. IBM HTTP Server estimated disk space

Directory	Disk space after installation
<ul style="list-style-type: none"> • IBM HTTP Server /opt/IBM/HTTPServer • IBM Global Security Kit (GSKit) gskit_root • The Web server plug-ins for WebSphere Application Server /opt/IBM/WebSphere/plugins 	763 MB

On SPARC 32-bit platforms, the following space is required for the IBM WebSphere Application Server Clients:

150 MB for the *app_client_root* directory

The amount of space required to install the application clients is actually less than 150 MB. The amount of space depends on the clients that you install as features.

The following space is required for the Update Installer.

Table 23. Update Installer estimated disk space

Directory	Description	Disk space after installation
Default directory: /opt/IBM/WebSphere/UpdateInstaller	The installation wizard for each component displays required space on the confirmation panel before you install the product files and selected features. The installation wizard also warns you if you do not have enough space to install the product.	200 MB

The installation wizard for each component displays required space on the confirmation panel before you install the product files and selected features. The installation wizard also warns you if you do not have enough space to install the product.

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

9. Set kernel values to support Application Server. Several Solaris kernel values are typically too small.

The instructions in this step apply to the Solaris SPARC (32-bit and 64-bit) operating system only. For Solaris x64 processor-based systems, see *How to Get Started with IBM WebSphere Application Server on Solaris 10 and Zones*. The article was written for Solaris 10 on SPARC but the principles apply equally to x64.

Before installing, 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_semni = 1024
set semsys:seminfo_semap = 1026
set semsys:seminfo_semns = 16384
set semsys:seminfo_semns1 = 100
set semsys:seminfo_semopm = 100
set semsys:seminfo_semnu = 2048
set semsys:seminfo_sesume = 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 Sun Microsystems documentation. For example, the *Solaris Tunable Parameters Reference Manual*.

10. 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 Supported hardware and software Web site if you have not done so already. Refer to the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

Note: If your Solaris system does not have sufficient available memory as specified on the supported hardware and software Web site, then you might experience a prerequisite error during installation: "A supported operating system architecture was not detected". If you proceed to the end of the installation wizard, you might also see the following insufficient disk space error:

```
java.io.IOException: Cannot run program "sh": error=12, Not enough space
    at java.lang.ProcessBuilder.start(ProcessBuilder.java:459)
    at java.lang.Runtime.exec(Runtime.java:593)
    at java.lang.Runtime.exec(Runtime.java:466)
```

Free up additional memory on the machine and retry the installation.

11. Verify the system `cp` command when using emacs or other freeware.

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

- a. Type which `cp` at the command prompt before running the installation program for the WebSphere Application Server product.
- b. Remove the freeware directory from your `PATH` if the resulting directory output includes freeware. For example, assume that the output is similar to the following message: `.../freeware/bin/cp`. If so, remove the directory from the `PATH`.
- c. Install the WebSphere Application Server 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 `app_server_root/java` directory.

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

12. Verify that the Java SDK on the installation image disc is functioning correctly, if you created your own disc.

For example, you might have downloaded an installation image from Passport Advantage, or you might have copied an installation image onto a backup disc. In either case, perform the following steps to verify that the disc contains a valid Java software development kit (SDK).

- a. Change directories to the `/JDK/jre.pak/repository/package.java.jre/java/jre/bin` directory on the product disc. For example:

```
cd /JDK/jre.pak/repository/package.java.jre/java/jre/bin
```

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

```
./java -version
```

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

Results

This procedure results in preparing the operating system for installing the product.

What to do next

After verifying prerequisites, verifying the product disc, and setting your installation goals, you can start installing. Use one of the following links to open the installation procedure that you require.

Install the Express product on your operating system.

- Perform an installation using the graphical user interface.

The typical installation installs all of the features. The features include the core product files (required), the Javadoc (optional), and the Sample applications (optional).

See “Installing Express” on page 79.

- Perform a silent installation.

A silent installation requires you to edit the example response file to contain all of your installation choices. After creating a valid response file, issue the install command with the silent parameter from a command window.

See “Installing silently” on page 91.

- Install additional features to an existing product.

After using a custom installation to omit one or both of the optional features, you can install the product again to add the features. Select a missing feature to install it.

See “Installing additional features on an existing Express product” on page 84.

- Upgrade the Express trial to the Express product.

After installing a trial, you can install the actual product to upgrade the trial to the real product.

See “Upgrading the Express trial to the Express product” on page 89.

Preparing Windows systems for installation

This topic describes how to prepare your Windows systems for the installation of IBM WebSphere Application Server products.

Before you begin

The installation uses an InstallShield MultiPlatform (ISMP) wizard. You can use the graphical interface of the wizard. You can also use the wizard in silent mode.

About this task

Preparing the operating system involves such changes as allocating disk space and installing patches to the operating system. IBM tests WebSphere Application Server products on each operating system platform. Such tests verify whether an operating system change is required for WebSphere Application Server products to run correctly. Without the required changes, WebSphere Application Server products do not run correctly.

1. Log on to a user ID that belongs to the administrator group.

Log on as a member of the administrator group to successfully install the product. You cannot create Windows services from a user ID that does not belong to the administrator group. The creation of Windows services requires the user to have the advanced user rights *Act as part of the operating system* and *Log on as a service*.

During the procedure, you can assign another ID or the one you are using to install as the user who will log on the Windows service. That user requires the advanced user right: *Log on as a service*.

However, if you do not have this advanced user right or if the user ID that is to log on the Windows service does not have the advanced user right, the Installation wizard assigns the advanced right to the user.

Tip: Windows service creation can be disabled by launching the graphical interface from the command line with the following additional option:

```
install.exe -OPT PROF_winserviceCheck="false"
```

2. Optional: Download and install a Web browser. You must install a Web browser if you want to use the launchpad application. If your system does not have a default browser or the browser has been corrupted or installed incorrectly, then you might experience errors when trying to open various hyperlinks in the installation wizard panels.
3. Stop all WebSphere Application Server-related Java processes on the machine where you are installing the product.
4. Stop any Web server process such as the IBM HTTP Server.
5. Stop all instances of the process_spawner.exe program.
6. Provide adequate disk space.

The Express product requires the following disk space:

Table 24. Estimated disk space

Directory	Description	Disk space after installation
The C:\Program Files\IBM\WebSphere\AppServer directory before creating profiles	The installation root directory includes the core product files. This size includes the Sample applications. This size includes space for the default application server profile for the server1 process. The requirement does not include space for applications that you might install.	930 MB
The C:\temp directory	The temporary directory is the working directory for the installation program.	100 MB
Total disk space requirement before creating profiles	This amount is the total space requirement when installing the product from the disc.	1030 MB

Table 25. Estimated profile disk space

Directory	Description	Disk space after installation
Application server profile with Samples	This size does not include space for applications that you might develop and install.	200 MB

The IBM HTTP Server product requires the following space:

Table 26. IBM HTTP Server estimated disk space

Directory	Disk space after installation
<ul style="list-style-type: none"> • IBM HTTP Server C:\Program Files\IBM HTTP Server • IBM Global Security Kit (GSKit) C:\Program Files\ibm\gsk7 • The Web server plug-ins for WebSphere Application Server C:\Program Files\IBM\WebSphere\Plugins 	763 MB

The following space is required for the Application Client for WebSphere Application Server.

Table 27. Application Client estimated disk space

Directory	Description	Disk space after installation
Default directory: C:\Program Files\IBM\WebSphere\AppClient	The amount of space required to install the application clients is actually less than 150 MB. The amount of space depends on the clients that you install as features.	150 MB

The following space is required for the Update Installer for WebSphere Software.

Table 28. Update Installer estimated disk space

Directory	Description	Disk space after installation
C:\Program Files\IBM\WebSphere\Update\Installer	The installation wizard for each component displays required space on the confirmation panel before you install the product files and selected features. The installation wizard also warns you if you do not have enough space to install the product.	200 MB

7. 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 Supported hardware and software Web site if you have not done so already.
Refer to the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.
8. Download Windows Script 5.6 to create Start menu items correctly on Windows 2000 and Windows XP.
Download Windows Script 5.6 from the following Microsoft® Web page: <http://www.microsoft.com/downloads/details.aspx?FamilyId=C717D943-7E4B-4622-86EB-95A22B832CAA>.
9. Verify that the Java 2 SDK on your copy of the product disc is functioning correctly.
If you created your own product disc from an ISO image or by copying the actual disc, perform the following steps to verify that the Java 2 SDK on the product CD-ROM or DVD is working correctly.
 - a. Change directories to the `\win\WAS\jdk\java\bin` directory on the product disc. Type the following command:

```
cd disc_drive_D:\WAS\jdk\java\bin
```
 - b. Verify the version of the Java 2 SDK. Type the following command:

```
.\java -version
```

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

Results

This procedure results in preparing the operating system for installing the product.

What to do next

After verifying prerequisites, verifying the product disc, and setting your installation goals, you can start installing. Use one of the following links to open the installation procedure that you require.

Install the Express product on your operating system.

- Perform an installation using the graphical user interface.

The typical installation installs all of the features. The features include the core product files (required), the Javadoc (optional), and the Sample applications (optional).

See “Installing Express” on page 79.

- Perform a silent installation.

A silent installation requires you to edit the example response file to contain all of your installation choices. After creating a valid response file, issue the install command with the silent parameter from a command window.

See “Installing silently” on page 91.

- Install additional features to an existing product.

After using a custom installation to omit one or both of the optional features, you can install the product again to add the features. Select a missing feature to install it.

See “Installing additional features on an existing Express product” on page 84.

- Upgrade the Express trial to the Express product.

After installing a trial, you can install the actual product to upgrade the trial to the real product.

See “Upgrading the Express trial to the Express product” on page 89.

Chapter 6. Installing the product and additional software

Install the application server product on AIX, HP-UX, Linux, Solaris, or Windows operating systems.

Before you begin

Before you use the installation tools, read this topic to prepare for installation and to learn about installation options. Also read the hardware and software requirements on the Supported hardware and software Web site.

The launchpad is the preferred method of starting the installation. Use the launchpad console to access the product overview, the installation guide, and the readme file. Use the launchpad to launch each installation procedure. Read “Using the launchpad to start the installation” on page 7 for more information.

Windows The installation procedure requires the installer ID to have the following advanced user rights, *Act as part of the operating system* and *Log on as a service* to install Windows services.

You can install as a root or non-root user. For detailed information on non-root installation considerations, read “Non-root installation” on page 97.

About this task

Use the information in this topic to learn about the types of installation available. This topic has links to more detailed installation topics.

You can install a product using the installation wizard GUI or silent mode. The installation wizard performs the following actions:

- Automatically checks prerequisites
 - Looks for a previous WebSphere Application Server Version installation to determine whether to let you add features to the product binaries or to install a new set of product binaries
 - Looks for a previous installation to determine whether to let you upgrade from a trial installation to the real product
 - Installs the necessary product binaries
 - Prompts you to create a cell profile, a management profile, a stand-alone application server profile, or a custom profile; or prompts you to start the Profile Management Tool to create a profile
1. Plan your installation as described in Chapter 4, “Planning the installation,” on page 35.
 2. Prepare your operating platform for installation as described in Chapter 5, “Preparing the operating system for product installation,” on page 47.
 3. Review the roadmap for installing the Express product as described in “Roadmap: Installing the Express product” on page 77.
 4. Install the Express product.

If you cannot use a graphical user interface on your operating system for some reason, use the wizard in silent mode.

Choose an installation scenario:

- **Graphical user interface:** Install with the wizard as described in “Installing Express” on page 79.
- **Graphical user interface:** Install additional features to an existing installation as described in “Installing additional features on an existing Express product” on page 84.

After installing Express, you can install it again to update the system files by installing previously uninstalled features.

- **Graphical user interface:** Upgrade a trial version to a product version as described in “Upgrading the Express trial to the Express product” on page 89.

- **Command-line interface:** Perform a silent installation as described in “Installing silently” on page 91.

A silent installation requires you to edit the response file that contains all of your installation choices. After creating a valid response file, issue the install command with the `-silent` parameter and the `-options` parameter from a command window.

The installer program does not support the ISMP-console installation method at this time.

If you encounter a problem such as needing more disk space or temporary space or missing prerequisite packages on your system, cancel the installation, make the required changes, and restart the installation.

5. Optional: Install optional components for use with the application server.

Many of these components are included on the Supplements disk included with the application server. Use the Supplements disk to access installation programs and documentation for Application Client for WebSphere Application Server, IBM Support Assistant Agent, Update Installer, GSKit, IBM HTTP Server, Installation Factory, and Web server plug-ins. You can also use the migration tools or copy the tools to your system from this disk.

The launchpad application in the root directory of the Supplements disk lets you install and view information about many of the components on the disk.

The Supplements disk also has World Type and Devanagari fonts on Linux. Use your Linux system utilities to install the World Type fonts or the Devanagari fonts. Use your operating system utilities to install the Devanagari fonts on other operating systems. The Devanagari fonts support Hindi, Sanskrit, and some other languages.

- a. Optional: Install IBM HTTP Server.

After installing a WebSphere Application Server product, you can use the application server to serve applications over the Internet. It is not necessary to install the IBM HTTP Server or another Web server.

The installation solution diagrams in Chapter 4, “Planning the installation,” on page 35 show the components that are present in different types of environments.

- b. Optional: Install Web server plug-ins for IBM HTTP Server or another supported Web server.

If you install the IBM HTTP Server or another Web server, you must then install a binary module for the Web server to enable it to communicate with WebSphere Application Server products.

After installing a Web server plug-in, the Plug-ins installation wizard configures a new element in the application server configuration called a *Web server definition*. You can then manage applications for the Web server using the administrative console.

- c. Optional: Install the application clients.

You do not need to install the Application Client for WebSphere Application Server unless an application that you are deploying was designed to run as a client application.

- d. Optional: Install the Update Installer for WebSphere Software.

Use the Update Installer to install maintenance packages for any of the installable WebSphere software components in the product package. Read Installing the Update Installer for more information.

- e. Optional: Install the IBM Support Assistant Workbench on a local workstation running the Windows or Linux Intel operating system.

IBM Support Assistant allows you to search multiple knowledge repositories and gives you access to the latest product information. You can choose to be guided through your problem symptoms or view a complete listing of advanced tooling for analyzing everything from logs to memory dumps.

You can troubleshoot a local system using the workbench, or you can troubleshoot a remote system from a local workstation using the IBM Support Assistant Agent. You can connect to the IBM Support Assistant Agent installed on a remote system running on the AIX, Linux, Windows, or Solaris operating system by using the IBM Support Agent Manager installed on a local workstation running the Windows or Linux Intel operating system. You can use IBM Support Assistant to run

automated, symptom-specific data collectors. This data can then be attached to an IBM Service Request so that you can get help from IBM Support.

Results

You can install IBM WebSphere Application Server - Express Version 7.0 by following this procedure.

You can also install IBM HTTP Server, the Web server plug-ins, and the Application Client for WebSphere Application Server.

Roadmap: Installing the Express product

Use the launchpad to install IBM WebSphere Application Server - Express from the product disc or from an installation image that you can download from the Passport Advantage site.

Before you begin

This topic assumes that you have read Chapter 6, “Installing the product and additional software,” on page 75 and have decided to install Express using the installation wizard graphical user interface. This topic also assumes that you have prepared your operating system for installation.

About this task

This topic provides an overview of installing the WebSphere Application Server - Express product.

The installation program uses the InstallShield MultiPlatform (ISMP) product to perform the installation. You can use the installation wizard either from a graphical interface or from the command line. If you use the `-silent` parameter on the command line option, the installation wizard does not display the graphical user interface.

Install the Express product to create a single standalone application server named *server1*. After installing Express and creating a single standalone application server, you can use the Profile Management Tool to create more standalone application servers on the machine.

1. Use the launchpad to get started, if possible.

The launchpad gives you important clues about creating typical topologies. The installation solution diagrams identify some of the system topologies you can create. The launchpad is in the root directory of the product CD.

The launchpad also provides access to the documentation for each of the installable components on the product CD. Use the launchpad to launch the installation program for each of the installable components in the primary disc packet. See “Using the launchpad to start the installation” on page 7.

Start the installation of a product image with the launchpad script.

- `AIX` `HP-UX` `Linux` `Solaris` `launchpad.sh`
- `Windows` `launchpad.bat` or `launchpad.exe`

Or you can start the installation directly with the **install** command.

- `AIX` `HP-UX` `Linux` `Solaris` `/WAS/install`
- `Windows` `\WAS\install`

2. Install a standalone application server.

See “Installing Express” on page 79.

The installation of the product creates a standalone application server. You simply have to start the application server named *server1* to begin using the server.

The steps for installing a standalone application server are:

- a. Prepare the operating system. Read the Chapter 5, “Preparing the operating system for product installation,” on page 47 topic for more information.
- b. Insert the product disc or access a downloaded installation image.
- c. Start the launchpad, or run the install command.
- d. Install the Express product.
- e. Check for and install any recommended maintenance packages.
- f. Open the First steps console and start the application server.

Or start the application server from the command line:

- 1) Change directories to the *profile_root/bin* directory:

```
cd profile_root/bin
```

- 2) Start the application server named *server1* with the *startServer* command.

- **AIX** **HP-UX** **Linux** **Solaris** `./startServer.sh server1`
- **Windows** `startServer.bat server1`

Read the “startServer command” topic for more information.

3. Optional: Create multiple application servers on a single machine.

Installing the Express product creates one standalone application server profile. Use the Profile Management Tool to create additional standalone application server profiles. Each profile contains one *server1* application server.

Each application server profile is a unique runtime environment, with its own configuration, applications, data, logs, and administrative interface. All of the application server instances on a machine share the same set of core product files.

The following procedure shows the basic steps for creating two profiles on one machine:

- a. Install the Express product.
- b. Check for and install any recommended maintenance packages.
- c. Change directories to the *profile_root/firststeps* directory.
- d. Start the First steps console with the *firststeps* command.

- **AIX** **HP-UX** **Linux** **Solaris** `./firststeps.sh`
- **Windows** `firststeps.bat`

- e. Select the Profile Management Tool option and create a new application server profile.

Give the new profile a unique name, such as `Profile02`.

- f. Start each application server.

4. Troubleshoot any problems.

If you encounter a problem such as needing more space or missing the right prerequisite updates on your system, cancel the installation, make the required changes, and restart the installation. The installation procedure has a description of more comprehensive troubleshooting procedures.

Results

The Express product is installed on a single machine and you can start its application server.

If the server process cannot start, follow the procedure in Chapter 8, “Troubleshooting installation,” on page 145.

What to do next

After installing the product from the installation image, the next step is to check for available updates before you alter the configuration of the product. Read the “Installing maintenance packages” topic for more information.

After installing, updating, and verifying, the next step is to use the product. Start the application server. to use the administrative console to deploy an existing application. See *Fast paths for WebSphere Application Server* for more information.

Getting the latest information: This topic is available on the product disc and online in an information center. The information center always has the most current information. The information center displays in the language of your machine locale if possible.

Access the information center for a WebSphere Application Server product from the WebSphere Application Server library page.

The *Getting Started* PDF is updated occasionally. Download a new *Getting Started* guide by clicking the "Installing your application serving environment (PDF)" link on the WebSphere Application Server library page. The name of the file is different than the one on your product disc to keep from overlaying other PDF files you might download. (All of the PDF files on the product disc have the same file name.)

The HTML version of the *Getting Started* guide is not available for downloading because you can download and install the entire information center.

Installing Express

Install IBM WebSphere Application Server - Express using the Installation wizard on distributed operating system platforms. You can install from the installation image on the product disc, or the downloaded Passport Advantage image.

Before you begin

This topic assumes that you do not have an existing Express installation and that you want to install Express using the Installation wizard graphical user interface.

- "Installing additional features on an existing Express product" on page 84
- "Upgrading the Express trial to the Express product" on page 89
- "Installing silently" on page 91

Knowing which components to install and in what order to install them is important. Before starting this installation, see Chapter 4, "Planning the installation," on page 35. The planning diagrams show typical topologies for the product. The solutions are also available through the *Installation solution diagrams* link in the launchpad. See "Using the launchpad to start the installation" on page 7. You cannot run the launchpad remotely to install a product. Only local use of the launchpad is supported.

Make sure that your operating system is ready for product installation. Read the Chapter 5, "Preparing the operating system for product installation," on page 47 topic for more information.

Note: If you are installing remotely and want to use the installation wizard, then you must use a connection mechanism that supports the use of graphics. If your connection does not support the use of graphics, then install the product silently.

About this task

Perform the following procedure to install the WebSphere Application Server - Express product.

1. Log on to the operating system. If you are installing as a non-root or non-administrative user, then there are certain limitations. See the documentation for non-root installation for more information.

AIX **HP-UX** **Linux** **Solaris** In addition, select a umask that allows the owner to read/write to the files, and allows others to access them according to the prevailing system policy. For

root, a umask of 022 is recommended. For non-root users, a umask of 002 or 022 could be used, depending on whether or not the users share the group. To verify the umask setting, issue the following command:

```
umask
```

To set the umask setting to 022, issue the following command:

```
umask 022
```

Windows When installing as an administrative user on a Windows operating system, a Windows service is automatically created to autostart the application server. The installer user account must have the following advanced user rights:

- Act as part of the operating system
- Log on as a service

For example, on some Windows operating systems, click **Administrative Tools > Local Security Policy > User Rights Assignments** to set the advanced options. See your Windows operating system documentation for more information.

Windows If you plan to run the application server as a Windows service, do not install from a user ID that contains spaces. A user ID with spaces cannot be validated. Such a user ID is not allowed to continue the installation. To work around this restriction, install with a user ID that does not contain spaces.

2. Access the root directory of your installation image on your hard disk, or insert the disc labeled **WebSphere Application Server - Express** into the disc drive.

The application server product installer is spanned across multiple CDs. If you are installing the product from CD, you will be prompted during the installation for the next CD.

Note: To avoid being prompted for subsequent CDs, copy both installation CDs into the same directory on your hard disk, name them DISC1 and DISC2, and run the installer from the DISC1 directory. You will not be prompted for the next CD during installation if you have followed this naming convention. If you are installing silently, then you must use this naming convention or the installation will not proceed. If you are installing from a DVD or a downloaded image, then you do not need to take any action because these images are not spanned.

AIX **HP-UX** **Linux** **Solaris** Mount the drive if necessary as described in “Mounting disc drives on operating systems such as AIX or Linux” on page 107.

3. Start the installation.

Start the installation of a product image with the launchpad script.

- **AIX** **HP-UX** **Linux** **Solaris** launchpad.sh
- **Windows** launchpad.bat or launchpad.exe

Or you can start the installation directly with the install command.

- **AIX** **HP-UX** **Linux** **Solaris** /WAS/install
- **Windows** \WAS\install

Note: There might be certain operating system policy restrictions if you are installing as a non-administrator on Windows 2003 on an AMD processor. You might not be able to run the install command by double-clicking the file in Windows Explorer. Run the command from a command prompt or rename the command to something other than install.exe or setup.exe and run the command.

If an error occurs with the Java SE Runtime Environment 6 (JRE 6), force the installation to use the correct runtime environment with the following command, where *downloaded_directory* is the name of the directory in which you downloaded the image:

- **AIX** **HP-UX** **Linux** **Solaris** `./install -is:javahome disc_mount_point/downloaded_directory/JDK/jre.pak/repository/package.java.jre/java/jre`
- **Windows** `install -is:javahome disc_drive:\downloaded_directory\JDK\jre.pak\repository\package.java.jre\java\jre`

If you cannot start the launchpad, use the troubleshooting information in “Using the launchpad to start the installation” on page 7 to correct the problem.

When using the launchpad, launch the installation wizard for WebSphere Application Server - Express.

4. The installation wizard initializes and then displays the Welcome panel.

Click **Next** to continue.

5. The license agreement panel is displayed. Read the license agreement and accept its terms. After you accept the licensing terms, the installation wizard checks for a supported operating system and prerequisite patches.

Although the installation wizard automatically checks for prerequisite operating system patches with the prereqChecker application, review the prerequisites on the WebSphere Application Server detailed system requirements Web site if you have not already done so. 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.

The installation process verifies that the minimum required version of a supported operating system is available. If you meet the minimum release requirements or are at a higher *minor* release of a supported operating system, then you will not encounter a prerequisite error. If you are not at the minimum version of a supported operating system, you can continue with the installation, but the installation or product operation might not succeed without applying maintenance. If you are at a higher *major* release of a supported operating system, or the operating system itself is not on the supported list, you might encounter the following warning:

Warning: A supported operating system was not detected.

Support for your operating system might have been added after the release of the product. See the WebSphere Application Server detailed system requirements Web pages for more information about supported operating systems. You can continue with the installation, but the installation or product operation might not succeed without applying maintenance. Go to the product support Web pages to obtain the latest maintenance packages to apply after installation.

Refer to the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

Click the radio button beside the message **I accept both the IBM and the non-IBM terms** to agree to the license agreement and click **Next** to continue.

6. The systems prerequisite check panel is displayed. After confirming that your operating system is supported and that you have installed all necessary patches, click **Next** to continue. The Installation wizard checks for a previous application server installation at the same product level.
7. If you are installing the product as a non-root user (or a non Administrator on Windows operating systems), then a panel is displayed indicating that a non-root user has been detected. This panel contains important information about installing as a non-root user. See “Non-root installation” on page 97 for more information. Click **Next**.
8. If the wizard detects a previous installation, then the product detection panel is displayed. If the wizard does not detect a previous installation, then skip this step.

You have the following options:

- Add features to the existing installation
- Install a new copy of the product to another directory
- Create a new WebSphere Application Server profile using the Profile management tool
- Upgrade the product to another edition

This procedure assumes that you do not have an existing installation that you intend to update. If the wizard detects a previous installation, see the following depending on your situation:

- See “Installing additional features on an existing Express product” on page 84 for the installation scenario that adds features to an existing product.
- See “Upgrading the Express trial to the Express product” on page 89 for the installation scenario that upgrades a trial to the full Express product.

9. The optional features panel is displayed.

There are several features available. If you choose not to install a feature at this time, then you can run the installer later and add features to this installation. Choose from the following features:

- **Install the sample applications**

Installs the samples applications for learning and demonstration environments. The samples are not recommended for installation on production environments.

- **Install non-English language packages for the administrative console**

Installs all the non-English language files for using the administrative console from machines with non-English locales. If you do not select this option then only the English language pack is installed.

- **Install non-English language packages for the application server runtime environment**

Installs all the non-English language files that support the application server runtime environment such as the wsadmin tool and logging. If you do not select this option then only the English language pack is installed.

Note: Language support has been modularized into language packs for the administrative console and application server runtime components. This allows you to update your current language packs or add new language packs released by IBM using the Update Installer. The language pack design also allows you to defer installing non-English language packs for these two components if you want to save disk space.

Note: You might want to defer installing features, such as language packs and samples, to save disk space. However, consider installing the features if there is a chance you might use them in the future. If you choose not to install the features and then later install maintenance, you will have to uninstall all maintenance, install the features, and then reapply all maintenance or the features might be corrupted.

Select the features you want to install and click **Next**.

10. The installation directory panel is displayed. Specify the destination of the installation root directory and click **Next**.









Specify the location of the installation root directory for the product binaries, which are also known as the core product files or system files.

The core product files do not change unless you:

- Add a feature
- Install maintenance, such as refresh packs, fix packs, or interim fixes
- Install another product that extends the Express product.

The system-owned default *app_server_root* directories for installing as a root user or an administrator are different than the user-owned default *app_server_root* directories when installing as a non-root installer.

Note:

- Deleting the default target location and leaving an installation directory field empty prevents you from continuing.
-     Do not use symbolic links as the destination directory. Symbolic links are not supported.
-     Spaces are not supported in the name of the installation directory on systems such as AIX or Linux.

- **Windows** Do not use a semicolon in the directory name on Windows systems. WebSphere Application Server cannot install properly on a Windows platform if the target directory includes a semicolon. A semicolon is the character used to construct the class path on Windows systems. Also, if you are using parentheses () in your directory name, you must include a space before the leading parenthesis or profile creation actions will fail.

The installer program checks for required space before calling the Installation wizard. If you do not have enough space, stop the installation program, free space by deleting unused files and emptying the recycle bin, then restart the installation.

11. Select an initial server environment on the WebSphere Application Server environments panel.

The following values are valid:

Table 29. Profile types

Profile Type	Description
Management	Create a management profile that provides the servers and services necessary to manage your WebSphere environment. You can select one of the following management profile types on the following panel: <ul style="list-style-type: none"> • Administrative agent The basic function of the administrative agent is to provide a single interface to administer multiple application servers.
Application server	Create a stand-alone application server profile.
None	Do not create a profile during installation. However, if you do not create a profile during installation, then you must create a profile after installation to have an operational product.

12. The administrative security panel is displayed. Choose whether to enable administrative security and click **Next**.

The default setting is to enable administrative security. Clear the check box to disable security or supply an administrative ID and password. If you are installing the samples on an application server profile, you must specify the samples security information in the samples section below the administrative security section.

Note:

- In environments where you plan to have multiple standalone application servers, the security policy of each application server profile is independent of the others. Changes to the security policies in one application server profile are not synchronized with the other profiles.
- Write down the user name and password. You cannot log onto the administrative console without it. You cannot use the product at all unless you know the ID and password.

13. The installation summary panel is displayed.

- **AIX** **HP-UX** **Linux** **Solaris** If you are installing as a non-root user, you can choose to verify whether you have the correct permissions to install the product successfully. Select the **Verify my permissions to perform the installation** check box if you wish to verify your permissions to install the product. If the permission check fails, then review your user permissions and retry the installation. Read the “Non-root installation” on page 97 topic for more information.
 - **Windows** The verify permissions function is currently not available on Windows operating systems.
- Review the summary information. Click **Next** to install the product code or **Back** to change your specifications.

The installation wizard creates the uninstaller program and then displays a progress panel that shows which components are being installed.

14. The Installation results panel is displayed. Verify the success of the installer program by examining the completion panel and the `app_server_root/logs/install/log.txt` file to verify that there were no file system or other unusual errors while installing. If there are problems, correct them, and reinstall the

product. Important information about the profile you created is also available in *profile_root/logs/AboutThisProfile.txt*. See Chapter 8, “Troubleshooting installation,” on page 145 for more information on other installation logs and log locations.

Select the **Launch the First steps console** checkbox if you wish to launch the First steps application. Use the First steps console to verify the installation, start the Profile Management Tool, start the application server, or open the administrative console, where you can deploy sample applications. See the First steps documentation for more information.

If the installation of the core product files fails, fix the error and reinstall.

If the creation of a profile fails, fix the error and run the Profile Management Tool to recreate the profile.

Troubleshoot the installation if the *app_server_root/logs/install/log.txt* file or the *app_server_root/logs/manageprofiles/profile_name_create.log* file does not contain a record of any errors, but errors exist.

Read the Chapter 8, “Troubleshooting installation,” on page 145 and “Installation component troubleshooting tips” on page 152 topics for more information.

Windows

Examine the Start menu entry. The menu is an indication of a successful installation:

- **[All] Programs > IBM WebSphere > Application Server, Express V7.0**

If problems exist that cause you to reinstall the product, correct the errors, uninstall the product as described in the uninstallation topics, reboot a Windows machine or log off and back on as root on a machine with an operating system such as AIX or Linux, and reinstall.

15. Click **Finish** to close the installation wizard.

If you did not create a profile during the installation, the option to launch the Profile Management Tool is displayed. Use the Profile Management Tool to create an operational environment that includes a profile.

If you did create a profile, select the check box to open the First Steps console then click **Finish**.

Results

This procedure results in the installation wizard installing WebSphere Application Server - Express into the installation root directory. The installation wizard creates a profile named default that provides the runtime environment for the server1 application server.

Further configuration is not necessary at this time. However, you can create additional stand-alone application servers with the Profile Management Tool. Each profile is created in the *profile_root* directory by default.

What to do next

After installing the product from the installation image, the next step is to check for available updates before you alter the configuration of the product. Read the “Installing maintenance packages” topic for more information.

1. Start the application server. On the First steps console, click **Start the server**.
See “Roadmap: Installing the Express product” on page 77 for more information on starting a server.
2. Open the administrative console. On the First steps console, click **Administrative console** and log in.

After creating an application server profile, you can deploy an application. See Fast paths for WebSphere Application Server to get started deploying applications.

Installing additional features on an existing Express product

This topic describes how to install additional features to an existing IBM WebSphere Application Server - Express installation.

Before you begin

This topic assumes that you have an existing Express installation and that you want to install a feature using the Installation wizard graphical user interface.

If this topic does not describe the procedure that you meant to select, click the link to the description of the appropriate installation procedure before you issue the **install** command.

- “Installing Express” on page 79
- “Upgrading the Express trial to the Express product” on page 89
- “Installing silently” on page 91

Before starting this installation, see the following topics:

- Chapter 5, “Preparing the operating system for product installation,” on page 47
- “Using the launchpad to start the installation” on page 7.

About this task

Use the following procedure to add features to an existing WebSphere Application Server - Express installation.

1. Log on to the operating system. If you are installing as a non-root or non-administrative user, then there are certain limitations. See the documentation for non-root installation for more information.

AIX **HP-UX** **Linux** **Solaris** In addition, select a umask that allows the owner to read/write to the files, and allows others to access them according to the prevailing system policy. For root, a umask of 022 is recommended. For non-root users, a umask of 002 or 022 could be used, depending on whether or not the users share the group. To verify the umask setting, issue the following command:

```
umask
```

To set the umask setting to 022, issue the following command:

```
umask 022
```

Windows When installing as an administrative user on a Windows operating system, a Windows service is automatically created to autostart the application server. The installer user account must have the following advanced user rights:

- Act as part of the operating system
- Log on as a service

For example, on some Windows operating systems, click **Administrative Tools > Local Security Policy > User Rights Assignments** to set the advanced options. See your Windows operating system documentation for more information.

Windows If you plan to run the application server as a Windows service, do not install from a user ID that contains spaces. A user ID with spaces cannot be validated. Such a user ID is not allowed to continue the installation. To work around this restriction, install with a user ID that does not contain spaces.

2. Stop each running application server with the stopServer command.

Stop all server processes in all profiles associated with the target product instance. You do not have to stop processes related to other instances of the product on your machine. For example, issue the following command from the *profile_root/bin* directory to stop the server1 process in the application server profile:

```
./stopServer.sh server1
```

If a server is running and security is enabled, use the following command:

```
./stopServer.sh server1 -user user_ID -password password
```

3. Uninstall all maintenance packages.

You are using the product installation image to install additional features. The features have not had any maintenance applied to them. If you remove all maintenance packages, your entire product will be at the same release level. You can then reapply the maintenance packages as described in a later step.

Start the Update Installer program with the `updi_root/update` command to search for and uninstall all maintenance packages.

4. Determine which disc or product image contains the feature you intend to install. Access the root directory of your installation image on your hard disk, or insert the disc into the disc drive.

The application server product installer is spanned across multiple CDs. If you are installing the product from CD, you might be prompted during the installation for the next CD depending on which CD contains the feature you are installing.

Note: To avoid being prompted for subsequent CDs, copy both installation CDs into the same directory on your hard disk, name them DISC1 and DISC2, and run the installer from the DISC1 directory. You will not be prompted for the next CD during installation if you have followed this naming convention. If you are installing silently, then you must use this naming convention or the installation will not proceed. If you are installing from a DVD or a downloaded image, then you do not need to take any action because these images are not spanned.

AIX **HP-UX** **Linux** **Solaris** Mount the drive if necessary as described in “Mounting disc drives on operating systems such as AIX or Linux” on page 107.

5. Start the installation.

Start the installation of a product image with the launchpad script.

- **AIX** **HP-UX** **Linux** **Solaris** `launchpad.sh`
- **Windows** `launchpad.bat` or `launchpad.exe`

Or you can start the installation directly with the install command.

- **AIX** **HP-UX** **Linux** **Solaris** `/WAS/install`
- **Windows** `\WAS\install`

Note: There might be certain operating system policy restrictions if you are installing as a non-administrator on Windows 2003 on an AMD processor. You might not be able to run the install command by double-clicking the file in Windows Explorer. Run the command from a command prompt or rename the command to something other than `install.exe` or `setup.exe` and run the command.

If an error occurs with the Java SE Runtime Environment 6 (JRE 6), force the installation to use the correct runtime environment with the following command, where `downloaded_directory` is the name of the directory in which you downloaded the image:

- **AIX** **HP-UX** **Linux** **Solaris** `./install -is:javahome disc_mount_point/downloaded_directory/JDK/jre.pak/repository/package.java.jre/java/jre`
- **Windows** `install -is:javahome disc_drive:\downloaded_directory\JDK\jre.pak\repository\package.java.jre\java\jre`

If you cannot start the launchpad, use the troubleshooting information in “Using the launchpad to start the installation” on page 7 to correct the problem.

When using the launchpad, launch the installation wizard for WebSphere Application Server - Express.

6. The installation wizard initializes and then displays the Welcome panel.

Click **Next** to continue.

7. The license agreement panel is displayed. Read the license agreement and accept its terms. After you accept the licensing terms, the installation wizard checks for a supported operating system and prerequisite patches.

Although the installation wizard automatically checks for prerequisite operating system patches with the `prereqChecker` application, review the prerequisites on the WebSphere Application Server detailed system requirements Web site if you have not already done so. 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.

The installation process verifies that the minimum required version of a supported operating system is available. If you meet the minimum release requirements or are at a higher *minor* release of a supported operating system, then you will not encounter a prerequisite error. If you are not at the minimum version of a supported operating system, you can continue with the installation, but the installation or product operation might not succeed without applying maintenance. If you are at a higher *major* release of a supported operating system, or the operating system itself is not on the supported list, you might encounter the following warning:

Warning: A supported operating system was not detected.

Support for your operating system might have been added after the release of the product. See the WebSphere Application Server detailed system requirements Web pages for more information about supported operating systems. You can continue with the installation, but the installation or product operation might not succeed without applying maintenance. Go to the product support Web pages to obtain the latest maintenance packages to apply after installation.

Refer to the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

Click the radio button beside the message **I accept both the IBM and the non-IBM terms** to agree to the license agreement and click **Next** to continue.

8. The systems prerequisite check panel is displayed. After confirming that your operating system is supported and that you have installed all necessary patches, click **Next** to continue. The Installation wizard checks for a previous application server installation at the same product level.
9. If you are installing the product as a non-root user (or a non Administrator on Windows operating systems), then a panel is displayed indicating that a non-root user has been detected. This panel contains important information about installing as a non-root user. See “Non-root installation” on page 97 for more information. Click **Next**.
10. If the wizard detects a previous installation, then the product detection panel is displayed.

You have the following options:

- Add features to the existing installation
- Install a new copy of the product to another directory
- Create a new WebSphere Application Server profile using the Profile management tool
- Upgrade the product to another edition

This procedure assumes that you want to add features to an existing installation. Otherwise if you wish to upgrade the product see the following:

- See “Upgrading the Express trial to the Express product” on page 89 for the installation scenario that upgrades a trial to the full Express product.

An incremental installation adds features to the shared binaries identified in the field. You can add features to the core product files at any time by running the Installation wizard again. Installing additional features does not affect profiles that you might have already created.

Choose the radio button to add additional features. Do not change the corresponding installation directory unless another existing installation is in the directory that you specify.

Click **Next** to continue.

11. The optional features panel is displayed.
- There are several features available:
- **Install the sample applications**

Installs the samples applications for learning and demonstration environments. The samples are not recommended for installation on production environments.

- **Install non-English language packages for the administrative console**

Installs all the non-English language files for using the administrative console from machines with non-English locales. If you do not select this option then only the English language pack is installed.

- **Install non-English language packages for the application server runtime environment**

Installs all the non-English language files that support the application server runtime environment such as the wsadmin tool and logging. If you do not select this option then only the English language pack is installed.

If you choose not to install a feature at this time, then you can run the installer later and add features to this installation. Select the features you want to install and click **Next**.

Note: You might want to defer installing features, such as language packs and samples, to save disk space. However, consider installing the features if there is a chance you might use them in the future. If you choose not to install the features and then later install maintenance, you will have to uninstall all maintenance, install the features, and then reapply all maintenance or the features might be corrupted.

12. The installation summary panel is displayed.

- **AIX** **HP-UX** **Linux** **Solaris** If you are installing as a non-root user, you can choose to verify whether you have the correct permissions to install the product successfully. Select the **Verify my permissions to perform the installation** check box if you wish to verify your permissions to install the product. If the permission check fails, then review your user permissions and retry the installation. Read the “Non-root installation” on page 97 topic for more information.
- **Windows** The verify permissions function is currently not available on Windows operating systems.

Review the summary information. Click **Next** to install the product code or **Back** to change your specifications.

The installation wizard creates the uninstaller program and then displays a progress panel that shows which components are being installed.

13. The Installation results panel is displayed. You can verify the success of the installer program by examining the completion panel and the `app_server_root/logs/install/log.txt` file for feature installation status. Although the samples feature has been installed, the samples have not yet been deployed into a specific application server. To deploy the samples choose one of the following options:

- Deploy the samples to an existing application server. Run the install command found in `app_server_root/samples/bin`
- Create a new profile using the Profile Management Tool, which provides an option to deploy the samples during profile creation. Select the checkbox if you want run the Profile Management Tool when the installation has completed.

14. Click **Finish** to close the installation wizard.

Results

The Installation wizard installs the new features in the existing installation root directory. The Installation wizard configures the WebSphere Application Server - Express product for the new features.

What to do next

Adding the samples feature does not automatically deploy the samples to existing profiles that did not have samples deployed to them initially. Use the samples install command mentioned in the installation summary panel, or create a new profile and deploy the samples. Use the Profile Management Tool or the `manageprofiles` command to create a profile. Make sure that you deploy the samples applications during profile creation.

Reinstall all maintenance packages which you uninstalled before adding the feature. See [Installing maintenance packages](#) for more information.

Upgrading the Express trial to the Express product

This topic describes how to upgrade a trial installation of the Express product to the full Express product.

Before you begin

Knowing which components to install and in what order to install them is important. Before starting this installation, see Chapter 4, “Planning the installation,” on page 35. The planning diagrams show typical topologies for the product. The solutions are also available through the *Installation solution diagrams* link in the launchpad. See “Using the launchpad to start the installation” on page 7. You cannot run the launchpad remotely to install a product. Only local use of the launchpad is supported.

About this task

Perform the following installation to upgrade a trial installation to the actual WebSphere Application Server - Express product.

1. Log on to the operating system. If you are installing as a non-root or non-administrative user, then there are certain limitations. See the documentation for non-root installation for more information.

AIX **HP-UX** **Linux** **Solaris** In addition, select a umask that allows the owner to read/write to the files, and allows others to access them according to the prevailing system policy. For root, a umask of 022 is recommended. For non-root users, a umask of 002 or 022 could be used, depending on whether or not the users share the group. To verify the umask setting, issue the following command:

```
umask
```

To set the umask setting to 022, issue the following command:

```
umask 022
```

Windows When installing as an administrative user on a Windows operating system, a Windows service is automatically created to autostart the application server. The installer user account must have the following advanced user rights:

- Act as part of the operating system
- Log on as a service

For example, on some Windows operating systems, click **Administrative Tools > Local Security Policy > User Rights Assignments** to set the advanced options. See your Windows operating system documentation for more information.

Windows If you plan to run the application server as a Windows service, do not install from a user ID that contains spaces. A user ID with spaces cannot be validated. Such a user ID is not allowed to continue the installation. To work around this restriction, install with a user ID that does not contain spaces.

2. Access the root directory of your installation image on your hard disk, or insert the disc labeled **WebSphere Application Server - Express** into the disc drive.

The application server product installer is spanned across multiple CDs. If you are installing the product from CD, you will be prompted during the installation for the next CD.

Note: To avoid being prompted for subsequent CDs, copy both installation CDs into the same directory on your hard disk, name them DISC1 and DISC2, and run the installer from the DISC1 directory. You will not be prompted for the next CD during installation if you have followed this naming convention. If you are installing silently, then you must use this naming convention or the installation will not proceed. If you are installing from a DVD or a downloaded image, then you do not need to take any action because these images are not spanned.

AIX **HP-UX** **Linux** **Solaris** Mount the drive if necessary as described in “Mounting disc drives on operating systems such as AIX or Linux” on page 107.

3. Start the installation.

Start the installation of a product image with the launchpad script.

- **AIX** **HP-UX** **Linux** **Solaris** `launchpad.sh`
- **Windows** `launchpad.bat` or `launchpad.exe`

Or you can start the installation directly with the install command.

- **AIX** **HP-UX** **Linux** **Solaris** `/WAS/install`
- **Windows** `\WAS\install`

Note: There might be certain operating system policy restrictions if you are installing as a non-administrator on Windows 2003 on an AMD processor. You might not be able to run the install command by double-clicking the file in Windows Explorer. Run the command from a command prompt or rename the command to something other than `install.exe` or `setup.exe` and run the command.

If an error occurs with the Java SE Runtime Environment 6 (JRE 6), force the installation to use the correct runtime environment with the following command, where *downloaded_directory* is the name of the directory in which you downloaded the image:

- **AIX** **HP-UX** **Linux** **Solaris** `./install -is:javahome disc_mount_point/downloaded_directory/JDK/jre.pak/repository/package.java.jre/java/jre`
- **Windows** `install -is:javahome disc_drive:\downloaded_directory\JDK\jre.pak\repository\package.java.jre\java\jre`

If you cannot start the launchpad, use the troubleshooting information in “Using the launchpad to start the installation” on page 7 to correct the problem.

When using the launchpad, launch the installation wizard for WebSphere Application Server - Express.

4. The installation wizard initializes and then displays the Welcome panel.

Click **Next** to continue.

5. The license agreement panel is displayed. Read the license agreement and accept its terms. After you accept the licensing terms, the installation wizard checks for a supported operating system and prerequisite patches.

Although the installation wizard automatically checks for prerequisite operating system patches with the `prereqChecker` application, review the prerequisites on the WebSphere Application Server detailed system requirements Web site if you have not already done so. 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.

The installation process verifies that the minimum required version of a supported operating system is available. If you meet the minimum release requirements or are at a higher *minor* release of a supported operating system, then you will not encounter a prerequisite error. If you are not at the minimum version of a supported operating system, you can continue with the installation, but the installation or product operation might not succeed without applying maintenance. If you are at a higher *major* release of a supported operating system, or the operating system itself is not on the supported list, you might encounter the following warning:

Warning: A supported operating system was not detected.

Support for your operating system might have been added after the release of the product. See the WebSphere Application Server detailed system requirements Web pages for more information about supported operating systems. You can continue with the installation, but the installation or product operation might not succeed without applying maintenance. Go to the product support Web pages to obtain the latest maintenance packages to apply after installation.

Refer to the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

Click the radio button beside the message **I accept both the IBM and the non-IBM terms** to agree to the license agreement and click **Next** to continue.

6. The systems prerequisite check panel is displayed. After confirming that your operating system is supported and that you have installed all necessary patches, click **Next** to continue. The Installation wizard checks for a previous application server installation at the same product level.
7. If you are installing the product as a non-root user (or a non Administrator on Windows operating systems), then a panel is displayed indicating that a non-root user has been detected. This panel contains important information about installing as a non-root user. See “Non-root installation” on page 97 for more information. Click **Next**.
8. If the wizard detects a previous installation, then the product detection panel is displayed.

You have the following options:

- Add features to the existing installation
- Install a new copy of the product to another directory
- Create a new WebSphere Application Server profile using the Profile management tool
- Upgrade the product to another edition

This procedure assumes that you wish to upgrade the product. Otherwise if you wish to add features to an existing installation see the following:

- See “Installing additional features on an existing Express product” on page 84 for the installation scenario that adds features to an existing product.

Select the Upgrade option and click **Next**. The installer program installs the new license files and updates the system properties to indicate that the actual product is installed.

Click **Next** to continue.

Results

The wizard completes the upgrade and exits at the end of the upgrade without presenting another panel.

This procedure results in upgrading a trial installation to the actual WebSphere Application Server - Express product.

What to do next

You can install the Express product again to add features.

Further configuration is not necessary at this time. However, you can create additional stand-alone application servers with the Profile Management Tool. Each profile is created in the *profile_root* directory by default.

See information on creating profiles in the Administering applications and their environment PDF.

If you have already created the topology that you require, try deploying an application in your environment.

Installing silently

Silently install the application server product. To configure the installation, change the options in the response file before you issue the installation command.

Before you begin

This topic describes installing silently on any supported operating system.

Before starting this installation, review the following topics.

- Chapter 4, “Planning the installation,” on page 35

The "Planning to install" diagrams show typical topologies for the product.

- Chapter 5, "Preparing the operating system for product installation," on page 47

Ensure that the operating system for the machine has prerequisite software installed, has enough disk space, and had met all other prerequisites.

Customize the response file to add your selections before attempting to install silently.

Use the response file to supply values to the installation wizard as the wizard runs in silent mode. The wizard does not display interactive panels when it runs in silent mode, but reads values from the response file instead.

Be precise when supplying values in the file: Customize the options response file precisely to let the installation program read the option values that the file contains. Incorrect specifications affect the silent interface of the installation wizard. For example, always enclose values in double quotation marks.

About this task

A silent installation uses the installation wizard to install the product in silent mode, without the graphical user interface. Instead of displaying a wizard interface, the silent installation causes the installation program to read all of your responses from a file that you provide. To specify non-default options during a silent installation, you must use the response file. To install silently, you must accept the license agreement in the agreement option.

Perform the following procedure to edit the response file.

1. Log on to the operating system. If you are installing as a non-root or non-administrative user, then there are certain limitations. See the documentation for non-root installation for more information.

AIX **HP-UX** **Linux** **Solaris** In addition, select a umask that allows the owner to read/write to the files, and allows others to access them according to the prevailing system policy. For root, a umask of 022 is recommended. For non-root users, a umask of 002 or 022 could be used, depending on whether or not the users share the group. To verify the umask setting, issue the following command:

```
umask
```

To set the umask setting to 022, issue the following command:

```
umask 022
```

Windows When installing as an administrative user on a Windows operating system, a Windows service is automatically created to autostart the application server. The installer user account must have the following advanced user rights:

- Act as part of the operating system
- Log on as a service

For example, on some Windows operating systems, click **Administrative Tools > Local Security Policy > User Rights Assignments** to set the advanced options. See your Windows operating system documentation for more information.

Windows If you plan to run the application server as a Windows service, do not install from a user ID that contains spaces. A user ID with spaces cannot be validated. Such a user ID is not allowed to continue the installation. To work around this restriction, install with a user ID that does not contain spaces.

2. Access the root directory of your installation image on your hard disk, or insert the disc labeled **WebSphere Application Server - Express** into the disc drive.

Note: The application server product installer is spanned across multiple CDs. If you are installing the product from CD, then you must copy both installation CDs into the same directory on your hard disk, name the directories DISC1 and DISC2, and run the installer from the DISC1 directory.

You must use this naming convention or the installation will not proceed. If you are installing from a DVD or a downloaded image, then you do not need to take any action because these images are not spanned.

3. Locate the sample options response file. The file is named `responsefile.express.txt` in the WAS directory on the product image, CD-ROM, or DVD.
4. Copy the file to preserve it in its original form. For example, copy and save it as `myresponsefile.txt` to a location on your hard drive.
5. Edit the copy in your flat file editor of choice, on the target operating system. Read the directions within the response file to choose appropriate values that reflect parameters for your system. The response file contains a description of each option. See “Customizing the installation response file” on page 94 for more information.
6. Save the file.
7. Issue the proper command to use your custom response file. For example, issue a command such as the following:

- `AIX` `HP-UX` `Linux` `Solaris` `mnt_cdrom/WAS/install -options /tmp/WAS/myresponsefile.txt -silent`

- `Windows` `"disc_drive:\WAS\install" -options "C:\temp\WAS\myresponsefile.txt" -silent`

Although the installation process verifies that the minimum required version of the operating system is available, the installation process might not correctly flag a maintenance upgrade of that operating system version as being a supported configuration. If you have upgraded your supported operating system version to a higher maintenance level and you receive an error message indicating that the prerequisites have not been met, then you can uncomment the `-OPT disableOSPrereqChecking="true"` option in the response file to bypass operating system prerequisite checking. See the response file for more information.

Note: Although maintenance upgrades of the same major release are supported, subsequent *major* releases of the operating system might not be supported. Review the prerequisites on the WebSphere Application Server detailed system requirements web site if you have not already done so.

8. After the installation, examine the logs for success.

Results

This procedure results in creating a customized response file and using the file to start a silent installation. The silent installation takes some time to complete.

Troubleshooting

If you customize the response file incorrectly, the installation wizard cannot install the product with the `-options` or `-silent` parameters. If the error is an invalid option value, the installer displays a warning message that you must confirm and stops the installation.

Compare your options response file to the `responsefile.express.txt` file that is shipped with the product to make the necessary corrections. After correcting the file, reinstall.

Verify the success of the installer program by examining the `app_server_root/logs/install/log.txt` file to verify that there were no file system or other unusual errors while installing. See the “Troubleshooting Installation” topic for more information on other installation logs and log locations.

Verify or troubleshoot the installation if the `app_server_root/logs/install/log.txt` file or the `app_server_root/logs/manageprofiles/pmt.log` file does not contain a record of a problem, but problems

exist. If the error happens early in the installation, look for the logs in the system temporary area. The installation program copies the logs from the system temporary area to the logs directory at the end of the installation.

If the *profile_root* directory does not exist, the *pmt.log* file is in the *user_home* directory. Issue the *env* command to display the *user_home* directory on operating systems such as AIX or Linux. See the environment variable settings on Windows system to display the value of the variable.

What to do next

After installing the product from the installation image, the next step is to check for available updates before you alter the configuration of the product. Read the "Installing maintenance packages" topic for more information.

After updating the product, create a profile if you have not yet done so. Use the Profile Management Tool or the *manageprofiles* command to create a profile.

Windows On Windows systems, use the Start menu to locate IBM WebSphere and select appropriate menu options to display the **First steps** option for the profile that you intend to verify.

AIX **HP-UX** **Linux** **Solaris** The First steps console, *firststeps.sh*, is available in the *profile_root/firststeps* directory. A separate First steps console exists for each profile, except custom profiles. Use the First Steps console of each profile to verify the profile.

Use the *installver* program to compare the checksum of all installed files against the bill of materials that ships with the product, if you want to perform more installation verification. See "Verifying checksums of installed files" on page 121.

After verifying the product installation and starting the stand-alone application server, use the administrative console to deploy an existing application. See Fast paths for WebSphere Application Server for more information.

Customizing the installation response file

To configure a silent installation of the product, change the options in the silent response file before you issue the *install* command. Silent installation mode does not accept interactive installation options on the command line. To specify non-default options during a silent installation, you must use the response file. The installation program reads this file to determine installation option values when you install silently.

Verify that you have met the operating system prerequisites for the product. See Chapter 5, "Preparing the operating system for product installation," on page 47 for more information.

See "Installing silently" on page 91 for more information about installing silently using a response file.

Customization considerations

- The sample options response file is named *responsefile.express.txt* and is located in the WAS directory on the product disc, the downloaded installation image, or the customized installation package (CIP).
- **Be precise when supplying values in the file:** Customize the options response file precisely to let the installation program read the option values that the file contains. Incorrect specifications affect the silent interface of the installation wizard. For example, always enclose values in double quotation marks.
- The response file is in English and is intended to be copied and edited. Copy the file to preserve it in its original form. For example, copy and save it as *myresponsefile.txt* to a location on your hard drive. Edit this file directly with your flat file editor of choice.

- All lines preceded by a hash mark (#) are comments. You must uncomment all options that you plan to use. If you do not specify a value for an option, the default value is used.
- **Reserved names:** Avoid using reserved folder names as field values. The use of reserved folder names can cause unpredictable results. The following words are reserved: cell, nodes, servers, clusters, applications, and deployments.
- **AIX** To prepare the file for a silent installation on AIX, use line-end characters (0x0D0A) to terminate each line of the options response file. The safest method of preparing the file is to edit the file on the target operating system.

Descriptions of mandatory options follow.

License acceptance

To install silently, you must accept the license agreement in the agreement option which is set to false by default. Change the value of the `silentInstallLicenseAcceptance` option to true. A value of false prevents the installation from running.

```
-OPT silentInstallLicenseAcceptance="true"
```

Non-root installation

Installing as a non-root or non-administrator user results in certain limitations. You must also have write access to the target directory where you intend to install the product. The following actions cannot be performed as a non-root or non-administrative user:

- Creation of a Windows or Linux service for WebSphere Application Server
- Native registration with the operating system
- Port conflicts may occur with other installations of WebSphere Application Server that are not registered with the operating system

Uncomment the following option to accept the limitations and install the product as non-root or non-administrator user. Setting the value to false indicates that you do not agree with these limitations and you will be prevented from installing the product.

```
-OPT allowNonRootSilentInstall="true"
```

File permission checking

The installer does not check whether the current user has sufficient file permissions to perform the installation. Uncomment the following option to verify that you have sufficient file permissions to successfully perform the installation. For more information, read the “Verifying and setting file permissions” on page 102 topic.

```
-OPT checkFilePermissions="true"
```

Installation type

Use the `-OPT installType="install_type"` option to specify the installation type. You can only specify one type of installation:

Table 30. Installation types

Response file value	Description
upgrade	Upgrades a trial edition to a licensed edition, or upgrades Express edition to Base edition.

Profile type

Create a profile during silent installation by specifying the `-OPT profileType="profile_type"` option. You must specify a profile type, and some profile types require additional options. The following profile types are available:

Table 31. Profile types

Response file value	Description
management	Creates a management profile that provides the servers and services necessary to manage your WebSphere environment. You must also specify the type of management profile in the profiles section with the <code>-OPT PROF_serverType</code> option: <ul style="list-style-type: none"> ADMIN_AGENT
standAlone	Creates a stand-alone application server profile.
none	Does not create a profile during installation. However, if you specify none, then you must create a profile after installation to have an operational product. You can create profiles after installation using the following tools: <ul style="list-style-type: none"> The Profile Management Tool The <code>manageprofiles</code> command

Features

You must specify the `-OPT feature="feature_name"` option for each feature you want to install, whether you are installing a new application server product or just adding features to an existing installation. Even if you are not installing any features, you must still specify `-OPT feature="noFeature"` or the installation will fail. The following are valid values:

Table 32. Features

Response file value	Description
languagepack.console.all	Installs all the non-English language files for using the administrative console from machines with non-English locales. If you do not select this option then only the English language pack is installed.
languagepack.server.all	Installs all the non-English language files that support the application server runtime environment such as the <code>wsadmin</code> tool and logging. If you do not select this option then only the English language pack is installed.

Administrative security

Specify whether you want to enable administrative security. Turning on administrative security activates the settings that protect your server from unauthorized users. Administrative security is enabled by default during profile creation. There might be some environments where no security is needed such as a development system. On these systems you can elect to disable administrative security. However, in most environments you should keep unauthorized users from accessing the administrative console and your business applications. Administrative security must be enabled to restrict access. Set `-OPT PROF_enableAdminSecurity` to true or false, and specify a user name and password.

If you have chosen to install the samples applications and are enabling administrative security, then you must uncomment and specify a value for the `-OPT PROF_samplesPassword` option.

```
-OPT PROF_enableAdminSecurity="true"
-OPT PROF_adminUserName=
-OPT PROF_adminPassword=
-OPT PROF_samplesPassword=
```

Examples

The following response file examples demonstrate simple installation scenarios without any profile customization. Uncomment the listed options or change their values to match the examples. Read the "Installing silently" on page 91 topic for silent installation command specifics

- **Example 1: New installation with a stand-alone profile with no features**

The following minimum options will create a new installation of the product that includes a stand-alone profile with no installed features. The user must be root or an administrative user. The directory value for `installLocation` is the default root user installation directory for an HP-UX, Linux, or Solaris machine.

```
-OPT silentInstallLicenseAcceptance="true"
-OPT installType="installNew"
-OPT profileType="standAlone"
-OPT feature="noFeature"
-OPT PROF_enableAdminSecurity="false"
-OPT installLocation="/opt/IBM/WebSphere/AppServer"
```

- **Example 2: New installation with a stand-alone profile with no features with administrative security enabled**

The following minimum options will create a new installation of the product that includes a stand-alone profile with no installed features and with administrative security enabled. The user must be root or an administrative user. The directory value for `installLocation` is the default root user installation directory for an HP-UX, Linux, or Solaris machine.

```
-OPT silentInstallLicenseAcceptance="true"
-OPT installType="installNew"
-OPT profileType="standAlone"
-OPT feature="noFeature"
-OPT PROF_enableAdminSecurity="true"
-OPT PROF_adminUserName=wasadmin
-OPT PROF_adminPassword=password
-OPT installLocation="/opt/IBM/WebSphere/AppServer"
```

- **Example 3: New non-root installation with a stand-alone profile with no features with administrative security enabled**

The following minimum options will create a new installation of the product that includes a stand-alone profile with no installed features and with administrative security enabled. The application server is installed as a non-root user. The directory value for `installLocation` is the default non-root user installation directory for an HP-UX, Linux, or Solaris machine, where `user_home` is the non-root user's home directory.

```
-OPT silentInstallLicenseAcceptance="true"
-OPT allowNonRootSilentInstall="true"
-OPT installType="installNew"
-OPT profileType="standAlone"
-OPT feature="noFeature"
-OPT PROF_enableAdminSecurity="true"
-OPT PROF_adminUserName=wasadmin
-OPT PROF_adminPassword=password
-OPT installLocation="user_home/IBM/WebSphere/AppServer"
```

Profile creation details

The response file contains a full section of example options for each available profile type near the end of the file. You can use one of these profile examples in addition to the basic options previously reviewed to customize any profile that you create. Options include profile path, port value assignment, node, host, and cell names, and many other profile details.

Non-root installation

Non-root users can install WebSphere Application Server - Express in both silent and interactive mode for full product installations and removals, incremental feature installations, edition upgrades, and silent profile creation. The term *non-root* implies an installer on an operating system such as AIX or Linux, but it also means a non-administrator group installer on a Windows system. Significant enhancements have been made to non-root installation in the current version of the product.

For existing installations, the root or non-root installer who owns the currently installed files is the only user who can perform subsequent installation or removal operations on that installation, unless the owner

reassigns ownership of the appropriate directories and files to another user. The root user is not under the same restriction, and can delete an installation owned by a non-root user.

The set of post-installation operations that are subject to this rule includes installing a feature (incremental installation), upgrading a trial, or from Express to the base product, installing maintenance, uninstalling the product, and installing a *customized installation package* (CIP) created with the IBM WebSphere Installation Factory on top of an existing installation in a *slip installation*.

The full installer programs and the Update Installer (UPDI) check to verify that the current installer is also the owner of the installed files.

- “Installation considerations”
- “Verifying and setting permissions” on page 99
- “Private GSKit installation” on page 99
- “Non-root limitations” on page 99
- “Uninstallation considerations” on page 102

Installation considerations

There are various considerations you must examine if you want to install as a non-root user.

- **Non-root installations apply to all of the WebSphere software components in the product package**

Non-root installers can install all of the components, including:

- WebSphere Application Server
- IBM HTTP Server
- Web server plug-ins
- DMZ Secure Proxy Server for IBM WebSphere Application Server
- Application Client
- Update Installer

- **Non-root installations install an operational product**

Whenever possible, if some portion of an installation requires root privileges, the installation programs provide an option so that the non-root installer can install an operational product, but without enabling the privileged option.

- **Installation programs identify root-only options**

Installation programs clearly identify privileged options by disabling such options in the interface of the non-root installer.

- **Default installation locations are within your home directory**

Default installation locations are within the home directory of the non-root installer to verify a writable disk space. The installation programs verify that specified disk locations are writable.

- **Installation programs display a list of limitations**

Non-root installers see a panel in the installation user interface after prerequisite checking completes. The panel clearly summarizes limitations that exist for a non-root installation. The non-root installer can continue with the knowledge of the existing limitations or can cancel to install as root without the limitations.

- **Silent installers support non-root installations**

Silent installations have a new option across all installation packages that achieves a similar objective. The `allowNonRootSilentInstall` option has a default value of `false`.

- The installation program checks the value of this option when a non-root installer attempts the installation. The installation program ignores the option when the root user is installing.
- A `false` value discontinues a non-root installation. The resulting message in the installation log indicates that the `allowNonRootSilentInstall` value must be `true`. The log also indicates non-root installation limitations.

- A true value permits the installation to proceed. The resulting message in the log indicates conditions that might exist because of the non-root limitations.
- Comments for the non-root installer option in the sample response file clearly summarize the limitations.
- **Root can use specialized installation routines to install privileged options**
Whenever possible, separately installed privileged options are integrated with the non-root installation.

Verifying and setting permissions

Note: A major enhancement to non-root support for the application server is the ability to verify and set file permissions. Users can now verify adequate file permissions before installing the product, and can use a utility to change ownership to another user for the file system after installation for future operations on that product.

Certain subsequent install operations (SIOs) on the application server can now be attempted and performed by other users, whether root or non-root. SIOs include installing features, edition upgrades, fix packs, and slip installs of customized installation packages created with the IBM Installation Factory. New utilities allow you to determine whether your user has sufficient file permissions to perform a subsequent installation operation successfully before the operation begins, and to change owner and group file permissions on a targeted application server installation.

See “Verifying and setting file permissions” on page 102 for more information.

Note: The permissions features are not currently available on Windows operating systems.

Private GSKit installation

Note: IBM HTTP Server and the Web server plug-ins installers now install a private copy of IBM Global Security Kit (GSKit) which allows both root and non-root users to enable SSL support.

In previous versions of the product, IBM Global Security Kit (GSKit) was installed as a global installation by the IBM HTTP Server and Web server plug-ins installers and was shared among all registered applications. The only supported GSKit installation method was to run the native installation package as a root user. In the current version of the product, a private copy of GSKit is installed as part of the IBM HTTP Server and Web server plug-ins installations which allows non-root users to perform complete installations that include SSL support.

The GSKit package is installed to the gsk7 directory within the installing product’s root directory.

The private copy of GSKit is maintained through GSKit update packages delivered in IBM HTTP Server and Web server plug-in fix packs. Fix packs are applied using the Update Installer (UPDI).

Solaris Because a global copy of the GSKit is no longer installed, if you are using zones on the Solaris operating system you can now use the private GSKit without a zone-writable /usr directory. In previous releases, GSKit had to be installed manually in the global zone before installing IBM HTTP Server or plug-in in a non-global zone.

Non-root limitations

There are some limitations and differences when installing as a non-root user as opposed to a root user.

- **Local Web server plug-in installation**

When the Web server plug-in and the application server are installed on the same machine (local installation scenario), non-root installation for the plug-in component is only supported if the application server was also installed by the same non-root user. Otherwise the Web server configuration scripts will fail to run against the application server installation.

- **Port value assignment**

- Creating a profile is optional during WebSphere Application Server - Express installation.

Port value assignments for the profile occur only when the installation creates a profile. The port value assignments are part of the profile configuration.

The installation program does not prompt an installer for which port values to use, but instead, generates and assigns a set of nonconflicting port values. The installation program assigns appropriate port values to a non-root installer, such as greater than 1024, for example.

- Profile creation avoids port value conflicts by examining port values in use by other WebSphere Application Server installations.

Multiple non-root installers diminish the ability to detect and avoid port value conflicts. WebSphere Application Server installations are visible to the installer ID only, because the non-root installations do not register globally. If the root user performs all WebSphere Application Server installations, the problem is avoided.

- When running as non-root, the IBM HTTP Server installation program displays a default port value of 8080.

The default value for a root installer is 80.

- **Operating system and InstallShield Multi-Platform (ISMP) registration**

- **AIX** **HP-UX** **Linux** **Solaris** Packages installed by a non-root installer cannot register using the native operating system mechanisms, such as Red Hat Package Manager (RPM) on Linux. WebSphere software registers in the WebSphere Application Server installation registry file and the vpd.properties file. All installable components are fully functional despite the lack of native registration.

- **Solaris** **HP-UX** ISMP uses native operating system registration on these platforms when installing as root, and does not create a vpd.properties file.

When installing as a non-root installer, the installer programs create a vpd.properties file on all platforms, including Solaris and HP-UX.

- **Windows** Registry entries are on a non-administrator per user basis instead of registering the software for the entire machine, which occurs when an administrator user installs.

- **Installation visibility**

The non-root installer cannot register software packages natively. However, ISMP registers installed programs in its vpd.properties file, while the installer programs register installed components in the WebSphere Application Server installation registry file. Both files are in the home directory of the non-root installer as opposed to being a globally shared resource available to all users.

In case a non-root or non-administrator user is granted access or visibility to share installation information with a root or administrator user, all installation information cannot be accessed in certain scenarios. If the non-root or non-administrator user has previously installed WebSphere Application Server before increased access rights are granted, the scope of the installation registry will still be local instead of global.

However, if the non-root or non-administrator user has not installed WebSphere Application Server before and access is upgraded, it becomes possible to access global installation information generated by a root or admin user.

- **Solaris** **Temporary files**

Non-root users installing on Solaris might experience errors accessing temporary files left in the /var/tmp directory from a previous installation attempt by another user, as seen in the installation log:


```
Process, com.ibm.ws.install.ni.ismp.actions.FeaturePanelControlAction,
err, java.io.FileNotFoundException:
/var/tmp/normalFeaturePanelControl.xml (Permission denied)
```

Manually delete all *Control.xml files in the tmp directory before running the installation program.

- **Windows Adaptive Fast Path Architecture (AFPA) limitations**

AFPA is a software architecture that dramatically improves the efficiency, and therefore the capacity, of Web servers and other network servers by caching static files.

AFPA is a Windows kernel-level device driver within the IBM HTTP Server. AFPA provides caching of static files served from IBM HTTP Server. AFPA is recommended for very high-volume static-file Web sites only.

Dynamic Web pages, such as those generated by WebSphere Application Server, are not usually cacheable. Most application servers should not enable AFPA.

- A Windows kernel-level device driver cannot install from a non-administrator installer. Windows requires administrator group privileges when installing device drivers.
- The IBM HTTP Server installation program indicates to non-administrator installers that AFPA is not installed.

- **Users and group definition limitations**

IBM HTTP Server Administrative Server configuration creates users and user groups. A root user is required to perform such configuration.

- **Edge Components**

Edge requires root privileges because of its native installation mechanisms.

- **Windows Java Web Start**

The Application Client supports Java Web Start (JWS) on all supported platforms. Particularly on a Windows system, the Application Client requires administrator access in order to configure JWS properly, by updating Windows native registry entries with some JWS-specific entries.

Non-administrator installers cannot register the update, which provides less than full support for JWS. For example, a JWS application cannot launch from the Internet Explorer or Mozilla Firefox browser.

JWS is not an installable feature for the Client and cannot be separately installed by an administrator installer. The installation program lists JWS as one of the non-administrator limitations on Windows systems.

- **Windows Windows services limitations**

- The non-root installer cannot create Windows services for any of the WebSphere Application Server processes, including the application server, the IBM HTTP Server, or the IBM Administration Server.
- An administrator installer can create the service after installation using the WASService command.

- **Menu limitations**

- **Windows Start menu entries**

Entries in the menu are for the non-administrator installer, but they are not available to all users.

If an administrator installs the product and then non-administrators create profiles, the non-administrators can see their shortcuts.

- **Linux Gnome and KDE menu entries**

Entries in the menus are for the non-root installer instead of being applicable to all users.

Normally, menu items are only visible to the installing user. If you want to allow other users who create profiles to see menu items for their profiles, they must have access to a copy of the base WebSphere#.menu file. All profile shortcuts are visible to all users who have access to the base WebSphere#.menu file. Copy this file into either the /etc/xdg/menus/applications-merged directory (for all users) or the user's \$HOME/.config/menus/applications-merged directory. Make sure there are no conflicts between the menu file names in the /etc/xdg/menus/applications-merged directory and any user's \$HOME/.config/menus/applications-merged directory.

Uninstallation considerations

- **Windows** **Uninstalling as an administrator**

If an administrator user uninstalls an application server which is owned by another user, then all registry entries for all application server instances owned by the administrator will also be removed. You should uninstall any non-administrator application server with the owning non-administrator user if possible.

Verifying and setting file permissions

Non-root users performing installation and subsequent installation operations (SIOs) on the application server product can verify whether they have the correct permissions to ensure that the installation operation can be completed successfully, without failure due to file permission errors. In addition to the function which verifies file permissions, you can set the ownership and permissions (with limitations) on all installed files.

SIOs include operations such as feature installations, edition upgrades, maintenance installations (such as fix packs or refresh packs), feature pack installations, and slip installations of custom installation packages (CIPs) created with IBM WebSphere Installation Factory. You can change file ownership and permissions after installation using the `chutils` command.

Note: The verify and set permissions features are not currently available on Windows operating systems.

Verifying file permissions

When an application server installation is initially performed, the resulting installation is owned by a single user and group. Certain SIOs can be performed by another user whether the user is root or non-root.

Use the verify permissions utility to determine whether a subsequent installation operation would fail due to insufficient file permissions. You can run this check as an optional function in the standard application server installer, CIPs, and the Update Installer. If the check fails, the installation operation is prevented until the error has been resolved. The installation operation is prevented in order to avoid corruption of installations caused by an incomplete subsequent installation operation. Without a successful installation permissions check, an unexpected file permission error could occur. This would cause the installation to fail and leave the product in an indeterminate state.

The verify permissions utility is available in the installation wizard as a check box on the installation summary panel before you begin the actual installation process, or if you are installing silently, then you can run the utility by uncommenting the `-OPT checkFilePermissions="true"` option in the response file.

During the verify permissions check, the installer does not create or modify any product files. The permissions check only confirms whether the file operations would succeed based on file ownership and permissions. The target location is not modified as a result, and no configuration actions are run.

If the verify permissions check fails, then all file permission problems that occur during the simulation are written to a log in the user's home directory. Entries in the log files will indicate which files are not writable by the current user including file names, file operations, and specific permission issues. You can address file permission errors and rerun the verify permissions utility without exiting the installation wizard. The log file is located in the `<user_home>/waslogs/log.txt` directory.

Setting file ownership and permissions with the `chutils` command

You can use the `chutils` command to set the file ownership and permissions for an entire installation to an owner or group that differs from the user that performed the initial installation. The main benefit is the ability to have the initial install performed by one user and then have different users perform supported SIOs. The `chutils` command is located in the `app_server_root/instutils` directory.

The command can be used for the following:

- Add or remove the ability of other non-root users to update the installation
- Transfer all file ownership of the installation to another user
- Reestablish consistent file permissions for the entire installation

The command can edit the following ownership and permissions:

- File owner
- File group
- Owner permissions
You can only change owner permissions to the default values set during installation through the `-setmod=reset` parameter.
- Group permissions
You can elevate group permissions to match the owner permissions using the `-setmod=grp2owner` parameter.
- Others permissions
You can only change others, or "world" permissions to the default values set during installation through the `-setmod` parameter.

Table 33. *chutils* command options and descriptions

Option	Description
<code>-installlocation=<install_home></code>	Optional. The absolute path to the installation root directory. Defaults to the current install location, or <code>app_server_root</code> .
<code>-setowner=<username></code>	Sets the owner for each file and directory.
<code>-setgroup=<groupname></code>	Sets the group for each file and directory.
<code>-setmod=[reset] [grp2owner]</code>	Sets the permissions on the files and directories. <ul style="list-style-type: none"> • <code>reset</code> - Resets the owner, group and other permissions to the default values. • <code>grp2owner</code> - Sets the group's permission to match the owner's permissions.
<code>-help</code>	Displays the permission utility's help.
<code>-debug</code>	Displays additional runtime information.

Considerations and limitations:

1. *chutils* is intended to be run by root
2. *chutils* can be run with multiple options at once
3. Cannot modify permissions for parent directories of `app_server_root`. For example, if `app_server_root` is in User A's home directory, and the root user uses *chutils* to change the ownership of `app_server_root` to User B, then `app_server_root` might still be inaccessible to User B since it is still a subdirectory of User A's home directory.
4. Cannot modify permissions for owner or world, although group permissions can be elevated to match owner permissions.

Directory existence errors

If you have not yet created a profile after installing the application server and you run the *chutils* command, then you might experience a profile-related directory error like the following:

```
INFO: (Jul 17, 2008 16:16:35) Initializing permission utility...
INFO: (Jul 17, 2008 16:16:35) Executing commands...
INFO: (Jul 17, 2008 16:16:47) The directory does not exist: /data/WebSphere/AppServer/instutils/./properties/fsdb
INFO: (Jul 17, 2008 16:16:58) The permission utility has completed successfully.
```

Because the overall process is successful, this message can be safely ignored in this situation.

Updating ports in an existing profile

Use the updatePorts.ant script to change ports in an installed profile.

Before you begin

The updatePorts.ant script for application server profiles is in the *app_server_root/profileTemplates/template_name/actions* directory. To use the script, you have to identify which profile to update.

Note: You should only run this script if the profile is unfederated and if the configuration is the same structure as it was when the profile was created. For example, this script is ideal for changing ports for an unfederated application server profile after you created the profile but before you altered its configuration. For all other situations, use the techniques described in "Setting port numbers kept in the serverindex.xml file using scripting".

About this task

Use the following procedure to become familiar with using the updatePorts.ant script. Each step is an exercise that results in reassigning ports using a particular method that the updatePorts.ant script supports.

Look at steps for all of the operating systems mentioned. The differences are mainly in the extension of the script file and the direction of the directory delimiters. For example, Linux shell scripts (*.sh) and other commands require a ./ before the command to tell the operating system that the command is in the current working directory.

- **Linux** Assign nonconflicting ports to the AppSrv01 profile.

The ANT script assigns nonconflicting ports by default. No special arguments are needed. Identify the fully qualified directory paths, profile name, unique node name, and unique cell name. Then issue the command.

1. Create the Java properties file encoded in ISO8859-1 file encoding, to assign nonconflicting port values to the application server profile.

For this example, assume that the system is a Linux operating system and that you create the following /TMP/was_props/appserver.props properties file.

```
WAS_HOME=/opt/IBM/WebSphere/AppServer
was.install.root=/opt/IBM/WebSphere/AppServer
profileName=AppSrv01
profilePath=/opt/IBM/WebSphere/AppServer/profiles/AppSrv01
templatePath=/opt/IBM/WebSphere/AppServer/profileTemplates/default
nodeName=appserver_node01
cellName=appserver_cell01
hostName=myserver.ibm.com
```

2. Open a command shell window.
3. Change directories to the /opt/IBM/WebSphere/AppServer/bin directory.

```
cd /opt/IBM/WebSphere/AppServer/bin
```

(Or, if the product is installed to a non-default directory, change directories to the *app_server_root/bin* directory.)

4. Issue the command.

```
./ws_ant.sh -propertyfile /TMP/was_props/appserver.props \  
-file /opt/IBM/WebSphere/AppServer/profileTemplates/default/actions/updatePorts.ant
```

5. Open the administrative console and view the changed port assignments.

To view the port assignments, click **Servers** → **Application servers** → *server_name* → **[Communications] Ports**.

6. Run the script again and view the ports. Are they the same as before?

The resulting dynamically assigned port values apply to all of the ports currently assigned to the AppSrv01 profile, for every server listed in the serverindex.xml file for the profile node name. Each port receives a new nonconflicting value. None of the old port value assignments are used because the port values are in use at the time of the new assignment.

- **Windows** Assign default ports to the AppSrv02 profile.

The ANT script assigns nonconflicting ports by default. The defaultPorts=true special argument is needed. Identify the fully qualified directory paths, profile name, unique node name, and unique cell name. Then issue the command.

1. Create the Java properties file encoded in ISO8859-1 file encoding, to assign default port values to the application server profile.

For this example, assume that the system is a Windows operating system and that you create the following C:\temp\was_props\appserver.props properties file.

```
WAS_HOME="C:/Program Files/IBM/WebSphere/AppServer"  
was.install.root="C:/Program Files/IBM/WebSphere/AppServer"  
profileName=AppSrv02  
profilePath="C:/Program Files/IBM/WebSphere/AppServer/profiles/AppSrv02"  
templatePath="C:/Program Files/IBM/WebSphere/AppServer/profileTemplates/default"  
nodeName=appserver_node02  
cellName=appserver_cell02  
hostName=myserver2.ibm.com  
defaultPorts=true
```

Use double quotation marks around a Windows path name with spaces. Do not use quotation marks around the path name if there are no spaces in the path.

2. Open a DOS command window.
3. Change directories to the C:\Program Files\IBM\WebSphere\AppServer\bin directory.

```
cd "C:\Program Files\IBM\WebSphere\AppServer\bin"
```

(Or, if the product is installed to a non-default directory, change directories to the *app_server_root*/bin directory.)

4. Issue the command.

```
ws_ant.bat -propertyfile C:\temp\was_props\appserver.props  
-file "C:\Program Files\IBM\WebSphere\AppServer\profileTemplates\default\actions\updatePorts.ant"
```

5. Open the administrative console and view the changed port assignments.

To view the port assignments, click **Servers** → **Application servers** → *server_name* → **[Communications] Ports**.

6. Run the script again and view the ports. Are they the same as before?

The resulting assigned port values are the same each time because the values are the default values. This method does not resolve conflicting port assignments. To view all port assignments for a profile, see the C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv02\config\cells\appserver_cell02\nodes\appserver_node02\serverindex.xml file. Issue the netstat -a command to see all ports in use on the machine.

- **AIX** Assign ports starting at 2050 to the AppSrv03 profile.

The ANT script assigns nonconflicting ports by default. The startingPort=2050 special argument is needed. Identify the fully qualified directory paths, profile name, unique node name, and unique cell name. Then issue the command.

1. Create the Java properties file encoded in ISO8859-1 file encoding, to assign default port values to the application server profile.

For this example, assume that the system is an AIX operating system and that you create the following /usr/tmp/was_props/appserver.props properties file.

```
WAS_HOME=/usr/IBM/WebSphere/AppServer  
was.install.root=/usr/IBM/WebSphere/AppServer  
profileName=AppSrv03  
profilePath=/usr/IBM/WebSphere/AppServer/profiles/AppSrv03"
```

```
templatePath=/usr/IBM/WebSphere/AppServer/profileTemplates/default"
nodeName=appserver_node03
cellName=appserver_cell03
hostName=myserver3.ibm.com
startingPort=2050
```

2. Open a command shell window.
3. Change directories to the /usr/IBM/WebSphere/AppServer/bin directory.

```
cd /usr/IBM/WebSphere/AppServer/bin
```

(Or, if the product is installed to a non-default directory, change directories to the *app_server_root/bin* directory.)

4. Issue the command.

```
./ws_ant.sh -propertyfile /usr/tmp/was_props/appserver.props \  
-file /usr/IBM/WebSphere/AppServer/profileTemplates/default/actions/updatePorts.ant
```

5. Open the administrative console and view the changed port assignments.

To view the port assignments, click **Servers** → **Application servers** → *server_name* → **[Communications] Ports**.

6. Run the script again and view the ports. Are they the same as before?

After using the `-startingPort` option, the resulting dynamically assigned port values are not the same each time because the ANT script assigns nonconflicting port values starting from the `startingPort` number (port 2050 in this case). This method resolves conflicting port assignments.

- **HP-UX** **Solaris** Use a port definition property file to assign ports to the AppSrv04 profile.

The ANT script assigns nonconflicting ports by default. The `portsFile=/opt/was/portdefs.our_appsrv_ex.props` special argument is needed. Identify the fully qualified directory paths, profile name, unique node name, and unique cell name. Then issue the command.

1. Create the Java properties file encoded in ISO8859-1 file encoding, to assign nonconflicting port values to the application server profile.

Assume that you create the following `/opt/was/portdefs.our_appsrv_ex.props` properties file:

```
WC_defaulthost=19080
WC_adminhost=19060
WC_defaulthost_secure=19443
WC_adminhost_secure=19043
BOOTSTRAP_ADDRESS=22809
SOAP_CONNECTOR_ADDRESS=28880
IPC_CONNECTOR_ADDRESS=9633
SAS_SSL_SERVERAUTH_LISTENER_ADDRESS=29401
CSIV2_SSL_SERVERAUTH_LISTENER_ADDRESS=29403
CSIV2_SSL_MUTUALAUTH_LISTENER_ADDRESS=29402
ORB_LISTENER_ADDRESS=39100
DCS_UNICAST_ADDRESS=39353
SIB_ENDPOINT_ADDRESS=37276
SIB_ENDPOINT_SECURE_ADDRESS=37286
SIB_MQ_ENDPOINT_ADDRESS=45558
SIB_MQ_ENDPOINT_SECURE_ADDRESS=45578
SIP_DEFAULTHOST=45060
SIP_DEFAULTHOST_SECURE=45061
```

Note: The ports used in the port definition property file should reflect the template type. The ports in this example are for the default template type, and they might vary for other template types. The management template has three different `portdef.props` files, one for each `servertype`. They are `adminagent.portdef.props`, `dmgr.portdef.props` and `jmgr.portdef.props`. They can be modelled after the `portdef.props` file found in the template directory.

Assume that you create the following `/TMP/was_props/appserver.props` properties file:

```
WAS_HOME=/opt/IBM/WebSphere/AppServer
was.install.root=/opt/IBM/WebSphere/AppServer
profileName=AppSrv04
```

```
profilePath=/opt/IBM/WebSphere/AppServer/profiles/AppSrv04
templatePath=/opt/IBM/WebSphere/AppServer/profileTemplates/default
nodeName=appserver_node04
cellName=appserver_cell04
hostName=myserver4.ibm.com
portsFile=/opt/was/portdefs.our_appsrv_ex.props
```

2. Open a command shell window.
3. Change directories to the /opt/IBM/WebSphere/AppServer/bin directory.

```
cd /opt/IBM/WebSphere/AppServer/bin
```

(Or, if the product is installed to a non-default directory, change directories to the *app_server_root/bin* directory.)

4. Issue the command.

```
./ws_ant.sh -propertyfile /TMP/was_props/appserver.props \
            -file /opt/IBM/WebSphere/AppServer/profileTemplates/default/actions/updatePorts.ant
```

5. Open the administrative console and view the changed port assignments.

To view the port assignments, click **Servers** → **Application servers** → *server_name* → **[Communications] Ports**.

6. Run the script again and view the ports. Are they the same as before?

The resulting assigned port values are from a props file. Therefore, the values do not change. This method does not resolve conflicting port assignments.

Results

This procedure results in four different methods of port assignments with the updatePorts.ant script.

What to do next

You can change port values in a variety of ways. The **install** command and the silent installation response file also support setting port values in the same manner as described in this article. In fact, the two installation methods use the same options:

- -OPT PROF_defaultPorts=
No value is required. The equal sign is a standardization misnomer.
- -OPT PROF_startingPort="nnnn"
- -OPT PROF_portsFile="*path_to_portsdef.props file*"
- If you omit one of the preceding arguments when calling the **install** command or leave one of the preceding arguments out of your silent response file, the default action is to assign nonconflicting port values.

The use of the exact same options for a graphical user interface installation and a silent installation is no coincidence. Most WebSphere Application Server component installation programs are implementations of the Common Install Engine for WebSphere Application Server. The use of the exact same actions for the ANT script is also because of the same pervading design theme, which is to simplify your installation experience.

Mounting disc drives on operating systems such as AIX or Linux

Some operating systems such as AIX or Linux require you to mount the drive before you can access data on the product disc.

Before you begin

Insert the product disc into the drive before mounting the drive.

Note: You may experience errors if you install from a mounted ISO file created using a WebSphere Application Server product disc. Mount the drive which contains an official product disc or a product disc which was created from a licensed downloaded zip or tar file.

About this task

Use these procedures to mount the product discs for WebSphere Application Server.

- **AIX** Mounting the CD-ROM on AIX

To mount the CD-ROM on AIX using the System Management Interface Tool (SMIT), perform the following steps:

1. Log in as a user with root authority.
2. Insert the CD-ROM in the drive.
3. Create a CD-ROM mount point by entering the `mkdir -p /cdrom` command, where `cdrom` represents the CD-ROM mount point directory.
4. Allocate a CD-ROM file system using SMIT by entering the `smit storage` command.
5. After SMIT starts, click **System Storage Management (Physical & Logical Storage) > File Systems > Add / Change / Show / Delete File Systems > CDROM File Systems > Add a CDROM File System**.
6. In the Add a CDROM File System window:
 - Enter a device name for your CD-ROM file system in the **DEVICE Name** field. Device names for CD-ROM file systems must be unique. If there is a duplicate device name, you may need to delete a previously-defined CD-ROM file system or use another name for your directory. The example uses `/dev/cd0` as the device name.
 - Enter the CD-ROM mount point directory in the **MOUNT POINT** window. In our example, the mount point directory is `/cdrom`.
 - In the **Mount AUTOMATICALLY at system restart** field, select yes to enable automatic mounting of the file system.
 - Click **OK** to close the window, then click **Cancel** three times to exit SMIT.
7. Next, mount the CD-ROM file system by entering the `smit mountfs` command.
8. In the Mount a File System window:
 - Enter the device name for this CD-ROM file system in the **FILE SYSTEM name** field. In our example, the device name is `/dev/cd0`.
 - Enter the CD-ROM mount point in the **Directory over which to mount** field. In our example, the mount point is `/cdrom`.
 - Enter `cdafs` in the **Type of Filesystem** field. To view the other kinds of file systems you can mount, click List.
 - In the **Mount as READ-ONLY system** field, select yes.
 - Accept the remaining default values and click **OK** to close the window.

Your CD-ROM file system is now mounted. To view the contents of the CD-ROM, place the disk in the drive and enter the `cd /cdrom` command where `cdrom` is the CD-ROM mount point directory.

- **HP-UX** Mounting the CD-ROM on HP-UX Because WebSphere Application Server contains several files with long file names, the mount command can fail. The following steps let you mount successfully your WebSphere Application Server product CD-ROM on the HP-UX platform:

1. Log in as a user with root authority.
2. In the `/etc` directory, add the following line to the `pfs_fstab` file:

```
/dev/dsk/c0t2d0 mount_point pfs-rrip ro,hard
```

where `mount_point` represents the mount point of the CD-ROM.

3. Start the `pfs` daemon by entering the following commands (if they are not already running):

```
/usr/sbin/pfs_mountd &  
/usr/sbin/pfsd 4 &
```

4. Insert the CD-ROM in the drive and enter the following commands:

```
mkdir /cdrom  
/usr/sbin/pfs_mount /cdrom
```

The `/cdrom` variable represents the mount point of the CD-ROM.

5. Log out.

- **Linux** Mounting the CD-ROM on Linux To mount the CD-ROM on Linux:

1. Log in as a user with root authority.
2. Insert the CD-ROM in the drive and enter the following command:

```
mount -t iso9660 -o ro /dev/cdrom /cdrom
```

The `/cdrom` variable represents the mount point of the CD-ROM.

Note: If you have enabled and enforced Security-Enhanced Linux (SELinux) on your Red Hat Enterprise Linux Version 5 operating system while you are installing the product from the CD, then you must mount the CD with the following option. For more information see Preparing Red Hat Enterprise Linux 5 for installation.

```
-o context=system_u:object_r:textrel_shlib_t
```

3. Log out.

Some window managers can automatically mount your CD-ROM for you. Consult your system documentation for more information.

- **Solaris** Mounting the CD-ROM on Solaris To mount the CD-ROM on Solaris:

1. Log in as a user with root authority.
2. Insert the CD-ROM into the drive.
3. If the Volume Manager is not running on your system, enter the following commands to mount the CD-ROM:

```
mkdir -p /cdrom/unnamed_cdrom  
mount -F hsfs -o ro /dev/dsk/c0t6d0s2 /cdrom/unnamed_cdrom
```

The `/cdrom/unnamed_cdrom` variable represents the CD-ROM mount directory and the `/dev/dsk/c0t6d0s2` represents the CD-ROM drive device.

If you are mounting the CD-ROM drive from a remote system using NFS, the CD-ROM file system on the remote machine must be exported with root access. You must also mount that file system with root access on the local machine.

If the Volume Manager (vold) is running on your system, the CD-ROM is automatically mounted as:

```
/cdrom/unnamed_cdrom
```

4. Log out.

What to do next

Return to the installation procedure to continue.

Operating system registry keys

Use the installation procedures to register WebSphere Application Server and the associated products with the native operating system registry. Associated products include the IBM HTTP Server, the Web server plug-ins, the Application Client, and the Edge Components. This topic describes possible registry key values.

Installations are registered with the native operating system registries, such as the Red Hat Package Manager (RPM) on Linux systems. The InstallShield for Multiplatforms (ISMP) installation wizard also creates the `vpd.properties` file that contains a list of product codes that ISMP uses to track installations that it has performed.

See “Non-root installation” on page 97 for more information about registry entries.

Table 34. Keys used to register WebSphere Application Server

Registry file location	WebSphere Application Server	Application Client	IBM HTTP Server	Web Server Plug-ins	DMZ Secure Proxy Server for IBM WebSphere Application Server	Edge Components	Update Installer (UPDI)
vpd.properties	WSBAA70	WSCAA70	WSHS70	WSPA70	WSNDDMZ70	WSE70	WSUPD70
AIX	WSBAA70	WSCAA70	WSHS70	WSPA70	WSNDDMZ70	WSE70	WSUPD70
HP-UX	WSBAA70	WSCAA70	WSHS70	WSPA70	WSNDDMZ70	WSE70	WSUPD70
Linux	WSBAA70LicensingComponent	WSCAA70LicensingComponent	WSHS70LicensingComponent	WSPA70LicensingComponent	WSNDDMZ70LicensingComponent	WSE70-0	WSUPD70
Solaris	WSBAA70	WSCAA70	WSHS70	WSPA70	WSNDDMZ70	WSE70	WSUPD70
Windows	HKEY_CURRENT_USER\SOFTWARE\IBM\WebSphere Application Server\7.0.0.0	HKEY_CURRENT_USER\SOFTWARE\IBM\Application Client for WebSphere Application Server\7.0.0.0	<ul style="list-style-type: none"> HKLM\SOFTWARE\IBM\HTTP Server\7.0.0.0 HKLM\SYSTEM\CurrentControlSet\Services\IBMHTTPServer7.0 HKLM\SYSTEM\CurrentControlSet\Services\IBMHTTPAdministration7.0 HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\IBM HTTP Server 7.0.0.0 	HKLM\SOFTWARE\IBM\Web server Plug-ins for IBM WebSphere Application Server\7.0.0.0	N/A	HKLM\SOFTWARE\IBM\WAS Update Installer\7.0.0.0	

In addition to the vpd.properties file, the WebSphere Application Server installation programs also create a record of installed products in an install registry file. The WebSphere Application Server - Express installation program also creates a catalog signature file for use by IBM Tivoli License Compliance Manager.

The install registry file

The install registry file is an XML file that contains data entries for all of the installed products that are listed in the preceding table:

- **Product information:** product ID (offering), product installation location, and product version
- **Package information:** package name, package installation location, product installation location, and any associated products

The catalog signature files

Packages installed by a non-root installer might not register using native operating system mechanisms.

AIX For example, a WebSphere Application Server product installed as a non-root user on an AIX version 5.3 operating system cannot register to the AIX lpp command. Thus, running the ls lpp command does not list the current WebSphere Application Server version that is installed.

You can use the IBM Tivoli License Compliance Manager to manage the WebSphere Application Server license and version.

To enable the IBM Tivoli License Compliance Manager to detect and monitor WebSphere Application Server software components, obtain the ITLMReadinessOfferings.xml catalog file. This file is also referred to in IBM Tivoli License Compliance Manager as the IBMUseOnlySoftwareCatalog_****-**-**.xml or IBMSoftwareCatalog_****-**-**.xml file. The IBMUseOnlySoftwareCatalog_****-**-**.xml file is used with the Sub-Capacity version. The IBMSoftwareCatalog_****-**-**.xml file is used for the Full version.

The catalog file lists software signature recognition and usage files in XML format that are used by the IBM Tivoli License Compliance Manager components to identify and monitor software found on the agents. You can obtain the catalog file from <http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliLicenseManager.html>.

Linux

Example package entries

Issue the following command on a Linux system to show packages for the WebSphere Application Server products:

```
rpm -qa | grep WS
```

Host name values

WebSphere Application Server requires a host name specification during installation, profile creation, and for some configuration activities. This topic describes acceptable values for host name fields.

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 nodes use the host name to connect to and to communicate with this node. The following guidelines can help in determining the appropriate host name for your machine:

- Select a host name that other machines can reach within your network.
- Do not use the generic identifier, localhost, for this value.

- Do not attempt to install WebSphere Application Server products on a machine with a host name that uses characters from the double-byte character set (DBCS). DBCS characters are not supported when used in the host name.
- Avoid using 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 until you rename the machine.

If you define coexisting nodes on the same computer with unique IP addresses, define each IP address in a domain name server (DNS) look-up table. Configuration files for stand-alone Application Servers 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 configuration documents for the stand-alone Application Server. 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 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 the 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 Express 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.

Chapter 7. Configuring the product after installation

This topic summarizes how to configure the application serving environment.

Before you begin

Use the First steps console to configure and test the WebSphere Application Server environment after creating a profile.

About this task

This procedure uses the First steps console to launch the installation verification test (IVT) that tests and verifies your WebSphere Application Server - Express environment. This procedure also uses the First steps console to launch the Profile Management Tool to create an additional application server.

1. Start the First steps console by selecting the check box on the last panel of the wizard.

The First steps console can start automatically at the end of the installation. Select the check box on the last panel of the Installation wizard.

The First steps console is an easy way to start using the product. The console provides one-stop access to the administrative console, Samples Gallery, Profile Management Tool, installation verification test, Migration wizard, and other activities.

See the description of the “firststeps command” for more information.

2. Click **Installation verification** on the First steps console.

The installation verification test starts the application server process named server1 and runs several tests to verify that the server1 process can start without errors.

See “Using the installation verification tools” on page 119 for more information.

3. Click Profile Management Tool on the First steps console to create an application server profile.

You can create multiple application servers on your system without installing the product again.

4. Start the First steps console by selecting the check box on the last panel of the Profile Management Tool.

This First steps console belongs to the Application Server profile that you just created. Each profile has its own First steps console.

5. Click **Installation verification** on the First steps console.

The installation verification test starts the new application server process named server1 and runs several tests to verify that the server1 process can start without error.

Results

This procedure results in configuring and testing the application server environment.

What to do next

See Chapter 4, “Planning the installation,” on page 35 for diagrams of topologies that you can create using the First steps console and the Profile Management Tool.

firststeps command

The firststeps command starts the First steps console. The First steps console is a post-installation ease-of-use tool for directing WebSphere Application Server - Express elements from one place. Options display dynamically on the First steps console, depending on features that you install and the availability of certain elements on a particular operating system platform. Options include verifying the installation,

starting and stopping application server processes, creating profiles, accessing the administrative console, launching the Migration wizard, accessing the online information center, and accessing the Samples gallery.

First steps overview

Select the check box to start the First steps console at the end of the product installation.

You can also start the First steps console from the command line as described later in this topic.

Option descriptions

Installation verification

This option starts the installation verification test (IVT). The test consists of starting and monitoring the application server during its start up.

If this is the first time that you have used the First steps console for this application server profile, click **Installation verification** to verify the installation. The verification process starts the application server.

The **Start the server** option is unavailable while the IVT runs.

The IVT provides the following useful information about the application server:

- The server name
- The name of the profile
- The profile file path
- The type of profile: default
- The cell name
- The node name
- The current encoding
- The port number for the administrative console
- Various informational messages that include the location of the SystemOut.log file and how many errors are listed within the file
- A completion message

Start the server

This option toggles to **Stop the server** when the application server runs.

This option displays when the First steps console is in a stand-alone application server profile.

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 e-business. Then the menu item toggles to **Stop the server** and both the **Administrative console** option and the **Samples gallery** option enable.

If you select the **Start the server** option, the **Installation verification** option is unavailable while the application server runs.

Start the administrative agent

This option toggles to **Stop the administrative agent** when the administrative agent runs.

After selecting the **Start the administrative agent** option, an output screen displays with status messages. The success message informs you that the administrative agent is open for e-business. Then the menu item changes to **Stop the administrative agent**.

If you select the **Start the administrative agent** option, the **Installation verification** option is unavailable while the administrative agent runs.

Administrative console

This option is unavailable until the application server runs.

The administrative console is a configuration editor that runs in one of the supported Web browsers. The administrative console lets you work with XML configuration files for the stand-alone application server .

To launch the administrative console, click **Administrative console** or point your browser to <http://localhost:9060/ibm/console>. Substitute the host name for localhost if the address does not load. Verify the installation to verify the administrative console port number, if 9060 does not load.

Note: If you are installing the product on the Windows Vista operating system, then you must disable IPv6 and restart the machine to view and log on to the administrative console. See IPv6 for Microsoft Windows: Frequently Asked Questions for more information on disabling IPv6 on Windows Vista.

The administrative console prompts for a login name. This is not a security item, but merely a tag to identify configuration changes that you make during the session. Secure signon is also available when administrative security is enabled.

The installation procedure in the information center cautions you to write down the administrative user ID and password when security is enabled during installation. Without the ID and password, you cannot use the administrative console or scripting.

Profile Management Tool

This option starts the Profile Management Tool, which can create additional stand-alone application server profiles, a management profile, a cell profile, or a custom profile.

Each profile has its own administrative interface.

Each profile also has its own First steps console. The location of the command is within the profile as described later in this topic.

Samples gallery

This option starts the Samples gallery. The option is unavailable until you start the application server. The option displays when you have installed the Samples during installation.

To launch the Samples gallery, click **Samples gallery** or point your browser to <http://localhost:9080/WSSamples>. The Web address is case sensitive.

Substitute your own host name and default host port number if the address does not load. Verify the port number by opening the administrative console and clicking **Servers** → **Application servers** → **server_name** → **[Communications] Ports**. Use the WC_defaulthost port number value or the WC_defaulthost_secure value instead of 9080, which is the default.

If you do not install the Samples during the initial installation of the product, the option does not display on the First steps console. You can perform an incremental installation to add the Samples feature. After adding the Samples, the option displays on the First steps console.

Information center for WebSphere Application Server

This option links you to the online information center.

Migration wizard

This option starts the Migration wizard, which is the graphical interface to the migration tools.

The migration tools are described in the *Migrating, coexisting, and interoperating* PDF.

Exit This option closes the First steps console.

Location of the command file

The location of the firststeps command that starts the First steps console for a profile is:

- | | | | |
|-----|-------|-------|---------|
| AIX | HP-UX | Linux | Solaris |
|-----|-------|-------|---------|

`profile_root/firststeps/firststeps.sh`

- **Windows** `profile_root\firststeps\firststeps.bat`

Parameters

No parameters are associated with this command.

Syntax for the firststeps command

Use the following syntax for the command:

- **AIX** **HP-UX** **Linux** **Solaris** `./firststeps.sh`
- **Windows** `firststeps.bat`

Link tips

The following links exist on the First steps console for the WebSphere Application Server - Express product:

Option	Link
Installation verification	<p>Calls the ivt command.</p> <p>The location of the installation verification test command is:</p> <ul style="list-style-type: none"> • AIX HP-UX Linux Solaris <code>profile_root/bin/ivt.sh</code> • Windows <code>profile_root\bin\ivt.bat</code>
Start the server	<p>Calls the startServer command.</p> <p>The location of the startServer command is:</p> <ul style="list-style-type: none"> • AIX HP-UX Linux Solaris <code>profile_root/bin/startServer.sh server_name</code> • Windows <code>profile_root\bin\startServer.bat server_name</code> <p>When you have more than one application server on the same machine, the command starts the same application server that is associated with the First steps console.</p>
Stop the server	<p>Calls the stopServer command.</p> <p>The location of the stopServer command is:</p> <ul style="list-style-type: none"> • AIX HP-UX Linux Solaris <code>profile_root/bin/stopServer.sh server_name</code> • Windows <code>profile_root\bin\stopServer.bat server_name</code>
Administrative console	<p>Opens the default browser to the <code>http://localhost:9060/ibm/console</code> Web address.</p> <p>When you have more than one application server on the same machine, the port varies. The First steps console starts the administrative console that is associated with the First steps console.</p> <p>Note: If you are installing the product on the Windows Vista operating system, then you must disable IPv6 and restart the machine to view and log on to the administrative console. See IPv6 for Microsoft Windows: Frequently Asked Questions for more information on disabling IPv6 on Windows Vista.</p>

Option	Link
Profile Management Tool	<p>The command file name is:</p> <ul style="list-style-type: none"> <code>AIX</code> <code>HP-UX</code> <code>Linux</code> <code>Solaris</code> <code>app_server_root/bin/ProfileManagement/pmt.sh</code> <code>Windows</code> <code>app_server_root/bin/ProfileManagement/pmt.bat</code>
Samples gallery	<p>Opens the default browser to the <code>http://localhost:9080/WSsamples</code> Web address.</p>
Information center for WebSphere Application Server products	<p>Opens the default browser to the online information center.</p>
Migration wizard	<p>Calls the migration command to start the Migration wizard.</p> <p>The location of the migration command is:</p> <ul style="list-style-type: none"> <code>AIX</code> <code>HP-UX</code> <code>Linux</code> <code>Solaris</code> <code>app_server_root/bin/migration.sh</code> <code>Windows</code> <code>app_server_root\bin\migration.bat</code> <p>The migration tools are also in the <code>/migration</code> folder on the supplements disc.</p>

Using the installation verification tools

Use the installation verification tools to verify that the installation of the product and the application server profile is successful. A *profile* consists of files that define the runtime environment for an application server. Verify the core product files with the `installver` checksum tool. Verify each profile from its First steps console with the IVT tool.

Before you begin

After installing the product, you are ready to use the installation verification tools.

About this task

Use the installation verification tools to gain assurance that the product is successfully installed. Two tools exist. This task describes when and how to use to both tools. One tool is the checksum tool (the `installver` tool). The `installver` tool compares the checksum of each installed file to the correct checksum value for each file and reports differences. The other tool is the installation verification test (IVT). The IVT tests stand-alone application server profiles to make sure that the server processes can start.

The IVT program scans product log files for errors and verifies core functionality of the product installation.

After installing the product, the Installation wizard displays a prompt for starting the First steps console.

Installation verification is the first option on the First steps console.

The test consists of starting and monitoring the application server during its start up.

1. Run the `installver` tool to verify that all files are correctly installed.
 - See “Verifying checksums of installed files” on page 121 for more information.
2. Use the installation verification test to verify the proper creation of profiles.
 - a. Select **Installation verification** on the First steps console after installing the product.
 - You can also start the First steps console from the command line as described in “firststeps command” on page 115.

You can also start the “ivt command” directly from the bin directory of the profile:

- **AIX** **HP-UX** **Linux** **Solaris** `profile_root/bin/ivt.sh`
- **Windows** `profile_root\bin\ivt.bat`

If you create additional profiles, the ivt script location is within the `plugins_root/bin` directory.

- b. Observe the results in the First steps status window.

The log file for installation verification is the `profile_root/logs/ivtClient.log`.

The IVT provides the following useful information about the application server:

- The application server name
- The name of the profile
- The profile file path
- The type of profile
- The node name
- The current encoding
- The port number for the administrative console
- Various informational messages that include the location of the SystemOut.log file and how many errors are listed within the file
- A completion message

As the IVT starts the application server on a Windows platform, the IVT attempts to start the Windows service for the application server, if a Windows service exists. This is true even though the Windows service might have a manual startup type.

- c. If the log shows that errors occurred during the installation verification, correct the errors and run the IVT again. If necessary, create a new profile after correcting the error, and run the IVT on the new profile.

Results

The installver tool validates the integrity of all installed files.

The IVT tool starts the server process of a profile automatically if the server is not running. Once the server initializes, the IVT runs a series of verification tests. The tool displays pass or fail status in a console window. The tool also logs results to the `plugins_root/logs/ivtClient.log` file. As the IVT verifies your system, the tool reports any detectable errors in the SystemOut.log file.

What to do next

After installing the product and verifying the installation, you can configure the installation by creating more profiles.

You can also install other packages on the product installation image, such as IBM HTTP server, the Web server plug-ins, or the Application Client.

ivt command

The ivt command starts the installation verification test (IVT) program. The IVT verifies that the installation of the application server profile was successful. A *profile* consists of files that define the runtime environment for an application server. Each profile has its own IVT command.

The IVT program starts the application server automatically if the server process is not already running. After the server process initializes, the IVT runs a series of verification tests and displays pass or fail status in a console window.

The IVT program scans the SystemOut.log file for errors and verifies core functionality of the profile.

You can start the IVT program from the command line or from the First steps console.

Location of the command file

The location of the installation verification test script for a profile is the *profile_root/bin* directory. The script file name is:

- **AIX** **HP-UX** **Linux** **Solaris** `ivt.sh`
- **Windows** `ivt.bat`

Parameters

The following parameters are associated with this command.

server_name

Required parameter that identifies the name of the server process, such as `server1`.

profile_name

Required parameter that identifies the name of the profile that contains the server definition.

-p server_port_number

Optional parameter that identifies the default_host port when the port is not 9080, which is the default.

-host machine_host_name

Optional parameter that identifies the host machine of the profile to test. The default is `localhost`.

Syntax for the ivt command

Use the following syntax for the command:

- **AIX** **HP-UX** **Linux** **Solaris** `profile_root/bin/ivt.sh`
- **Windows** `profile_root\bin\ivt.bat`

Logging

The `ivt` command logs results to the *profile_root/logs/ivtClient.log* file.

Example

The following examples test the `server1` process in the `profile01` profile on the `myhost` machine using the `default_host` on port 9081.

AIX **HP-UX** **Linux** **Solaris**
`ivt.sh server1 profile01 -p 9081 -host myhost`

Windows
`ivt.bat server1 profile01 -p 9081 -host myhost`

Verifying checksums of installed files

After installing the product or after installing maintenance packages, you can use the installation verification utility (IVU) to compute checksums of the installed file set to verify the checksum against the checksum in the product bill of materials.

Before you begin

Installing the product also installs the IVU, which is the `installver` command-line tool.

About this task

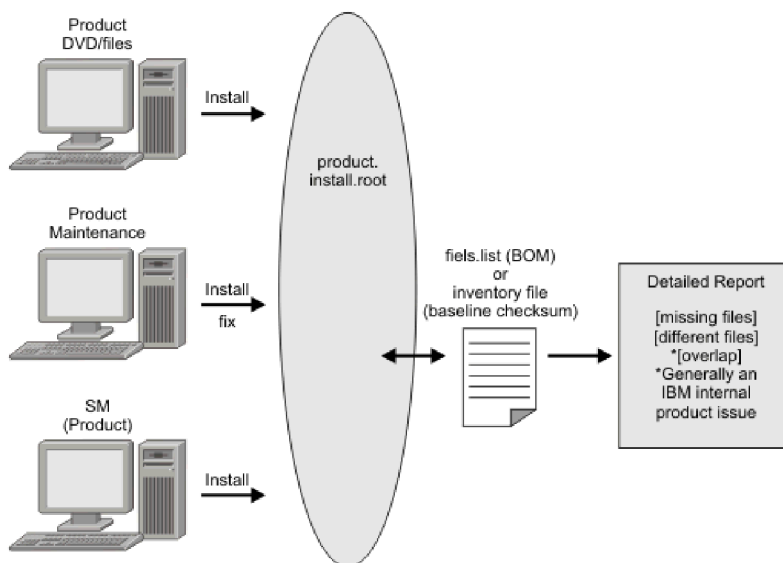
This topic describes using the **installver** command to compute a checksum on the installed files and compare the checksum to the product bill of materials.

The IVU tool is installed during the installation of the following product components:

- WebSphere Application Server - Express
- Application Client
- IBM HTTP Server
- Web server plug-ins
- Update Installer for WebSphere Application Server

You can also use the IVU to compute a new checksum for a system after you make significant configuration changes. The **installver** tool computes a new baseline checksum for each file in the inventory of a configured system to use to identify file changes in the later comparisons. Such a comparison is useful for detecting file tampering on the configured system, for example.

You can use the new checksums to compare installations on multiple systems. The following graphic illustrates the main use-cases where you can perform product verification at any point of the product life-cycle or use the inventory file, which is part of the baseline checksum feature, to provide full-file verification of a configured system.



Although the most common use of the tool is to compare the product bill of materials to the installed file set after installation or after installing maintenance, other tasks are also possible.

- Verify the installed files against the bill of materials.
See “Verifying against the bill of materials” on page 123 for more information.
- Create and use a new baseline checksum.
See “Computing a new baseline checksum for an inventory of configured files” on page 127 for more information.
- Exclude files and components from the comparison.
See “Excluding files from a checksum comparison” on page 129 for more information.
- Include only specific files and components in the comparison.
See “Comparing specific file and component checksums” on page 132 for more information.

- Change the default message digest algorithm for computing checksums.
See “Changing the default message digest algorithm” on page 134 for more information.
- Handle out-of-memory conditions.
See “Handling out-of-memory situations” on page 135 for more information.
- Verify the installver command files.
See “Verifying the installver command” on page 136 for more information.

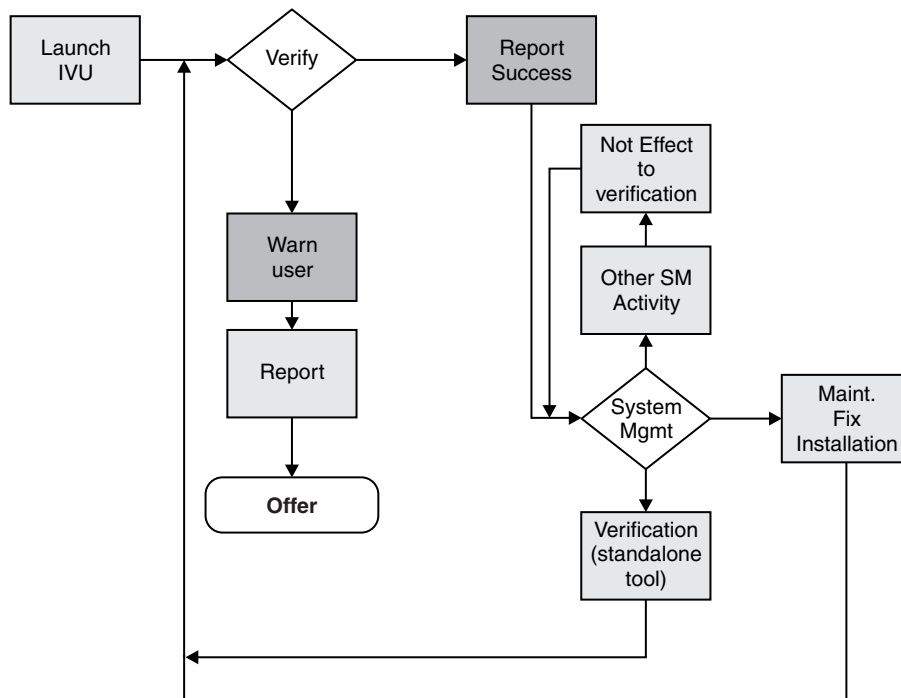
Results

When you are satisfied that your installed or updated file set matches the product bill of materials, you are finished installing and verifying the product or updating and verifying the product.

IBM Support has documents and tools that can save you time gathering information needed to resolve problems. If you detect a problem, before opening a problem report see if the problem is a known problem by checking the Support page:

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

The IVU performs the tasks using the logic described in the following graphic:



Verifying against the bill of materials

After installation, verify actual checksums of installed files against a bill of materials that ships with the product. If the checksums match, the installed product is installed correctly. If the checksums differ, review the differences to determine whether a problem exists.

Before you begin

Install the product before attempting to compare checksums of the installed files to the shipped bill of materials.

About this task

This topic describes using the `installver` command to compare a set of bill-of-material files against a checksum of the installed files to verify that all installed files are correct. The product includes a bill-of-materials file for each component to provide this system of verifying installation files.

The `installver` tool dynamically generates a list of total components found in the installation.

- Check the bill of materials against the installed file system.

Compare the checksum of product files to the correct checksum in the bill-of-material files:

```
– AIX HP-UX Linux Solaris app_server_root/bin/installver.sh
```

```
– Windows app_server_root\bin\installver.bat
```

- Compare checksums and display trace results:

```
– AIX HP-UX Linux Solaris ./installver.sh -trace
```

```
– Windows installver.bat -trace
```

- Display usage information:

```
– AIX HP-UX Linux Solaris ./installver.sh -help
```

```
– Windows installver.bat -help
```

- Compare checksums and include only specified files and components in the comparison:

See “Comparing specific file and component checksums” on page 132 for more information about comparing only files and components that you list in the command.

- Compare checksums and ignore user-excluded files:

See “Excluding files from a checksum comparison” on page 129 for information about creating a list of user-excluded files.

Ignore the list of files to exclude and include the files in the comparison:

```
– AIX HP-UX Linux Solaris ./installver.sh -ignoreuserexclude
```

```
– Windows installver.bat -ignoreuserexclude
```

- Compare checksums and ignore IBM-excluded files:

Ignore the list of IBM-excluded files and include the files in the comparison:

```
– AIX HP-UX Linux Solaris ./installver.sh -ignoreibmexclude
```

```
– Windows installver.bat -ignoreibmexclude
```

Results

When you issue one of the checksum commands from the `app_server_root/bin` directory, the status of the command is displayed on the terminal console.

Logging results: The `installver` tool creates messages for each component. The tool also reports overall success based on the verification of all components in the bill of materials. The following messages indicate completion:

- I CWNVU0400I: [ivu] Total issues found : 625
- I CWNVU0340I: [ivu] Done.

The messages report the total number of issues found. If the issue count is zero, all of the components exist and no problems exist. The tool logs the results of the command to the `app_server_root/logs/installver.log` file if you use the `-log` parameter without specifying a file name for the log.

You can redirect the output using the `-log` parameter and an argument. The directory that you specify must already exist. For example:

```
./installver.sh -log /tmp/waslogs/my_installver.log
```

Example

The following command produces this example, which shows the results of comparing the installed product against the product bill of materials.

- `AIX` `HP-UX` `Linux` `Solaris` `./installver.sh`
- `Windows` `installver.bat`

Example output from components with errors

This example shows errors that the comparison finds.

```
I CWNVU0160I: [ivu] Verifying.
I CWNVU0170I: [ivu] The installation root directory is C:\Program Files\eclipse\eclipse3.x\workspace\
WAS.installver\test\v6x\product.installroot\
I CWNVU0300I: [ivu] The total number of user excluded files found are 0.
I CWNVU0300I: [ivu] The total number of IBM excluded files found are 0.
I CWNVU0180I: [ivu] Searching directory properties\version\install\6.0.0.0\backup for file listing:
files.list
I CWNVU0260I: [ivu] The total number of components found is: 6
I CWNVU0270I: [ivu] Gathering installation root data.
W CWNVU0280W: [ivu] Component mismatch: expected mismatchcomponentname
but found mismatchingname
I CWNVU0360I: [ivu] The following bill of materials issue is found for component
nullvaluesample: Hash must not be null or an empty string.
I CWNVU0360I: [ivu] The following bill of materials issue is found for component
nullvaluesample: Name must not be null or an empty string.
I CWNVU0360I: [ivu] The following bill of materials issue is found for component
nullvaluesample: Hash must not be null or an empty string.
I CWNVU0360I: [ivu] The following bill of materials issue is found for component
nullvaluesample: Permission must not be null or an empty string.
I CWNVU0360I: [ivu] The following bill of materials issue is found for component
symlinksample: Hash must not be null or an empty string.
I CWNVU0290I: [ivu] Starting the verification for 6 components.

I CWNVU0470I: [ivu] Starting to analyze: _binarycomponentsample
I CWNVU0480I: [ivu] Done analyzing: _binarycomponentsample

I CWNVU0470I: [ivu] Starting to analyze: nullvaluesample
I CWNVU0430I: [ivu] The following file is missing: testpath
I CWNVU0390I: [ivu] Component issues found : 1
I CWNVU0480I: [ivu] Done analyzing: nullvaluesample

I CWNVU0470I: [ivu] Starting to analyze: overlapbinarycomponentsample
W CWNVU0422W: [ivu] The following file is overlapped: lib/binaryTest.jar
W CWNVU0425W: [ivu] The overlap is caused by: _binarycomponentsample
I CWNVU0390I: [ivu] Component issues found : 1
I CWNVU0480I: [ivu] Done analyzing: overlapbinarycomponentsample

I CWNVU0470I: [ivu] Starting to analyze: regularcomponentsample
I CWNVU0440I: [ivu] The following file is different: lib/different.jar
I CWNVU0410I: [ivu] fc19318dd13128ce14344d066510a982269c241b
is the checksum in the bill of materials.
I CWNVU0420I: [ivu] 517d5a7240861ec297fa07542a7bf7470bb604fe
is the checksum on the file system.
I CWNVU0440I: [ivu] The following file is different: lib/ibmtemplateexclude.jar
I CWNVU0410I: [ivu] d3ac7a4ef1a8ffb4134f2f6e7f3c0d249d74b674
is the checksum in the bill of materials.
I CWNVU0420I: [ivu] d3ac7a4ef1a838b4134f2f6e7f3c0d249d74b674
is the checksum on the file system.
I CWNVU0430I: [ivu] The following file is missing: lib/missing.jar
I CWNVU0440I: [ivu] The following file is different: lib/usertemplateexclude.jar
I CWNVU0410I: [ivu] 12dea96fec20593566ab75ff2c9949596833adc9
```

```

                                is the checksum in the bill of materials.
I CWNVU0420I: [ivu] 12dea96fec20593566ab75692c9949596833adc9
                                is the checksum on the file system.
I CWNVU0430I: [ivu] The following file is missing:
                                missingfilebutwithbaddirectory/missingBadDirectory.jar
I CWNVU0390I: [ivu] Component issues found : 5
I CWNVU0480I: [ivu] Done analyzing: regularcomponentsample

I CWNVU0470I: [ivu] Starting to analyze: symlinksample
I CWNVU0480I: [ivu] Done analyzing: symlinksample

I CWNVU0400I: [ivu] Total issues found : 7
I CWNVU0340I: [ivu] Done.

```

Example output from a typical successful installation

This example shows typical results from checking a successful installation.

You can safely ignore issues from the prereq.wccm component. These known issues do not cause overall system issues.

Carefully examine an issue before assuming that the issue is a problem.

```

I CWNVU0160I: [ivu] Verifying.
I CWNVU0170I: [ivu] The installation root directory is C:\WebSphere\V6x-ND\
I CWNVU0300I: [ivu] The total number of user excluded files found are 1.
I CWNVU0300I: [ivu] The total number of IBM excluded files found are 75.
I CWNVU0180I: [ivu] Searching directory properties\version\install\6.0.0.0\backup
                                for file listing: files.list
I CWNVU0260I: [ivu] The total number of components found is: 285
I CWNVU0270I: [ivu] Gathering installation root data.
I CWNVU0460I: [ivu] The utility is running.
I CWNVU0460I: [ivu] The utility is running.
I CWNVU0290I: [ivu] Starting the verification for 285 components.

I CWNVU0470I: [ivu] Starting to analyze: activity
I CWNVU0480I: [ivu] Done analyzing: activity

I CWNVU0470I: [ivu] Starting to analyze: activity.impl
I CWNVU0480I: [ivu] Done analyzing: activity.impl

I CWNVU0470I: [ivu] Starting to analyze: activity.session
I CWNVU0480I: [ivu] Done analyzing: activity.session

I CWNVU0470I: [ivu] Starting to analyze: activity.session.impl
I CWNVU0480I: [ivu] Done analyzing: activity.session.impl

I CWNVU0470I: [ivu] Starting to analyze: acwa
I CWNVU0480I: [ivu] Done analyzing: acwa

I CWNVU0470I: [ivu] Starting to analyze: adapter
I CWNVU0480I: [ivu] Done analyzing: adapter
...
I CWNVU0470I: [ivu] Starting to analyze: prereq.wccm
I CWNVU0430I: [ivu] The following file is missing: web/configDocs/activitysessionejbext/
ActivitySessionEJBJarExtension.html
I CWNVU0430I: [ivu] The following file is missing: web/configDocs/activitysessionejbext/
ActivitySessionEnterpriseBeanExtension.html
I CWNVU0430I: [ivu] The following file is missing: web/configDocs/activitysessionejbext/
ContainerActivitySession.html
I CWNVU0430I: [ivu] The following file is missing: web/configDocs/activitysessionejbext/
classes-frame.html
I CWNVU0430I: [ivu] The following file is missing: web/configDocs/activitysessionservice/
ActivitySessionService.html

...

```



```

I CWNVU0430I: [ivu] The following file is missing: web/configDocs/wssecurity/consumer-binding.html
I CWNVU0430I: [ivu] The following file is missing: web/configDocs/wssecurity/default-bindings.html
I CWNVU0430I: [ivu] The following file is missing: web/configDocs/wssecurity/generator-binding.html
I CWNVU0390I: [ivu] Component issues found : 625
I CWNVU0480I: [ivu] Done analyzing: prereq.wccm

I CWNVU0470I: [ivu] Starting to analyze: prereq.webtlsrn
I CWNVU0480I: [ivu] Done analyzing: prereq.webtlsrn

I CWNVU0470I: [ivu] Starting to analyze: prereq.wsadie
I CWNVU0480I: [ivu] Done analyzing: prereq.wsadie

...
I CWNVU0470I: [ivu] Starting to analyze: wsexception
I CWNVU0480I: [ivu] Done analyzing: wsexception

I CWNVU0470I: [ivu] Starting to analyze: wsif
I CWNVU0480I: [ivu] Done analyzing: wsif

I CWNVU0400I: [ivu] Total issues found : 627
I CWNVU0340I: [ivu] Done.

```

What to do next

See the description of the “installver command” on page 138 for explanations of each parameter.

Go to “Computing a new baseline checksum for an inventory of configured files” to learn more about the installver command.

Computing a new baseline checksum for an inventory of configured files

After installation, you can verify the actual checksums of installed files against a bill of materials that ships with the product. After configuring your system, create a new checksum so that you can compare the system periodically to the new checksum. Use the result to analyze changes to your configured system.

Before you begin

After configuring the product, save a new baseline checksum to establish a new checksum standard for your system.

About this task

This topic describes using the installver command to create and compare an inventory of configured files to the currently installed files.

The installver tool can compute a new baseline checksum for the inventory of all files in the installation root directory. The tool stores the new checksum by default in the sys.inv file within the current working directory. You can specify a different file path and file name. Create the file outside of the installation root directory or exclude the file from comparisons.

Later, compare the checksums in the sys.inv file (or the file that you specified when creating the inventory) to the checksums of the currently installed files to see what files have changed.

The baseline checksum report identifies missing files, additional files, and changed files.

- Create an inventory list of the files that are currently installed in the installation root directory:

```

– AIX HP-UX Linux Solaris ./installver.sh -createinventory
– Windows installver.bat -createinventory

```

For example, the following messages might display on a Windows system when you issue the installver.bat -createinventory command to create the default *app_server_root\bin\sys.inv* file:

```
W CWNVU0320W: [ivu] The
C:\IBM\WebSphere\AppServerV602\bin\sys.inv
inventory file is within the product installation root directory:
C:\IBM\WebSphere\AppServerV602.
```

Create the file outside of the installation root directory to omit the file from the verification.

```
I CWNVU0300I: [ivu] The total number of user excluded files found are 2.
```

```
I CWNVU0300I: [ivu] The total number of IBM excluded files found are 78.
```

```
I CWNVU0310I: [ivu] Creating the following inventory file:
```

```
C:\IBM\WebSphere\AppServerV602\bin\sys.inv
```

```
I CWNVU0460I: [ivu] The utility is running.
```

When it finishes running, a completion message is displayed:

```
I CWNVU0340I: [ivu] Done.
```

The sys.inv contains the new inventory:

```
#C:\IBM\WebSphere\AppServer\
#2005.10.10_06.24.06PM_EDT
#user_ID
#-createinventory -log
241fe4e309abfd8f2c5911216dbabd61dd4751a6
|_jvm\bin\appletviewer.exe
|42032
|2004.10.28 05.37.02AM EDT
e00c6ea688ab67e004ec6cfac26ec48541a5b9ff
|_jvm\bin\dbghe1p.dll
|712192
|2004.10.28 05.36.50AM EDT
916e244deeb44b9d3218aafa3b56c8680aa31f2f
|_jvm\bin\extcheck.exe
|42040
|2004.10.28 05.37.02AM EDT
...
7fc3bb38e8b90fed05cd0440953000c2cc965b44
|web\spidocs\stylesheet.css
|1240
|2005.10.09 12.14.17AM EDT
22706a0d900c52f1c015c870ddee25581c5d57b
|web\spidocs\toHTML\index.html
|867
|2005.10.09 12.14.17AM EDT
```

- Create the inventory file in a directory outside of the installation root directory to exclude the inventory file from the comparison.

```
– AIX HP-UX Linux Solaris ./installver.sh -createinventory /tmp/system.inv
```

```
– Windows installver.bat -createinventory "C:\temp\system.inv"
```

- Compare the inventory list to files that are currently installed in the installation root directory:

```
– AIX HP-UX Linux Solaris ./installver.sh -compare
```

```
– Windows installver.bat -compare
```

If you created the inventory file somewhere other than the default location, use the following syntax:

```
– AIX HP-UX Linux Solaris ./installver.sh -compare /tmp/system.inv
```

```
– Windows installver.bat -compare "C:\temp\system.inv"
```

- Compare and display trace results:

```
– AIX HP-UX Linux Solaris ./installver.sh -compare -trace
```

```
– Windows installver.bat -compare -trace
```

- Compare and exclude specified files from the inventory comparison:

```
– AIX HP-UX Linux Solaris ./installver.sh -compare -exclude fn1;fn2;fn3;...
```

```
– Windows installver.bat -compare -exclude fn1;fn2;fn3;...
```

- Compare and include only specified files in the inventory comparison:
 - `AIX HP-UX Linux Solaris ./installver.sh -compare -include fn1;fn2;fn3;...`
 - `Windows installver.bat -compare -include fn1;fn2;fn3;...`

Results

When you issue an `installver` commands from the `app_server_root/bin` directory, the status of the command is displayed on the terminal console. To create a log, use the `-log` parameter.

What to do next

See the description of the “`installver` command” on page 138 for explanations of each parameter.

Go to “Excluding files from a checksum comparison” to learn more about the `installver` command.

Excluding files from a checksum comparison

Specify individual files to exclude from a comparison, specify individual components to exclude, or create a single configurable properties file to specify a list of files to exclude from the bill of materials verification.

Before you begin

Install the product before comparing checksums and using exclusion properties.

About this task

This topic describes how to use exclusion properties.

By default, IBM excludes some files from the checksum comparison. You can also exclude files. The number of files excluded is reported within the first few messages:

```
I CWNVU0160I: [ivu] Verifying.
I CWNVU0170I: [ivu] The installation root directory is C:\IBM\WebSphere\AppServerV602\
I CWNVU0300I: [ivu] The total number of user excluded files found are 0.
I CWNVU0300I: [ivu] The total number of IBM excluded files found are 78.
I CWNVU0180I: [ivu] Searching directory properties\version\install\6.0.0.0\
                    backup for file listing: files.list
I CWNVU0260I: [ivu] The total number of components found is: 285
I CWNVU0270I: [ivu] Gathering installation root data.
I CWNVU0460I: [ivu] The utility is running.
I CWNVU0290I: [ivu] Starting the verification for 285 components.

I CWNVU0470I: [ivu] Starting to analyze: activity
I CWNVU0480I: [ivu] Done analyzing: activity
```

...

Several different methods are provided to exclude files from the comparison.

- Compare checksums and exclude all of the files within one or more components from the comparison:
 - `AIX HP-UX Linux Solaris ./installver.sh -excludecomponent comp1;comp2;comp3;...`
 - `Windows installver.bat -excludecomponent comp1;comp2;comp3;...`
 - `Windows installver -excludecomponent comp1;comp2;comp3;...`

For example, you might exclude the `prereq.wccm` component to avoid known but acceptable issues in the component:

```
./installver.sh -log -excludecomponent prereq.wccm
```

The resulting messages show the exclusion:

```
I CWNVU0160I: [ivu] Verifying.
I CWNVU0170I: [ivu] The installation root directory is /opt/IBM/WebSphere/AppServerV602/
I CWNVU0300I: [ivu] The total number of user excluded files found are 0.
I CWNVU0300I: [ivu] The total number of IBM excluded files found are 78.
I CWNVU0180I: [ivu] Searching directory properties/version/install/6.0.0.0/
                    backup for file listing: files.list
I CWNVU0260I: [ivu] The total number of components found is: 285
I CWNVU0270I: [ivu] Gathering installation root data.
I CWNVU0460I: [ivu] The utility is running.
I CWNVU0290I: [ivu] Starting the verification for 284 components.
...
I CWNVU0400I: [ivu] Total issues found : 0
I CWNVU0340I: [ivu] Done.
```

- Exclude certain files from the comparison:

```
- [AIX] [HP-UX] [Linux] [Solaris] app_server_root/bin/installver.sh -exclude
  fn1;fn2;fn3
- [Windows] app_server_root\bin\installver.bat -exclude fn1;fn2;fn3
```

For example, suppose that you include only the prereq.wccm component for comparison:

```
installver.bat -log -includecomponent prereq.wccm
```

The comparison shows all of the missing file issues in the component:

```
I CWNVU0160I: [ivu] Verifying.
I CWNVU0170I: [ivu] The installation root directory is C:\IBM\WebSphere\AppServerV602\
I CWNVU0300I: [ivu] The total number of user excluded files found are 0.
I CWNVU0300I: [ivu] The total number of IBM excluded files found are 78.
I CWNVU0180I: [ivu] Searching directory properties\version\install\6.0.0.0\
                    backup for file listing: files.list
I CWNVU0260I: [ivu] The total number of components found is: 285
I CWNVU0270I: [ivu] Gathering installation root data.
I CWNVU0460I: [ivu] The utility is running.
I CWNVU0290I: [ivu] Starting the verification for 1 components.

I CWNVU0470I: [ivu] Starting to analyze: prereq.wccm
I CWNVU0430I: [ivu] The following file is missing:
web/configDocs/activitysessionejbext/ActivitySessionEJBJarExtension.html
I CWNVU0430I: [ivu] The following file is missing:
web/configDocs/activitysessionejbext/ActivitySessionEnterpriseBeanExtension.html
I CWNVU0430I: [ivu] The following file is missing:
web/configDocs/activitysessionejbext/ContainerActivitySession.html
...
I CWNVU0390I: [ivu] Component issues found : 625
I CWNVU0480I: [ivu] Done analyzing: prereq.wccm

I CWNVU0400I: [ivu] Total issues found : 625
I CWNVU0340I: [ivu] Done.
```

You can exclude files. For example, exclude the highlighted files in the previous example:

```
installver -log -includecomponent prereq.wccm
-exclude web/configDocs/activitysessionejbext/
ActivitySessionEJBJarExtension.html;web\configDocs\activitysessionejbext\
ActivitySessionEnterpriseBeanExtension.html
```

Note: Use slashes to delimit directories.

The result shows that the excluded files were not compared:

```
I CWNVU0160I: [ivu] Verifying.
I CWNVU0170I: [ivu] The installation root directory is C:\IBM\WebSphere\AppServerV602\
I CWNVU0300I: [ivu] The total number of user excluded files found are 0.
I CWNVU0300I: [ivu] The total number of IBM excluded files found are 78.
I CWNVU0180I: [ivu] Searching directory properties\version\install\6.0.0.0\
                    backup for file listing: files.list
```

```

I CWNVU0260I: [ivu] The total number of components found is: 285
I CWNVU0270I: [ivu] Gathering installation root data.
I CWNVU0460I: [ivu] The utility is running.
I CWNVU0290I: [ivu] Starting the verification for 1 components.

I CWNVU0470I: [ivu] Starting to analyze: prereq.wccm
I CWNVU0430I: [ivu] The following file is missing:
web/configDocs/activitysessionejbext/ContainerActivitySession.html
...
I CWNVU0390I: [ivu] Component issues found : 623
I CWNVU0480I: [ivu] Done analyzing: prereq.wccm

I CWNVU0400I: [ivu] Total issues found : 623
I CWNVU0340I: [ivu] Done.

```

If the two files were in the comparison, they would be in the list and the count would be 625, as in the previous example.

Note: The highlighted line in the example is reserved for excluded files listed in the user template file, as described in the next step. The highlighted line does not count files that you list in the installver command line with the `-exclude` parameter.

- Compare checksums and exclude certain files from the comparison by creating and using a user template file:

A single user configurable properties file is available to specify a list of files to exclude from the bill of materials verification.

1. Create an empty template file.

```

- AIX HP-UX Linux Solaris app_server_root/bin/installver.sh -createtemplate
  template_name
- Windows app_server_root\bin\installver.bat -createtemplate template_name

```

For example, create the default user template file on a Windows system:

```

installver -createtemplate
I CWNVU0200I: [ivu] Creating template:
C:\IBM\WebSphere\AppServerV602\profiles\
Dmgr01\properties\ivu_user.template
I CWNVU0340I: [ivu] Done.

```

The `ivu_user.template` file is created in the properties directory of the default profile.

The `-template_name` parameter is optional. However, a template file must reside in the properties directory of the default profile, such as the `app_server_root` directory.

2. List files to exclude in the templates file.

The properties file has the following format:

```

<template>
<componentfiles componentname="name_of_component">
  <file>
    <relativepath action="exclude">file_name</relativepath>
  </file>
</componentfiles>
</template>

```

For example, list the component and files from the previous example:

```

<template>
<componentfiles componentname="prereq.wccm">
  <file>
    <relativepath action="exclude">
web/configDocs/activitysessionejbext/ActivitySessionEnterpriseBeanExtension.html
    </relativepath>
  </file>
  <file>
    <relativepath action="exclude">
web/configDocs/activitysessionejbext/ActivitySessionEJBJarExtension.html

```

```
</relativepath>
</file>
</componentfiles>
</template>
```

Note: Do not use quotation marks or double quotation marks to delimit a file name.

3. Use the template file to exclude files from the comparison:

```
installver -log
```

If the `ivu_user.template` file exists in the properties directory of the default profile, the `installver` command uses it.

The result shows that some user files are excluded:

```
I CWNVU0160I: [ivu] Verifying.
I CWNVU0170I: [ivu] The installation root directory is C:\IBM\WebSphere\AppServerV602\
I CWNVU0300I: [ivu] The total number of user excluded files found are 2.
I CWNVU0300I: [ivu] The total number of IBM excluded files found are 78.
I CWNVU0180I: [ivu] Searching directory properties\version\install\6.0.0.0\
backup for file listing: files.list
I CWNVU0260I: [ivu] The total number of components found is: 285
I CWNVU0270I: [ivu] Gathering installation root data.
I CWNVU0460I: [ivu] The utility is running.
I CWNVU0290I: [ivu] Starting the verification for 1 components.

I CWNVU0470I: [ivu] Starting to analyze: prereq.wccm
I CWNVU0430I: [ivu] The following file is missing:
web/configDocs/activitysessionejbext/ContainerActivitySession.html

...
I CWNVU0430I: [ivu] The following file is missing:
web/configDocs/wssecurity/generator-binding.html
I CWNVU0390I: [ivu] Component issues found : 623
I CWNVU0480I: [ivu] Done analyzing: prereq.wccm

I CWNVU0400I: [ivu] Total issues found : 623
I CWNVU0340I: [ivu] Done.
```

Results

When you issue one of the checksum commands from the `app_server_root/bin` directory, the status of the command is displayed on the terminal console or in a log file.

What to do next

Go to “Comparing specific file and component checksums” to learn more about the `installver` command.

Comparing specific file and component checksums

Specify individual files or components to include in the bill of materials verification.

Before you begin

Install the product before comparing checksums of individual files and components.

About this task

This topic describes how to use inclusion properties to specify individual files and components.

By default, IBM includes all files in the checksum comparison except for the 78 IBM excluded files.

```
I CWNVU0160I: [ivu] Verifying.
I CWNVU0170I: [ivu] The installation root directory is C:\IBM\WebSphere\AppServerV602\
I CWNVU0300I: [ivu] The total number of user excluded files found are 0.
```

```

I CWNVU0300I: [ivu] The total number of IBM excluded files found are 78.
I CWNVU0180I: [ivu] Searching directory properties\version\install\6.0.0.0\
                    backup for file listing: files.list
I CWNVU0260I: [ivu] The total number of components found is: 285
I CWNVU0270I: [ivu] Gathering installation root data.
I CWNVU0460I: [ivu] The utility is running.
I CWNVU0290I: [ivu] Starting the verification for 285 components.

I CWNVU0470I: [ivu] Starting to analyze: activity
I CWNVU0480I: [ivu] Done analyzing: activity

```

...

Several different methods are provided to include only certain files in the comparison.

- Compare checksums and include specified components only in the comparison:

```

- AIX HP-UX Linux Solaris ./installver.sh -includecomponent
  comp1;comp2;comp3;...

- Windows installver.bat -includecomponent comp1;comp2;comp3;...

```

For example, you might include the activity component:

```

- AIX HP-UX Linux Solaris ./installver.sh -log -includecomponent activity
- Windows installver.bat -log -includecomponent activity

```

The resulting messages show the inclusion:

```

I CWNVU0160I: [ivu] Verifying.
I CWNVU0170I: [ivu] The installation root directory is C:\IBM\WebSphere\AppServerV602\
I CWNVU0300I: [ivu] The total number of user excluded files found are 0.
I CWNVU0300I: [ivu] The total number of IBM excluded files found are 78.
I CWNVU0180I: [ivu] Searching directory properties\version\install\6.0.0.0\
                    backup for file listing: files.list
I CWNVU0260I: [ivu] The total number of components found is: 285
I CWNVU0270I: [ivu] Gathering installation root data.
I CWNVU0460I: [ivu] The utility is running.
I CWNVU0460I: [ivu] The utility is running.
I CWNVU0290I: [ivu] Starting the verification for 1 components.

I CWNVU0470I: [ivu] Starting to analyze: activity
I CWNVU0480I: [ivu] Done analyzing: activity

I CWNVU0400I: [ivu] Total issues found : 0
I CWNVU0340I: [ivu] Done.

```

- Include only certain files in the comparison:

```

- AIX HP-UX Linux Solaris app_server_root/bin/installver.sh -include
  fn1;fn2;fn3

- Windows app_server_root\bin\installver.bat -include fn1;fn2;fn3

```

For example, you might include only the properties/version/proxy.server.component file, which was changed to generate the checksum difference in this example.

```

installver.bat -log
-include properties/version/proxy.server.component

```

The result shows that the included file was in the comparison, which scanned 285 components looking for all components that refer to the file:

```

I CWNVU0160I: [ivu] Verifying.
I CWNVU0170I: [ivu] The installation root directory is C:\IBM\WebSphere\AppServerV602\
I CWNVU0300I: [ivu] The total number of user excluded files found are 0.
I CWNVU0300I: [ivu] The total number of IBM excluded files found are 78.
I CWNVU0180I: [ivu] Searching directory properties\version\install\6.0.0.0\
                    backup for file listing: files.list
I CWNVU0260I: [ivu] The total number of components found is: 285
I CWNVU0270I: [ivu] Gathering installation root data.

```



```

I CWNVU0460I: [ivu] The utility is running.
I CWNVU0290I: [ivu] Starting the verification for 285 components.

I CWNVU0470I: [ivu] Starting to analyze: activity
I CWNVU0480I: [ivu] Done analyzing: activity
...
I CWNVU0470I: [ivu] Starting to analyze: proxy.server
I CWNVU0440I: [ivu] The following file is different: properties/version/
proxy.server.component
I CWNVU0410I: [ivu] f385fc95977092e0482d52f9d1d5bebbc39fbb10 is the checksum
in the bill of materials.
I CWNVU0420I: [ivu] b43bda7f1e7202d1f9495fc74ac14b8d85830aab is the checksum
on the file system.
I CWNVU0390I: [ivu] Component issues found : 1
I CWNVU0480I: [ivu] Done analyzing: proxy.server
...
I CWNVU0400I: [ivu] Total issues found : 1
I CWNVU0340I: [ivu] Done.

```

If you know that a file is in only one component, you can speed up the comparison by restricting the comparison of the file to the relevant component:

```
installver.bat -log -includecomponent proxy.server -include properties/version/
proxy.server.component
```

The result shows the comparison was restricted to one component:

```

I CWNVU0160I: [ivu] Verifying.
I CWNVU0170I: [ivu] The installation root directory is C:\IBM\WebSphere\AppServerV602\
I CWNVU0300I: [ivu] The total number of user excluded files found are 0.
I CWNVU0300I: [ivu] The total number of IBM excluded files found are 78.
I CWNVU0180I: [ivu] Searching directory properties\version\install\6.0.0.0\
backup for file listing: files.list
I CWNVU0260I: [ivu] The total number of components found is: 285
I CWNVU0270I: [ivu] Gathering installation root data.
I CWNVU0460I: [ivu] The utility is running.
I CWNVU0290I: [ivu] Starting the verification for 1 components.

I CWNVU0470I: [ivu] Starting to analyze: proxy.server
I CWNVU0440I: [ivu] The following file is different: properties/version/
proxy.server.component
I CWNVU0410I: [ivu] f385fc95977092e0482d52f9d1d5bebbc39fbb10 is the checksum
in the bill of materials.
I CWNVU0420I: [ivu] b43bda7f1e7202d1f9495fc74ac14b8d85830aab is the checksum
on the file system.
I CWNVU0390I: [ivu] Component issues found : 1
I CWNVU0480I: [ivu] Done analyzing: proxy.server

I CWNVU0400I: [ivu] Total issues found : 1
I CWNVU0340I: [ivu] Done.

```

Results

When you issue one of the checksum commands from the *app_server_root/bin* directory, the status of the command is displayed on the terminal console or in a log file.

What to do next

Go to “Changing the default message digest algorithm” to learn more about the *installver* command.

Changing the default message digest algorithm

Change the default message digest algorithm from SHA to MD5 only if absolutely necessary. Edit the *installver.bat* file or the *installver.sh* file to make the change. Changing the algorithm invalidates the SHA-based checksums in the product bill of materials. For this reason, verify the product files before changing the message digest algorithm.

Before you begin

Install the product before attempting to change the default message digest algorithm from SHA to MD5.

About this task

The default message digest algorithm is one of the secure hash algorithms (SHA) that are part of the Secure Hash Standard (SHS) from the National Institute of Standards and Technology (NIST). See the Federal Information Processing Standards (FIPS) publication 180-2 for more information. SHA-1 is the standard hash function of the U.S. government.

Also available is the older MD5 message digest algorithm. MD5 is a deprecated type of message algorithm that is not as secure as SHA and is provided only for backward compatibility.

This topic describes changing the default message digest algorithm. You must edit the `installver.bat` file or the `installver.sh` file to change the algorithm.

Add the following environmental property to the script file:

```
-Dchecksum.type=MD5
```

The default value is:

```
-Dchecksum.type=SHA
```

What to do next

Go to “Handling out-of-memory situations” to learn more about the `installver` command.

Handling out-of-memory situations

Memory requirements for using the `installver` command are related to the size of the installed file set for the product. For the basic verification scenario, comparing an installed file set with the provided bill of materials might require a maximum heap size of 128 MB to 256 MB.

Before you begin

Install the product at the Version 6.0.2 level or later to install the `installver` command tool. After installing the command, you can increase the maximum heap size setting.

About this task

If you need more memory for either a product verification or a baseline checksum verification, increase the maximum heap size setting for your Java virtual machine (JVM) by including a setting in the `installver` command script.

- Edit the `installver` command script:

– **AIX** **HP-UX** **Linux** **Solaris** Edit the `app_server_root/bin/installver.sh` file.

– **Windows** Edit the `app_server_root\bin\installver.bat` file.

- Add or increase the maximum heap size setting:

– **AIX** **HP-UX** **Linux** **Solaris** Change the following line:

```
"$JAVA_HOME"/bin/java \
```

to:

```
"$JAVA_HOME"/bin/java -Xmx256M \
```

– **Windows** Change the following line:

```
"%JAVA_HOME%\bin\java" "-Dproduct.home=%WAS_HOME%"
```

to:

```
"%JAVA_HOME%\bin\java" -Xmx256M "-Dproduct.home=%WAS_HOME%"
```

Results

After you change the setting, run the `installver` command to verify that it works correctly.

What to do next

Go to “Verifying the `installver` command” to learn more about the `installver` command.

Verifying the `installver` command

Use the `verifyinstallver` command to perform a checksum on the files that comprise the `installver` command.

Before you begin

Install the product at the Version 6.0.2 level or later before attempting to verify the checksums of the files that comprise the `installver` command.

About this task

This topic describes using the `verifyinstallver` command to compute a checksum on the installed files that comprise the `installver` command. Verifying the checksums of the command files ensures that the command can function properly.

1. Change directories to the `bin` directory in `app_server_root`.

- `AIX` `HP-UX` `Linux` `Solaris` `cd app_server_root/bin`
- `Windows` `cd app_server_root\bin`

2. Start the `verifyinstallver` command script from the command line.

- `AIX` `HP-UX` `Linux` `Solaris` `./verifyinstallver.sh`
- `Windows` `verifyinstallver.bat`

You can use the `-trace` parameter to show verbose results. You can use the `-help` parameter to see usage information.

Results

If the command successfully verifies the `installver` files, you see messages that are similar to the following example:

```
I CWNVU0160I: [ivu] Verifying.
I CWNVU0170I: [ivu] The installation root directory is C:\WebSphere\V6X-ND\
I CWNVU0300I: [ivu] The total number of user excluded files found are 0.
I CWNVU0300I: [ivu] The total number of IBM excluded files found are 75.
I CWNVU0180I: [ivu] Searching directory properties\version\install\6.0.0.0\backup for file listing:
files.list
I CWNVU0260I: [ivu] The total number of components found is: 285
I CWNVU0270I: [ivu] Gathering installation root data.
I CWNVU0460I: [ivu] The utility is running.
I CWNVU0290I: [ivu] Starting the verification for 1 components.

I CWNVU0470I: [ivu] Starting to analyze: installver
I CWNVU0480I: [ivu] Done analyzing: installver

I CWNVU0400I: [ivu] Total issues found : 0
I CWNVU0340I: [ivu] Done.
```

What to do next

Go to the description of the “verifyinstallver command” to learn more.

verifyinstallver command

The verifyinstallver command is a verification program that performs a checksum on the files that comprise the installver command.

Purpose

This topic describes the command-line syntax for the verifyinstallver command. Start the verifyinstallver command script from the command line. This topic describes how to locate the command and use it to verify that the installver command is valid.

Use the following syntax for the command to automatically check the bill of materials against the installed file system:

- `AIX` `HP-UX` `Linux` `Solaris` `app_server_root/bin/verifyinstallver.sh`
- `Windows` `app_server_root\bin\verifyinstallver.bat`

Display verbose results:

`AIX` `HP-UX` `Linux` `Solaris`
`verifyinstallver.sh -trace`

`Windows`
`verifyinstallver.bat -trace`

Display usage information:

`AIX` `HP-UX` `Linux` `Solaris`
`verifyinstallver.sh -help`

`Windows`
`verifyinstallver.bat -help`

The location of the verification program for installver command is:

- `AIX` `HP-UX` `Linux` `Solaris` `app_server_root/bin/verifyinstallver.sh`
- `Windows` `app_server_root\bin\verifyinstallver.bat`

Parameters

The command has optional parameters.

path_name_and_file_name

Optional parameter to identify the location of the installver command file.

The default location and filename are:

- `AIX` `HP-UX` `Linux` `Solaris` `app_server_root/bin/installver.sh`
- `Windows` `app_server_root\bin\installver.bat`

-help

Displays usage information.

-trace

Provides trace output of what the tool checks and what the tool discovers.

Next

Go to the description of the “installver command” to learn more.

installver command

The installver command performs two main functions. The tool computes a checksum on the installed files and compares the checksum to the shipped bill of materials for the product. The installver command can also compute a new baseline checksum for each file in the inventory of a configured system to use to identify file changes in later comparisons.

Purpose

This topic describes the location of the command file, command syntax, and links to task information about using the tool.

The default log file is the *app_server_root/logs/installver.log* file. You can redirect the output using the `-log` parameter and an argument. Use the `-log` parameter without the file argument to generate the default log file.

Computing the checksum

The installver tool computes a checksum for each installed file in the product. The tool compares each computed checksum to the correct checksum for the file. The correct checksums are shipped in the bill-of-material files. One bill-of-materials file exists for each component.

The tool parses the bill-of-materials file for each component to find the correct checksum value for each file in the component. Each product file has an entry in some bill-of-materials file. The entry for a product file lists the product file path and the correct checksum value.

Shipped bill-of-material files

Each bill-of-materials file is named *files.list*. Each component has one *files.list* file. Each *files.list* file is in one of the *app_server_root/properties/version/install/6.1.0.0/backup/component_name* directories. A *component_name* directory exists for each component.

For instance, the *files.list* file for the activity component is in the *app_server_root/properties/version/install/6.1.0.0/backup/activity* directory. The file resembles the following example:

```
<?xml version="1.0" encoding="UTF-8"?>
<componentfiles componentname="activity">
  <file>
    <relativepath>properties/version/activity.component</relativepath>
    <checksum>1a20dc54694e81fccd16c80f7c1bb6b46bba8768</checksum>
    <permissions>644</permissions>
    <installopération>remove</installopération>
  </file>
  <file>
    <relativepath>lib/activity.jar</relativepath>
    <checksum>2f056cc01be7ff42bb343e962d26328d5332c88c</checksum>
    <permissions>644</permissions>
    <installopération>remove</installopération>
  </file>
</componentfiles>
```

Comparing the computed checksum to the correct checksum

As the tool processes each product file in each bill-of-materials file, the tool also computes the actual checksum value of the corresponding installed product file. The tool then compares the checksum of the product file to the correct checksum value in the bill-of-materials file. The tool then reports any differences.

Location of the command file

The installver command file is located in the bin directory of the installation root directory:

- **AIX** **HP-UX** **Linux** **Solaris** `app_server_root/bin/installver.sh`
- **Windows** `app_server_root\bin\installver.bat`

Change directories to the bin directory to start the installver tool from the command line. The tool runs on any supported operating system except z/OS.

AIX **HP-UX** **Linux** **Solaris** Use the following command to start the tool on an operating system such as AIX or Linux:

```
./installver.sh
```

See the following topics for more information about the purpose of the command:

- “Verifying against the bill of materials” on page 123
- “Computing a new baseline checksum for an inventory of configured files” on page 127
- “Excluding files from a checksum comparison” on page 129
- “Comparing specific file and component checksums” on page 132
- “Changing the default message digest algorithm” on page 134
- “Handling out-of-memory situations” on page 135
- “Verifying the installver command” on page 136

Syntax for displaying usage information

- **AIX** **HP-UX** **Linux** **Solaris** `./installver.sh -help`
- **Windows** `installver.bat -help`

Syntax for listing all components

- **AIX** **HP-UX** **Linux** **Solaris** `./installver.sh -listcomponents`
- **Windows** `installver.bat -listcomponents`

Syntax for comparing product files to the bill-of-material files

Use the following command syntax to automatically check the bill of materials against the installed file system.

- **AIX** **HP-UX** **Linux** **Solaris** `app_server_root/bin/installver.sh`
- **Windows** `app_server_root\bin\installver.bat`

See “Verifying against the bill of materials” on page 123 for examples of using the command to compare the installed files to the product bill-of-materials files.

Example comparisons and command usage

Compare checksums and include specified files only in the comparison:

- **AIX** **HP-UX** **Linux** **Solaris** `./installver.sh -include fn1;fn2;fn3`
- **Windows** `installver.bat -include fn1;fn2;fn3`

See “Comparing specific file and component checksums” on page 132 for examples of using the command to compare only files or components that you specify.

Compare checksums and include specified components only in the comparison:

- `AIX` `HP-UX` `Linux` `Solaris` `./installver.sh -includecomponent comp1;comp2;comp3;...`
- `Windows` `installver.bat -includecomponent comp1;comp2;comp3;...`

Compare checksums and exclude certain components from the comparison:

- `AIX` `HP-UX` `Linux` `Solaris` `./installver.sh -excludecomponent comp1;comp2;comp3;...`
- `Windows` `installver.bat -excludecomponent comp1;comp2;comp3;...`

See “Excluding files from a checksum comparison” on page 129 for examples of using the command to exclude files from the comparison.

Compare checksums and ignore user-excluded files:

- `AIX` `HP-UX` `Linux` `Solaris` `./installver.sh -ignoreuserexclude`
- `Windows` `installver.bat -ignoreuserexclude`

Compare checksums and ignore IBM-excluded files:

- `AIX` `HP-UX` `Linux` `Solaris` `./installver.sh -ignoreibmexclude`
- `Windows` `installver.bat -ignoreibmexclude`

List all components only:

- `AIX` `HP-UX` `Linux` `Solaris` `./installver.sh -listcomponents`
- `Windows` `installver.bat -listcomponents`

Create template (for listing excluded files) only:

- `AIX` `HP-UX` `Linux` `Solaris` `./installver.sh -createtemplate`
- `Windows` `installver.bat -createtemplate`

Parameters for comparing checksums against the bill of materials

The following parameters are associated with the command when comparing product file checksums to the correct checksums in the bill of material files.

-componentdir *directory_1; directory_2; directory_n*

Optional parameter that identifies the names of directories where WebSphere Application Server products store the individual bill-of-material lists for each component.

The default value is the `app_server_root/properties/version/install/6.1.0.0/backup` directory.

The directory path delimiter can be either a colon (:) or a semi-colon (;).

-createtemplate [*file_name*]

Creates a template properties file for excluding files from the checksum comparison. Edit the template properties file to add a line for each file that you want to exclude from verification.

Without a file specification argument, the `installver` tool creates the `profile_root/properties/ivu_user.template` file.

If you specify a file name, the `installver` tool creates the file in the working directory, which is the `profile_root/bin` directory by default.

- **AIX** **HP-UX** **Linux** **Solaris** Perform the following procedure:
 1. `cd app_server_root/bin`
 2. `./installver.sh -createtemplate`
- **Windows** Perform the following procedure:
 1. `cd app_server_root\bin`
 2. `installver.bat -createtemplate`

The installver tool creates the template properties file in the properties directory of the default profile.

- **AIX** **HP-UX** **Linux** **Solaris** `profile_root/properties/ivu.user.template`
- **Windows** `profile_root\properties\ivu.user.template`

-exclude *file1;file2;file3; ...*

Excludes files from verification.

Use a semi-colon (;) or a colon (:) to delimit file names.

-excludecomponent *component1;component2;component3; ...*

Excludes components from verification.

Use a semi-colon (;) or a colon (:) to delimit component names.

-filelist *file_name*

Optional parameter that identifies the name of the file that IBM uses to identify the correct checksums of product files in a particular product component.

The default value is files.list.

-help

Displays usage information.

-ignoreuserexclude

Ignores the default `profile_root/properties/ivu_user.template` file, if the file exists and compares the files listed in the template.

If you use the `-createtemplate` parameter with a file specification to create a template file in another location, the `-ignoreusertemplate` parameter has no effect.

-ignoreibmexclude

Compares checksums for all of the files in the installation root directory. IBM specifies certain files to exclude from the verification by default. You can cause the installver tool to verify those files as well by using the `-ignoreibmexclude` parameter.

-include *file1;file2;file3; ...*

Includes files in the verification and excludes all other files.

Use a semi-colon (;) or a colon (:) to delimit file names.

-includecomponent *component1;component2;component3; ...*

Includes components in the verification and excludes all other components.

Use a semi-colon (;) or a colon (:) to delimit component names.

-installroot *directory_name*

Overrides the default installation root directory.

-listcomponents

Displays a list of components in the product. Each component must have a files.list file.

-log [*file_path_and_file_name_of_log_file*]

The default log file is the `app_server_root/logs/installver.log` file. You can redirect the output using the `-log` parameter and an argument.

-profilehome *directory_name*

Overrides the default profiles directory in the installation root directory.

-trace

Provides trace output of what the tool checks and what the tool discovers.

Syntax for creating and using a new baseline checksum for an inventory of configured files

Use the following syntax to create and compare an inventory of configured files to the currently installed files.

Create an inventory list of the files that are currently installed in the installation root directory

- **AIX** **HP-UX** **Linux** **Solaris** `./installver.sh -createinventory [path/file_name]`, such as `./installver.sh -createinventory /tmp/system.inv`
- **Windows** `installver.bat -createinventory [path/file_name]`, such as `installver.bat -createinventory C:\temp\system.inv`

Compare the inventory list to files that are currently installed in the installation root directory

- **AIX** **HP-UX** **Linux** **Solaris** `./installver.sh -compare /path/file_name`
- **Windows** `installver.bat -compare path\file_name`

Compare and display trace results

- **AIX** **HP-UX** **Linux** **Solaris** `./installver.sh -compare /path/file_name -trace`
- **Windows** `installver.bat -compare /path/file_name -trace`

Display usage information

- **AIX** **HP-UX** **Linux** **Solaris** `./installver.sh -help`
- **Windows** `installver.bat -help`

Compare and exclude specified files from the inventory comparison

- **AIX** **HP-UX** **Linux** **Solaris** `./installver.sh -compare /path/file_name -exclude fn1;fn2;fn3;...`
- **Windows** `installver.bat -compare \path\file_name -exclude fn1;fn2;fn3;...`

Compare and include only specified files in the inventory comparison

- **AIX** **HP-UX** **Linux** **Solaris** `./installver.sh -compare /path/file_name -include fn1;fn2;fn3;...`
- **Windows** `installver.bat -compare /path/file_name -include fn1;fn2;fn3;...`

Parameters for creating and using checksums for a file inventory

The following parameters are associated with this command.

-compare *file_path_and_file_name_of_existing_inventory_file*

Compares the existing inventory list to the existing files to determine changes.

First use the `-createinventory` parameter to create an inventory list. Then use the `-compare` parameter to compare the inventory list to the actual files that exist in the system at the time of the comparison.

The result of the comparison shows changed classes, changed files, missing files, and added files. Such a comparison is very useful for verifying the absence of virus files, for example.

-createinventory *directory_name*

Creates the new checksum by default in the `sys.inv` file within the current working directory, such as the `profile_root/bin` directory. You can specify a file path and file name. Create the file outside of the installation root directory or exclude the file from comparisons.

You can point the installver tool at any directory. The default directory is the installation root directory.

You can exclude files or components from the inventory.

The installver tool computes a checksum for each file. Each file entry in the inventory has the following general pattern:

```
checksum|relativepath/file_name|file_size|last_modified_time
```

After creating an inventory list, use the `-compare` parameter to compare the list to the actual files that exist in the system at the time of the comparison.

-exclude *file1;file2;file3;...*

Excludes files from comparison.

Use a semi-colon (;) or a colon (:) to delimit file names.

-help

Displays usage information.

-include *file1;file2;file3; ...*

Includes files in the comparison and excludes all other files.

Use a semi-colon (;) or a colon (:) to delimit file names.

-installroot *directory_name*

Overrides the *default installation root directory*.

-log [*file_path_and_file_name_of_log_file*]

The default log file is the `app_server_root/logs/installver.log` file. You can redirect the output using the `-log` parameter and an argument.

-trace

Provides trace output of what the tool checks and what the tool discovers.

Example issues

The following examples show issues that might occur when you run the `installver` command to compare checksums.

Ignore entries for checksum mismatches that you introduce on purpose, such as might occur when you extend a component

The checksums differ for each file that you change:

```
I CWNVU0470I: [ivu] Starting to analyze: regularcomponentsample
I CWNVU0440I: [ivu] The following file is different: lib/different.jar
I CWNVU0410I: [ivu] fc19318dd13128ce14344d066510a982269c241b is the checksum in the bill of materials.
I CWNVU0420I: [ivu] 517d5a7240861ec297fa07542a7bf7470bb604fe is the checksum on the file system.
I CWNVU0390I: [ivu] Component issues found : 1
I CWNVU0480I: [ivu] Done analyzing: regularcomponentsample
```

Ignore issues that are obvious informational (I) messages

Some messages indicate deviations from the normally expected result, but are not indicators of a serious issue:

```
I CWNVU0360I: [ivu] The following bill of materials issue is found for component nullvaluesample:  
Hash must not be null or an empty string.
```

Overlapped files are either a potential product issue or potential tampering with the IBM provided bill of materials

```
I CWNVU0470I: [ivu] Starting to analyze: overlapbinarycomponentsample  
W CWNVU0422W: [ivu] The following file is overlapped: lib/binaryTest.jar  
W CWNVU0425W: [ivu] The overlap is caused by: _binarycomponentsample  
I CWNVU0390I: [ivu] Component issues found : 1  
I CWNVU0480I: [ivu] Done analyzing: overlapbinarycomponentsample
```

Contact IBM support for the following issue

If you see any messages with the following format, contact IBM support:

```
W CWNVU0280W: [ivu] Component mismatch: expected ... but found ...
```

IBM Support has documents that can save you time gathering information needed to resolve this problem. Before opening a PMR, see this [IBM Support page](#).

Next

After verifying your installation, you can create profiles or deploy an application on an existing application server profile.

After installing, updating, and verifying, the next step is to use the product. Start the application server. to use the administrative console to deploy an existing application. See [Fast paths for WebSphere Application Server](#) for more information.

Chapter 8. Troubleshooting installation

This topic describes troubleshooting the installation of the WebSphere Application Server - Express product.

Before you begin

If you are looking for troubleshooting information for the Web server plug-ins for WebSphere Application Server, read the "Troubleshooting Web server plug-ins installation and removal" topic. This topic does not describe the plug-ins.

Use this topic after installing your WebSphere Application Server product.

A successful installation of a WebSphere Application Server product installs the core product files and creates the server1 Application Server.

If an installation is not successful, use this troubleshooting information to correct the problems.

About this task

Use this topic to help interpret the log files and diagnose possible problems when the installation is unsuccessful.

The installer program records the following indicators of success in the logs:

- INSTCONFSUCCESS
- INSTCONFPARTIALSUCCESS
- INSTCONFFAILED

1. Use the First steps console to run the installation verification test (IVT).

The installation wizard can start the First steps console at the end of installation. Select **Installation verification**. Check the *profile_root/logs/ivt.log* file for a summary of test results. Correct any errors and retry. If you performed a custom installation, the location of the default profile is in the profiles installation root directory that you selected during the installation.

2. Run the `installver` command to calculate and compare checksums for all installed components to the bill of materials list for the product.

See "Verifying checksums of installed files" on page 121 for more information.

Compare the output from the `installver` command to the installation log files that are described in the next step.

3. Check the installation log files for errors after installing:

If the error happens early in the installation, look for the `log.txt` file in the system temporary area. The installation program copies the log from the temporary area to the logs directory at the end of the installation.

If the installation fails and the `log.txt` file has only this one pointer to the temporary directory, open the `log.txt` file in the temporary directory. The log might have clues to the installation failure.

Log more information when InstallShield MultiPlatform (ISMP) cannot start the installation wizard.

Certain events can prevent the installer from starting the installation wizard. Such an event is not enough disk space to launch the installation wizard, for example. If your installation fails and there is no information in the installation logs, use the `-log` parameter to record entries for events that cause the installer program to fail to start the installation wizard. The syntax of the `install` command for logging such events is:

```
install -options fully_qualified_options_response_file_name
-silent
-log # !fully_qualified_log_file_name @ALL
```

- **AIX**

```
install -options "/usr/IBM/WebSphere/silentFiles/myresponsefile.txt"
-silent -log # !/usr/IBM/WebSphere/myOptionFiles/log.txt @ALL
```

- **Linux** **HP-UX** **Solaris**

```
install -options "/opt/IBM/WebSphere/silentFiles/myresponsefile.txt"
-silent -log # !/opt/IBM/WebSphere/myOptionFiles/log.txt @ALL
```

- **Windows**

```
install.exe -options "C:\IBM\WebSphere\silentFiles\myresponsefile.txt"
-silent -log # !C:\IBM\WebSphere\silentFiles\log.txt @ALL
```

Log file names and locations

The following information shows the log files for all of the installable components on the product disc.

Log files for IBM HTTP Server

The following table shows the installation log locations when installing IBM HTTP Server.

Table 35. Installation log locations when installing IBM HTTP Server

Windows system log path name	Log path name on operating systems such as AIX or Linux
Windows C:\Program Files\IBM HTTP Server\logs\install\log.txt	AIX /usr/IBMHttpServer/logs/install/log.txt Linux HP-UX Solaris /opt/IBMHttpServer/logs/install/log.txt

Log files for Application Client for WebSphere Application Server

The following table shows the installation log locations when installing the Application Client.

Table 36. Installation log locations when installing the Application Client for WebSphere Application Server

Windows system log path name	Operating system log path name on systems such as AIX or Linux
Windows C:\Program Files\IBM\WebSphere\AppClient\logs\log.txt	AIX /usr/IBM/WebSphere/AppClient/logs/log.txt Linux HP-UX Solaris /opt/IBM/WebSphere/AppClient/logs/log.txt

Installation log files for WebSphere Application Server

The following table shows the installation logs, content, and indicators of success and failure for the product:

Table 37. Installation and profile creation logs for WebSphere Application Server - Express

Log	Content	Indicators
<i>app_server_root</i> /logs/install/log.txt	Logs all installation events	Return code Meaning 0 Success 1 Failure 2 Partial Success

Table 37. Installation and profile creation logs for WebSphere Application Server - Express (continued)

Log	Content	Indicators
<i>app_server_root/logs/</i> <i>manageprofiles/</i> <i>profile_name_create.log</i>	<ul style="list-style-type: none"> Traces all events that occur during the creation of the named profile Created when using the Profile Management Tool or the manageprofiles command 	<p>INSTCONFFAIL Total profile creation failure.</p> <p>INSTCONFSUCCESS Successful profile creation.</p> <p>INSTCONFPARTIALSUCCESS Profile creation errors occurred but the profile is still functional. Additional information identifies the errors.</p>
<i>app_server_root/logs/</i> <i>manageprofiles/</i> <i>profile_name_delete.log</i>	<ul style="list-style-type: none"> Traces all events that occur during the deletion of the named profile Created when using the Profile Management Tool or the manageprofiles command 	<p>INSTCONFFAIL Total profile deletion failure.</p> <p>INSTCONFSUCCESS Successful profile deletion.</p> <p>INSTCONFPARTIALSUCCESS Profile deletion errors occurred but the profile is still deleted. Additional information identifies the errors.</p>
<i>app_server_root/logs/install/</i> <i>installconfig.log.gz</i>	<ul style="list-style-type: none"> Logs the activities of ANT configuration scripts that run at the end of the installation procedure Gzip file 	<p>Configuration action failed: Unsuccessful ANT script configuration.</p> <p>Configuration action succeeded: Successful ANT script configuration.</p>

Description of the *profile_name_create.log* file

The *profile_name_create.log* file is an XML file that contains a record of the events that occur during the creation of the last profile.

In addition to the date tag at the beginning of the file, other tags of interest in the log files include the sequence tag, the level tag, the method tag, and the message tag:

- The sequence tag records the sequence of events that occur during the creation of the profile.
- The level tag is an early indicator of event status:

INFO Indicates a normal event.

WARNING

Indicates an event that occurred with errors that do not prevent the creation of the profile.

ERROR

Indicates an event that prevents the creation of the profile.

- The method tag indicates the name of the routine that recorded the event.
- The message tag describes the event and contains any data returned by the method.

The following stanza is an example of how an event is documented in each log file:

```
<record>
  <date>2004-09-08T11:51:39</date>
  <millis>1094658699225</millis>
  <sequence>0</sequence>
  <logger>com.ibm.ws.profile.WSProfile</logger>
  <level>INFO</level>
  <class>com.ibm.ws.profile.WSProfile</class>
  <method>getRegistryFile</method>
  <thread>10</thread>
```

```

<message>Returning registry file at:
  C:\IBM\WebSphere\AppServer\properties\profileRegistry.xml
</message>
</record>

```

Other log files

In addition to the logs created within the core product files, the following logs are created in the *profile_root/logs* and the *app_server_root/logs/manageprofiles/profile_name* directories.

Table 38. Profile logs for WebSphere Application Server - Express

Log	Description
AboutThisProfile.txt	General information about the profile
activity.log	Compiled activity log from various installation activities
amjrte_config.log	Tivoli Access Manager configuration log for its Java Runtime Environment
createDefaultServer.log	A log from wsadmin recording the creation of the server1 process in the default profile
createshortcutforprofile.log	Windows tool log for creating menu entries and shortcuts
defaultapp_config.log	JACL script log from configuring default application resources
defaultapp_deploy.log	Application DefaultApplication installation log
node_name Service.log	Start and stop events for server1
filetransfer_config.log	Application filetransfer installation log
hamanager_config.log	Configuration log for the high availability application
ivt_config.log	Application ivtApp installation log
mejb_config.log	Application ManagementEJB installation log
query_config.log	Application Query installation log
samples_config.log	Configuration log for the PlantsByWebSphere Samples application
samples_install.log	Installation log for the SamplesGallery and PlantsByWebSphere Samples applications
scheduler.cal_config.log	Application SchedulerCalendars installation log
SIBDefineChains.log	Creation log for service integration bus endpoints, inbound channels and channel chains, outbound thread pool, and outbound channel and channel chains
SIBDeployRA.log	Deployment log for the service integration bus function
webui_config.log	Application administrative console installation log
winservice_config.log	Service log for the Windows service created for server1

The following logs are created in the *profile_root/logs/server1* directory:

Table 39. Server logs for WebSphere Application Server - Express

Log	Description
startServer.log	Log of start server events
stopServer.log	Log of stop server events
SystemErr.log	Record system errors
SystemOut.log	Log of all activity within the system
trace.log	Log of all traced events within the system

The following logs are created in the *profile_root/logs/ffdc* directory:

Table 40. First failure data capture logs for WebSphere Application Server - Express

Log	Description
<code>server1_exception.log</code>	First failure data capture log for server1 errors
<code>server1_numeric_identifier.txt</code>	Any first failure data capture logs

Log files for Web server plug-ins for WebSphere Application Server

Read the "Troubleshooting Web server plug-ins installation and removal" topic for a description of log files and other troubleshooting information.

- Determine whether the installation problem is caused by a failing ANT script.

The *app_server_root/logs/instconfig.log* file indicates ANT configuration problems that could prevent the product from working correctly. The log file is not present on systems such as AIX or Linux.

See "Diagnosing a failing ANT configuration script" on page 153 for a description of how to manually diagnose and fix an ANT script problem.

- Verify that no files exist in the *app_server_root/classes* directory.

IBM Support sometimes queues work for customers and provides test or debugging fixes. A common location for the fixes is in the *app_server_root/classes* directory.

By default, the *app_server_root/classes* directory is picked up first in the WebSphere Application Server class path to let it override other classes.

Putting a fix in the directory lets you verify that the fix does indeed solve your problem. After verifying that the fix solves the problem, you are supposed to delete the fix from the *app_server_root/classes* directory to return the system to a working state.

If you do not remove such fixes from the *app_server_root/classes* directory, you can experience errors.

- Uninstall the product, if possible, and reinstall after turning on tracing if the error 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:

– **AIX** **HP-UX** **Linux** **Solaris**

```
./install -is:javaconsole
```

Capture the stream to a file with the following commands:

```
./install -is:javaconsole > captureFileName.txt 2>&1
```

– **Windows**

```
install.exe -is:javaconsole
```

Capture the stream to a file with the following commands:

```
install -is:javaconsole > drive:\captureFileName.txt
```

Note: Although the usage of `-is:javaconsole` is supported, the usage of `-console`, for example `install -console`, is not supported.

- Capture additional information to a log of your choice with the `-is:log file_name` option.
- Turn on additional installation logging by passing the `-W Setup.product.install.logAllEvents="true"` parameter to the install command:

– **AIX** **HP-UX** **Linux** **Solaris**

```
install -W Setup.product.install.logAllEvents="true"
```

– **Windows**

```
install -W Setup.product.install.logAllEvents="true"
```

- Use the First steps console or the command line method to start the application server.

Start the First steps console for a particular node:

- `AIX` `HP-UX` `Linux` `Solaris` `profile_root/firststeps/firststeps.sh`
- `Windows` `profile_root\firststeps\firststeps.bat`

Start the server from the command line:

- Change directories to the `profile_root/bin` directory in the profile.
- Start the server process.

- `AIX` `HP-UX` `Linux` `Solaris` `./startServer.sh server1`
- `Windows` `startServer server1`

- 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 `profile_root/logs/server1` (platforms such as AIX or Linux) or `profile_root\logs\server1` (Windows platforms) directory in an Application Server profile.

- Start the Snoop servlet to verify the ability of the Web server to retrieve an application from the Application Server.

Test your environment by starting your Application Server, your Web server, and using the snoop servlet with an IP address.

- Start the Application Server.

Change directories to the `profile_root/bin` directory and run the `startServer` command:

- `AIX` `HP-UX` `Linux` `Solaris` `./startServer.sh server1`
- `Windows` `startServer server1`

- Start the IBM HTTP Server or the Web server that you are using.

To start the IBM HTTP Server from the command line:

Access the `apache` and `apachectl` commands in the `IBMHttpServer/bin` directory.

- `AIX` `HP-UX` `Linux` `Solaris` `./apachectl start`
- `Windows` `apache`

- Point your browser to `http://localhost:9080/snoop` to test the internal HTTP transport provided by the Application Server. Point your browser to `http://Host_name_of_Web_server_machine/snoop` to test the Web server plug-in.

The HTTP Transport port is 9080 by default and must be unique for every profile. The port is associated with a virtual host named `default_host`, which is configured to host the installed `DefaultApplication` and any installed `Samples`. The snoop servlet is part of the `DefaultApplication`. Change the port to match your actual HTTP Transport port.

- Verify that snoop is running.

Either Web address should display the Snoop Servlet - Request/Client Information page.

- Remote IBM HTTP Server only:**

Verify that the automatic propagation function can work on a remote IBM HTTP Server by using the following steps. This procedure is not necessary for local Web servers.

- Create a `user=adminUser`, `password=adminPassword` in the `IHS_root/conf/admin.passwd` file. For example: `c:\ws\ihs60\bin\htpasswd -cb c:\ws\ihs60\conf\admin.passwd adminUser adminPassword`
- Use the administrative console of the Application Server to enter the User ID and password information that you created for the administrative user of IBM HTTP Server. Go to **Servers > Web server > Web_server_definition > Remote Web server administration**. Set the following values: `admin Port=8008`, `User Id=adminUser`, `Password=adminPassword`.

- 3) Set the correct read/write permissions for the httpd.conf file and the plugin-cfg.xml file. See the *IHS_root/logs/admin_error.log* file for more information.

Automatic propagation of the plug-in configuration file requires the IBM HTTP administrative server to be up and running. If you are managing an IBM HTTP Server using the WebSphere Application Server administrative console, the following error might display:

"Could not connect to IHS Administration server error"

Perform the following procedure to correct the error:

- 1) Verify that the IBM HTTP Server administration server is running.
 - 2) Verify that the Web server host name and the port that is defined in the WebSphere Application Server administrative console matches the IBM HTTP Server administration host name and port.
 - 3) Verify that the fire wall is not preventing you from accessing the IBM HTTP Server administration server from the WebSphere Application Server administrative console.
 - 4) Verify that the user ID and password that is specified in the WebSphere Application Server administrative console under remote managed, is created in the admin.passwd file, using the htpasswd command.
 - 5) If you are trying to connect securely, verify that you export the IBM HTTP Server administration server keydb personal certificate into the WebSphere Application Server key database as a signer certificate. This key database is specified by the com.ibm.ssl.trustStore directive in the sas.client.props file in the profile where your administrative console is running. This consideration is primarily for self-signed certificates.
 - 6) If you still have problems, check the IBM HTTP Server admin_error.log file and the WebSphere Application Server logs (trace.log file) to determine the cause of the problem.
10. Start the WebSphere Application Server administrative console.
 - a. Start the Application Server.
 - b. Point your browser to <http://localhost:9060/ibm/console>.

The HTTP Admin port is 9060 by default and must be unique for the administrative console of each stand-alone Application Server. The port is associated with a virtual host named admin_host, which is configured to host the administrative console, which is installed by default as a system application. Change the port to match your actual HTTP Admin port.

If you have problems accessing the administrative console after installation, check the installAdminConsole.log file for a failure indication. Clean up the system temporary directory and reinstall the administrative console using the wsadmin scripting facility.
 - 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.

11. 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.

For more information about the Java 2 SDK

12. Linux Restore the original copy of the etc/issue file if the file is modified.

The prereqChecker program in the installation wizard uses the file to verify the version of the operating system. If you cannot restore the original version, ignore the Operating System Level Check message about the operating system being unsupported. The installation can continue successfully despite the warning.

Results

This procedure results in debugging errors that might occur during installation.

What to do next

The “Installation problems” on page 153 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 the information that you need to resolve a problem. Before opening a PMR, see the IBM Support page.

Installation component troubleshooting tips

If you are having problems installing the Web server plug-ins for WebSphere Application Server, read the “Troubleshooting Web server plug-ins installation and removal” topic.

If you are having problems installing your WebSphere Application Server product, follow these steps to resolve the problem:

- Follow the steps that are outlined in Chapter 8, “Troubleshooting installation,” on page 145.
- Browse the relevant log files for clues:
 - The main installation log file: *app_server_root/logs/log.txt*.
 - The profile creation log for creating the profile: *app_server_root/logs/manageprofiles/profile_name_create.log*.
 - IBM HTTP Server log: *IHS_root/log.txt* and *IHS_root/ihsv61_install.log*.
 - The log files produced when the default application .ear file is installed are: *app_server_root/profiles/profile_name/logs/defaultapp_config.log* and *app_server_root/profiles/profile_name/logs/defaultapp_deploy.log*.
 - Other logs for other applications for a profile in the *app_server_root/profiles/profile_name/logs* directory.
- Verify that you have installed the correct level of dependent software, such as operating system version and revision level, by reviewing the Supported hardware and software Web page.

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.

Installation problems

Select the problem that you are having with the WebSphere Application Server installation:

- I need information about installing the Web server plug-ins. Read the "Troubleshooting Web server plug-ins installation and removal" topic for more information.
- "Installation either completes with errors or warnings, or hangs."
- The installation process completes, but the server process does not start or starts with errors.
- There are "Messages issued during installation and profile creation" on page 157.
- The installation completes but the administrative console does not start.

If you do not see a problem that resembles yours, or if the information provided does not solve your problem, see Chapter 8, "Troubleshooting installation," on page 145.

IBM Support has documents and tools that can save you time gathering information needed to resolve problems. If you detect a problem, before opening a problem report see if the problem is a known problem by checking the Support page:

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

Installation either completes with errors or warnings, or hangs

Errors while installing the product

If the WebSphere Application Server installation program indicates that errors were encountered while installing the product:

- Browse the log files in the *app_server_root/logs* directory and in the *app_server_root/profiles/profile_name/logs* directory for clues. Pay particular attention to the main installation log file, *log.txt*.
- Check the command prompt from which the installation panel was launched for error messages.
- Look up any error or warning messages in the message reference table by selecting the "Reference" view in the information center navigation and expanding the "Messages" heading.
- Review Chapter 8, "Troubleshooting installation," on page 145.

Diagnosing a failing ANT configuration script

This topic helps you determine whether a product installation problem on an operating system such as AIX or Linux is caused by a failing ANT configuration script.

Before you begin

Start diagnosing installation problems by looking at the troubleshooting procedure. See Chapter 8, "Troubleshooting installation," on page 145. After the installation completes successfully, several ANT scripts configure the product. This topic describes what to do when an ANT script fails.

If you are looking for troubleshooting information for the Web server plug-ins for WebSphere Application Server, read the "Troubleshooting Web server plug-ins installation and removal" topic. This topic does not describe the plug-ins.

Use this topic when the installation log does not indicate a failure, to correct any problems with failing ANT configuration scripts.

About this task

The `app_server_root/logs/instconfig.log` file contains information about ANT scripts. The file is not created on systems such as AIX or Linux. The installation utility known as the ConfigManager runs the ANT scripts.

The `app_server_root/logs/instconfig.log` file, when present, describes any failure of an ANT script.

Use this topic to determine if any of the following configuration scripts failed. If so, use the configuration script recovery procedures. Use the investigative action to manually verify that the following configuration scripts ran successfully during the configuration of the WebSphere Application Server product. If any script failed, use the recovery action to complete the function of the script.

- **Windows 85SUpdateProductStartMenuToBase.ant**

This script creates product shortcuts on Windows operating systems.

Log file to investigate for a possible error:

- `app_server_root/logs/install/log.txt`
- `app_server_root/logs/install/product_StartMenu.log`

```
Microsoft (R) Windows Script Host Version 5.6
Copyright (C) Microsoft Corporation 1996-2001. All rights reserved.
```

```
Input Error: There is no script engine for file extension ".js".
```

Investigative action: Verify that Windows Script is installed and functional.

Recovery action: Download and install Windows Script.

- **90SCLoudscapeModifyPermission.ant**

This script changes the permission of the following directory to 766: `app_server_root/cloudscape/databases`

Log file to investigate for a possible error: `app_server_root/logs/ModifyCloudscapePermission.log`

Investigative action: Verify that the permissions of the following directory are 766:
`app_server_root/cloudscape/databases`

Recovery action: Issue the following command to change the permission: `chmod -R 766 app_server_root/cloudscape/databases`

- **90SConfigMigrationScript.ant**

This script changes the permissions of the following script to 755: `app_server_root/bin/migration.sh`

This script also replaces the following tokens in the `app_server_root/bin/migration.sh` script:

From:	To the value that you selected during installation:
<code>\${JAVAROOT}</code>	<code>app_server_root/java/jre/bin/java</code>
<code>\${MIGRATIONJAR}</code>	<code>app_server_root/bin/migration/migrationGUI/migrationGUI.jar</code>
<code>\${WASROOT}</code>	<code>app_server_root</code>
<code>\${PRODUCTID}</code>	<code>\${WS_CMT_PRODUCT_TYPE}</code>

Log file to investigate for a possible error: No log file exists for this script.

Investigative action:

1. Verify that the permissions of the `app_server_root/bin/migration.sh` script are 755.
2. Open the `app_server_root/bin/migration.sh` script in an editor. Verify that real values exist instead of the following values:
 - `${JAVAROOT}`

- \${MIGRATIONJAR}
- \${WASROOT}
- \${PRODUCTID}

Recovery actions:

1. Issue the following command: `chmod 755 app_server_root/bin/migration.sh`
2. Change the following tokens to actual values in the `app_server_root/bin/migration.sh` script.
 - \${JAVAROOT}
 - \${MIGRATIONJAR}
 - \${WASROOT}
 - \${PRODUCTID}

• **90SConfigNoProfileFirstStepsND.ant**

This script copies all files from the `app_server_root /properties/version/install/firststeps` directory to the `app_server_root /firststeps/html/noprofile` directory.

This script also replaces the following tokens in the `app_server_root /firststeps/firststeps.sh` script:

From:	To the value that you selected during installation:
\${JAVAROOT}	<code>app_server_root/java/jre/bin/java</code>
\${PROFILEROOT}	<code>app_server_root</code>
\${HTMLSHELLJAR}	<code>app_server_root/lib/htmlshell.jar</code>
\${CELLNAME}	<code>\${WS_CMT_CELL_NAME}</code>

Log file to investigate for a possible error: No log file exists for this script.

Investigative actions:

1. Verify that all files are copied from the `app_server_root /properties/version/install/firststeps` directory to the `app_server_root /firststeps/html/noprofile` directory.
2. Open the `app_server_root/bin/migration.sh` script in an editor. Verify that real values exist instead of the following values:
 - \${JAVAROOT}
 - \${PROFILEROOT}
 - \${HTMLSHELLJAR}
 - \${CELLNAME}

Recovery actions:

1. Copy all of the files from the `app_server_root /properties/version/install/firststeps` directory to the `app_server_root /firststeps/html/noprofile` directory.
2. Change the following tokens to actual values in the `app_server_root/bin/migration.sh` script.
 - \${JAVAROOT}
 - \${PROFILEROOT}
 - \${HTMLSHELLJAR}
 - \${CELLNAME}

• **90SModifyDirectoryPermission.ant**

This script modifies the permissions of the following directories to 755:

- `app_server_root/uninstall`
- `app_server_root/logs`
- `app_server_root/properties`

Log file to investigate for a possible error: `app_server_root/logs/ModifyPermission.log`

Investigative action: Verify that the permissions of the following directories are 755:

- `app_server_root/uninstall`
- `app_server_root/logs`
- `app_server_root/properties`

Recovery action: Issue the following commands:

1. `chmod -R 755 app_server_root/uninstall`
2. `chmod -R 755 app_server_root/logs`
3. `chmod -R 755 app_server_root/properties`

- **99SCreateEmptyDirs.ant**

This script creates the following empty directories:

- `app_server_root/classes`
- `app_server_root/lib/ext`
- `app_server_root/properties/version/history`

Log file to investigate for a possible error: No log file exists for this script.

Investigative action: Verify that the empty directories exist.

Recovery action: Create the directories.

Results

After you correct any installation errors and any ANT script configuration errors by performing the corrective actions in this procedure, the installation is complete.

What to do next

Use the `firststeps` script to start the First steps console. See “`firststeps` command” on page 115 for more information.

Web server installation and startup problems

The following topics might help you determine the solution for a problem you experience while installing or starting Apache servers or IBM HTTP Servers.

If you do not see a problem that resembles yours, or if the information provided does not solve your problem, see the *Troubleshooting and support* PDF for further assistance.

“Failed to initialize GSK environment” error appears when trying to start the Apache server

The following messages may appear in Apache’s error log file when you attempt to start Apache:

```
[Wed Jan 27 19:21:59 2006] [error] lib_security: initializeSecurity: Failed to initialize GSK
environment
[Wed Jan 27 19:21:59 2006] [error] ws_transport: transportInitializeSecurity: Failed to initialize
security
[Wed Jan 27 19:21:59 2006] [error] ws_server: serverAddTransport: Failed to initialize security
```

These messages are most common after building the Apache server from the downloadable source code and installing the Apache server separately from WebSphere Application Server.

If a secure transport is defined in the `plugin-cfg.xml` file, the plug-in will try to load the Global Security Kit (GSKit) library file, `libgsk7ssl.so`. The error messages appear in the error log file if the level 7 GSKit library file is not installed on your system. To correct these errors, try one of the following:

- Remove the transport section that has “https” in the `plugin-cfg.xml` file
- Install the level 7 GSKit

Note: The GSKit installs automatically if you install either the IBM HTTP Server product or the Web server plug-in for either the IBM HTTP Server or the Apache server.

For details and help on the Apache Web server, visit the Apache Web site <http://httpd.apache.org/>.

Windows

IBM HTTP Server on Windows operating system does not start, error WSADuplicateSocket failed for socket appears in error.log

If your installation of IBM HTTP Server on a Windows operating system does not start, you might find a message similar to the following in the log\error.log file of your IBM HTTP Server installation:

```
"[crit] (10045) The attempted operation is not supported for the type of object referenced:  
Parent: WSADuplicateSocket failed for socket nnnn"
```

This problem occurs when an IBM HTTP Server is run on an operating system with a Virtual Private Networking client such as Aventail Connect. Aventail Connect is a Layered Service Provider (LSP) that intercepts calls between the Winsock 2 API and Window's native Winsock 2 implementation. The failure occurs because Aventail Connect does not implement WASDuplicateSocket(). The interception still takes place when Aventail Connect is shut down.

To correct the problem try one of the following:

- Reboot the machine, or
- Uninstall the LSP product

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.

Messages issued during installation and profile creation

What kind of problem are you having?

- "Error: The input line is too long"
- "Note: The following file systems will be expanded during the installation" on page 159
- "The disk space is nn Mbyte less than required. The installation cannot continue." on page 159
- "Specify a different directory or perform a manual uninstall" on page 159
- "Error: /usr/opt/ibm/gskta/bin/gsk7ikm: not found" on page 159
- "Error writing file = There may not be enough temporary disk space." on page 159
- "Error: localhost is not a valid host name for remote access" on page 160
- "The installer could not successfully add the product information into the RPM database." on page 160
- "Error: java.io.IOException: conqueror: not found" on page 160

Error: The input line is too long

Windows This is a profile creation error.

It can occur during installation or when using the Profile Management Tool.

Installation problem

The following error within a log in the *app_server_root\profiles\default\logs* directory indicates that a wsadmin action has failed to create a profile. The failure is because the length of the file path, the profile name, and the node name on the command string has caused the entire command to exceed the operating system limit for command length.

The input line is too long.

Windows The installation directory path must be no longer than 60 characters.

- **Option 1:** If the installation failed, reinstall the WebSphere Application Server product using a shorter directory path and a shorter node name.

The node name field is available during a custom installation. The length of the default node name is usually short enough. Avoid using a node name that is longer than 10 characters if possible.

- **Option 2:** If the installation was successful but the ISMPWSPprofileLaunchAction failed, use the Profile Management Tool to create the profile. Use a shorter profile directory path, a shorter profile name, and a shorter node name when creating the profile.

You can select your own profiles path, which could be *C:\profiles*, for example.

You can select your own profile name.

Verify from the *<install location>/logs/install/log.txt* file that the ISMPConfigManagerLaunchAction is successful.

Examine the following messages in the *log.txt* file to determine whether the installation was successful. If so, you can run the Profile Management Tool to create the default profile.

```
(date time), Install,
com.ibm.ws.install.ni.ismp.actions.ISMPConfigManagerLaunchAction,
msg1, INSTCONFSUCCESS: Post-installation configuration is successful.
```

```
(date time), Install,
com.ibm.ws.install.ni.ismp.actions.ISMPWSPprofileLaunchAction,
err, INSTCONFFAILED: Cannot complete required configuration actions
after the installation. The configuration failed. The installation is
not successful.
```

Refer to

C:\Program Files\IBM\WebSphere\AppServer1234567890\logs\manageprofiles\default_create.log for more details.

```
(date time), Install,
com.ibm.ws.install.ni.ismp.actions.ISMPLogSuccessMessageAction,
msg1, INSTCONFFAILED
```

Profile Management Tool problem

The following error within a log in the *app_server_root\profiles\default\logs* directory indicates that a wsadmin action has failed to create a profile. The failure is because the length of the file path, the cell name, and the node name on the command string has caused the entire command to exceed the operating system limit for command length.

The input line is too long.

Windows The number of characters in the *profile_root* must be no more than 80 characters.

If your *profiles_directory_path\profile_name* string is 80 characters or less and you still have a problem, edit the *app_server_root\bin\setupCmdLine.bat* file to make it use the Windows subst command. The subst command maps an entire path to a virtual drive. After editing the file, run the Profile Management tool again. If changing the *setupCmdLine.bat* file does not fix the problem, you can install the WebSphere Application Server product using a shorter installation path, such as *C:\WAS*.

Note: The following file systems will be expanded during the installation

AIX You can allocate expansion space for directories on AIX. If the Installation wizard does not have enough space, InstallShield MultiPlatform (ISMP) issues a system call for more space that increases the space allocation dynamically. The message you might see when this occurs for the /usr directory is similar to the following example:

NOTE: The following file systems will be expanded during the installation:
/usr

The disk space is nn Mbyte less than required. The installation cannot continue.

Linux **Solaris** **AIX** **HP-UX** If the file system is not dynamically expandable, an insufficient amount of disk space results in a message that is similar to the following example:

The disk space is 33 Mbyte less than required. The installation cannot continue.

Specify a different directory or perform a manual uninstall

This error indicates that you deleted the installation root directory before using the uninstaller program to remove the product. Now you are attempting to reinstall into the same directory.

To correct the problem, perform a manual uninstall. See “Uninstalling manually” on page 210 for an introduction to manually uninstalling. The topic has a link to the manual uninstall procedure for your operating system.

The warning entry in the \$TMP/log.txt file is:

```
(Month day, year time), Install,  
com.ibm.ws.install.ni.ismp.actions.ISMPWarningDialogAction,  
wrn, Specify a different directory or perform a manual uninstall  
to remove all packages before reinstalling to the same directory.
```

Error: /usr/opt/ibm/gskta/bin/gsk7ikm: not found

This error indicates that the xIC.rte 6.0 runtime code has not been installed. You must install the xIC.rte 6.0 runtime code before you install Global Security Kit 7 (GSKit7).

AIX If you have AIX 5.2, then you can install the xIC.rte 6.0 runtime code from the AIX 5.2 CD.

For a complete list of installation prerequisites, see the Supported hardware and software Web page.

Error writing file = There may not be enough temporary disk space.

```
Searching for Java(tm) Virtual Machine...  
A suitable JVM could not be found.  
Please run the program again using the option  
-is:javahome <JAVA HOME DIR>  
Error writing file = There may not be enough temporary disk space.  
Try using -is:tempdir to use a temporary directory on a partition with more disk space.
```

This error can occur when you have not provided enough temporary space to create a profile. Verify that you have a minimum of 40 MB of temporary space available before creating a profile.

Note: The product installation cannot use the InstallShield -is:tempdir parameter to redirect the location of the temporary directory. You must free up space in the temporary directory of the system for the installation to proceed.

Error: localhost is not a valid host name for remote access

This error occurs when you enter localhost as the value for the Host name field in the Profile Management Tool.

The error can also occur during product installation if you enter localhost as the value of the host name field.

Warning: Cannot convert string "<type_name>" to type FontStruct

If you install the Web server plug-ins for WebSphere Application Server, you also install the ikeyman utility. The ikeyman utility is part of the Global Security Kit 7 (GSKit7).

If you issue the ikeyman.sh script on a Linux system, you might see the following message:

```
Warning: Cannot convert string
"-monotype-arial-regular-r-normal--*-140-*--p--iso8859-1"
to type FontStruct
```

You can safely ignore the warning and use the ikeyman utility.

The installer could not successfully add the product information into the RPM database.

If the last line in the log.txt file is something similar to the following example, the problem might be a corrupt RedHat Package Manager (RPM) database:

```
(Oct 17, 2004 4:02:16 PM),
Plugin.Install,
com.ibm.wizard.platform.linux.LinuxProductServiceImpl,
wrn, The installer could not successfully add the product
information into the RPM database. Installation will continue
as this is not critical to the installation of the product.
```

Run the following command to verify that the problem is a corrupt RPM database:

```
rpm -q --all
```

If the command hangs, the problem is a corrupt RPM database.

Error: java.io.IOException: konqueror: not found

The ISMP Launch Browser action of the Installation wizard or the Update Installer wizard throws the following exception on operating systems such as AIX or Linux:

```
com.installshield.wizardx.actions.LaunchBrowserAction, err, java.io.IOException:
konqueror: not found
STACK TRACE: 11
java.io.IOException: konqueror: not found
    at java.lang.UNIXProcess.forkAndExec(Native Method)
    at java.lang.UNIXProcess.<init>(UNIXProcess.java:72)
    at java.lang.Runtime.execInternal(Native Method)
    at java.lang.Runtime.exec(Runtime.java:602)
    at java.lang.Runtime.exec(Runtime.java:524)
    at java.lang.Runtime.exec(Runtime.java:490)
    at com.installshield.util.BrowserLauncher.openURL(BrowserLauncher.java:578)
    at com.installshield.wizardx.actions.LaunchBrowserAction.execute(LaunchBrowserAction
.java:62)
    at com.installshield.wizard.RunnableWizardBeanContext.run(RunnableWizardBeanContext.
java:21)
```

This action searches for a Netscape, Mozilla, or Konqueror browser for displaying an HTML page or a Web site. In the case of the Web server plug-ins for WebSphere Application Server, the target page is the Plug-ins roadmap. Even though the ISMP Launch Browser action might find Mozilla or Netscape, the exception is thrown and a log entry occurs.

You can safely ignore this error.

Chapter 9. Installing maintenance packages

You can use a single instance of the IBM Update Installer for WebSphere Software to install interim fixes, fix packs, and refresh packs for Version 6.0.2.21, V6.1, and V7.0.

Before you begin

Learn about important prerequisites, permissions, and precautions before installing a maintenance package by reviewing the topic *Installing maintenance packages overview*.

Note:

The V7.0 Update Installer supports multiple releases. The V7.0 Update Installer is also compatible with earlier releases; it works with V6.0.2.21 and newer maintenance and any maintenance for V6.1.0.x and V7.0 releases. This allows a single instance of the Update Installer to apply maintenance to more than one version of the application server. For V6.0.2.19 and previous releases, apply maintenance with the V6.0.2.x Update Installer.

The Update Installer has a file permission verification feature. This feature saves time and allows you to resolve potential file permission problems for Application Server maintenance before you install it.

The Update Installer can update language packs to add new languages.

The Update Installer supports updates for DMZ Secure Proxy Server.

The Update Installer is available in .tar format on Unix type operating systems.

When installing the Update Installer, you can choose to create or not create start menu shortcuts.

About this task

The following procedure describes how to install a maintenance package. See “Uninstalling maintenance packages” on page 175 for a description of how to roll back a maintenance package.

1. Log on as root on an operating system such as AIX or Linux, or log on as a member of the administrator group on a Windows system.

AIX **HP-UX** **Linux** **Solaris** In addition, verify that the umask setting is 022. To verify the umask setting, issue the following command:

```
umask
```

To set the umask setting to 022, issue the following command:

```
umask 022
```

2. Install the product that you intend to update.

If you already have the product installed, proceed to the next step.

3. Download the maintenance package *.pak file from the Support Web site into the maintenance directory.

Download maintenance packages for the Update Installer for WebSphere Software to install from the following IBM Web pages:

- Download maintenance packages for IBM WebSphere Extended Deployment from the IBM Support site for IBM WebSphere Extended Deployment.
- Download maintenance packages for Version 7.0 of the WebSphere Application Server products from the IBM Support site for WebSphere Application Server.

Note: Do not attempt to unzip or unpack the *.pak file. If your browser changes the download package from *.pak file to *.zip, do not attempt to unzip the package. Instead, rename the file to *.pak and proceed to the next step without unzipping the renamed *.pak file.

4. **Windows** Make sure that all application servers are stopped.

Run the **stopServer** command on all WebSphere Application Server profiles.

5. Stop all Java processes that use the IBM Software Developer Kit (SDK) that the WebSphere Application Server product provides.

Before installing or uninstalling interim fixes, fix packs, and refresh packs on a machine, stop all Java processes on the machine that use the IBM SDK, Java Technology Edition that WebSphere Application Server provides.

Stop all WebSphere Application Server-related Java processes that are running on the system where you are using the Update Installer program. For example, Java processes can include:

- All Java Virtual Machines (JVMs)
- WebSphere Application Server processes:
WebSphere Application Server processes include application server processes, such as the process created when server1 is running.
- IBM HTTP Server processes
- Web server processes that use a plug-in that you are updating
- First steps consoles
- Installation verification test (IVT) processes
- The Profile Management Tool
- Other InstallShield for Multiplatforms (ISMP) installation programs
- InstallShield for Multiplatforms uninstall programs
- The IBM Rational Application Developer Agent Controller

Stop all Java processes if necessary. If you install an interim fix while a WebSphere Application Server-related Java process runs, IBM does not guarantee that the product can continue to run successfully, or without error.

See the following technote for more information, Stop all WebSphere Application Server-related Java processes before using the Update Installer for WebSphere software.

6. Verify that the following prerequisite conditions are met:

- All of the product hardware and software prerequisites exist.
The official statement of supported hardware and software is on the Supported hardware and software Web site.
- The WebSphere software that you are updating is correctly installed and is not corrupt.
- The WebSphere SDK, Java technology edition is not corrupt.
- The user is root on a system such as AIX or Linux or a member of the administrator group on a Windows system.

7. Change directories to the *updi_root* directory and use the updatecommand to install the maintenance package.

For more information on root versus non-root for installing maintenance with the Update Installer, refer to “Using root or non-root when installing with the Update Installer” on page 202.

Use the following command syntax to install the last maintenance package that you downloaded. The Update Installer wizard runs in two modes: the silent mode, as a background process, and the regular mode, using the graphical user interface.

The Update Installer wizard does not display the graphical user interface when running in silent mode:

Windows
`update.bat -silent -options responsefile`

Vista

2008

update.exe -silent -options *responsefile*

AIX

HP-UX

Linux

Solaris

./update.sh -silent -options *responsefile*

There are three types of silent installation procedures that can be used with the Feature Pack for Web Servers. They are listed below:

- a. Installing a fix pack or refresh pack, refer to “Installing a fix pack with silent install” on page 181 for more information.
- b. Installing an interim fix or interim feature or test fix, refer to “Installing an interim fix, interim feature, or test fix with silent install” on page 183 for more information.
- c. Installing multiple maintenance packs, refer to “Installing multiple maintenance packs with silent install” on page 185 for more information.

The procedure using the Feature Pack for Web Services to uninstalling a fix pack, or interim fix, or interim feature are similar when using the silent uninstall.

Or, issue the update command to start the graphical user interface: Windows

update.bat

Vista

2008

update.exe

AIX

HP-UX

Linux

Solaris

./update.sh

There are three types of installation procedures that use the installation wizard graphical user interface with the Feature Pack for Web Services:

- a. Installing a fix pack or refresh pack, refer to “Installing a fix pack using the graphical user interface” on page 187 for more information.
- b. Installing an interim fix, interim feature, or test fix, refer to “Installing an interim fix, interim feature, or test fix using the graphical user interface” on page 190 for more information.
- c. Installing multiple maintenance packs, refer to “Installing multiple maintenance packs using the graphical user interface” on page 191 for more information.

The procedure for uninstalling is similar for fix packs, interim fixes, and interim features. Uninstall only one fix pack, interim fix, or interim feature at a time. To find out more about uninstalling a fix pack or refresh pack, refer to “Uninstalling a fix pack, interim fix, interim feature or test fix using the graphic user interface” on page 195 for more information.

The following tables show options that are available when using the update command.

The commands in the first table each start the Update Installer wizard with a graphical user interface. The command in the second table causes the Update Installer wizard to run in silent mode.

Table 41. Update installer commands for installing with the graphical interface

Command example	Description
update.bat	<p>Initializes the maintenance package field with the name of the maintenance package that has the most recent date stamp and time stamp.</p> <p>Accept all of the default values to install the maintenance package with the most recent time stamp.</p>

Table 41. Update installer commands for installing with the graphical interface (continued)

Command example	Description
update.bat -options "responsefiles/file_name"	Overrides all graphical interface values with values that you specified in the options response file. Always use a response file that is based on the response file under <i>updi_root/responsefiles</i> .
update.bat -W maintenance.package="e: \IBM\WebSphere\AppServer \updateinstaller\maintenance\ PQ20029.pak"	Overrides the name of the maintenance package to apply.
update.bat -W product.location="e: \IBM\WebSphere\AppServer"	Overrides the location of the WebSphere software to update.
update.bat -W product.location="e: \IBM\WebSphere\AppServer" -W maintenance.package="e: \IBM\WebSphere\AppServer \updateinstaller\maintenance\ PQ20029.pak"	Overrides the location of the WebSphere software to update and the name of the maintenance package to apply.
update.bat -OPT disableDiskSpaceCheck=true	Overrides the prerequisite check for disk space.

Specify an appropriate JOBQ parameter value to have the job run in a different subsystem. Verify that the storage pool that the job runs in has as much memory as possible.

The command in the following table starts the Update Installer wizard in silent mode without the graphical user interface:

Table 42. Update Installer command for installing in silent mode

Command example	Description
update.bat -silent -options "responsefiles/file_name"	Overrides all default values with values that you specified in the options response file. Always use a response file that is based on the response file under <i>updi_root/responsefiles</i> .

Results

This procedure results in installing maintenance packages to update WebSphere software.

What to do next

Click **Relaunch** on the last panel of the Update Installer to begin installing a second maintenance package.

After installing all maintenance packages, continue to use your WebSphere software.

Installing maintenance packages overview

Before you install maintenance to your WebSphere product, you should be familiar with the following important considerations and precautions.

Overview of the installation procedure

The Update Installer wizard is an InstallShield for Multiplatforms wizard that runs with either a graphical user interface or in silent mode with a response file.

1. Download, unpack, and install the Update Installer for WebSphere Software; or install the Update Installer that is on the WebSphere Application Server supplements disc. For more information, see the documentation on installing the Update Installer.

2. Download the most current version of the interim fix, fix pack, or refresh pack file from the Support site into the maintenance directory.

Note: If you have not installed features, such as language packs and samples, consider installing the features if there is a chance you might use them in the future. If you choose not to install the features and then later install maintenance, you will have to uninstall all maintenance, install the features, and then reapply all maintenance or the features might be corrupted.

3. Use the Update Installer to install the interim fix, fix pack, or refresh pack. The Update Installer creates a backup file in the *app_server_root/properties/version/nif/backup* directory. IBM does not support restoring a backup file that you have modified.

Permissions

Permissions can only be given to one user account. To install and launch the Update Installer, use the same user account that installed WebSphere Application Server, or give permission to another user. If permission is given to a non-root user, then the non-root user should give permission to the root user when finished installing maintenance. If the non-root user does not return permission to the root user, then the root user cannot read or write to the file system.

- To use the *updi_root* location, user accounts other than the account used to install WebSphere Application Server must have reading and running access. These accounts must also have writing access to the *updi_root/logs* directory and its subdirectory.
- To update the target WebSphere Application Server product location, user accounts other than the account used to install WebSphere Application Server must have full access (reading, writing, and running) to the target location where a maintenance package is to be applied. For example, if the user account does not have write access to *updi_root/logs*, then you might see the following exceptions from the standard output:

```
W      -1      mkdirs failed for: file:/home/nonroot/IBM/WebSphere/UpdateInstaller1/logs/tmp1
java.io.IOException: mkdirs failed for: file:/home/nonroot/IBM/WebSphere/UpdateInstaller1/logs/tmp1
    at com.ibm.ws.install.ni.framework.io.DiskFileSystem.mkdirs(DiskFileSystem.java:369)
    at com.ibm.ws.install.ni.framework.io.FileSystemEntry.mkdirs(FileSystemEntry.java:399)
    at com.ibm.ws.install.ni.framework.logging.TextLoggingBridge.createLogger(TextLoggingBridge.java:159)
    at com.ibm.ws.install.ni.framework.logging.TextLoggingBridge.init(TextLoggingBridge.java:45)
    at com.ibm.ws.install.ni.framework.plugin.NIFPlugin.createPlugin(NIFPlugin.java:782)
```

- **AIX** If a non-root user launches the Update Installer program, that user account must be able to run the *slibclean* command; otherwise, a root user must run the *slibclean* command whenever the Update Installer program is used.
- Ensure that processes from users are not locking files in the target location of a maintenance package.

Updating existing profiles in WebSphere Application Server products

The Update Installer updates the core product files in a WebSphere Application Server product. Service in a maintenance package might update the following files in the installation root directory:

- The SDK, Java technology edition, in the *java/jre* directory
- JAR files in the *lib* directory
- Scripts in the *bin* directory
- Profile templates

Some maintenance packages provide required service for existing profiles in addition to service for the core product files. Each maintenance package that has profile maintenance provides a script that changes the profile. The Update Installer prompts you to back up your configuration when installing a maintenance package that has required maintenance for profiles.

Some maintenance packages provide optional service for existing profiles. The readme file for the maintenance package describes whether the maintenance package contains optional service for existing profiles. If so, the readme file describes how to use the script provided with the maintenance package.

Use the backupConfig command to back up the configuration of each profile that the maintenance package can update. Or archive the `app_server_root/profiles` directory to back up all of the profiles at once.

If you uninstall a maintenance package, the Update Installer does not uninstall the maintenance package from profiles. The reason for not removing the maintenance is that you might have configured the profile after installing the maintenance. To restore an original profile, use the restoreConfig command or copy the profile from the archived `profile_root` directory to replace the changed profile.

Updating cluster members

Apply the same maintenance packages to all of the WebSphere Application Server installations 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 function improperly.

Required information

The graphical interface requires you to supply the following information:

Table 43. Information required when installing a maintenance package

Field	Valid values	Description
File path of the installation root directory of the WebSphere product or component. Installation root directory of the Update Installer. See <code>updi_root</code> for more information.	Identify the installation root directory for one of the following products: <ul style="list-style-type: none"> • IBM WebSphere Application Server • IBM WebSphere Application Server - Express • Embedded version of the IBM WebSphere Application Server - Express • IBM WebSphere Application Server Network Deployment • IBM WebSphere Extended Deployment • IBM Application Client for WebSphere Application Server • IBM WebSphere Business Integration Server Foundation • Web server plug-ins for WebSphere Application Server 	Download, unpack, and install the Update Installer for WebSphere Software. Or install the Update Installer that is on the WebSphere Application Server supplements disc. Install the Update Installer into each component that you intend to update. The Update Installer application updates the product in its parent directory by default.
File name of the maintenance package to install.	Select a maintenance package to install from the maintenance directory.	The default maintenance package is the package with the latest date stamp and time stamp.

install.txt

The Update Installer for WebSphere Software can use a response file to install maintenance packages from a command line interface.

The Update Installer for WebSphere Software reads the response file to determine installation choices. The Update Installer installs the maintenance package in silent mode instead of displaying a graphical user interface.

The install.txt file has one directive that identifies the backup file for installing a service update. Comments in the file describe how to set the string value.

Location of the response file

The sample response file is named install.txt. The file is in the *updi_root/responsefiles* directory after you install the Update Installer for WebSphere Software into the installation root directory of the WebSphere software product.

Installing silently

The response file supplies the values to the Update installer when installing silently. The Update Installer reads the response file to determine responses and does not display the graphical user interface.

The following command uses a copy of the response file named myresponsefile.txt to provide installation option responses during a silent installation:

```
./update.sh -options "responsefiles/myresponsefile.txt" -silent
```

If you do not use the `-silent` option, the wizard uses the response file to provide initial values for the graphical interface:

```
./update.sh -options "responsefiles/myresponsefile.txt"
```

Response file user entry validation

In a silent installation, response file validation is coded into the installation. If the validation does not pass, the failure is recorded in the log files in the *app_server_root/logs/update/tmp* directory.

Location of the maintenance package to be installed

Default directive setting

```
-W maintenance.package=""
```

Note: If no package is specified, maintenance packages from the default folder (such as, `UpdateInstaller_HOME\maintenance`) are installed.

Valid setting

You must set this directive to the location of the maintenance package PAK file. For example, you might specify the following location on a Linux system:

```
/opt/IBM/WebSphere/AppServer/updateinstaller/maintenance/PQ20029.pak
```

Error identifiers:

- Maintenance package *maintenance_package_name* is already installed on the system.
- Selected product is not supported.
- Configuration failed. The config action that failed was: *configuration_action*.
- Install the following prerequisite APARs before installing the current maintenance to the target product: *list_of_prerequisite_maintenance_packages_to_install*
- Install the following prerequisite maintenance packages before installing the package you are currently attempting to install: *list_of_prerequisite_maintenance_packages_to_install*

- Uninstall the following APARs before applying the current maintenance to the target product: *list_of_prerequisite_maintenance_packages_to_uninstall*
- Uninstall the following maintenance packages before applying the current maintenance to the target product: *list_of_prerequisite_maintenance_packages_to_uninstall*
- Unable to locate the correct version of *the_update_installer*. Looking for version *version_identifier*.
- *Maintenance_package* is not a valid maintenance package.

Product location

Default directive setting

-W product.location="*SPECIFY_PRODUCT_INSTALL_LOCATION_HERE*"

Valid setting

Set this directive to the installation root directory of the product. For example, you might specify the following location on a Linux system:

/opt/IBM/WebSphere/AppServer2

Error identifiers:

- Maintenance package *maintenance_package_name* is already installed on the system.
- Selected product is not supported.
- Configuration failed. The config action that failed was: *configuration_action*.
- Install the following prerequisite APARs before installing the current maintenance to the target product: *list_of_prerequisite_maintenance_packages_to_install*
- Install the following prerequisite maintenance packages before installing the package you are currently attempting to install: *list_of_prerequisite_maintenance_packages_to_install*
- Uninstall the following APARs before applying the current maintenance to the target product: *list_of_prerequisite_maintenance_packages_to_uninstall*
- Uninstall the following maintenance packages before applying the current maintenance to the target product: *list_of_prerequisite_maintenance_packages_to_uninstall*
- Unable to locate the correct version of *the_update_installer*. Looking for version *version_identifier*.
- *Maintenance_package* is not a valid maintenance package.
- *Alternate_product_directory* could not be validated as an existing directory.

Usage notes

- The response file is not a read-only file.
- Edit this file directly with your flat file editor of choice, such as Kate on SLES or WordPad on a Windows platform.
- The file must exist to perform a silent installation. The Update installer reads this file to determine installation parameters. Provide the fully qualified file path to the backup file.
- Save the copy of the response file in the responsefiles directory for best results.

Example install.txt file

Edit the version of the response file that is included in the Update Installer for WebSphere Software ZIP file. The following example is not guaranteed to be an accurate representation of the actual file.

```
#####
#
# This is the silent install response file for installing maintenance packages
# using the update installer.
#
# A common use of an options file is to run the wizard in silent mode. This lets
# the options file author specify wizard settings without having to run the
```

```

# wizard in graphical or console mode. To use this options file for silent mode
# execution, *uncomment* and modify the parameters defined within.
#
# Use the following command line when running the wizard from the update
# installer directory:
#
#   update -options responsefiles/install.txt
#
# Please enclose all values within a single pair of double quotes.
#
#####

#####
#
# This section describes how to apply a maintenance package using the full filename specifications to be installed.
# There are three ways you can specify installing a maintenance package. They are the following:
# (Use the examples below and edit where appropriate.)
#
# 1. Specify a single maintenance package full filename to be installed.
#
#   For example:
#   -W maintenance.package="/QIBM/ProdData/WebSphere/UpdateInstaller/V61/UPDI/maintenance/PQ20029.pak"
#
# 2. Specify a multiple maintenance package full filename to be installed.
#   - Use a semicolon to separate the full filename specifications.
#   - Update Installer will install the latest applicable maintenance in the order listed.
#
#   For example:
#   -W maintenance.package="/QIBM/ProdData/WebSphere/UpdateInstaller/V61/UPDI/maintenance/PQ20029.pak;
#   /QIBM/ProdData/WebSphere/UpdateInstaller/V61/UPDI/maintenance/PQ20030.pak";"
#
# 3. Specify a full folder name that contains the maintenance packages.
#   Update Installer will install the latest applicable maintenance in the order listed in the folder.
#
#   For example:
#   -W maintenance.package="/QIBM/ProdData/WebSphere/UpdateInstaller/V61/UPDI/maintenance"
#
# Notes: If no package is specified, maintenance packages from the default folder (such as, UpdateInstaller_HOME\maintenance )
#        will be installed.
#
#-W maintenance.package=""

#####
#
# Prerequisite Checking
#
# The update installer checks the system for prerequisites by default.
#
# Uncomment the following option to notify the installer to continue with
# the update and log the warnings even though prerequisite checking
# failed.
#
#-OPT disableNonBlockingPrereqChecking="true"

#####
#
# Used to input the product install location that will be updated.
#
# ie. -W product.location="/QIBM/ProdData/WebSphere/AppServer/V61/Express"
#
# Note: The product install location should always been specified, and it should
# always be the full path.
#
#-W product.location=""

#####

```

```
#
# Do not edit these values.
#
-W update.type="install"
```

Installing the Update Installer for WebSphere Software

The Update Installer for WebSphere Software has a new installation program for Version 7.0, Installation Wizard for the Update Installer.

Before you begin

A single installation of the Update Installer can be used to install maintenance on the following WebSphere software products:

- IBM WebSphere Application Server Version 6 or above
- IBM WebSphere Application Server Network Deployment Version 6 or above
- IBM WebSphere Application Server - Express Version 6 or above
- IBM Application Client for WebSphere Application Server Version 6 or above
- Web server plug-ins for WebSphere Application Server Version 6 or above
- IBM WebSphere Extended Deployment Version 5.1 or above
- IBM HTTP Server Version 6 or above
- IBM WebSphere Process Server Version 6.0 or above
- IBM WebSphere Enterprise Service Bus Version 6.0.1 or above

The Update Installer ships on the Version 7.0 supplements disc.

The Update Installer undergoes regular maintenance and offers updated versions on the WebSphere software support pages. See Recommended Updates for WebSphere Application Server. Look under your release of the WebSphere software for a link to the Update Installer download page.

Note:

- Only one copy of the Update Installer should be installed on your system at one time for use with all Version 7.0 products.
- The user account that originally installed the WebSphere Application Server product to be updated should be used to launch the Installation Wizard to install the Update Installer, and the same user account should be used to launch the Update Installer program to update a product.
 - When a different user account uses the *updi_root* location, that user account must have reading and running access to that location. It must also have writing access to the *updi_root/logs* directory and its subdirectory.
 - When a different user account is used to update the target WebSphere Application Server product location, that user account must have full access (reading, writing, and running) to the target location where a maintenance package is to be applied.
- **AIX** If a non-root user launches the Update Installer program, then that user account must be able to run the *slibclean* command; otherwise, a root user must run the *slibclean* command whenever the Update Installer program is used.
- Make sure that no processes from any users are locking any files in the target location where a maintenance package is to be installed.

Hardware and software requirements

The hardware and software requirements for the Update Installer are the same as the product or component requirements that the Update Installer is used to update. For example, you can use the Update

Installer to install maintenance for WebSphere software on distributed platforms and iSeries platforms. The Update Installer does not install maintenance for WebSphere Application Server for z/OS.

The official statements of support for hardware and software for the IBM WebSphere Application Server Version 7.0 are on the IBM WebSphere Application Server supported hardware and software Web site. 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.

About this task

You can install the Update Installer either with a graphical user interface or in silent mode. To install the Update Installer silently, issue the install -silent command. The following steps demonstrate how to install the Update Installer with a graphical user interface.

1. Install one of the products that the Update Installer can update.
See Chapter 6, “Installing the product and additional software,” on page 75 for more information.
2. Insert the supplements disc in a disc drive.
Mount the drive if necessary.
3. Change directories to the UpdateInstaller directory on the supplements disc.
4. Issue the install command to use the graphical user interface.
5. The installation wizard initializes and displays the **Welcome** panel. Click **Next** to continue.
6. The **License agreement** panel is displayed. Read the license agreement and accept its terms. After you accept the licensing terms, the installation wizard checks for a supported operating system and prerequisite patches. If you encounter a problem such as not having the right prerequisite updates on your system, cancel the installation, make the required changes, and restart the installation.
7. The **Installation directory** panel is displayed. Specify the destination of the installation root directory.
8. Select **Create a start menu icon** to create a shortcut for the Update Installer. Deselect this checkbox if you do not need a shortcut for the Update Installer in your start menu. Click **Next** to continue.
9. The **Installation summary** panel appears. Review the summary. Click **Next** to begin the installation or click **Back** to make changes to previous panels.
10. The **Installation results** panel is displayed. Verify the success of the installer program by examining the completion panel.
 - a. If you would like to launch the Update Installer upon completion of the installation, select **Launch Update Installer for WebSphere Software on exit**.
 - b. Click **Next** to continue.

Results

The Update Installer is installed under the root directory that you specified during installation.

What to do next

See Chapter 9, “Installing maintenance packages,” on page 163 for information about using the Update Installer to install maintenance packages.

Uninstalling the Update Installer for WebSphere Software

The Update Installer for WebSphere Software has a new installation and uninstallation program for Version 7.0, Installation Wizard for the Update Installer.

Before you begin

Note: Only one copy of the Update Installer should be installed on your system at any one time for use with all Version 7.0 products.

About this task

The Update Installer uses the Common Install Engine for WebSphere Software. Part of the Common Installer is the uninstaller program that is generated when ISMP installs the Update Installer. This procedure explains how to use the uninstaller program for the Update Installer.

1. Change directories to the Update Installer root directory that you specified during installation.
2. Issue the `uninstall` or `uninstall -silent` command.

HP-UX

Linux

Solaris

```
./uninstall.sh
```

Windows

```
uninstall.bat
```

AIX

```
uninstall
```

See the description of the “uninstall command” on page 207 for more information.

Results

The Update Installer is removed from the product.

What to do next

Go to “Updating the Update Installer for WebSphere Software” for information on downloading and installing the most current version of the Update Installer.

Updating the Update Installer for WebSphere Software

This topic describes how to get the most recent version of the Update Installer for WebSphere Software.

Before you begin

Note: Only one copy of the Update Installer should be installed on your system at any one time for use with all products.

To get the latest copy of the Update Installer, download the most current version from the support site and reinstall it. The Update Installer ships on the Version 7.0 supplements disk. The Update Installer undergoes regular maintenance and offers updated versions on the WebSphere software support pages.

See Recommended Updates for WebSphere Application Server. Look under your release of the WebSphere software for a link to the Update Installer download page.

About this task

1. Download the latest Update Installer files from the product Support site.
See Recommended Updates for WebSphere Application Server to locate the Update Installer download page.
2. Extract the contents of the zip file to a directory on the system from which you will perform the install.
3. Install the new Update Installer.

For detailed information about installing the update installer, see the installing the product chapter or the *Installing your application serving environment* PDF book.

Results

The Update Installer is installed under the root directory that you specified during installation.

What to do next

See Chapter 9, “Installing maintenance packages,” on page 163 for information about using the Update Installer to install maintenance packages.

Uninstalling maintenance packages

You can use the Update Installer for WebSphere Software to uninstall interim fixes, fix packs, and refresh packs or you can uninstall maintenance in silent mode.

Before you begin

The Update Installer wizard is an InstallShield for Multiplatforms wizard that runs with either a graphical user interface or in silent mode with a response file.

Use the proper authorizations to successfully uninstall product updates. Use the update installer program as the root user on a Linux or UNIX[®] platform, or as the administrator on a Windows platform.

Note: See “Update command - known problems and workarounds” on page 202 for information about known problems and workarounds.

The following descriptions contain reference information about uninstalling interim fixes, fix packs, and refresh packs on WebSphere Application Server products:

Viewing the fix level of the node

You can use the `versionInfo` command in the `app_server_root/bin` directory to display the exact fix and version level of the product. However, **do not** use the `versionInfo` command while installing or uninstalling a maintenance package.

Do not launch multiple copies of the Update Installer wizard at one time: Concurrent launches of the update installer program are not supported. Performing more than one update at the same time can produce unpredictable results, which might include a failed or faulty installation.

Required information

The graphical interface requires the following information that you must supply:

Table 44. Information required when uninstalling a maintenance package

Field	Valid values	Description
File path of the installation root directory of the WebSphere product and the Update Installer	Identify the installation root directory for one of the following products: <ul style="list-style-type: none"> • IBM WebSphere Application Server • IBM WebSphere Application Server - Express • Embedded version of the IBM WebSphere Application Server - Express • IBM WebSphere Application Server Network Deployment • IBM Application Client for WebSphere Application Server • Web server plug-ins for WebSphere Application Server 	The Update Installer application defaults to the last-visited product location.
File name of the maintenance package to uninstall.	Select a maintenance package to uninstall from the <i>app_server_root/properties/version/update/backup</i> directory.	The default maintenance package is the package with the latest date stamp and time stamp in the <i>app_server_root/properties/version/update/backup</i> directory.

About this task

The following procedure describes how to uninstall a maintenance package using the graphical user interface and silent mode.

1. Log on to the operating system.

Linux **UNIX** In addition, verify that the umask setting is 022. To verify the umask setting, issue the following command:

```
umask
```

To set the umask setting to 022, issue the following command:

```
umask 022
```

2. Change directories to the *updi_root* directory.
3. **Windows** Use the Windows Services panel to stop all services for WebSphere Application Server processes.
4. Stop all Java processes that use the IBM Software Developer Kit (SDK) that the WebSphere Application Server product provides.

Before uninstalling interim fixes, fix packs, and refresh 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, such as the process created when *server1* is running.

Stop all Java processes if necessary. If you uninstall a maintenance package while a WebSphere Application Server-related Java process runs, IBM does not guarantee that the product can continue to run successfully, or without error.

5. Use the update installer to uninstall the maintenance package.

Issue one of the following commands to uninstall with the graphical interface:

Table 45. Update installer commands for uninstalling with the graphical interface

Command example	Type of installation	Description
update.bat -W update.type="uninstall"	Graphical interface mode	Initializes the maintenance package field with the name of the maintenance package that was most recently installed. Accept all of the default values to uninstall the maintenance package with the most recent date stamp and time stamp.
update.bat -W product.location="e:\IBM\WebSphere\AppServer" -W update.type="uninstall"	Graphical interface mode	Overrides the graphical interface with the location of the WebSphere software to update. The default maintenance package to uninstall is the most recently installed maintenance package for that software.
update.bat -W backup.package="PQ20029.pak" -W update.type="uninstall"	Graphical interface mode	Overrides the maintenance package field with the name of the maintenance package to uninstall.
update.bat -W product.location="e:\IBM\WebSphere\AppServer" -W backup.package="PQ20029.pak" -W update.type="uninstall"	Graphical interface mode	Overrides the location of the WebSphere software to update and the name of the maintenance package to uninstall.
update.bat -options "responsefiles/file_name"	Graphical interface mode with an options file	Overrides all default values with values that you specified in the options response file. If you omit either value from the response file, the default maintenance package is the installed package with the most recent date stamp and time stamp. The default software is the software installed in the parent directory.

Issue the following command to use the silent interface:

Table 46. Update installer command for uninstalling in silent mode

Command example	Type of installation	Description
update.bat -W backup.package="PQ20029.pak" -W update.type="uninstall"	Silent mode with an options file	Overrides all default values with values that you specified in the options response file. Always use a response file that is based on the response file under <i>updi_root</i> /responsefiles.

Note: The commands for installing and uninstalling maintenance silently are different. Installation requires specifying the maintenance package using maintenance.package and uninstallation requires backup.package

For example:

- Install maintenance silently: update.bat -W maintenance.package="e:\IBM\WebSphere\AppServer\updateinstaller\maintenance\PQ20029.pak"

- Uninstall maintenance silently: `update.bat -W backup.package="PQ20029.pak" -W update.type="uninstall"`

Results

This procedure results in uninstalling maintenance packages to update WebSphere software.

Note: The Update Installer should not check OS prerequisites when uninstalling Custom Installation Package created by the Install Factory. When you launch the Update Installer to uninstall a Custom Installation Package, additional command line options need to be passed into Update Installer to disable OS prerequisite checking. These command line options are:

```
-W maintenancewarningprereqcheckactionInstallWizardBean.active=false -W
prereqswarningpanelInstallWizardBean.active=false -W
maintenanceprereqcheckactionInstallWizardBean.active=false -W
prereqfailedpanelInstallWizardBean.active=false
```

On Windows issue the command:

```
update.bat -W maintenancewarningprereqcheckactionInstallWizardBean.active=false -W
prereqswarningpanelInstallWizardBean.active=false -W
maintenanceprereqcheckactionInstallWizardBean.active=false -W
prereqfailedpanelInstallWizardBean.active=false
```

On operating systems such as AIX or Linux, issue the command:

```
./update.sh -W maintenancewarningprereqcheckactionInstallWizardBean.active=false -W
prereqswarningpanelInstallWizardBean.active=false -W
maintenanceprereqcheckactionInstallWizardBean.active=false -W
prereqfailedpanelInstallWizardBean.active=false
```

What to do next

After uninstalling maintenance packages, you can continue to use the WebSphere software.

Rolling back changes to existing profiles: Some maintenance packages for WebSphere Application Server products update existing profiles. If you roll back a maintenance package that contains a profile update, also use any undo scripts provided with the profile update script to roll back changes to the existing profiles.

The readme file for a maintenance package describes scripts that update and scripts that roll back profile fix levels.

Deleting profiles created by a service level that is now rolled back: Profiles should be at a service level that is less than or equal to the service level of the WebSphere Application Server product. For example, if you install a fix pack, create a profile, and then uninstall the fix pack, then you must also delete the profile.

uninstall.txt

The Update Installer for WebSphere Software can use a response file to uninstall maintenance packages from a command line interface.

The `uninstall.txt` file has one directive that identifies the backup file for uninstalling a service update. Comments in the file describe how to set the string value.

The Update Installer for WebSphere Software wizard reads the options file to determine your uninstallation choices. The Update Installer uninstalls the maintenance package in silent mode, instead of displaying a graphical user interface.

Location of the response file

The sample options response file is named `uninstall.txt`. The file is located in the `updi_root/responsefiles` directory after you unzip the Update Installer for WebSphere Software into the installation root directory of the WebSphere software product.

Uninstalling silently

The options file supplies the values to the Update installer wizard when uninstalling silently. The wizard reads the options file to determine responses and does not display the graphical user interface.

The following command uses a copy of the options file named `myresponsefile.txt` to provide uninstall option responses during a silent uninstall:

```
./update.sh -options "responsefiles/myresponsefile.txt" -silent
```

If you do not use the `-silent` option, the wizard uses the response file to provide initial values for the graphical interface:

```
./update.sh -options "responsefiles/myresponsefile.txt"
```

Note: The commands for installing and uninstalling maintenance silently are different. Installation requires specifying the maintenance package using `maintenance.package` and uninstallation requires `backup.package`

For example:

- Install maintenance silently: `update.bat -W maintenance.package="e: \IBM\WebSphere\ AppServer \updateinstaller\maintenance\ PQ20029.pak"`
- Uninstall maintenance silently: `update.bat -W backup.package="PQ20029.pak" -W update.type="uninstall"`

Response file user entry validation

In a silent uninstall, response file validation has been coded into the uninstall process. If the validation does not pass, the failure is recorded in the log files in the `app_server_root/logs/update/tmp` directory.

Location of the maintenance package to be uninstalled

Default directive setting

```
-W backup.package=""
```

Valid setting

You must set this directive to the location of the backup file. The backup file reverses the application of the maintenance. For example, you might specify the following location on a Linux system:

```
/opt/properties/version/nif/backup/maintenance_package_to_uninstall
```

Error identifiers:

- The maintenance package cannot be uninstalled. Uninstalling the maintenance would break the following superseding maintenance packages. Uninstall the superseding maintenance packages first: *list_of_superseding_maintenance_packages*
- This maintenance package cannot be uninstalled. The following maintenance packages are dependent on the package that you are attempting to uninstall: *list_of_dependent_maintenance_packages*
- This maintenance package cannot be uninstalled. The following maintenance packages are dependent on the APARs you are attempting to uninstall: *list_of_dependent_maintenance_packages*
- No installation backup packages are available for uninstalling maintenance.

Product location

Although uninstalling maintenance from another product is possible, always use the Update installer wizard from the directory structure of the product that you are updating if possible. Problems can occur when a mismatch between product SDKs occurs, for example.

Do not use this directive unless absolutely necessary.

Default directive setting

`-W product.location="SPECIFY_PRODUCT_INSTALL_LOCATION_HERE"`

Valid setting

You must set this directive to the installation root directory of the alternate product. For example, you might specify the following location on a Linux system:

`/opt/IBM/WebSphere/AppServer2`

Error identifiers:

- The maintenance package cannot be uninstalled. Uninstalling the maintenance would break the following superseding maintenance packages. Uninstall the superseding maintenance packages first: *list_of_superseding_maintenance_packages*
- This maintenance package cannot be uninstalled. The following maintenance packages are dependent on the package that you are attempting to uninstall: *list_of_dependent_maintenance_packages*
- This maintenance package cannot be uninstalled. The following maintenance packages are dependent on the APARs you are attempting to uninstall: *list_of_dependent_maintenance_packages*
- No installation backup packages are available for uninstalling maintenance.

Usage notes

- The file is not a read-only file.
- Edit this file directly with your flat file editor of choice, such as Kate on SLES or WordPad on a Windows platform.
- The file must exist to perform a silent uninstall. The Update installer wizard reads this file to determine uninstall parameters. Provide the fully qualified file path to the backup file.
- Save the copy of the options file in the responsefiles directory for best results.

Example uninstall.txt file

Edit the version of the file that is included in the Update Installer for WebSphere Software ZIP file. The following example is not guaranteed to be an accurate representation of the actual file.

```
#####  
#  
# This is the silent install response file for uninstalling maintenance packages  
# using the update installer.  
#  
# A common use of an options file is to run the wizard in silent mode. This lets  
# the options file author specify wizard settings without having to run the  
# wizard in graphical or console mode. To use this options file for silent mode  
# execution, *uncomment* and modify the parameters defined within.  
#  
# Use the following command line when running the wizard from the update  
# installer directory:  
#  
#   update -options responsefiles/uninstall.txt -silent  
#  
# Please enclose all values within a single pair of double quotes.  
#  
#####  
  
#####  
#  
# Used to input the maintenance backup package filename to be uninstalled.  
# This is the same filename as the package that was originally installed.
```

```

# A maintenance package can only be uninstalled if a backup package exists.
#
# ie. -W backup.package="PQ20029.pak"
#
# Note: If no package is specified, a default of the last installed maintenance
# package will be used.
#
#-W backup.package=""

#####
#
# Used to modify the product install location that will be updated.
# This value should be left commented out if the Update Installer is
# being run from the recommended location
#
# ie. -W product.location="C:\Program Files\IBM\WebSphere\AppServer"
#
# Note: The product install location should always been specified, and it should
# always be the full path.
#
-W product.location="<SPECIFY_PRODUCT_INSTALL_LOCATION_HERE>"

#####
#
# Do not edit these values.
#
-W update.type="uninstall"

```

Installing a fix pack with silent install

If you would like to install maintenance without the graphical user interface, you can use the Update Installer for WebSphere Software to install a fix pack in silent mode.

Before you begin

Ensure that the most recent version of the Update Installer is installed on a target system locally.

About this task

1. Download the required fix pack from the official IBM support Web site into the *updi_root/maintenance* directory.
2. Ensure that all running processes have been stopped.
3. Edit a response file. The one located at the bottom of this page can be used as an example. There are also sample response files found in the *updi_root/responsefiles* directory.
 - a. Specify the location of the product to the response file.
 - b. Specify the choice of *install* maintenance in the response file. For example: `-W update.type="install"`
 - c. Add the maintenance location where packages can be found to the response file.
4. Run the Update Installer.

For example:

Windows

```
update.bat -silent -options "responsefiles\file_name"
```

Vista

2008

```
update.exe -silent -options "responsefiles\file_name"
```

```
./update.sh -silent -options "responsefiles/file_name"
```

- Review the log file to verify that maintenance is installed successfully. You can find the log at *app_server_root/logs/update/maintenance_package.install*. If the maintenance package is not applicable to the installation, a log file found in *updi_root/logs/tempX* lists the reason for the failure. The most recent log file, *tmpX*, where *X* refers to the first available empty directory, is created to reflect the status for this attempted install. You might not receive an error message for a failed installation in some cases. If you silently install a maintenance package and you do not receive a response after a short period of time, view the logs. If logs are not generated, then an invalid or missing argument might be causing the installation to fail. Verify the Update Installer syntax for the command line with the response files *install.txt* and *uninstall.txt*, located under *<Installed_UPDI_root>/responsefiles*

Results

One of the following results appears in the log:

INSTCONFSUCCESS

The operation was a success.

INSTCONFPARTIALSUCCESS

The operation was partially successful, refer to the log for more details.

INSTCONFFAILED

The operation failed, refer to the log for more details. In some cases, you might not receive an error message for a failed installation. If you silently install a maintenance package and you do not receive a response after a short period of time, view the logs. If logs are not generated, then an invalid or missing argument might be causing the installation to fail. Verify the Update Installer syntax for the command line with the response files *install.txt* and *uninstall.txt*, located under *<Installed_UPDI_root>/responsefiles*

Example

The following example is a sample response file used in a silent installation:

```
#####
#
# This is the silent install response file for installing maintenance packages
# using the update installer.
#
# A common use of an options file is to run the wizard in silent mode. This lets
# the options file author specify wizard settings without having to run the
# wizard in graphical or console mode. To use this options file for silent mode
# execution, *uncomment* and modify the parameters defined within.
#
# Use the following command line when running the wizard from the update
# installer directory:
#
#   update -options responsefiles/install.txt
#
# Please enclose all values within a single pair of double quotes.
#
#####

#####
#
# This section describes how to apply a maintenance package using the full filename specifications to be installed.
# There are three ways you can specify installing a maintenance package. They are the following:
# (Use the examples below and edit where appropriate.)
#
# 1. Specify a single maintenance package full filename to be installed.
#
#   For example:
#   -W maintenance.package="/QIBM/ProdData/WebSphere/UpdateInstaller/V61/UPDI/maintenance/PQ20029.pak"
#
# 2. Specify a multiple maintenance package full filename to be installed.
#   - Use a semicolon to separate the full filename specifications.
#   - Update Installer will install the latest applicable maintenance in the order listed.
#
#   For example:
#   -W maintenance.package="/QIBM/ProdData/WebSphere/UpdateInstaller/V61/UPDI/maintenance/PQ20029.pak;
#   /QIBM/ProdData/WebSphere/UpdateInstaller/V61/UPDI/maintenance/PQ20030.pak";"
```



```

#
# 3. Specify a full folder name that contains the maintenance packages.
# Update Installer will install the latest applicable maintenance in the order listed in the folder.
#
# For example:
# -W maintenance.package="/QIBM/ProdData/WebSphere/UpdateInstaller/V61/UPDI/maintenance"
#
# Notes: If no package is specified, maintenance packages from the default folder
# (such as, UpdateInstaller_HOME\maintenance )
# will be installed.
#
#-W maintenance.package=

#####
#
# Prerequisite Checking
#
# The update installer checks the system for prerequisites by default.
#
# Uncomment the following option to notify the installer to continue with
# the update and log the warnings even though prerequisite checking
# failed.
#
#-OPT disableNonBlockingPrereqChecking="true"

#####
#
# Used to input the product install location that will be updated.
#
# ie. -W product.location="/QIBM/ProdData/WebSphere/AppServer/V61/Express"
#
# Note: The product install location should always been specified, and it should
# always be the full path.
#
-W product.location=""

#####
#
# Do not edit these values.
#
-W update.type="install"

```

Installing an interim fix, interim feature, or test fix with silent install

You can use the Update Installer for WebSphere Software to install an interim fix, interim feature, or test fix using the silent installation option.

Before you begin

Ensure that the most recent version of the Update Installer is installed on a target system locally.

About this task

The following steps lead you through the process of applying maintenance to an interim fix, interim feature, or test fix pack using the silent mode.

1. Ensure that the most recent version of the Update Installer is installed on a target system locally.
2. Download the required interim fix, interim feature, or test fix pack from the official IBM support Web site into the *updi_root/maintenance* directory.
3. Ensure that all running processes have been stopped.
4. Edit the response file. An example of a response file is located at the bottom of this article.
 - a. The location of the product needs to be added to the response file.
 - b. Specify the choice of *Install* maintenance in the response file.
 - c. Add the maintenance location where packages can be found to the response file. Provide the directory name that contains the packages.

In the response file, point to the interim fix, interim feature, or test fix directory that contains the package to be installed.

5. Run the Update Installer.

For example:

Windows

```
update.bat -silent -options "responsefiles\file_name"
```

Vista

2008

```
update.exe -silent -options "responsefiles\file_name"
```

AIX

HP-UX

Linux

Solaris

```
./update.sh -silent -options "responsefiles/file_name"
```

6. Review the log to verify that the maintenance is applied successfully. The log can be found at `app_server_root/logs/update/maintenance_package.install`.

Results

You can find one of the following results in the log:

INSTCONFSUCCESS

The operation was a success.

INSTCONFPARTIALSUCCESS

The operation was partially successful, refer to the log for more details.

INSTCONFFAILED

The operation failed, refer to the log for more details.

Example

The following is a sample of a response file used by the Update Installer to install an interim fix, interim feature, or test fix using the silent installer.

```
#####
#
# This is the silent install response file for installing maintenance packages
# using the update installer.
#
# A common use of an options file is to run the wizard in silent mode. This lets
# the options file author specify wizard settings without having to run the
# wizard in graphical or console mode. To use this options file for silent mode
# execution, *uncomment* and modify the parameters defined within.
#
# Use the following command line when running the wizard from the update
# installer directory:
#
#   update -options responsefiles/install.txt
#
# Please enclose all values within a single pair of double quotes.
#####

#####
#
# This section describes how to apply a maintenance package using the full filename specifications to be installed.
# There are three ways you can specify installing a maintenance package. They are the following:
# (Use the examples below and edit where appropriate.)
#
# 1. Specify a single maintenance package full filename to be installed.
#
#   For example:
#   -W maintenance.package="/QIBM/ProdData/WebSphere/UpdateInstaller/V61/UPDI/maintenance/PQ20029.pak"
#
# 2. Specify a multiple maintenance package full filename to be installed.
#   - Use a semicolon to separate the full filename specifications.
#   - Update Installer will install the latest applicable maintenance in the order listed.
#
#   For example:
#   -W maintenance.package="/QIBM/ProdData/WebSphere/UpdateInstaller/V61/UPDI/maintenance/PQ20029.pak;
#   /QIBM/ProdData/WebSphere/UpdateInstaller/V61/UPDI/maintenance/PQ20030.pak";
#
# 3. Specify a full folder name that contains the maintenance packages.
#   Update Installer will install the latest applicable maintenance in the order listed in the folder.
#
#   For example:
```

```

# -W maintenance.package="/QIBM/ProdData/WebSphere/UpdateInstaller/V61/UPDI/maintenance"
#
# Notes: If no package is specified, maintenance packages from the default folder
# (such as, UpdateInstaller_HOME\maintenance )
# will be installed.
#
#-W maintenance.package=

#####
#
# Prerequisite Checking
#
# The update installer checks the system for prerequisites by default.
#
# Uncomment the following option to notify the installer to continue with
# the update and log the warnings even though prerequisite checking
# failed.
#
#-OPT disableNonBlockingPrereqChecking="true"

#####
#
# Used to input the product install location that will be updated.
#
# ie. -W product.location="/QIBM/ProdData/WebSphere/AppServer/V61/Express"
#
# Note: The product install location should always been specified, and it should
# always be the full path.
#
-W product.location=""

#####
#
# Do not edit these values.
#
-W update.type="install"

```

Installing multiple maintenance packs with silent install

This topic describes how to use the Update Installer for WebSphere Software to install multiple maintenance packages using the silent install option. This feature can install maintenance for WebSphere Application Server and all stack products installed in the same WebSphere Application Server home directory.

Before you begin

Ensure that the most recent version of the Update Installer is installed on a target system locally.

About this task

The Update Installer is capable of automatically selecting the recommended maintenance for a product stack and determining the appropriate installation sort order of the maintenance packages. For example, if multiple feature packs are both installed and there is a recommended fix pack and interim fix for each product, the Update Installer can determine if this maintenance is applicable and install them in the correct order. The following steps lead you through the process of installing multiple maintenance packages using the silent mode.

1. Ensure that the most recent version of the Update Installer is installed on a target system locally.
2. Download all the required maintenance packages from the official IBM support Web site into the *updi_root*/maintenance directory.
3. Ensure that all running processes have been stopped.
4. Edit the response file. An example of a response file is located at the bottom of this pane.
 - a. The location of the product needs to be added to the response file.
 - b. Specify the choice of *Install* maintenance in the response file.
 - c. Add the maintenance location where packages can be found to the response file.

There are two options for installing the fix pack:

- 1) In the response file, point to the directory containing the fix packages and allow the Update Installer to determine which maintenance packages to install.
 - 2) In the response file, provide a list of all the maintenance packages you want installed, with their complete file path.
5. Run the Update Installer.

For example:

Windows

```
update.bat -silent -options "responsefiles\file_name"
```

Vista

2008

```
update.exe -silent -options "responsefiles\file_name"
```

AIX

HP-UX

Linux

Solaris

```
./update.sh -silent -options "responsefiles/file_name"
```

6. Review the log to ensure maintenance was applied successfully. The log can be found at *app_server_root/logs/update/maintenance_package.install*.

Results

One of the following results will appear in the log.

INSTCONFSUCCESS

The operation was a success.

INSTCONFPARTIALSUCCESS

The operation was partially successful, refer to the log for more details.

INSTCONFFAILED

The operation failed, refer to the log for more details.

Example

The following is a sample response file used by the Update Installer to install multiple maintenance packages using the silent installer.

```
#####
#
# This is the silent install response file for installing maintenance packages
# using the update installer.
#
# A common use of an options file is to run the wizard in silent mode. This lets
# the options file author specify wizard settings without having to run the
# wizard in graphical or console mode. To use this options file for silent mode
# execution, *uncomment* and modify the parameters defined within.
#
# Use the following command line when running the wizard from the update
# installer directory:
#
#   update -options responsefiles/install.txt -silent
#
# Please enclose all values within a single pair of double quotes.
#
#####

#####
#
# This section describes how to apply a maintenance package using the full
# filename specifications to be installed.
# There are three ways you can specify installing a maintenance package.
# They are the following:
# (Use the examples below and edit where appropriate.)
#
# 1. Specify a single maintenance package full filename to be installed.
#
#   For example:
#   -W maintenance.package="C:\Program Files\IBM\WebSphere\AppServer\UpdateInstaller\maintenance\PQ20029.pak"
#
```

```

# 2. Specify a multiple maintenance package full filename to be installed.
# - Use a semicolon to separate the full filename specifications.
# - Update Installer will install the latest applicable maintenance in the order listed.
#
# For example:
# -W maintenance.package="C:\maintenance\PQ20029.pak;C:\maintenance\PK31008.pak;D:\6.1.0-WS-WAS-WinX32-FP0000001.pak"
#
# 3. Specify a full folder name that contains the maintenance packages.
# Update Installer will install the latest applicable maintenance in the order listed in the folder.
#
# For example:
# -W maintenance.package="D:\UpdateInstaller\maintenance"
#
# Notes: If no package is specified, maintenance packages from the default folder
# (such as, UpdateInstaller_HOME/maintenance )
# will be installed.
#
-W maintenance.package="D:\UpdateInstaller\maintenance\6.1.0-WS-WAS-WinX32-FP0000001.pak"

#####
#
# Prerequisite Checking
#
# The update installer checks the system for prerequisites by default.
#
# Uncomment the following option to notify the installer to continue with
# the update and log the warnings even though prerequisite checking
# failed.
#
#-OPT disableNonBlockingPrereqChecking="true"

#####
#
# Used to input the product install location that will be updated.
#
# ie. -W product.location="C:\Program Files\IBM\WebSphere\AppServer"
#
# Note: The product install location should always been specified, and it should
# always be the full path.
#
-W product.location="D:\Program Files\IBM\WebSphere\AppServer"

#####
#
# Do not edit these values.
#
#
-W update.type="install"

```

Installing a fix pack using the graphical user interface

This topic describes how to install a fix pack using the Update Installer. WebSphere Application Server fix packs contain enabling code to ensure feature packs continue to function when maintenance is applied.

Before you begin

Ensure you have the most recent version of the Update Installer installed locally on a target system.

About this task

Follow these steps to install a maintenance fix pack:

1. Download the required fix pack from the official IBM support Web site into the *updi_root/maintenance* directory.
2. Make the current working directory: *updi_root*.
3. Ensure that you stop all running processes.
4. Launch the Update Installer.

For example:

Windows

update.bat

update.exe

./update.sh

5. The Welcome panel displays. Click **Next**.
6. The system prompts for the location of the product that you want updated. Click **Next**.
7. The system presents the choices of Install or Uninstall maintenance. The install option is the default. Click **Next**.
8. The system prompts for the maintenance location where packages can be found. Enter the directory name containing the packages, or browse for the required directory. Click **Next**.

For a list of the recommended fixes for WebSphere Application Server, refer to the support Web site located at the following location: <http://www.ibm.com/support/docview.wss?rs=180&uid=swg27004980#ver61>

When you install a fix pack, certain logic is used to determine which packages are selected for the install. To find out more, refer to “Logic that the Update Installer uses for system recommended installations” on page 189.

You can choose from the following options when installing a fix pack:

- a. To install a fix pack without a feature pack, select the desired fix pack. Click **Next**. For more information about this type of installation, refer to “Installing a fix pack without a feature pack installed” on page 189.
- b. To install a fix pack with a feature pack, select the desired fix pack. Another panel is displayed that prompts you to install the enabling interim fix. Click **Next**. For more information about this type of install, refer to the topic “Installing a fix pack to a location with a feature pack installed” on page 190.

If a maintenance package is grayed out with the designation *Not applicable* on the selection panel, you can review the logs in the `updi_root/logs/latest_temp_folder` to find out why the maintenance package is not appropriate for installation.

9. Before the installation, the Confirmation panel confirms which packages will be installed.
10. On the Confirmation panel, you can also ensure that you have the correct permissions to perform the installation of a maintenance package.
 - a. To ensure you have the correct permissions to apply maintenance, select **Verify My Permissions**. After the permission checking finishes, the confirmation panel displays the permission checking results. If permission checking succeeds, then **Verify My Permissions** is deselected. You can then click **Next** to install maintenance. If permission checking fails, then **Verify My Permissions** remains selected. You can perform the necessary actions to resolve your permission problems and then verify your permissions again.
 - b. If you deselect **Verify My Permissions** and click **Next**, then you skip permission checking and the Update Installer performs the installation. If you do not have all of the necessary permissions, then the installation fails.
11. After the installation, the Summary panel lists which packages have been installed.
12. After you install the fix pack, check the installation log to verify that the install is successful. The log can be found at `app_server_root/logs/update/maintenance_package.install`.

Results

You can find the following results in the log:

INSTCONFSUCCESS

The operation is a success.

INSTCONFPARTIALSUCCESS

The operation is partially successful, refer to the log for more details.

INSTCONFFAILED

The operation has failed, refer to the log for more details.

Logic that the Update Installer uses for system recommended installations

When you select the *Recommended update* option, the following logic is used by the Update Installer for WebSphere Software to install an update.

If you are using the Update Installer with the graphical user interface, after you select the *Recommended update* option on the maintenance panel of the wizard, certain packages may be grayed out for certain reasons. The following describes some of the reasons this occurs.

The package will not be shown or will be grayed out if:

- The maintenance packages have already been installed
- The maintenance packages are corrupted and not readable
- The maintenance packages are not applicable to products installed in the selected install location directory
- The maintenance packages are not applicable to target operating system and architecture
- The maintenance packages are enabling interim fixes

As further maintenance packages are selected, the installer will evaluate prerequisites and dependencies to determine the installation sort order based on the following rules:

1. Maintenance packages all belong to products already installed in the selected install location directory
2. Only permit the most recent versions of selected maintenance packages to be installed
3. Identify and warn about containment relationship conflicts between refresh packs, fix packs and interim fixes. For example,
 - Ensure APARs already in fix pack are not also selected as interim fixes
 - Ensure there are no duplicated maintenance packages selected
 - Ensure APARs and maintenance prerequisite and ex-requisite requirements are met
 - Ensure "depends on" dependency requirements are met
 - Ensure current selecting maintenance package can be installed with previous selected maintenance packages
 - Ensure the maintenance package is supported by the current Update Installer. *updi_root/framework/supportedpakversion.xml* is used to specify which version of maintenance packages is supported by the Update Installer.

Installing a fix pack without a feature pack installed

You can use the Update Installer to install maintenance packages without a feature pack installed.

To install a fix pack on a location without a feature pack, follow these steps:

- On the Installation panel select the fix pack to be installed. Click **Next**.
 - If there is an interim fix already installed, the panel informs you that the interim fix will be uninstalled. Most likely this interim fix is part of the fix pack being installed and will be replaced. In certain cases you will need to reinstall the interim fix.
 - Because there is no feature pack installed, there are no enabling interim fixes required.

Installing a fix pack to a location with a feature pack installed

You can use the Update Installer to install maintenance packages to a location where a feature pack is installed.

To install a fix pack on a location with a feature pack, follow these steps:

- On the Installation panel, select the fix pack to be installed. Click **Next**.
 - If there is an interim fix for a feature pack already installed, the panel informs you that the interim fix will be uninstalled. Most likely this interim fix is part of the fix pack being installed and will be replaced.
 - If an enabling interim fix is already installed because a feature pack is installed, an additional maintenance panel displays. This panel shows which feature pack requires an enabling interim fix.

Installing an interim fix, interim feature, or test fix using the graphical user interface

This topic describes how to install an interim fix, interim feature, or test fix using the Update Installer for WebSphere Software.

Before you begin

Ensure that you have installed the most recent version of the Update Installer on a target system locally.

About this task

The following steps outline the process of installing an interim fix, interim feature, or test fix pack.

1. Download the required interim fix, interim feature, or test fix pack from the official IBM support Web site into the `updi_root/maintenance` directory.
2. Make the current working directory: `updi_root`.
3. Ensure that you stop all running processes.
4. Launch the Update Installer.

For example:

Windows

`update.bat`

Vista

2008

`update.exe`

AIX

HP-UX

Linux

Solaris

`./update.sh`

5. The Welcome panel is displayed. Click **Next**.
6. Specify the location of the product that you want updated.
7. Select either to Install or Uninstall maintenance, the default is the install option. Click **Next**.
8. The system will prompt for the maintenance location where packages can be found. Enter the directory name containing the packages. Click **Next**.
9. Select to install an interim fix, interim feature, or test fix.

The system will automatically determine the appropriate maintenance packages based on the version of the product that is installed.

When you select the interim fix, interim feature, or test fix, certain logic is used to determine which packages are installed. To find out more, refer to “Logic that the Update Installer uses for system recommended installations” on page 189.

10. Before the installation, the Confirmation panel confirms which packages will be installed.
If a maintenance package is grayed out with the designation *Not applicable* on the selection panel, you can review the logs in the `updi_root/logs/latest_temp_folder` to find out why the maintenance package is not currently appropriate for installation.
11. On the Confirmation panel, you can also ensure that you have the correct permissions to perform the installation of a maintenance package.
 - a. To ensure you have the correct permissions to apply maintenance, select **Verify My Permissions**. After the permission checking finishes, the confirmation panel displays the permission checking results. If permission checking succeeds, then **Verify My Permissions** is deselected. You can then click **Next** to install maintenance. If permission checking fails, then **Verify My Permissions** remains selected. You can perform the necessary actions to resolve your permission problems and then verify your permissions again.
 - b. If you deselect **Verify My Permissions** and click **Next**, then you skip permission checking and the Update Installer performs the installation. If you do not have all of the necessary permissions, then the installation fails.
12. After the installation, the Summary panel lists which packages have been installed.
13. After the interim fix, interim feature, or test fix has been installed, check the installation log to verify the install was successful. The log can be found at `app_server_root/logs/update/maintenance_package.install`.

Results

One of the following results will appear in the log.

INSTCONFSUCCESS

The operation was a success.

INSTCONFPARTIALSUCCESS

The operation was partially successful, refer to the log for more details.

INSTCONFFAILED

The operation failed, refer to the log for more details.

Installing multiple maintenance packs using the graphical user interface

You can install maintenance for WebSphere Application Server and all stack products installed in the same WebSphere Application Server home directory.

Before you begin

Ensure that the most recent version of the Update Installer is installed on a target system locally.

About this task

The Update Installer is capable of automatically selecting the recommended maintenance for stack products and determining the appropriate installation sort order of the maintenance packages. For example, if multiple feature packs are installed and there is a recommended fix pack and interim fix for each product, the Update Installer will determine if this maintenance is applicable and install them in the correct order. The following steps lead you through the process of installing multiple maintenance packages.

1. Download the required packages from the official IBM support Web site into the `updi_root/maintenance` directory. It is also recommended you download the maintenance for any stack products in this same directory.
2. Make the current working directory: `updi_root`.

3. Ensure that you stop all running processes.
4. Launch the Update Installer.

For example:

Windows

update.bat

Vista

2008

update.exe

AIX

HP-UX

Linux

Solaris

./update.sh

5. The system displays the Welcome panel. Click **Next**.
6. The system prompts for the location of the product that needs to be updated.
7. Select Install. Click **Next**.
8. The system prompts for the maintenance location where packages can be found.

Note: Before entering the directory name of the location that contains the maintenance packages, notice there are links to obtain recommended maintenance for WebSphere Application Server. We recommend to click the link to **Recommended fixes for Websphere application Server** to verify the latest maintenance available for WebSphere Application Server has been downloaded. Also download maintenance for any stack products installed under the same location as you selected in step 6.

Enter the directory name containing the packages. Click **Next**.

9. The system displays a list of maintenance packages available for installation. Select Recommended updates or select the packages you need installed. The Recommended updates selects the most recent applicable pack. Click **Next**. To find out more about how the multiple installation works, refer to “Logic that the Update Installer uses for system recommended installations” on page 189. If you choose to make your own selection, the system logically changes the remaining packages available for selection based on product, prerequisite and containment relationships.
10. Confirm the information from the pre-installation confirmation Summary panel. This panel highlights the maintenance packages to be installed and products to be updated.
If a maintenance package is grayed out with the designation *Not applicable* on the selection panel, you can review the logs in `updi_root/logs/latest_temp_folder` to find out why the maintenance package is not currently appropriate for installation.
11. On the Confirmation panel, you can also ensure that you have the correct permissions to perform the installation of a maintenance package.
 - a. To ensure you have the correct permissions to apply maintenance, select **Verify My Permissions**. After the permission checking finishes, the confirmation panel displays the permission checking results. If permission checking succeeds, then **Verify My Permissions** is deselected. You can then click **Next** to install maintenance. If permission checking fails, then **Verify My Permissions** remains selected. You can perform the necessary actions to resolve your permission problems and then verify your permissions again.
 - b. If you deselect **Verify My Permissions** and click **Next**, then you skip permission checking and the Update Installer performs the installation. If you do not have all of the necessary permissions, then the installation fails.
12. The Update Installer shows progress as backup and installation of maintenance packages are completed.
After all maintenance packages have been selected and verified to be installable as a group, the installer installs the packages in the following sequence:
 - a. Refresh packs

- b. Fix packs
- c. Enabling interim fixes (automatically installed)
- d. Interim fixes
- e. Interim features.

Prerequisite checking continues to apply as each maintenance package is installed. Any failure that is detected stops the install flow. The message is displayed and you can find details in the installation logs covering the failure.

13. A final panel displays the Summary panel. This panel reports information about the completed install action taken. The user is prompted to click **Finish** to exit the wizard.
14. Review the log to verify maintenance was installed successfully. The log can be found at `app_server_root/logs/update/maintenance_package.install`.

Results

One of the following results will appear in the log.

INSTCONFSUCCESS

The operation was a success.

INSTCONFPARTIALSUCCESS

The operation was partially successful, refer to the log for more details.

INSTCONFFAILED

The operation failed, refer to the log for more details.

Silently uninstalling a fix pack, an interim fix, or a test fix

Use a response file to uninstall maintenance silently.

Before you begin

About this task

Refer to the example response file, located at the bottom of this topic, for more details.

Follow these steps to uninstall maintenance silently:

1. Edit a response file. Use the sample response file at the bottom of the pane as an example.
2. Specify the location of the product that will be uninstalled in the response file.
3. Specify the choice of *Uninstall* maintenance in the response file.
4. Specify the maintenance pack to be uninstalled in the response file.

This is the same filename as the package that was originally installed. A maintenance package can only be uninstalled if a backup package exists, such as, `-W backup.package="PQ20029.pak"`

Note: The commands for installing and uninstalling maintenance silently are different. Installation requires specifying the maintenance package using `maintenance.package` and uninstallation requires `backup.package`

For example:

- Install maintenance silently: `update.bat -W maintenance.package="e: \IBM\WebSphere\ AppServer \updateinstaller\maintenance\ PQ20029.pak"`
- Uninstall maintenance silently: `update.bat -W backup.package="PQ20029.pak" -W update.type="uninstall"`

If no package is specified, a default of the last installed maintenance (#) package is used.

To uninstall a maintenance pack using the silent mode, the order of uninstalling needs to be in the reverse order of installing. For example, if you installed maintenance packs A, B, and C in that order, you should uninstall C, B, and then A.

5. Ensure that all running processes have been stopped.
6. Launch the Update Installer and point to a response file.
7. Review the log file to verify maintenance has been installed successfully. The log can be found at `WAS_HOME\logs\update\.`

Results

One of the following results will appear in the log.

INSTCONFSUCCESS

The operation was a success.

INSTCONFPARTIALSUCCESS

The operation was partially successful, refer to the log for more details.

INSTCONFFAILED

The operation failed, refer to the log for more details.

Example

The following response file demonstrates how to uninstall a fix pack silently.

```
#####  
#  
# This is the silent install response file for uninstalling maintenance packages  
# using the update installer.  
#  
# A common use of an options file is to run the wizard in silent mode. This lets  
# the options file author specify wizard settings without having to run the  
# wizard in graphical or console mode. To use this options file for silent mode  
# execution, *uncomment* and modify the parameters defined within.  
#  
# Use the following command line when running the wizard from the update  
# installer directory:  
#  
#   update -options responsefiles/uninstall.txt -silent  
#  
# Enclose all values within a single pair of double quotes.  
#  
#####  
  
#####  
#  
# Used to input the maintenance backup package filename to be uninstalled.  
# This is the same filename as the package that was originally installed.  
# A maintenance package can only be uninstalled if a backup package exists.  
#  
# For example: -W backup.package="PQ20029.pak"  
#  
# Note: If you do not specify a package, then a default of the last installed maintenance  
# package is used, as the following example demonstrate:  
#  
-W backup.package="6.1.0.1-WEBSV-FEP-WinX32-FP000001.pak"  
  
#####  
#  
# Used to modify the product install location that will be updated.  
# This value should be left commented out if the Update Installer is  
# being run from the recommended location, as the following example demonstrates:
```

```

#
# For example: -W product.location="C:\Program Files\IBM\WebSphere\AppServer"
#
# Note: The product install location needs to be specified, and it needs to
#       be the full path.
#
-W product.location="D:\IBM\WebSphere\AppServerNonroot3"

#####
#
# AIX Non-root user limitation
#
# The AIX user account running the Update Installer program also must be able to
# run the slibclean command; otherwise, a root user must run the slibclean command
# before the Update Installer program runs.
#
# Uncomment the following option to notify the installer that a root user has run
# the slibclean command before the Update Installer program runs.
#
#-OPT rootUserHasRunSlibcleanCommandSuccessfully="true"

#####
#
# Do not edit these values.
#
-W update.type="uninstall"

```

Uninstalling a fix pack, interim fix, interim feature or test fix using the graphic user interface

This topic describes how to use the Update Installer for WebSphere Software to uninstall a fix pack, interim fix, or test fix.

Before you begin

About this task

The following steps are required to uninstall maintenance using the graphical user interface.

1. The latest version of the Update Installer needs to be installed on a target system locally.
2. Make the current working directory *updi_root*.
3. Ensure that all running processes are stopped.
4. Launch the Update Installer.
5. The Welcome panel appears. Click **Next**.
6. The system prompts for the location of the product you want to uninstall.
7. You can choose either to *Install* or *Uninstall* maintenance. Select the *Uninstall* option. Click **Next**.
8. The system prompts for the maintenance package that you want to uninstall.
 - For uninstalling maintenance in an environment without a feature pack installed, select the package to be uninstalled. Click **Next**.
 - For uninstalling maintenance in an environment with a feature pack installed, select the package to be uninstalled. In certain cases the enabling ifix requires that you uninstall in a particular order. The additional maintenance remove panel shows the feature packs that depend on an enabling ifix.

Select the maintenance package, click **Next**.

When you uninstall the pack, certain logic is used to determine which maintenance package to uninstall. To find out more, refer to “Logic used by the Update Installer for uninstalling” on page 196.

9. Before the uninstallation, the Confirmation panel confirms which package has been uninstalled.

10. After the uninstallation, the Summary panel lists which package has been uninstalled.
11. Review the log file to verify maintenance has been uninstalled successfully. The log can be found in the `app_server_root\logs\update\<Maintenance name.install>` directory.

Results

One of the following results appears in the log:

INSTCONFSUCCESS

The operation was a success.

INSTCONFPARTIALSUCCESS

The operation was partially successful, refer to the log for more details.

INSTCONFFAILED

The operation failed, refer to the log for more details.

Logic used by the Update Installer for uninstalling

The Update Installer uses logical procedures when it uninstalls maintenance. The uninstall command works similar to the stack logic in computer science.

Uninstall fix packs in the reverse order that they were installed. The last fix pack installed should be the first one uninstalled.

For example, if maintenance packages A,B,C,D have been installed in that sequence, then the packages should be uninstalled in reverse order: D, C, B, A. This is true if these applications are made up of fix packs, interim fixes or feature packs.

update command

The update command starts the Update Installer for WebSphere Software.

The Update Installer installs and uninstalls interim fixes, fix packs, and refresh packs to update WebSphere software.

Overview

The **update** command calls the update installer program to install and uninstall service to update WebSphere software. This topic describes the update installer command and its command-line parameters.

The following descriptions contain reference information about the command.

See Chapter 9, “Installing maintenance packages,” on page 163 and “Uninstalling maintenance packages” on page 175 for information about using the command.

Note: See “Update command - known problems and workarounds” on page 202 for information about known problems and workarounds.

Command options

The following tables list commands for installing and uninstalling interim fixes.

Commands for installing interim fixes

Issue one of the following commands to use the graphical interface:

Windows

Note: For the Microsoft Windows Vista operating system, use update.exe rather than update.bat.

Table 47. Update installer commands for installing with the graphical interface

Command example	Type of installation	Description
<p>Windows</p> <pre>update.bat</pre> <p>AIX HP-UX Linux Solaris</p> <pre>./update.sh</pre>	Graphical interface mode	<p>Initializes the interim fix field with the name of the interim fix that has the most recent date stamp and time stamp.</p> <p>Accept all of the default values to install the interim fix with the most recent time stamp.</p>
<p>Windows</p> <pre>update.bat -options "responsefiles\file_name"</pre> <p>AIX HP-UX Linux Solaris</p> <pre>./update.sh -options "responsefiles/file_name"</pre>	Graphical interface mode with an options file	<p>Overrides all graphical interface values with values that you specified in the options response file.</p> <p>If you omit either value, the default maintenance package is the one with the most recent date stamp and time stamp. The default software is the software installed in the parent directory.</p>
<p>Windows</p> <pre>update.bat -W maintenance.package="e:\IBM\WebSphere\ AppServer\updateinstaller\maintenance\PQ20029.pak"</pre> <p>AIX HP-UX Linux Solaris</p> <pre>./update.sh -W maintenance.package="/opt/IBM/WebSphere/ AppServer/updateinstaller/maintenance/PQ20029.pak"</pre>	Graphical interface mode	Overrides the name of the maintenance package to apply.
<p>Windows</p> <pre>update.bat -W product.location="e:\IBM\WebSphere\ AppServer"</pre> <p>AIX HP-UX Linux Solaris</p> <pre>./update.sh -W product.location="/opt/IBM/WebSphere/ AppServer"</pre>	Graphical interface mode	Overrides the location of the WebSphere software to update.
<p>Windows</p> <pre>update.bat -W product.location="e:\IBM\WebSphere\ AppServer" -W maintenance.package="e:\IBM\WebSphere\ AppServer\updateinstaller\maintenance\PQ20029.pak"</pre> <p>AIX HP-UX Linux Solaris</p> <pre>./update.sh -W product.location="/opt/IBM/WebSphere" -W maintenance.package="/opt/IBM/WebSphere/AppServer/ updateinstaller/maintenance/PQ20029.pak"</pre>	Graphical interface mode	Overrides the location of the WebSphere software to update and the name of the maintenance package to apply.
<p>Windows</p> <pre>update.bat -OPT disableDiskSpaceCheck=true</pre> <p>AIX HP-UX Linux Solaris</p> <pre>./update.sh -OPT disableDiskSpaceCheck=true</pre>	Graphical interface mode	Overrides the prerequisite check for disk space.

Issue the following command to use the silent interface:

Table 48. Update installer command for installing in silent mode

Command example	Type of installation	Description
<p>Windows</p> <pre>update.bat -silent -options "responsefiles\file_name"</pre> <p>AIX HP-UX Linux Solaris</p> <pre>./update.sh -silent -options "responsefiles/file_name"</pre>	Silent mode with an options file	<p>Overrides all default values with values that you specified in the options response file.</p> <p>Always use a response file that is based on the response file under <i>updi_root</i>/responsefiles.</p>

Commands for uninstalling interim fixes

Issue one of the following commands to uninstall with the graphical interface:

Table 49. Update installer commands for uninstalling with the graphical interface

Command example	Description
<p>Windows</p> <pre>update.bat -W update.type="uninstall"</pre> <p>AIX HP-UX Linux Solaris</p> <pre>./update.sh -W update.type="uninstall"</pre>	<p>Initializes the interim fix field with the name of the interim fix that was most recently installed.</p> <p>Accept all of the default values to uninstall the interim fix with the most recent date stamp and time stamp.</p>
<p>Windows</p> <pre>update.bat -W product.location="e:\IBM\WebSphere\AppServer" -W update.type="uninstall"</pre> <p>AIX HP-UX Linux Solaris</p> <pre>./update.sh -W product.location="/opt/IBM/WebSphere/AppServer" -W update.type="uninstall"</pre>	<p>Overrides the graphical interface with the location of the WebSphere software to update. The default interim fix to uninstall is the most recently installed interim fix for that software.</p>
<p>Windows</p> <pre>update.bat -W backup.package="PQ20029.pak" -W update.type="uninstall"</pre> <p>AIX HP-UX Linux Solaris</p> <pre>./update.sh -W backup.package="PQ20029.pak" -W update.type="uninstall"</pre>	<p>Overrides the interim fix field with the name of the maintenance package to uninstall.</p>
<p>Windows</p> <pre>update.bat -W product.location="e:\IBM\WebSphere\AppServer" -W backup.package="PQ20029.pak" -W update.type="uninstall"</pre> <p>AIX HP-UX Linux Solaris</p> <pre>./update.sh -W product.location="/opt/IBM/WebSphere/AppServer" -W backup.package="PQ20029.pak" -W update.type="uninstall"</pre>	<p>Overrides the location of the WebSphere software to update and the name of the maintenance package to uninstall.</p>
<p>Windows</p> <pre>update.bat -options "responsefiles\file_name"</pre> <p>AIX HP-UX Linux Solaris</p> <pre>./update.sh -options "responsefiles/file_name"</pre>	<p>Overrides all default values with values that you specified in the options response file.</p> <p>If you omit either value from the response file, the default maintenance package is the installed package with the most recent date stamp and time stamp. The default software is the software installed in the parent directory.</p>

Issue the following command to use the silent interface:

Table 50. Update installer command for installing in silent mode

Command example	Type of installation	Description
<p>Windows</p> <pre>update.bat -silent -options "responsefiles\file_name"</pre>	Silent mode with an options file	Overrides all default values with values that you specified in the options response file.
<p>AIX HP-UX Linux Solaris</p> <pre>./update.sh -silent -options "responsefiles/file_name"</pre>		

Installing multiple interim fixes

Use a script to issue more than one command. Each command identifies one maintenance package to install.

AIX **HP-UX** **Linux** **Solaris**

Example 1

...

```
./update.sh -W maintenance.package=/opt/IBM/WebSphere/AppServer/updateinstaller/maintenance/PK20028.pak -silent
```

```
./update.sh -W maintenance.package=/opt/IBM/WebSphere/AppServer/updateinstaller/maintenance/PK20029.pak -silent
```

If any maintenance package contains service for the IBM Software Developer Kit (SDK), the resulting asynchronous return to the script causes multiple instances of the Update Installer to run, which is not allowed. Use the following procedure to avoid the problem:

1. Create the default cloned SDK location within the *updi_root* directory.

For example:

```
mkdir /opt/IBM/WebSphere/AppServer/updateinstaller/java
```

The command creates the same directory for the SDK that the Update Installer creates when it clones the SDK automatically.

2. Copy the SDK from the product installation root to the default clone location.

Copy the contents of the *app_server_root/java/jre* directory to the *updi_root/java* directory.

For example, the command for a Linux system might resemble the following example:

```
cp -rf /opt/IBM/WebSphere/AppServer/java/jre/* --target-directory='/opt/IBM/WebSphere/AppServer/updateinstaller/java'
```

3. Edit the script to change the command for the maintenance package that installs the update to the SDK. Or change all of the commands in the script.

...

```
./update.sh -is:javahome /opt/IBM/WebSphere/AppServer/updateinstaller/java -W maintenance.package=/opt/IBM/WebSphere/AppServer/updateinstaller/maintenance/PK20028.pak -silent
```

```
./update.sh -is:javahome /opt/IBM/WebSphere/AppServer/updateinstaller/java -W maintenance.package=/opt/IBM/WebSphere/AppServer/updateinstaller/maintenance/PK20029.pak -silent
```

See the UPDI: Control returns prematurely to the command line when the Update Installer rolls back an updated IBM Software Development Kit (SDK) technote for more information about asynchronous operations when the Update Installer is cloning the SDK.

Example 2

The InstallShield for Multiplatforms (ISMP) launcher program returns control to the command line or calling BAT script right away on Windows systems.

If a BAT script has the following two lines, the second line runs before the Update Installer has completed the first line.

```
"C:\IBM\WebSphere\AppServer60\updateinstaller\update"
-W maintenance.package="C:\IBM\WebSphere\AppServer\updateinstaller\maintenance\PK20028.pak"
-silent
```

```
"C:\IBM\WebSphere\AppServer60\updateinstaller\update"
-W maintenance.package="C:\IBM\WebSphere\AppServer\updateinstaller\maintenance\PK20029.pak"
-silent
```

The resulting asynchronous return to the script causes multiple instances of the Update Installer to run, which is not allowed. Use the following procedure to avoid the problem:

1. Use the XCOPY command to create the default clone location for the SDK and copy the product SDK from the installation root in one operation.

Copy the contents of the *app_server_root\java\jre* directory to the *updi_root\java* directory, which is the default location when the Update Installer clones the SDK automatically.

For example, use the following command when the installation root directory is the

C:\IBM\WebSphere\AppServer60 directory.

```
xcopy C:\IBM\WebSphere\AppServer60\java\jre\*.* C:\IBM\WebSphere\AppServer60\updateinstaller\java\*.* /S
```

2. Edit the batch script to change each **update** command to issue the Java calls directly instead of through ISMP:

```
"C:\IBM\WebSphere\AppServer60\updateinstaller\java\bin\java.exe" -cp update.jar -Xms48m -Xmx384m
run -W maintenance.package="C:\IBM\WebSphere\AppServer60\updateinstaller\maintenance\PK20028.pak"
-silent
```

```
"C:\IBM\WebSphere\AppServer60\updateinstaller\java\bin\java.exe" -cp update.jar -Xms48m -Xmx384m
run -W maintenance.package="C:\IBM\WebSphere\AppServer60\updateinstaller\maintenance\PK20029.pak"
-silent
```

The *-Xms48m* parameter and the *-Xmx384m* parameter are the minimum heap size and the maximum heap size, respectively.

3. Run the batch file to install the maintenance packages.

The reworked batch file avoids the ISMP asynchronous behavior by invoking the native Java process directly. Additional parameters are allowed at the end of each line, such as the *-options* parameter.

Automating maintenance operations

Most fix packs and refresh packs include some maintenance for the IBM SDK, Java technology edition in the *app_server_root\java\jre* directory. When a refresh pack, fix pack, or interim fix updates the SDK, the Update Installer for WebSphere Software program clones the SDK in the product by starting an ISMP process to copy the SDK to the *updi_root\java* directory:

```
updi_root
 /java
```

To use a script to perform a silent maintenance installation, you must launch the update installer program twice. The first command clones the SDK only and does not automatically relaunch the update installer program. The second command uses the cloned SDK to update the product and the SDK in the product.

The Update Installer for WebSphere always uses the SDK in the *updi_root\java* directory if the SDK is present.

Issue the following commands from the script:

1. `update -silent`

The update installer program uses the cloned copy of the SDK in the *updi_root* directory at the next invocation of the command. For example, use the following command to install the update using the cloned SDK:

```
/opt/WebSphere/AppServer/updateinstaller/update.sh \  
-silent -W maintenance.package=\  
"/opt/WebSphere/AppServer/updateinstaller/maintenance/\  
6.0.1.0-WS-WAS-LinuxIA32-RP0000002.pak" \  
-W update.type="install" \  
-W product.location="/opt/WebSphere/AppServer"
```

{Omit the Linux and UNIX line-continuation characters (\) when issuing the command on one line.}

Logging

The following sections describe logging that occurs when installing and uninstalling service.

Logs created when installing service

If no installation log file exists, refer to the temporary log file in the *updi_root/logs/update/tmp* directory. If all validations pass, the installation occurs.

Then the update installer program creates the *app_server_root/logs/update/maintenance_package.install* directory.

Within the directory are the *update.log.txt* file, the compressed *update.trace.log.gz* file, and the compressed *update.config.log.gz* file. The *update.config.log.gz* file exists only when the installation of service uses the internal configuration manager utility to run ANT scripts.

Logs created when uninstalling service

If no log file exists after uninstalling an interim fix, refer to the temporary log file in the *updi_root/logs/update/tmp* directory. If all validations pass, the uninstall procedure occurs.

Then the update installer program creates the *app_server_root/logs/update/maintenance_package.uninstall* directory.

Within the directory are the *update.log.txt* file, the compressed *update.trace.log.gz* file, and the compressed *update.config.log.gz* file. The *update.config.log.gz* file exists only when the removal of service uses the internal configuration manager utility to run ANT scripts.

Indicators of success

The log file includes an indicator of success:

INSTCONFSUCCESS

The current operation was successful. You do not need to review the log file any further.

INSTCONFPARTIALSUCCESS

The current operation was partially successful. System should still be in a usable state, however some non-critical actions have failed. Consult the log file to determine what has failed and how to recover from the failure, if possible.

INSTCONFFAILED

The current operation failed. The system is no longer in a usable state. Consult the log file for more information.

Update command - known problems and workarounds

This topic describes known problems and issues associated with the Update Installer for WebSphere Software program.

The update installer program displays its version information in the title bar of the graphical interface. Version information is stored in the version.txt file in the updateinstaller directory.

A new version might ship to correspond to any new fix. Information in the version.txt file is displayed prominently in the title bar of the wizard and is also recorded in the updatelog.txt file.

Always download and use the latest version of the Update installer wizard when installing an interim fix.

The Update Installer can not automatically detect locks on files by remote processes. So you must ensure that all AppServers processes have been stopped for all your profiles, including any remote profiles.

Using root or non-root when installing with the Update Installer

You can use the IBM Update Installer for WebSphere Software to install interim fixes, fix packs, and refresh packs. Learn about important prerequisites, permissions, and precautions before installing a maintenance package.

Using root or non-root for maintenance installation

In order to avoid problems, always use the same user ID for applying maintenance that you used to install WebSphere Application Server, the Update Installer, and any fix packs. If you choose to use a different user, then the maintenance action might not be successful, depending on the ownership and permissions of the files to be updated. If the update action is successful, the file ownerships of the updated files belong to the last user to perform the update and will prevent the original user from performing further updates.

The technote [Servers fail to start after applying fixes in version 6.1](#) describes how to restore file ownership to the original user and allow users to apply future updates.

If WebSphere Application Server is installed by root, and if you try to use a non-root user ID to update WebSphere Application Server, the install will fail because it does not have authority to update the files owned by root. Similarly, if WebSphere Application Server is installed by a non-root user and a different non-root user applies maintenance, the install could fail if the second non-root user ID does not have write authority to those files owned by the first non-root user. In these cases, the user will get a warning message similar to the following:

```
The current operation must be performed by the same
user who owns the existing files. Typically, the file owner is the user who performed the original installation.
Switch to the right user, and then run the installer again.
```

To avoid these potential problems, always use the same user ID for applying maintenance that you used to install the product.

Chapter 10. Uninstalling the product

Uninstall WebSphere Application Server - Express to remove the core product files.

Before you begin

The “uninstall command” on page 207 calls the uninstaller program that is created during installation. The uninstaller program is customized for each product installation, with specific disk locations and routines for removing installed features.

The uninstaller program removes registry entries, uninstalls the product, and removes all related features. The uninstaller program does not remove log files in the installation root directory.

Note: The uninstaller for WebSphere Application Server is now able to detect other products which extend the application server and have claimed a dependency on the application server. If you have installed other products which extend the application server, then you will be unable to uninstall the application server before uninstalling the other products. Products which extend the application server are feature packs and other products which rely on the application server runtime environment.

Uninstall any products which extend the application server, such as feature packs or other products which rely on the application server runtime environment, before you attempt to uninstall the application server. You will be unable to uninstall the application server product without uninstalling the other products.

Note: If an administrator user uninstalls an application server that is owned by another user, then all registry entries for all application server instances owned by the administrator will also be removed. You should uninstall any non-administrator application server with the owning non-administrator user if possible.

About this task

This procedure uninstalls the WebSphere Application Server - Express product.

For more information on uninstalling other components on the product disc such as IBM HTTP Server or the Web server plug-ins, see the documentation for those products.

The time required to uninstall is dependent on the processing speed of your machine. As a rough guideline, uninstalling the core product files and one application server profile takes approximately 10 minutes when using the uninstall command.

1. **AIX** **HP-UX** **Linux** **Solaris** Log on using the same user ID that was used when the product was installed.
Issue the **ls -al** command at the root of the WebSphere Application Server installation to find the user ID that was used to install the product.
2. **Windows** Log on as a user who belongs to the Administrators group or as the user who installed the product.
3. Run the uninstaller program for the Web server plug-ins for WebSphere Application Server.
If a Web server is configured to run with the Application Server, uninstall the plug-ins to remove the configuration from the Web server.
4. Stop each running application server with the stopServer command.

Stop all server processes in all profiles associated with the target product instance. You do not have to stop processes related to other instances of the product on your machine. For example, issue the following command from the *profile_root/bin* directory to stop the *server1* process in the application server profile:

```
./stopServer.sh server1
```

If a server is running and security is enabled, use the following command:

```
./stopServer.sh server1 -user user_ID -password password
```

5. Optional: Back up configuration files and log files to refer to them later if necessary.

Use the AdminTask command scripting interface to create a configuration archive file of an existing WebSphere Application Server profile, for example.

Back up the config folder and the logs folder of each profile to refer to it later if necessary. You cannot reuse profiles so there is no need to back up an entire profile.

6. Issue the uninstall command.

Run the uninstall command:

- **AIX** **HP-UX** **Linux** **Solaris** `app_server_root/uninstall/uninstall`
- **Windows** `app_server_root\uninstall\uninstall.exe`

The uninstaller wizard begins and displays the Welcome panel.

You can also issue the uninstall command with a silent parameter to use the wizard without the graphical user interface.

Issue the following command to start the uninstaller wizard in silent mode, without the graphical user interface, and to remove all profiles:

- **AIX** **HP-UX** **Linux** **Solaris** `app_server_root/uninstall/uninstall -silent` (default behavior)
- **AIX** **HP-UX** **Linux** **Solaris** `app_server_root/uninstall/uninstall -silent -OPT removeProfilesOnUninstall="true"`
- **Windows** `app_server_root\uninstall\uninstall -silent` (default behavior)
- **Windows** `app_server_root\uninstall\uninstall -silent -OPT removeProfilesOnUninstall="true"`

Issue the following command to start the uninstaller wizard in silent mode and to leave all profiles intact:

- **AIX** **HP-UX** **Linux** **Solaris** `app_server_root/uninstall/uninstall -silent -OPT removeProfilesOnUninstall="false"`
- **Windows** `app_server_root\uninstall\uninstall -silent -OPT removeProfilesOnUninstall="false"`

7. If you are using the wizard, click **Next** to begin uninstalling the product.

The uninstaller wizard displays a confirmation panel that lists a summary of the components that you are uninstalling.

- a. Click **Next** to continue uninstalling the product.

When using the wizard, a panel allows you to choose whether or not the uninstaller deletes all profiles before it deletes the core product files. By default, all profiles will be deleted, but this option can be deselected on the panel.

After uninstalling profiles, the uninstaller program deletes the core product files in component order.

- b. Click **Finish** to close the wizard after the wizard removes the product.

8. Review the log file.

Review the `app_server_root/logs/uninstall/log.txt` file.

The log file records file system or other unusual errors. Look for the INSTCONFSUCCESS indicator of success in the log:

```
(date_time),
Uninstall, com.ibm.ws.install.ni.ismp.actions.
SetExitCodeAction, msg1,
CWUPI0000I: EXITCODE=0
(date_time),
Uninstall, com.ibm.ws.install.ni.ismp.actions.
ISMPLogSuccessMessageAction, msg1,
INSTCONFSUCCESS
```

Windows If you are uninstalling on Windows operating systems, then you might see the following error in the uninstallation log:

```
Failed to delete: file:C:<input type = "hidden">/Installed/FI_INS_11/properties/version/nif/config/uninstall/lib/instcas.jar
java.io.IOException: Failed to delete: file:C:/Installed/FI_INS_11/properties/version/nif/config/uninstall/lib/instcas.jar
```

The instcas.jar file is locked by the operating system and cannot be deleted by the uninstaller. You can manually delete this file after the uninstallation with other files that have not yet been deleted.

9. If any product files remain, uninstall manually before reinstalling.

Manually uninstall the product to remove all artifacts of the product so that you can reinstall into the same installation root directory. If you do not plan to reinstall, you do not need to manually uninstall.

See “Uninstalling manually” on page 210 for more information.

Results

This procedure results in uninstalling the WebSphere Application Server - Express product.

What to do next

After uninstalling the product and cleaning the system with the manual uninstall procedure, you can reinstall.

See Chapter 3, “Task overview: Installing,” on page 5 for an overview of installing the product and creating a functional e-business environment.

installRegistryUtils command

The installRegistryUtils command-line tool runs on any supported operating system. The installRegistryUtils tool lists installed products and packages and assists in cleaning a particular registered product (including the associated packages), package, or all registered products (including all associated packages) which are visible to the current user.

Location of the command file

The command file is located on both the product disc and the installed product.

Note: When using the product disc, the command must be invoked on the machine targeted by the command. The tool does not work remotely.

To invoke the command file from the product disc, run the following command file from the root of the product CD:

- **AIX** **HP-UX** **Linux** **Solaris** `installRegistryUtils/bin/installRegistryUtils.sh`
- **Windows** `installRegistryUtils/bin/installRegistryUtils.bat`

To invoke the command file from the installed product, use the following command:

- **AIX** **HP-UX** **Linux** **Solaris** `app_server_root/bin/installRegistryUtils.sh`
- **Windows** `app_server_root/bin/installRegistryUtils.bat`

Syntax for the installRegistryUtils.sh command

AIX

HP-UX

Linux

Solaris

Clean up all accessible products and packages.

```
./installRegistryUtils.sh -cleanAll  
[-userHome user_home]
```

Clean up the specified product and all associated packages.

```
./installRegistryUtils.sh -cleanProduct  
-offering offering_ID  
-installLocation installation_location  
[-userHome user_home]
```

Clean up the specified package.

```
./installRegistryUtils.sh -cleanPackage  
-pakName package_name  
-installLocation installation_location  
[-userHome user_home]
```

List all visible products.

```
./installRegistryUtils.sh -listProducts  
[-userHome user_home]
```

List all visible packages.

```
./installRegistryUtils.sh -listPackages  
[-userHome user_home]
```

Syntax for the installRegistryUtils.bat command

Windows

Clean up all accessible products and packages.

```
installRegistryUtils.bat -cleanAll  
[-userHome user_home]
```

Clean up the specified product and all associated packages.

```
installRegistryUtils.bat -cleanProduct  
-offering offering_ID  
-installLocation installation_location  
[-userHome user_home]
```

Clean up the specified package.

```
installRegistryUtils.bat -cleanPackage  
-pakName package_name  
-installLocation installation_location  
[-userHome user_home]
```

List all visible products.

```
installRegistryUtils.bat -listProducts  
[-userHome user_home]
```

List all visible packages.

```
installRegistryUtils.bat -listPackages  
[-userHome user_home]
```


Parameters

Supported arguments include:

-installLocation *installation_location*

Specifies the full path to the product installation.

-offering *offering_ID*

Identifies the offering ID, also known as the product ID, of the specified product.

-pakName *package_name*

Identifies a package name of the specified product.

-userHome *user_home*

Specifies the full path to a user home directory. This parameter is not required for a root user unless you want to invoke the `installRegistryUtils` command on the home directory of a non-root user.

uninstall command

The **uninstall** command uninstalls the product. When you uninstall the product, the uninstaller program removes the core product files and all of the profiles. A silent parameter runs the wizard in silent mode without displaying the graphical user interface.

Purpose

This topic describes the command-line syntax for the **uninstall** command. Start the **uninstall** command module from the command line to uninstall the product.

Before you begin uninstalling the product

Manually stop all servers before uninstalling the product.

See Chapter 10, “Uninstalling the product,” on page 203 for more information.

The command file is in the `app_server_root\uninstall` directory.

The command file is named:

- **AIX** **HP-UX** **Linux** **Solaris** `uninstall`
- **Windows** `uninstall.exe`

All of the installable components in the product package use this command. If the command is not applicable for a component on a particular operating system, the N/A abbreviation is displayed in the following table. A command is not applicable if the component cannot be installed (or uninstalled) on the operating system.

Table 51. Component uninstall commands by operating system

Operating System	WebSphere Application Server	Application Client	IBM HTTP Server	Web Server Plug-ins	Edge Components	Update Installer (UPDI)
AIX	uninstall	uninstall	uninstall	uninstall	uninstall	uninstall
HP-UX	uninstall	uninstall	uninstall	uninstall	uninstall	uninstall
IBM i	uninstall	uninstall	N/A	uninstall	N/A	uninstall
Linux	uninstall	uninstall	uninstall	uninstall	uninstall	uninstall
Solaris	uninstall	uninstall	uninstall	uninstall	uninstall	uninstall
Windows	uninstall	uninstall	uninstall	uninstall	uninstall	uninstall

Parameters and syntax

This section describes the command syntax and the optional parameters for starting the Uninstaller wizard.

- Issue the following command to start the Uninstaller wizard and the graphical user interface:
 - `AIX HP-UX Linux Solaris app_server_root/uninstall/uninstall`
 - `Windows app_server_root\uninstall\uninstall`
- Issue the following command to start the Uninstaller wizard in silent mode, without the graphical user interface, and to remove all profiles:
 - `AIX HP-UX Linux Solaris app_server_root/uninstall/uninstall -silent` (default behavior)
 - `AIX HP-UX Linux Solaris app_server_root/uninstall/uninstall -silent -OPT removeProfilesOnUninstall="true"`
 - `Windows app_server_root\uninstall\uninstall -silent` (default behavior)
 - `Windows app_server_root\uninstall\uninstall -silent -OPT removeProfilesOnUninstall="true"`
- Issue the following command to start the Uninstaller wizard in silent mode and to leave all profiles intact:
 - `AIX HP-UX Linux Solaris app_server_root/uninstall/uninstall -silent -OPT removeProfilesOnUninstall="false"`
 - `Windows app_server_root\uninstall\uninstall -silent -OPT removeProfilesOnUninstall="false"`

Uninstalling WebSphere Application Server - Express removes all the product libraries and directories. If you do not specify the option to keep all the profiles when you invoke the uninstall script, the profiles are removed. If you later decide that you do not need the profiles, you can manually remove them.

Logging

Examine the `app_server_root/logs/uninstall/log.txt` file.

The log file records file system or other unusual errors. Look for the INSTCONFSUCCESS indicator of success in the log:

```
(date_time),
Uninstall, com.ibm.ws.install.ni.ismp.actions.
SetExitCodeAction, msg1,
CWUPI0000I: EXITCODE=0
(date_time),
Uninstall, com.ibm.ws.install.ni.ismp.actions.
ISMPLogSuccessMessageAction, msg1,
INSTCONFSUCCESS
```

Verify that there were no file system or other unusual errors while uninstalling. If there are problems, correct them, and uninstall manually before reinstalling the product. See “Uninstalling manually” on page 210.

After uninstalling WebSphere Application Server - Express, delete the installation root directory before reinstalling into the same directory. Deleting the old directory avoids XML configurations that are not valid that result from retaining old files.

vpd.properties file

The installer program for WebSphere Application Server - Express uses the Install Shield for Multiplatforms (ISMP) program to install code. 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.

HP-UX

Solaris

Operating system exceptions for using the vpd.properties file

- ISMP uses the vpd.properties file to track WebSphere products that it installs on all platforms but Solaris and HP-UX.
- ISMP uses native operating system registration on these platforms when installing as root, and does not create a vpd.properties file.

When installing as a non-root installer, the installer programs create a vpd.properties file on all platforms, including Solaris and HP-UX.

Location of the vpd.properties file

The location of the vpd.properties file varies per operating platform:

- **AIX** The root directory or the `usr/lib/objrepos` directory
- **Linux** **Solaris** The root or `user_home` directories.
- **Windows** Installation directory of the operating system, such as the `C:\WINNT` directory or the `C:\windows` directory, or the `user_home` directory.

Installation considerations

If you do not cleanly uninstall the application server product, then there might be entries left over in the vpd.properties file associated with the application server directory. You can reinstall into the same directory later, but you might see certain entries in the installation log which refer to the vpd.properties file. These entries can be safely ignored. The following message is an example of a vpd message in the installation log:

```
(Apr 19, 2008 9:15:23 PM), Process, com.installshield.product.service.product.PureJavaProductServiceImpl$InstallProduct, msg1, Did not replace installed object (IBM WebSphere Application Server - Plugins) with object (IBM WebSphere Application Server - Plugins) (Apr 19, 2008 9:15:23 PM), Process, com.installshield.product.service.product.PureJavaProductServiceImpl$InstallProduct, msg1, Did not replace installed object (LAP Component) with object (LAP Component)
```

You can edit the vpd.properties file manually to remove entries associated with the old uninstalled application server before you attempt to reinstall, but it is not recommended.

Example of the vpd.properties file

The following example shows all of the entries for the vpd.properties file for Version 7.0.0.0 of the Network Deployment product on a Linux platform. The example shows entire lines but breaks each line for formatting purposes. The identifier for the first component is highlighted. The installation location of the first component is also highlighted.

```
WSBAA70|7|0|0|0|7.0.0.0|1=IBM WebSphere Application Server|
  IBM WebSphere Application Server|IBM WebSphere Application Server V7.0|IBM|http://www.ibm.com|7.0.0.0|
  /opt/IBM/WebSphere/AppServer|0|0|1|
  WSBAA70|7|0|0|0|7.0.0.0|1|0|false|
  "_uninst" "uninstall.jar" "uninstall.dat" ""|true|3|WSBAA70|7|0|0|0|7.0.0.0|1
WSBAA70LicensingComponent|7|0|0|0|7.0.0.0|1=LAP Component|
  LAP Component|LAP| | |
  /opt/IBM/WebSphere/AppServer|0|0|1|
  WSBAA70|7|0|0|0|7.0.0.0|1|0|false| |true|3|
  WSBAA70LicensingComponent|7|0|0|0|7.0.0.0|1
```

Identifying entries in the vpd.properties file

Use the following table to help identify product entries.

Table 52. Identifiers in the vpd.properties file for WebSphere products

Identifier	Product
WSB...70	All Version 7.0 products use this identifier to identify the core product files: <ul style="list-style-type: none">• WebSphere Application Server - Express• WebSphere Application Server• WebSphere Application Server Network Deployment
WSP...70	Web server plug-ins for WebSphere Application Server
WSC...	WebSphere Application Server Clients
WSIHS70	IBM HTTP Server for WebSphere Application Server

Note: During installation of the Application Client for WebSphere Application Server, the product and feature entries are added to the vpd.properties file. After you uninstall the product, the feature entries may not be removed. This is a known limitation, but does not affect any subsequent client operations, including re-installing and uninstalling.

Uninstalling manually

The uninstaller program leaves some files that can prevent you from reinstalling into the original directory. Delete files and registry entries to *clean* the machine so that you can reinstall into any directory. If you are not planning to reinstall, do not uninstall manually.

Before you begin

You can reinstall without a clean machine. Such an installation creates a coexistence scenario that can prevent you from installing into the original directory.

The uninstaller program removes all profiles, including all of the configuration data and applications in each profile. Before you start the uninstall procedure, back up the config folder, the installableApps folder, and the installedApps folder of each profile, if necessary.

Cleaning the machine means deleting everything from the previous installation, including log files that are left behind by the uninstall command. Before you start the procedure, back up log files, if necessary. See Chapter 8, “Troubleshooting installation,” on page 145 for the location of log files.

About this task

This procedure uninstalls your WebSphere Application Server product. To uninstall other products such as IBM HTTP Server or Web server plug-ins, see the documentation for those products.

Run one of the following procedures to produce a clean machine on your operating system.

- **AIX** Uninstall manually on an AIX system.
- **HP-UX** Uninstall manually on an HP-UX system.
- **Linux** Uninstall manually on a Linux system.
- **Solaris** Uninstall manually on a Solaris system.
- **Windows** Uninstall manually on a Windows system.

Results

Manually uninstalling produces a clean system. A clean system has no evidence of a previously deleted installation.

What to do next

Go to Chapter 3, “Task overview: Installing,” on page 5 to begin planning a new installation.

Manually uninstalling on an AIX system

Uninstall a WebSphere Application Server product from an AIX system by running the uninstaller program and performing some manual steps to remove log files and registry entries. Such registry entries can prevent you from reinstalling the product into the original directory. If you are not planning to reinstall, you do not have to uninstall manually.

Before you begin

The uninstaller program removes all profiles by default, including all of the configuration data and applications in each profile. Before you start the uninstall procedure, back up the config folder, the installableApps folder, and the installedApps folder of each profile, if necessary, or use the `-OPT removeProfilesOnUninstall="false"` parameter on the uninstall command.

Determine the installation root directory for the product so that you remove the correct product and produce a clean system.

About this task

Reinstalling the product into a new directory when files remain from a previous installation can create a coexistence scenario. However, you can delete all files and registry entries to completely remove a WebSphere Application Server product. A clean system lets you reinstall the product into the original directory without coexistence.

Default directories are shown in the following planning table:

Identifier	Directory	Actual location
<i>app_server_root</i>	/usr/IBM/WebSphere/AppServer	
<i>profile_root</i>	/usr/IBM/WebSphere/AppServer/profiles	
<i>plugins_root</i>	/usr/IBM/WebSphere/Plugins	

The installation wizard and the Profile Management Tool provide an override for your own locations for root directories.

Use the `installRegistryUtils` command to examine the installation locations for all installed WebSphere Application Server products.

Perform the following procedure to produce a clean system.

1. Log on as the same user ID who installed the product.
2. Use the `kill` command to kill all Java processes that are running.

If running Java processes 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` command.

```
kill -9 java_pid_1 java_pid_2...java_pid_n
```

3. Run the uninstaller program for the Web server plug-ins for WebSphere Application Server.
If a Web server is configured to run with the application server, uninstall the plug-ins to remove the configuration from the Web server.
4. Issue the uninstall command.
If you have already run the uninstaller program or if you cannot run the uninstaller program, skip this step.
See the description of the “uninstall command” on page 207 for more information.
The Uninstaller wizard begins and displays the Welcome panel.
5. List WebSphere Application Server components that are installed.
Type the following command to search for related packages:

```
ls|pp -l| grep -i WS
```


Do not remove packages for WebSphere Application Server products that you are not uninstalling. Version 7.0 package names have a prefix of WSB or WSP and a suffix of 70. WSC package names do not have a suffix of 70.
6. Change directories to the `/usr/IBM` directory, or the equivalent top directory of your install.
7. Type `rm -rf WebSphere` to delete this WebSphere Application Server-related directory, but only if the `AppServer` directory is the only directory within the `WebSphere` directory. Delete the directory if the only products contained in the directory are products that you intend to delete.
8. Use the `installRegistryUtils` command to examine the installation locations for all installed WebSphere Application Server products and remove the desired products from the install registry.
9. Edit the “`vpd.properties` file” on page 209.
The file is located in the root directory or in the `/usr/lib/objrepos` directory.
Do not delete or rename the `vpd.properties` file because the InstallShield MultiPlatform (ISMP) program uses it for other products that it installs. If the WebSphere Application Server product that you are uninstalling is the only product with entries in the `vpd.properties` file, you can delete this file.
At this point, it should be possible to reinstall WebSphere Application Server. If not, run the `odmclean.sh` and `aixclean.sh` scripts as described in the next step.

Results

This procedure results in having a clean system. You can reinstall into the same directories now. A clean system has no trace of a previously deleted installation.

What to do next

Go to Chapter 3, “Task overview: Installing,” on page 5 to begin planning a new installation.

Manually uninstalling on an HP-UX system

This procedure uninstalls a WebSphere Application Server product from an HP-UX system. After running the uninstaller program, manual steps remove log files and registry entries that can prevent you from reinstalling the product into the original directory. If you are not planning to reinstall, do not uninstall manually.

Before you begin

The uninstaller program removes all profiles by default, including all of the configuration data and applications in each profile. Before you start the uninstall procedure, back up the `config` folder, the `installableApps` folder, and the `installedApps` folder of each profile, if necessary, or use the `-OPT removeProfilesOnUninstall="false"` parameter on the uninstall command.

Determine the installation root directory for the product so that you remove the correct product and produce a clean system.

About this task

Reinstalling the product into a new directory when files remain from a previous installation can create a coexistence scenario. However, you can delete all files and registry entries to completely remove a WebSphere Application Server product. A clean system lets you reinstall the product into the original directory without coexistence.

Default directories are shown in the following planning table:

Identifier	Directory	Actual location
<i>app_server_root</i>	/opt/IBM/WebSphere/AppServer	
<i>profile_root</i>	/opt/IBM/WebSphere/AppServer/profiles	
<i>plugins_root</i>	/opt/IBM/WebSphere/Plugins	

The installation wizard and the Profile Management Tool provide an override for your own locations for root directories.

Use the `installRegistryUtils` command to examine the installation locations for all installed WebSphere Application Server products.

Perform the following procedure to produce a clean system.

1. Log on as the same user ID who installed the product.
2. Run the uninstaller program for the Web server plug-ins for WebSphere Application Server.
If a Web server is configured to run with the application server, uninstall the plug-ins to remove the configuration from the Web server.
3. Use the kill command to kill all Java processes that are running.
If running Java processes 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` command.

```
kill -9 java_pid_1 java_pid_2...java_pid_n
```

4. Issue the `uninstall` command.
If you have already run the uninstaller program or if you cannot run the uninstaller program, skip this step.
See the description of the “uninstall command” on page 207 for more information.
The Uninstaller wizard begins and displays the Welcome panel.
5. Use HP-UX System Administration Manager (SAM) to remove packages.
 - a. Start the SAM utility with the `/usr/sbin/sam` command.
 - b. Verify that your `DISPLAY` and `TERM` environment variables are set properly.
 - c. Click **Software management**.
 - d. Click **View installed software**.
 - e. Look for WebSphere Application Server entries or IBM HTTP Server entries in the SD list.
 - f. Close the SD list.
 - g. Click **Remove local host software**.

- h. Click any of the following instances that display in the SD Remove List:
 - **IBM HTTP Server**
 - **WSBAA70**
 - **WSPAA70**
 - **WSCAA**
 - **gsk7bas**
 - i. Click **Actions > Mark for remove**.
 - j. Click **Actions > Remove**.
 - k. Click **OK** in the Remove analysis dialog box.
 - l. Click **Logs** to display real-time removal of selected packages.
 - m. Click **Done** when all packages are removed.
 - n. Exit SAM.
6. Search for the packages to verify their removal.
 Type **swlist | grep WS** to show packages for WebSphere Application Server.
 Package names for Web server plug-ins for WebSphere Application Server are:
- ```
WSPAA70
WSPAA70DGCC
WSPAA70DLVC
WSPAA70LC
WSPAA70WSPC
WSPAA70AddBytesHS
WSPAA70gskithP
WSPAA70gskithPC
WSPAA70jdkHP
```
7. Type `rm -rf app_server_root` to remove WebSphere Application Server directories in the `app_server_root` directory. Do not remove installation root directories for products that you intend to keep. Remove all of the profile directories as well.
  8. Use the `installRegistryUtils` command to examine the installation locations for all installed WebSphere Application Server products and remove the desired products from the install registry.

## Results

This procedure results in having a clean system. You can reinstall into the same directories now. A clean system has no trace of a previously deleted installation.

## Example of displaying package names for WebSphere Application Server products

Issue the following command:

```
swlist | grep WSBAA70
```

The following package name is returned:

```
WSBAA70 7.0.0 IBM WebSphere Application Server
```

## What to do next

Go to Chapter 3, “Task overview: Installing,” on page 5 to begin planning a new installation.

## Manually uninstalling on a Linux system

This procedure uninstalls a WebSphere Application Server product from a Linux system. After running the uninstaller program, manual steps remove log files and registry entries that can prevent you from reinstalling the product into the original directory. If you are not planning to reinstall, do not uninstall manually.



## Before you begin

The uninstaller program removes all profiles by default, including all of the configuration data and applications in each profile. Before you start the uninstall procedure, back up the config folder, the installableApps folder, and the installedApps folder of each profile, if necessary, or use the `-OPT removeProfilesOnUninstall="false"` parameter on the uninstall command.

Determine the installation root directory for the product so that you remove the correct product and produce a clean system.

## About this task

Reinstalling the product into a new directory when files remain from a previous installation can create a coexistence scenario. However, you can delete all files and registry entries to completely remove a WebSphere Application Server product. A clean system lets you reinstall the product into the original directory without coexistence.

Default directories are shown in the following planning table:

| Identifier             | Directory                             | Actual location |
|------------------------|---------------------------------------|-----------------|
| <i>app_server_root</i> | /opt/IBM/WebSphere/AppServer          |                 |
| <i>profile_root</i>    | /opt/IBM/WebSphere/AppServer/profiles |                 |
| <i>plugins_root</i>    | /opt/IBM/WebSphere/Plugins            |                 |

The installation wizard and the Profile Management Tool provide an override for your own locations for root directories.

Use the `installRegistryUtils` command to examine the installation locations for all installed WebSphere Application Server products.

Perform the following procedure to produce a clean system.

1. Log on as the same user ID who installed the product.
2. Run the uninstaller program for the Web server plug-ins for WebSphere Application Server.  
If a Web server is configured to run with the application server, uninstall the plug-ins to remove the configuration from the Web server.
3. Use the kill command to kill all Java processes that are running.

If running Java processes 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` command.

```
kill -9 java_pid_1 java_pid_2...java_pid_n
```

4. Issue the uninstall command.  
If you have already run the uninstaller program or if you cannot run the uninstaller program, skip this step.  
See the description of the “uninstall command” on page 207 for more information.  
The Uninstaller wizard begins and displays the Welcome panel.
5. Search for related packages.  
Read the “Operating system registry keys” topic for more information.

Do not remove packages for WebSphere Application Server products that you are not uninstalling. Version 7.0 package names have a prefix of WSB or WSP and a suffix of 70. WSC package names do not have a suffix of 70.

6. If there are packages to delete, type `rpm -e packagename` to remove any packages for the product that you are uninstalling.

Alternatively, you can search for packages to verify that everything in the list is something to delete:

```
rpm -qa | grep WS
```

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).

7. Type `rm -rf app_server_root` to remove WebSphere Application Server directories in the `app_server_root` directory. Do not remove installation root directories for products that you intend to keep. Remove all of the profile directories as well.
8. Edit the “vpd.properties file” on page 209.  
Do not delete or rename the `vpd.properties` file because the InstallShield MultiPlatform (ISMP) program uses it for other products that it installs. If the WebSphere Application Server product that you are uninstalling is the only product with entries in the `vpd.properties` file, you can delete this file.
9. Use the `installRegistryUtils` command to examine the installation locations for all installed WebSphere Application Server products and remove the desired products from the install registry.

## Results

This procedure results in having a clean system. You can reinstall into the same directories now. A clean system has no trace of a previously deleted installation.

## What to do next

Go to Chapter 3, “Task overview: Installing,” on page 5 to begin planning a new installation.

## Manually uninstalling on a Solaris system

This procedure uninstalls the WebSphere Application Server product from a Solaris system. After running the uninstaller program, manual steps remove log files and registry entries that can prevent you from reinstalling the product into the original directory. If you are not planning to reinstall, do not uninstall manually.

## Before you begin

The uninstaller program removes all profiles by default, including all of the configuration data and applications in each profile. Before you start the uninstall procedure, back up the `config` folder, the `installableApps` folder, and the `installedApps` folder of each profile, if necessary, or use the `-OPT removeProfilesOnUninstall=false` parameter on the uninstall command.

Determine the installation root directory for the product so that you remove the correct product and produce a clean system.

## About this task

Reinstalling the product into a new directory when files remain from a previous installation can create a coexistence scenario. However, you can delete all files and registry entries to completely remove a WebSphere Application Server product. A clean system lets you reinstall the product into the original directory without coexistence.

Default directories are shown in the following planning table:

| Identifier             | Directory                             | Actual location |
|------------------------|---------------------------------------|-----------------|
| <i>app_server_root</i> | /opt/IBM/WebSphere/AppServer          |                 |
| <i>profile_root</i>    | /opt/IBM/WebSphere/AppServer/profiles |                 |
| <i>plugins_root</i>    | /opt/IBM/WebSphere/Plugins            |                 |

The installation wizard and the Profile Management Tool provide an override for your own locations for root directories.

Use the `installRegistryUtils` command to examine the installation locations for all installed WebSphere Application Server products.

Perform the following procedure to produce a clean system.

1. Log on as the same user ID who installed the product.
2. Run the uninstaller program for the Web server plug-ins for WebSphere Application Server.  
If a Web server is configured to run with the application server, uninstall the plug-ins to remove the configuration from the Web server.
3. Use the `kill` command to kill all Java processes that are running.  
If running Java processes 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` command.

```
kill -9 java_pid_1 java_pid_2...java_pid_n
```

4. Issue the `uninstall` command.  
If you have already run the uninstaller program or if you cannot run the uninstaller program, skip this step.  
See the description of the “uninstall command” on page 207 for more information.  
The Uninstaller wizard begins and displays the Welcome panel.
5. Search for related packages. Type the following command to search for packages for WebSphere Application Server products:  

```
pkginfo | grep WS
```

  
If no packages appear when using these commands, skip the next step. The resulting list of packages has the following format:  

```
application WSBA070 WebSphere Application Server
```
6. Change directories to the directory where package information is registered.  

```
cd /var/sadm/pkg
```
7. Issue the following command to remove any WebSphere Application Server-related packages.  

```
pkgrm packagename1 packagename2 packagename3 ...
```

Do not remove packages for WebSphere Application Server products that you are not uninstalling. Version 7.0 package names have a prefix of WSB or WSP and a suffix of 70. WSC package names do not have a suffix of 70.

Issue the following commands from the `/var/sadm/pkg` directory to search for and remove any WebSphere Application Server product-related packages that are registered in the `/var/sadm/pkg` directory:

- a. Change directories to the correct directory: `cd /var/sadm/pkg`
- b. `ls |grep WSB|xargs -i pkgrm -n {}` for WebSphere Application Server products
- c. `ls |grep WSC|xargs -i pkgrm -n {}` for Application Client
- d. `ls |grep WSP|xargs -i pkgrm -n {}` for Web server plug-ins for WebSphere Application Server

Package names for Web server plug-ins for WebSphere Application Server are:

```
WSPAA70
WSPAA70AC
WSPAA70BC
WSPAA70CC
WSPAA70DC
WSPAA70FC
WSPAA70FB
WSPAA70GC
WSPAA70HC
```

If there is a problem removing the packages, remove the related package directories in the `/var/sadm/pkg` directory, including the preremove files.

For example, remove the following file before issuing the `pkgrm -n WSBA70` command:

```
/var/sadm/pkg/WSBA70/install/preremove
```

8. Type `rm -rf app_server_root` to remove WebSphere Application Server directories in the `app_server_root` directory. Do not remove installation root directories for products that you intend to keep. Remove all of the profile directories as well.
9. Use the `installRegistryUtils` command to examine the installation locations for all installed WebSphere Application Server products and remove the desired products from the install registry.

## Results

This procedure results in having a clean system. You can reinstall into the same directories now. A clean system has no trace of a previously deleted installation.

## What to do next

Go to Chapter 3, “Task overview: Installing,” on page 5 to begin planning a new installation.

## Manually uninstalling on a Windows system

Uninstall a WebSphere Application Server product from a Windows system by running the uninstaller program and performing some manual steps to remove log files and registry entries. Such registry entries can prevent you from reinstalling the product into the original directory. If you are not planning to reinstall, you do not have to uninstall manually.

## Before you begin

The uninstaller program removes all profiles by default, including all of the configuration data and applications in each profile. Before you start the uninstall procedure, back up the `config` folder, the `installableApps` folder, and the `installedApps` folder of each profile, if necessary, or use the `-OPT removeProfilesOnUninstall="false"` parameter on the uninstall command.

Determine the installation root directory for the product so that you remove the correct product and produce a clean system.

**Note:** If an administrator user uninstalls an application server which is owned by another user, then all registry entries for all application server instances owned by the administrator will also be removed. You should uninstall any non-administrator application server with the owning non-administrator user if possible.

## About this task

Reinstalling the product into a new directory when files remain from a previous installation can create a coexistence scenario. However, you can delete all files and registry entries to completely remove a WebSphere Application Server product. A clean system lets you reinstall the product into the original directory without coexistence.

Default directories are shown in the following planning table:

| Identifier             | Directory                                         | Actual location |
|------------------------|---------------------------------------------------|-----------------|
| <i>app_server_root</i> | C:\Program Files\IBM\WebSphere\AppServer          |                 |
| <i>profile_root</i>    | C:\Program Files\IBM\WebSphere\AppServer\profiles |                 |
| <i>plugins_root</i>    | C:\Program Files\IBM\WebSphere\Plugins            |                 |

**Windows** If you move either installation root directory, move them to a shorter path name. Some Windows systems have a length restriction of 258 characters for a command. A problem can occur that prevents the successful creation of a profile when either path is too long. The maximum length for the installation root directory is 60 characters. The maximum length for the profiles installation root directory is 80 characters.

The Installation wizard and the Profile Management Tool let you specify your own locations for installation root directories.

Use the `installRegistryUtils` command to examine the installation locations for all installed WebSphere Application Server products.

Perform the following procedure to produce a clean system.

1. Log on with the same user ID that you used to install the product.
2. Run the uninstaller program for the Web server plug-ins for WebSphere Application Server.  
If a Web server is configured to run with the application server, uninstall the plug-ins to remove the configuration from the Web server.
3. Stop any browsers and any Java processes related to WebSphere Application Server products, as described in Chapter 10, “Uninstalling the product,” on page 203.
4. Issue the uninstall command.

If you have already run the uninstaller program or if you cannot run the uninstaller program, skip this step.

```
app_server_root\uninstall\uninstall
```

See the description of the “uninstall command” on page 207 for more information.

The Uninstaller wizard begins and displays the Welcome panel.

5. Verify that you have an Emergency Recovery Disk. Instructions for creating this disk are in the Windows help documentation.  
This step is a safeguard. This procedure does not require the recovery disk.
6. Use the `regback.exe` program from the Windows Resource Kit to back up the registry.  
This step is a safeguard. This procedure does not require the backup copy of the registry.

7. Delete product registry entries for the WebSphere Application Server product that you are uninstalling. Edit the Windows system registry by invoking the regedit.exe command from a command prompt.

**Note:** You can easily make a mistake while using the registry 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. Press **Ctrl-F** to search for all instances of **WebSphere** 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.
  - b. Expand and select keys related to **WebSphere Application Server** products. Read the "Operating system registry keys" topic for a list of Windows registry keys to search for and delete.
  - 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.
8. Delete the installation root directory for the product that you are uninstalling.
  9. Determine all of the profile directories and remove the directories.
  10. Open a Windows Explorer window and browse to the C:\Documents and Settings\All Users\Start Menu\Programs\IBM WebSphere directory.  
If you have one installation of a WebSphere Application Server product, delete the following folder:  
Application Server, Express v7.x
  11. Delete the %WINDIR%\IsUninst.exe file.  
%WINDIR% is a variable. The Windows installation folder might be, for example, C:\Windows or C:\Winnt.
  12. Edit the "vpd.properties file" on page 209.  
The file is located in the installation directory of the operating system, such as the C:\WINNT directory or the C:\windows directory.  
Do not delete or rename the vpd.properties file because the InstallShield MultiPlatform (ISMP) program uses it for other products that it installs. If the WebSphere Application Server product that you are uninstalling is the only product with entries in the vpd.properties file, you can delete this file.
  - 13.
  14. Use the installRegistryUtils command to examine the installation locations for all installed WebSphere Application Server products and remove the desired products from the install registry.
  15. Restart your machine if a prompt displays that directs you to restart.

## Results

This procedure results in having a clean system. You can reinstall into the same directories now. A clean system has no trace of a previously deleted installation.

## What to do next

Go to Chapter 3, "Task overview: Installing," on page 5 to begin planning a new installation.

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