



Installing your application serving environment

Note

Before using this information, be sure to read the general information under “Notices” on page 113.

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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 WebSphere Application Server from your IBM i server” on page 14

You can now choose to install and configure the application server product on i5/OS using one of three supported Java SDKs. Read the “Customizing the response file” topic for more information.

- Chapter 10, “Installing maintenance packages,” on page 89

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.

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

Install the product

Configure the product after installation

Install available maintenance

Start the application server

Chapter 3. Checklist: Installing WebSphere Application Server on the IBM i platform

Print this topic and use it as a checklist of steps for installing WebSphere Application Server products on the IBM® i platform.

1. Step 1: Preparing for the installation

- a. ____ Determine if WebSphere Application Server for IBM i is already installed on your server.
Note that you are looking for Version 7.0 only, not previous versions of the product.
See Chapter 4, “Preparing the operating system for installation,” on page 7 for more information.
- b. ____ Read the product Release Notes® for the WebSphere Application Server product.
- c. ____ Schedule enough time for each step of the process.
See Chapter 4, “Preparing the operating system for installation,” on page 7 for more information.
- d. ____ Verify that your system meets all hardware and software prerequisites, and install prerequisite software if necessary.
 - ____ iSeries® server hardware requirements
 - ____ iSeries server software requirementsSee “IBM i prerequisites” on page 8 for more information.
- e. ____ Verify that your workstation meets all hardware and software prerequisites, and install prerequisite software if necessary.
See “Workstation prerequisites” on page 10 for more information.
- f. ____ Obtain and install the correct IBM icumulative PTF package.
See “Cumulative PTFs for IBM i” on page 12 for more information.
- g. ____ Obtain the WebSphere Application Server product and current fixes.
 - ____ WebSphere Application Server
 - ____ WebSphere Application Server Group PTFSee Chapter 4, “Preparing the operating system for installation,” on page 7 for more information.

2. Step 2: Installing WebSphere Application Server

- a. ____ Install WebSphere Application Server on your iSeries server.
See “Installing WebSphere Application Server for IBM i” on page 13 for more information.
- b. ____ Install the WebSphere Application Server group PTF.
See “Installing the WebSphere Application Server group PTF” on page 33 for more information.

3. Step 3: Configuring WebSphere Application Server

- a. ____ Set SQL server jobs.
See “Configuring SQL jobs” on page 40 for more information.
- b. ____ Configure TCP/IP.
See “Configuring TCP/IP” on page 41 for more information.
- c. ____ Configure an HTTP server instance.
See “Configuring an HTTP server instance” on page 42 for more information.

4. Step 4: Starting WebSphere Application Server

- a. ____ Start WebSphere Application Server.
See Chapter 7, “Starting WebSphere Application Server,” on page 49 for more information.
- b. ____ Verify that WebSphere Application Server is running.
See “Verifying that the application server is running” on page 50 for more information.
- c. ____ Start the administrative console.
See “Starting the administrative console” on page 51 for more information.

- d. ____ Configure the virtual host.
See “Configuring the virtual host” on page 55 for more information.
 - e. ____ Start the HTTP server.
See “Starting the HTTP server instance” on page 56 for more information.
5. **Step 5: Verifying the installation**
- a. ____ Verify the installation.
See Chapter 8, “Verifying the installation,” on page 59 for more information.

Chapter 4. Preparing the operating system for installation

Select the product components that you intend to install and verify that the product prerequisites are met. Also, plan for the amount of time required to perform each step of the installation.

About this task

Use this procedure to verify that you are ready to install. Complete the following procedure before you begin to install the product on your IBM i system.

1. Determine if WebSphere Application Server is already installed on your server.
 - a. Enter the Display Software Resources (DSPSFWRSC) command on a CL command line.
 - b. Look for an entry with the product Resource ID 5733W70.
 - If you do not find the product Resources ID, then this product has not been installed on your iSeries server.
 - If a previous version of WebSphere Application Server is installed on your server, read the coexistence instructions before you install the new version.

2. Print the Chapter 3, "Checklist: Installing WebSphere Application Server on the IBM i platform," on page 5 to use as a checklist during the installation process.

3. Determine the time requirements for installation.

Plan to set aside enough time for each step of the process. Depending on your server specifications, the process may take more or less time than the estimates provided in this documentation.

Note: The installation process might require at least one initial program load (IPL or restart) of the server, if you need to install an IBM i cumulative PTF package.

Task	Estimated time
Preparing for the installation	
Reading Release Notes and migration instructions, and verifying hardware and software prerequisites.	1-2 hours ¹
Obtaining the product and current fixes.	Up to 2 weeks
Installing any additional products and IBM i cumulative PTF package.	1-2 hours
Installing WebSphere Application Server	
Installing WebSphere Application Server on your IBM i server ²	45-120 minutes
Installing WebSphere Application Server Group PTF (depends on your system)	Up to 2 hours
Creating an initial configuration	
	30 minutes
Starting WebSphere Application Server for the first time	
	1-20 minutes
Verifying the installation	
	10 minutes

¹ This estimate applies if all product prerequisites are met. It does not take into account the time required to install additional prerequisite software.

² Actual time requirement depends on the method used. Installing the product from the disc drive of your iSeries server takes less time than installing it from a remote workstation.

4. Read the product Release Notes for important information about the product.
See the WebSphere Application Server documentation page for IBM i .
5. Verify that your system meets all hardware and software prerequisites, and install prerequisite software if necessary.
Verify that the IBM i prerequisites are satisfied. Install prerequisite software if necessary.

If you are running an IBM i server that does not meet the minimum recommended hardware requirements for WebSphere Application Server, you can still install and run the product. However, the WebSphere Application Server environment might run slowly, and your applications might not run successfully.

See “IBM i prerequisites” for more information.

6. Verify that your workstation meets all hardware and software prerequisites, and install prerequisite software if necessary.

See “Workstation prerequisites” on page 10 for more information.

7. Obtain the WebSphere Application Server product and current fixes.

Before you install WebSphere Application Server for IBM i, you need to obtain the application server product and current fixes. It can take up to two weeks to receive the product.

- **WebSphere Application Server Version 7.0 for IBM i** For information about how to order the product, see the **Ordering information** section of the WebSphere Application Server packaging information page.

- **Cumulative PTFs**

WebSphere Application Server Version 7.0 for IBM i was tested on a specific IBM i cumulative PTF package level.

To view the cumulative PTF package tested, see WebSphere Application Server PTFs.

From the PTFs page, select the link for your operating system release level. On the resulting page, click the **Cumulative Package** link.

You can install and run WebSphere Application Server Version 7.0 for IBM i successfully on earlier or later cumulative PTF packages.

See “Determining the proper cumulative PTF level” on page 11 for more information about determining the cumulative PTF package level for your server.

- **PTFs**

To install the WebSphere Application Server product, ensure that you have a recent level of the Java™ group PTF installed. For V5R4M0, level 13 or higher is recommended.

The WebSphere Application Server Version 7.0 for IBM i group PTF includes fixes for WebSphere Application Server and other IBM i products such as IBM DB2® Universal Database™, IBM Developer Kit for Java, and the IBM HTTP Server.

Installing the group PTF requires an IPL of your server, so plan accordingly.

To determine which IBM i group PTF you must order and install, see WebSphere Application Server for IBM i PTFs Web page. Group PTF numbers differ by WebSphere Application Server product and IBM i release level.

What to do next

IBM i prerequisites

Before you install WebSphere Application Server, verify that your hardware and software meet the minimum requirements.

iSeries hardware requirements

Overall system requirements will vary based on actual workload requirements. It is highly recommended to use IBM Systems Workload Estimator for sizing assistance.

Systems that do not meet the recommended minimums may be used in environments that support a limited number of users and where longer server initialization times are acceptable. The recommended hardware minimum requirements follow:

- Server requirements for servlets and JavaServer Pages (JSP) files

- Disk requirements

Minimum server requirements

- Recommended minimum server models:
 - WebSphere requires a partition with a minimum of 600 CPW
 - WebSphere applications can benefit from the addition of an Accelerator Feature on models where this is available
 - Each active WebSphere profile requires a minimum of 1 GB of memory
- Any partition running WebSphere Application Server should have a minimum of 2 GB of memory. This memory requirement is in addition to memory required for any other applications running on your iSeries server.

These requirements are based on a single WebSphere Application Server profile. Additional profiles running concurrently require additional resources.

These requirements represent the recommended minimum requirements. Deployments that must support many users or require shorter response times might require additional resources.

Disk requirements

Table 1. WebSphere Application Server for IBM i disk requirements

Installation option	Description	Disk space after installation
WebSphere Application Server	WebSphere Application Server run time	910 MB
Application Server Samples	Sample applications	90 MB
Application Client	Client development and run time	230 MB
Web Server Plug-ins	Web server plug-ins	100 MB

IBM i software requirements

The software required is as follows:

IBM i Version X Release Y (VXRY)

WebSphere Application Server is supported on IBM i Version 5 Release 4 (V5R4) or Version 6 Release 1 (V6R1). The IBM i server must be in an unrestricted state, and your user profile must have *ALLOBJ and *SECADM special authorities.

Java requirements

One of the following Java products is required to use or install WebSphere Application Server Version 7.0.

V5R4

- IBM Developer Kit for Java(TM) (5722-JV1), Version 1.6 (option 10)
- IBM J2SE 6.0 32-bit JVM (5722-JV1), (option 11)

V6R1

- IBM Developer Kit for Java(TM) (5761-JV1), Version 1.6 (option 10)
- IBM J2SE 6.0 32-bit JVM (5761-JV1), (option 11)
- IBM J2SE 6.0 64-bit JVM (5761-JV1), (option 12)

IBM i Qshell (5722-SS1 or 5761-SS1 option 30)

Required to run installation scripts and to use other scripts in WebSphere Application Server.

IBM i Extended Base Directory Support (5722-SS1 or 5761-SS1 option 3)

Required for installation.

IBM i Portable Application Solutions Environment (5722-SS1 or 5761-SS1 option 33)

Required to use Tivoli® Performance Viewer. Required for Java SE 6 32 bit and Java SE 6 64 bit.

IBM i Host Servers (5722-SS1 or 5761-SS1 option 12)

Required for installation.

IBM i Digital Certificate Manager (5722-SS1 or 5761-SS1 option 34)

Required for installation to use Secure Sockets Layer (SSL) protocol.

All necessary fixes

For a list of current fixes, see <http://www.ibm.com/systems/i/software/websphere/index.html> and click **PTFs**.

IBM i optional software

The optional software is as follows:

HTTP server

An HTTP server is not required for installation, but recommended for production environments that use servlets and JSP files. If you plan to deploy only enterprise beans, you do not need an HTTP server instance. WebSphere Application Server supports these HTTP server products:

- IBM HTTP Server (powered by Apache) (5722-DG1 or 5761-DG1)
- Lotus® Domino® for iSeries 6.0 (5733-LD6)
- Lotus Domino for iSeries 6.5 (5733-L65)

DB2® Query Manager and SQL Development Kit for iSeries (5722-ST1 or 5761-ST1)

The DB2 Query Manager and SQL Development Kit for iSeries help you develop client applications.

Next: See “Workstation prerequisites.”

Workstation prerequisites

Before you install WebSphere Application Server workstation components, verify that your hardware and software meet the minimum requirements.

Workstation hardware requirements

If you only plan to use your workstation to administer WebSphere Application Server, you can use any workstation running a supported Web browser.

The workstation hardware requirements for application development and assembly components follow:

Capable workstations

- See Detailed system requirements for more information.

Communications adapter or network interface

Your workstation must support a communications adapter or an appropriate network interface.

Free disk space

Your workstation must have a minimum of 120 MB of free disk space.

Memory

Your workstation must have a minimum of 256 MB of memory.

Disc drive

Your workstation must have a disc drive.

Workstation software requirements

If you only plan to use your workstation to administer WebSphere Application Server, you can use any operating system with a supported Web browser.

The following workstation software requirements apply to the application development and assembly component. See Detailed system requirements for more information.

Any of these IBM development kits for Java

- Windows® IBM Enhanced Java SE Development Kit 6
- HP-UX IBM Software Development Kit for the Java Platform, Version 1.6
- IBM Developer Kit for Linux®, Java 2 Technology Edition, Version 1.6
- Solaris IBM Java SE Development Kit 6
- IBM Developer Kit for AIX®, Java 2 Technology Edition, Version 1.6

These IBM development kits for Java are included on the WebSphere Application Server workstation disc. The appropriate development kit is automatically installed when you install any of the workstation components of WebSphere Application Server.

TCP/IP

TCP/IP must be installed and running.

Any of the following Web browsers

- Microsoft® Internet Explorer Version 6.0 SP2 or later

Next: See “Determining the proper cumulative PTF level.”

Determining the proper cumulative PTF level

WebSphere Application Server for IBM i was tested with a specific cumulative PTF package. Ensure that you have the same cumulative PTF package or newer applied to your system before using WebSphere Application Server for IBM i.

Before you begin

Check the cumulative PTF package level applied to your system. If it is not at the minimum required level, order and apply the currently available cumulative PTF package.

About this task

Perform this task to gather the needed information about the cumulative PTF level applied to your system.

1. Determine the prerequisite cumulative PTF package level for the version of WebSphere Application Server that you plan to install.
 - a. Go to the PTF page.
 - b. Under WebSphere PTF information, click the release level for your operating system.
 - c. Click the Cumulative Package link to see the minimum cumulative PTF package that is required.
2. Determine if the correct operating system cumulative PTF package is installed on your server.
 - a. Sign onto your server.
 - b. Enter the Display PTF Status (DSPPTF) command on a CL command line. The Display PTF Status screen is displayed. This screen lists the PTFs that are applied to the server.

The following example shows the Display PTF status screen on V5R4:

Chapter 5. Task overview: installing

Installing WebSphere Application Server involves installing the product and installing the group PTF.

Before you begin

Prepare for the installation before using this procedure. See Chapter 4, “Preparing the operating system for installation,” on page 7 for more information.

About this task

Use this procedure to install WebSphere Application Server for IBM i.

1. Install the product on your IBM i server.

Install the product locally from the optical drive of your IBM i server, or remotely from a supported workstation platform.

See “Installing WebSphere Application Server for IBM i.”

2. Install the WebSphere Application Server group PTF.

Apply the most recent WebSphere Application Server for IBM i group PTF before you start WebSphere Application Server for the first time.

The group PTF includes the most recent WebSphere Application Server PTFs and recent PTFs for other products that are required for WebSphere Application Server.

See “Installing the WebSphere Application Server group PTF” on page 33.

Results

If any part of the installation results in problems, see “iSeries installation troubleshooting tips” on page 86.

What to do next

Go to “Installing WebSphere Application Server for IBM i” to continue the installation.

Installing WebSphere Application Server for IBM i

Installation methods for installing the WebSphere Application Server product include installing from the server, installing from a Windows workstation command line, or installing from the Windows workstation graphical user interface.

Before you begin

Prepare for the installation before using this procedure. See Chapter 4, “Preparing the operating system for installation,” on page 7 for more information.

About this task

New, more granular installation procedures simplify installation and improve installation reliability. Installation routines exist for the following components on the product disc. Separate installation procedures let you install only what you need on a particular machine:

WebSphere Application Server

This component installs the application server run time and optionally installs various features:

Sample applications

If you do not want to use the WebSphere Application Server samples, you can clear the check box for this optional feature.

See “Installing and accessing the Samples Gallery” on page 60 for more information.

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.

Web server plug-ins

This component provides the necessary files and Web server plug-ins for running remote HTTP servers to access WebSphere Application Server.

Application client

This component provides the client application development and runtime portion of the WebSphere Application Server product. This component allows you to compile your client application code and run both Java Platform, Enterprise Edition (Java EE) client applications and thin applications.

Use any of the following installation methods to install WebSphere Application Server on your IBM i server.

- Install WebSphere Application Server from your IBM i server.
Installing the product from the CD-ROM drive of your IBM i server requires direct physical access to the server. The local installation requires less time to complete than a remote installation. The local installation reads installation options from a response file.
See “Installing WebSphere Application Server from your IBM i server.”
- Install WebSphere Application Server from a Windows workstation command line.
The install.exe command invokes the installation wizard. The wizard reads installation options from a response file. Installing the product from a Windows workstation does not require direct physical access to the IBM i server, but it typically requires more time to complete than a local installation.
See “Installing from a Windows workstation command line” on page 17.
- Run the GUI installation tool from a Windows workstation
The interactive GUI uses an InstallShield interface to prompt you for installation options. Installing the product from a Windows workstation does not require direct physical access to the IBM i server, but typically requires more time to complete than a local installation.
See “Installing on IBM i using a Windows workstation GUI” on page 18.

Results

Selecting one of the methods results in performing an installation that can take up to 120 minutes to complete.

Installing WebSphere Application Server from your IBM i server

Install WebSphere Application Server directly from your IBM i server.

Before you begin

Prepare for the installation before using this procedure. See Chapter 4, “Preparing the operating system for installation,” on page 7 for more information.

Before you install WebSphere Application Server, ensure that your user profile has *ALLOBJ and *SECADM special authorities.

About this task

You can install WebSphere Application Server from Qshell using the **INSTALL** command. You can also use the **RUNJVA** command to invoke the installation wizard.

1. Sign on the IBM i system with a user profile that has *ALLOBJ and *SECADM special authorities.
2. Verify that the host server jobs have started on your IBM i server.

The host server jobs allow the installation code to run on IBM i. On a CL command line, enter the following command:

```
STRHOSTSVR SERVER(*ALL)
```

3. Place the WebSphere Application Server - Express for IBM i disc in the disc drive of your server. Do not use the WebSphere Application Server - Express for Windows disc or any other operating system disc other than the disc for IBM i.

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.

4. Use the Copy (CPY) command to create a copy of the responsefile.express.txt file from the disc. For example:

```
CPY OBJ('/QOPT/WEBSHERE/WAS/responsefile.express.txt') TODIR('/MYDIR')
```

QOPT is the disc mount point.

WEBSHERE is the disc volume label.

/WAS is the product directory on the disc. This will be referred to in later steps.

Note: For DVD media, an additional directory prefix is required before the product directory that reflects the operating system and architecture of the installation. Using the previous example, the following installation path applies when you use CD-ROM media:

```
CPY OBJ('/QOPT/WEBSHERE/WAS/responsefile.express.txt')  
TODIR('/MYDIR')
```

However, the following installation path applies when you use DVD media to install the IBM i version of the product on the 64-bit architecture:

```
CPY OBJ('/QOPT/WEBSHERE/os400_ppc64/WAS/responsefile.express.txt')  
TODIR('/MYDIR')
```

Read the packaging topics for more information.

5. If you have not already done so, read the IBM International Program License Agreement located in the /WAS/lafiles directory.

If you agree to the terms of the agreement, continue with the installation process.

6. Edit the /MYDIR/responsefile.express.txt file.

- a. Change the value for -OPT silentInstallLicenseAcceptance from false to true.

A value of true indicates that you have read and accept the terms of the license agreement. This change is required to run the installation.

- b. By default, the PROF_enableAdminSecurity option is set to true. If you want to enable administrative security during installation, you must specify values for the PROF_adminUserName and PROF_adminPassword options.

The user ID and password do not need to be a system user ID and password or an LDAP user ID and password. The ID-and-password pair specified are stored in the user registry and used for administrative security for the default profile. Write down the user ID and password.

If you do not want to enable administrative security, change the value for the `PROF_enableAdminSecurity` option from true to false.

- c. Specify a Java Software Development Kit (SDK) to invoke the installer and configure the product and profiles. You can force the use of a specific Java SDK through the `i5osjdklocation` option in the response file.

Note: You can now choose to install and configure the application server product on IBM i using one of three supported Java SDKs. Read the "Customizing the response file" topic for more information.

- d. Various features might not be installed with the product by default. If you want to use install certain features, uncomment the `-OPT addFeature` line for each specific feature you want to install. Valid features are listed in the response file.
- e. Change other installation options to suit your installation requirements.

For more information about the installation options and values, see "Customizing the installation response file" on page 21.

7. Invoke the installation program for WebSphere Application Server - Express for IBM i.

To invoke the installation program for WebSphere Application Server - Express for IBM i, run the **INSTALL** command from Qshell or use the **RUNJAVA** command from the CL command line.

In the following example commands, *path/responsefile* represents the fully-qualified path of the `responsefile.express.txt` file that you edited.

- Run the **INSTALL** command from Qshell.
 - a. On a CL command line, issue the `STRQSH` command to start the Qshell command shell.
 - b. Issue the `INSTALL` command from the `/WAS` directory to start the installation program.

```
INSTALL -options path/responsefile
```

Note: Do not exit the Qshell session (PF3) until the installation has completed. Doing so might cause the installation to stop prematurely.

- Issue the **RUNJAVA** command from the CL command line:

At the CL command line, change back to the `/WAS` directory before issuing the following commands. Enter the `RUNJAVA` command on one line. The command is shown on more lines for formatting clarity.

```
RUNJAVA
CLASS(run) PARM('-options' 'path/responsefile')
CLASSPATH('lib/jt400.jar:setup.jar')
PROP(
('Xbootclasspath/p' '..\JDK\jre.pak/repository/package.java.jre/java/jre/lib/xml.jar')
(java.version 1.6)
(is.debug 1)
)
```

Results

After you invoke the installation, messages are displayed that indicate the progress of the installation process. When the setup program completes, press **F3** to exit.

Troubleshooting

Check the `app_server_root/logs/install/log.txt` file for success, partial success, or failure for an installation. If the `app_server_root/logs/install` directory does not exist, check the following locations for log files:

- `user_home/waslogs`
- `user_home/niflogs/tmp/waslogs`

where *user_home* is the home directory for the user performing the installation.

If the install completes indicating INSTCONFPARTIALSUCCESS, check the log files located under the *user_data_root/profileRegistry/logs/manageprofiles* directory for errors. Do not uninstall and attempt to reinstall. If you cannot determine the problem, contact IBM Support.

What to do next

For security purposes, if the host servers were not running prior to installation, it is recommended that you run the End Host Server (ENDHOSTSVR) command after the installation is complete.

Next: Go to “Installing the WebSphere Application Server group PTF” on page 33 to continue the installation.

Installing from a Windows workstation command line

One installation alternative to local installation is to install WebSphere Application Server for IBM i from a Windows workstation command line.

Before you begin

Prepare for the installation before using this procedure. See Chapter 4, “Preparing the operating system for installation,” on page 7 for more information.

About this task

The remote silent mode allows you to install the product with a single command from a remote Windows workstation. Installation options must be specified in a response file. During the installation, you are unable to change the installation options. The parameters and default values are described in the response file.

1. If TCP/IP is not started or if you don't know if TCP/IP is started, enter the Start TCP/IP (STRTCP) command on the Control Language (CL) command line.
2. Verify that the host server jobs are started on your IBM i server. The host server jobs allow the installation code to run on IBM i.

Enter this command on a CL command line:

```
STRHOSTSVR SERVER(*ALL)
```

3. Verify that your user profile has the *ALLOBJ and *SECADM special authorities.
4. Place the WebSphere Application Server - Express for IBM i disc in the disc drive of your Windows workstation. The autorun feature brings up the GUI. Click **Cancel** to exit the GUI. Do not use the WebSphere Application Server - Express for Windows disc or any other operating system disc other than the disc for IBM i.

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.

5. On your Windows workstation, open a command prompt.
6. Access the disc drive of your Windows workstation by switching to the disc drive. For example, enter `e:` where `e:` is the letter assigned to your CD-ROM or DVD drive.
7. Copy the response file from the disc directory to a directory on your Windows workstation, such as the `C:\temp` directory.

For example:

```
copy responsefile.express.txt C:\temp\RESPONSEFILE
```

8. If you have not already done so, read the IBM International Program License Agreement located in the /QOPT/WEBSPPHERE/WAS/DOCS/lafiles directory. If you agree to the terms of the agreement, continue with the installation process.
9. Edit the RESPONSEFILE file:
 - a. Change the value for `-OPT silentInstallLicenseAcceptance` from `false` to `true`. A value of `true` indicates that you have read and accept the terms of the license agreement. This change is required to run the installation.
 - b. By default, the `PROF_enableAdminSecurity` option is set to `true`. If you want to enable administrative security during installation, you must specify values for the `PROF_adminUserName` and `PROF_adminPassword` options.
 The user ID and password do not need to be a system user ID and password or an LDAP user ID and password. The ID-and-password pair specified are stored in the user registry and used for administrative security for the default profile. Write down the user ID and password.
 If you do not want to enable administrative security, change the value for the `PROF_enableAdminSecurity` option from `true` to `false`.
 - c. You can choose to install and configure the application server product on IBM i using one of three supported Java Software Development Kits (SDK). Specify an SDK to invoke the installer and configure the product and profiles. You can force the use of a specific Java SDK through the `i5osjdklocation` option in the response file.
 - d. Various features might not be installed with the product by default. If you want to use install certain features, uncomment the `-OPT addFeature` line for each specific feature you want to install. Valid features are listed in the response file.
 - e. Change the installation options to suit your installation requirements.
 For information about the installation options and values, see “Customizing the installation response file” on page 21.
10. Run the **install.exe** command. Specify the response file to use during the installation. Specify the system name and a valid user profile and password when you run this command.
 Your user profile must have `*ALLOBJ` and `*SECADM` special authorities for this step.

```
install.exe system_name user_name password -options response_file
```

 The `system_name` variable is the name of your IBM i server. The `user_name` variable and the `password` variable are your user profile login credentials, and the `response_file` variable is the name of your response file.
 The password used in this command is displayed in clear text on the command line. For example:

```
install.exe MYISERIES myUserName myPassword -options C:\temp\RESPONSEFILE
```

 After you issue the command, control returns to the command prompt while the installation process runs.
11. Check the `app_server_root/logs/install/log.txt` log file to verify that the installation is complete.

Results

This procedure results in installing WebSphere Application Server - Express from a Windows workstation command line, which can take up to 120 minutes to complete.

What to do next

Go to “Installing the WebSphere Application Server group PTF” on page 33 to continue the installation.

Installing on IBM i using a Windows workstation GUI

One alternative to local installation is to install WebSphere Application Server - Express for IBM i from a Windows workstation graphical user interface (GUI).

Before you begin

Prepare for the installation before using this procedure. See Chapter 4, “Preparing the operating system for installation,” on page 7 for more information.

About this task

When you run the GUI installation tool, you specify installation options interactively during the installation process.

Use this procedure to install WebSphere Application Server - Express for IBM i with the GUI installation program:

1. If TCP/IP is not started or if you don't know if TCP/IP is started, enter the Start TCP/IP (STRTCP) command on the Control Language (CL) command line.
2. Verify that the host server jobs are started on your IBM i server. The host server jobs allow the installation code to run on IBM i.

Enter this command on a CL command line:

```
STRHOSTSVR SERVER(*ALL)
```

3. Verify that your user profile has the *ALLOBJ and *SECADM special authorities.
4. Place the WebSphere Application Server - Express for IBM i disc in the disc drive of your Windows workstation. The autorun feature brings up the launchpad. Do not use the IBM WebSphere Application Server - Express Windows disc or any other operating system platform disc from the product package.

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.

5. Click **Launch the installation wizard for WebSphere Application Server**.
6. Enter the name of the IBM i server where you are installing WebSphere Application Server - Express for IBM i and your corresponding IBM i login information, then click **OK**.
You also must enter a valid user ID and password for the server. Your profile must have *ALLOBJ and *SECADM special authorities for this step.
7. The installation wizard initializes and then displays the Welcome panel.
Click **Next** to continue.
8. On the next panel, if you accept the terms of the license agreement, select **I accept both the IBM and the non-IBM terms**, then click **Next**. If you do not accept the terms of the license agreement, you cannot continue with the installation.
9. The system prerequisites check verifies that your server meets the minimum requirements to install the product. If the prerequisites are met, click **Next**. If the prerequisites are not met, you can continue the installation. However, it is recommended that you exit the Installation wizard and make the required changes.
10. If more than one Java SE Development Kit 6 (JDK 6) option is installed on the machine, then select one of the following.
 - IBM Technology for JDK 6 - 32 bit (5722-JV1 or 5761JV1 option 11)
 - IBM Technology for JDK 6 - 64 bit (5722-JV1 or 5761JV1 option 12)
 - IBM Development Kit for Java 1.6 (5722-JV1 or 5761JV1 option 10)

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 next panel displays the product installation root directory, the default profile location, and the product library name. Accept or change these values, then click **Next**.

The product installation root directory for WebSphere Application Server - Express for IBM i contains the core product files. It is referred to in many information center examples as the *app_server_root*.

The default profile location for WebSphere Application Server - Express for IBM i contains the configurable files for the profile. This directory is referred to in many information center examples as the *user_data_root*. The default profile location is the directory under which the profile registry and profiles directory are created. The default profile is created under *user_data_root/profiles/default*. The profile registry is created under *user_data_root/profileRegistry*.

The product library is often spelled out in information center examples, but it might also be referred to as the *product_library*

13. Select an initial server environment on the WebSphere Application Server environments panel.

The following values are valid:

Table 2. 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.

14. On the next panel, choose whether to enable administrative security. If enabled, specify a user name and password to access the administrative tools. Click **Next** to continue.

The user ID and password do not need to be a system user ID and password or an LDAP user ID and password. The ID-and-password pair specified are stored in the user registry and used for administrative security for the default profile.

15. Click **Finish** to close the InstallShield program.
16. For security purposes, if the host servers were not running prior to installation, it is recommended that you run the End Host Server (ENDHOSTSVR) command after the installation is complete

Results

This procedure results in installing WebSphere Application Server - Express for IBM i from a Windows workstation GUI, which can take up to 120 minutes to complete.

What to do next

Go to “Installing the WebSphere Application Server group PTF” on page 33 to continue the installation.

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 “IBM i prerequisites” on page 8 for more information.

See “Installing WebSphere Application Server for IBM i” on page 13 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.

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"
```

Selecting an SDK for installation and configuration

You can force the use of a specific Java Software Development Kit (SDK) with the `i5osjdklocation` option in the response file. Uncomment one of the following options to select the SDK to use to configure the product.

- IBM Technology for JDK 6 - 32 bit (5722-JV1 or 5761JV1 option 11)
`-OPT i5osjdklocation="/QOpenSys/QIBM/ProdData/JavaVM/jdk60/32bit"`
- IBM Technology for JDK 6 - 64 bit (5722-JV1 or 5761JV1 option 12)
`-OPT i5osjdklocation="/QOpenSys/QIBM/ProdData/JavaVM/jdk60/64bit"`
- IBM Developer Kit for Java 1.6 (5722-JV1 or 5761JV1 option 10)
`-OPT i5osjdklocation="/QIBM/ProdData/Java400/jdk6"`

If no SDK is specified, IBM Technology for JDK 6 - 32 bit will be selected by default, if it is installed. If IBM Technology for JDK 6 - 32 bit is not installed, IBM Technology for JDK 6 - 64 bit will be selected. If IBM Technology for JDK 6 - 32 bit and IBM Technology for JDK 6 - 32 bit are not installed, IBM Developer Kit for Java 1.6 will be selected. If no valid SDKs are installed, the installation will fail.

Installation type

Use the `-OPT installType="install_type"` option to specify the installation type. You can only specify one type of installation:

Table 3. 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 4. 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">• IBM Web Administration for IBM i• 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 5. 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 wsadmin tool and logging. If you do not select this option then only the English language pack is installed.

Profile location

For new installations, specify a valid directory into which the profiles should be installed. This directory must be either empty or nonexistent.

```
-OPT defaultProfileLocation="/QIBM/UserData/WebSphere/AppServer/V7/<edition>"
```

However, you can override the empty default profile location requirement by uncommenting the following line:

```
-OPT allowOverrideProfileLocation="true"
```

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.

- **Example 1: New installation with a stand-alone profile with no features**

The following minimum options will create a new installation of the Network Deployment product that includes a stand-alone profile with no installed features. The user must be root.

```
-OPT silentInstallLicenseAcceptance="true"
-OPT installType="installNew"
-OPT profileType="standAlone"
-OPT feature="noFeature"
-OPT PROF_enableAdminSecurity="false"
-OPT installLocation="/QIBM/ProdData/WebSphere/AppServer/V7/ND"
-OPT defaultProfileLocation="/QIBM/UserData/WebSphere/AppServer/V7/ND"
```

- **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 Network Deployment product that includes a stand-alone profile with no installed features and with administrative security enabled. The user must be root.

```
-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="/QIBM/ProdData/WebSphere/AppServer/V7/ND"
-OPT defaultProfileLocation="/QIBM/UserData/WebSphere/AppServer/V7/ND"
```

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.

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 - IBM i

These file paths are default locations. You can install the product and other components in any directory where you have write access. You can create profiles in any valid directory where you have write access. Multiple installations of WebSphere Application Server products or components require multiple locations.

app_client_root

The default installation root directory for the Java EE WebSphere Application Client is the /QIBM/ProdData/WebSphere/AppClient/V7/client directory.

app_client_user_data_root

The default Java EE WebSphere Application Client user data root is the /QIBM/UserData/WebSphere/AppClient/V7/client directory.

app_client_profile_root

The default Java EE WebSphere Application Client profile root is the /QIBM/UserData/WebSphere/AppClient/V7/client/profiles/*profile_name* directory.

app_server_root

The default installation root directory for WebSphere Application Server - Express is the /QIBM/ProdData/WebSphere/AppServer/V7/Express directory.

cip_app_server_root

The default installation root directory is the /QIBM/ProdData/WebSphere/AppServer/V7/Express/cip/*cip_uid* directory for a customized installation package (CIP) produced by the Installation Factory.

A CIP is a WebSphere Application Server - Express product bundled with optional maintenance packages, an optional configuration archive, one or more optional enterprise archive files, and other optional files and scripts.

cip_profile_root

The default profile root directory is the /QIBM/UserData/WebSphere/AppServer/V7/Express/cip/*cip_uid*/profiles/*profile_name* directory for a customized installation package (CIP) produced by the Installation Factory.

cip_user_data_root

The default user data root directory is the /QIBM/UserData/WebSphere/AppServer/V7/Express/cip/*cip_uid* directory for a customized installation package (CIP) produced by the Installation Factory.

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. The 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 created with the Installation Factory that can include one or more generally available installation packages, one or more customized installation packages (CIPs), and other user-specified files and directories.

java_home

The following directories are the root directories for all supported Java Virtual Machines (JVMs).

JVM	Directory
Classic JVM	/QIBM/ProdData/Java400/jdk6
32-bit IBM Technology for Java	/QOpenSys/QIBM/ProdData/JavaVM/jdk60/32bit
64-bit IBM Technology for Java	/QOpenSys/QIBM/ProdData/JavaVM/jdk60/64bit

plugins_profile_root

The default Web server plug-ins profile root is the `/QIBM/UserData/WebSphere/Plugins/V7/webserver/profiles/profile_name` directory.

plugins_root

The default installation root directory for Web server plug-ins is the `/QIBM/ProdData/WebSphere/Plugins/V7/webserver` directory.

plugins_user_data_root

The default Web server plug-ins user data root is the `/QIBM/UserData/WebSphere/Plugins/V7/webserver` directory.

product_library

product_lib

This is the product library for the installed product. The product library for each Version 7.0 installation on the system contains the program and service program objects (similar to .exe, .dll, .so objects) for the installed product. The product library name is QWAS7x (where x is A, B, C, and so on). The product library for the first WebSphere Application Server Version 7.0 product installed on the system is QWAS7A. The `app_server_root/properties/product.properties` file contains the value for the product library of the installation, `was.install.library`, and is located under the `app_server_root` directory.

profile_root

The default directory for a profile named `profile_name` for WebSphere Application Server - Express is the `/QIBM/UserData/WebSphere/AppServer/V7/Express/profiles/profile_name` directory.

shared_product_library

The shared product library, which contains all of the objects shared by all installations on the system, is QWAS7. This library contains objects such as the product definition, the subsystem description, the job description, and the job queue.

updi_root

The default installation root directory for the Update Installer for WebSphere Software is the `/QIBM/ProdData/WebSphere/UpdateInstaller/V7/updi` directory.

user_data_root

The default user data directory for WebSphere Application Server - Express is the `/QIBM/UserData/WebSphere/AppServer/V7/Express` directory.

The profiles and profileRegistry subdirectories are created under this directory when you install the product.

web_server_root

The default web server path is `/www/web_server_name`.

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 the topic "Setting port numbers to 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.

- Assign nonconflicting ports to profile *myprofile*.

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 CCSID 819 (ASCII), to assign nonconflicting port values to the application server profile.

For this example, assume that you create the following `/TMP/was_props/appserver.props` properties file.

```
WAS_HOME=/QIBM/ProdData/WebSphere/AppServer/V7/<edition>
was.install.root=/QIBM/ProdData/WebSphere/AppServer/V7/<edition>
profileName=myprofile
profilePath=/QIBM/UserData/WebSphere/AppServer/V7/<edition>/profiles/myprofile
templatePath=/QIBM/ProdData/WebSphere/AppServer/V7/<edition>/profileTemplates/default
nodeName=MYISERIES_myprofile
cellName=MYISERIES_myprofile
hostName=MYISERIES.mycompany.com
```

2. Start a Qshell session

```
STRQSH
```

3. Change directories to the `app_server_root/bin` directory.

```
cd /QIBM/ProdData/WebSphere/AppServer/V7/<edition>/bin
```

4. Issue the command.

```
ws_ant -propertyfile /TMP/was_props/appserver.props -file
/QIBM/ProdData/WebSphere/AppServer/V7/<edition>/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 > server1 > [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.

- 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 CCSID 819 (ASCII), to assign default port values to the application server profile.

For this example, assume that you create the following /TMP/was_props/appserver.props properties file.

```
WAS_HOME=/QIBM/ProdData/WebSphere/AppServer/V7/<edition>
was.install.root=/QIBM/ProdData/WebSphere/AppServer/V7/<edition>
profileName=AppSrv02
profilePath=/QIBM/UserData/WebSphere/AppServer/V7/<edition>/profiles/AppSrv02
templatePath=/QIBM/ProdData/WebSphere/AppServer/V7/<edition>/profileTemplates/default
nodeName=MYISERIES_AppSrv02
cellName=MYISERIES_AppSrv02
hostName=MYISERIES.mycompany.com
defaultPorts=true
```

2. Start a Qshell session

```
STRQSH
```

3. Change directories to the *app_server_root/bin* directory.

```
cd /QIBM/ProdData/WebSphere/AppServer/V7/<edition>/bin
```

4. Issue the command.

```
ws_ant -propertyfile /TMP/was_props/appserver.props -file
/QIBM/ProdData/WebSphere/AppServer/V7/<edition>/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 > server1 > [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 \serverindex.xml file for your profile. Issue the netstat *cnn command from the IBM i command line to see all ports in use on the machine.

- Assign ports starting at 20050 to the AppSrv03 profile.

On IBM i, the ANT script assigns ports starting at 20050 and does not attempt to determine port conflicts. The startingPort=20050 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 CCSID 819 (ASCII), to assign default port values to the application server profile.

For this example, assume that you create the following /TMP/was_props/appserver.props properties file.

```
WAS_HOME=/QIBM/ProdData/WebSphere/AppServer/V7/<edition>
was.install.root=/QIBM/ProdData/WebSphere/AppServer/V7/<edition>
profileName=AppSrv03
profilePath=/QIBM/UserData/WebSphere/AppServer/V7/<edition>/profiles/AppSrv03
templatePath=/QIBM/ProdData/WebSphere/AppServer/V7/<edition>/profileTemplates/default
nodeName=MYISERIES_AppSrv03
cellName=MYISERIES_AppSrv03
hostName=MYISERIES.mycompany.com
startingPort=20050
```

2. Start a Qshell session

STRQSH

3. Change directories to the *app_server_root/bin* directory.

```
cd /QIBM/ProdData/WebSphere/AppServer/V7/<edition>/bin
```

4. Issue the command.

```
ws_ant -propertyfile /TMP/was_props/appserver.props -file  
/QIBM/ProdData/WebSphere/AppServer/V7/<edition>/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 > server1 > [Communications] > Ports**.

6. Run the script again and view the ports. Are they the same as before?

After using the `-startingPort` option, the resulting port values are the same each time because the ANT script assigns port values starting from the `startingPort` number (port 20050 in this case).

- Use a port definition property file to assign ports to the AppSrv04 profile.

The `portsFile=/opt/was/portdefs.our_appsrv_ex.props` special argument allows you to assign specific ports for your profile. Port conflict resolution is not done for the specified ports. 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 CCSID 819 (ASCII), to assign nonconflicting port values to the application server profile.

Assume that you create the following `/TMP/was_props/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  
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. 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=/QIBM/ProdData/WebSphere/AppServer/V7/<edition>  
was.install.root=/QIBM/ProdData/WebSphere/AppServer/V7/<edition>  
profileName=AppSrv04  
profilePath=/QIBM/UserData/WebSphere/AppServer/V7/<edition>/profiles/AppSrv04  
templatePath=/QIBM/ProdData/WebSphere/AppServer/V7/<edition>/profileTemplates/default  
nodeName=MYISERIES_AppSrv04  
cellName=MYISERIES_AppSrv04  
hostName=MYISERIES.mycompany.com  
portsFile=/TMP/was_props/portdefs.our_appsrv_ex.props
```

2. Start a Qshell session

```
STRQSH
```

3. Change directories to the *app_server_root/bin* directory.

```
cd /QIBM/ProdData/WebSphere/AppServer/V7/<edition>/bin
```

(Or, if the product is installed to a non-default directory, change directories to the <install_root_directory>/bin directory.)

4. Issue the command.

```
ws_ant -propertyfile /TMP/was_props/appserver.props -file  
/QIBM/ProdData/WebSphere/AppServer/V7/<edition>/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 > server1 > [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

Start or restart your server to use the new ports.

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 according to the hardware platform. See Chapter 4, “Preparing the operating system for installation,” on page 7 for information about required disk space and how to prepare your operating system for installation:

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

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:

- Internet Explorer, Version 6.0 Service Pack 2 or later

Install a supported Web browser if one is not installed.

Use the launchpad from a Windows workstation.

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:

- Open a shell window and issue a fully qualified command to start the launchpad:
 - `l launchpad.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. 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.)
3. Restart the launchpad by issuing the following command:
 - `launchpad.exe`

Installing additional features on an existing application server product

You can install additional features on an existing IBM WebSphere Application Server Express for IBM i installation.

Before you begin

This topic assumes that you have an existing WebSphere Application Server Express for IBM i installation and that you want to install a feature using the installation wizard from a Windows workstation graphical user interface (GUI).

About this task

When you run the GUI installation tool, you specify installation options interactively during the installation process.

Use the following procedure to add a feature to an existing application server installation.

1. If TCP/IP is not started or if you don't know if TCP/IP is started, enter the Start TCP/IP (STRTCP) command on the Control Language (CL) command line.
2. Verify that the host server jobs are started on your IBM i server. The host server jobs allow the installation code to run on IBM i.

Enter this command on a CL command line:

```
STRHOSTSVR SERVER(*ALL)
```

3. Verify that your user profile has the *ALLOBJ and *SECADM special authorities.
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 server1
```

If a server is running and security is enabled, use the following command:

```
./stopServer server1 -user user_ID -password password
```

5. 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.

6. Place the WebSphere Application Server Express for IBM i disc that provides the feature in the disc drive of your Windows workstation. The autorun feature brings up the launchpad.

Do not use the product Windows disc or any other operating system disc from the product package.

7. On the Welcome panel, click **Next**.
8. On the next panel, if you accept the terms of the license agreement, select **I accept both the IBM and the non-IBM terms**, then click **Next**. If you do not accept the terms of the license agreement, you cannot continue with the installation.
9. 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 installation at the same product level. This task describes the scenario where a previous installation exists and you are adding features with an incremental installation.

When the wizard detects a previous installation, it displays the Existing installation panel. The panel lets you add features to the existing installation, or perform a new installation to another directory.

10. Choose to install additional features. Click **Next** to continue to the optional features panel.

Do not change the installation directory unless another existing installation is in the directory that you specify. 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.

When adding features during an incremental installation, the wizard displays the Features selection panel next.

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. On the next panel, verify that the summary information is correct. If not, click **Back** to change your specifications. If the summary information is correct, click **Next** to install the feature.

The InstallShield program displays messages that indicate the status of the installation and a status bar to show the progress of the installation.

After the installation runs, the Configuration Manager progress panel is displayed. The configuration manager performs post-installation tasks and creates the default profile.

After the installation process is complete, the summary panel displays the results of the installation process and links to additional information about the product.

13. Select the check box to open the First Steps console, then click **Finish** to close the InstallShield program.
14. For security purposes, if the host servers were not running prior to installation, it is recommended that you run the End Host Server (ENDHOSTSVR) command after the installation is complete

Results

The installation wizard installs the new feature in the existing installation root directory. The installation wizard configures the application server product for the new feature.

What to do next

Create any application server profile that your configuration requires.

Adding the samples feature does not automatically deploy the samples to existing profiles that did not have samples deployed to them initially. You must create a new profile to deploy the samples. For example, create an application server profile and select to deploy the sample applications.

Use the Profile Management Tool or the manageprofiles command to create additional profiles.

After creating an application server profile, you can deploy an application. See Fast paths for WebSphere Application Server to get started deploying applications.

Installing the WebSphere Application Server group PTF

Install the WebSphere Application Server group PTF to obtain the latest fix pack for the product and to install required PTFs for other products on which WebSphere Application Server relies. After installing the group PTF, an additional step is required to install the fix pack and bring the product to the current fix level.

Before you begin

Install the WebSphere Application Server product before using this procedure. See Chapter 5, “Task overview: installing,” on page 13 for more information.

About this task

Fixes for the WebSphere Application Server product are shipped in a fix pack. The WebSphere Application Server for IBM i group PTF delivers the most current level of the fix pack for the product.

Use this procedure to load and apply the latest WebSphere Application Server for IBM i group PTF before installing the current level of fix pack and then starting WebSphere Application Server for the first time.

Along with the current fix pack, the group PTF includes WebSphere Application Server PTFs that bring the product up to the latest service level for WebSphere Application Server Version for IBM i as well as the latest IBM DB2 Universal Database, IBM Developer Kit for Java, and IBM HTTP Server group PTFs.

This group PTF also contains miscellaneous PTFs for IBM Developer Kit for Java, DB2 Universal Database for IBM i, and IBM HTTP Server that are not included in other group PTFs or cumulative PTF packages but must be installed.

See the PTFs page on the WebSphere Application Server Web site to determine the group PTF that you must order and install for your WebSphere Application Server edition and for your IBM i release level.

Install all product prerequisites before you install the group PTF package. Otherwise, WebSphere Application Server might fail as it starts.

These instructions assume that you are ready to load and apply all PTFs included in the group PTF. Because some of these PTFs might require a restart of your iSeries server, the instructions include steps for placing the server in a restricted state and doing the IPL of the server.

If it is not convenient to restart your server, specify that the PTFs that require an IPL be applied at the next normal IPL of the server. However, do not attempt to start or use WebSphere Application Server until all of the PTFs have been successfully loaded and applied and the system has performed an IPL.

1. Verify that all of the prerequisite software is installed.
2. Place the WebSphere for IBM i group PTF disc into the disc drive on your iSeries server.
3. Sign on to your server and verify that your user profile has the *ALLOBJ and *SECADM special authorities.
4. Enter this command to bring your system into a restricted state:
ENDSBS SBS(*ALL)
5. Enter the following command from the CL command line when the system is in a restricted state:
GO PTF
6. Select option 8 (Install program temporary fix package) from the menu.
7. Specify the following parameter values and press **Enter**:
 - **Device:** Specify the device name of your disc drive, for example, OPT01.
 - **Automatic IPL:** Y
 - **PTF type:** 1 (All PTFs)

If it is not convenient to restart your server, specify **No** for **Automatic IPL**. Any PTFs that require an IPL are applied at the next normal IPL of the server. However, do not attempt to start or use WebSphere Application Server until all of the PTFs have been successfully loaded and applied.

After all of the PTFs are installed, your iSeries server restarts unless you specify **No** for **Automatic IPL**.

```

Install Options for Program Temporary Fixes
System: your.server

Type choices, press Enter.

Device . . . . . OPT01 Name, *SERVICE
Automatic IPL . . . . . Y Y=Yes
N=No
Restart type . . . . . *SYS *SYS, *FULL
PTF type . . . . . 1 1=All PTFs
2=HIPER PTFs and HIPER
LIC fixes only
3=HIPER LIC fixes only
4=Refreshed Licensed Internal Code
Other options . . . . . N Y=Yes
N=No
F3=Exit F12=Cancel

```

8. After you have installed the group PTF, install the fix pack for the product.
See Chapter 10, “Installing maintenance packages,” on page 89 for details on installing the fix pack.
9. See the product release notes for information about the release, including a description of known problems and workarounds.

Results

Installing the WebSphere Application Server group PTF and the fix pack results in a fully updated installation. At that point, you can set up the initial product configuration.

What to do next

You have completed step 2 of 5.

Go to Chapter 6, “Configuring the product after installation,” on page 39 to continue the installation.

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.

- IBM e-server Support: Fix Central

A Web facility for downloading fixes for hardware and operating systems, including z/OS and IBM i.

- Adobe® Acrobat Web site

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

Chapter 6. Configuring the product after installation

Configure your IBM i server, WebSphere Application Server - Express, and your HTTP server so that WebSphere Application Server runs correctly.

About this task

Creating the initial configuration for WebSphere Application Server involves configuring the IBM i server, the WebSphere Application Server product, and the HTTP server.

1. Configure SQL jobs, as described in “Configuring SQL jobs” on page 40.
Set the maximum number of jobs that are allowed for the SQL server jobs.
2. Configure TCP/IP, as described in “Configuring TCP/IP” on page 41.
Configure TCP/IP for WebSphere Application Server.
3. Configure an HTTP server instance, as described in “Configuring an HTTP server instance” on page 42.
Create an HTTP server instance and configure it to use WebSphere Application Server to serve JavaServer Pages (JSP) files and servlets.

Results

The result of performing each of the procedures listed in this topic is an initial configuration for WebSphere Application Server.

What to do next

Configuring software license information

Set the usage limit from the Proof of Entitlement (POE) or invoice before you start WebSphere Application Server for the first time.

Before you begin

This topic assumes that you have installed the WebSphere Application Server for IBM i product and that you have installed the WebSphere Application Server group PTF.

See Chapter 5, “Task overview: installing,” on page 13 to install the product and the group PTF.

Before you set the usage limit from a POE or invoice, verify that your user profile has the *ALLOBJ special authority.

About this task

Use the Work with License Information menu to set the usage limit from a POE or invoice.

1. Access the Work with License Information menu.
On a Control Language (CL) command line, enter the Work with License Information (WRKLICINF) command.
2. On the Work with License Information menu, press **F11 (Display Usage Information)**.
3. Move the cursor to the line that contains the product 5733W70 and the feature code for the product that you installed.
The feature code is 5101 for WebSphere Application Server Version 7.0 Express.
4. Select option **2 (Change)**, then press **Enter**.

The Change License Information display is shown.

5. Specify the usage limit shown on the POE or invoice for the Usage limit prompt (USGLMT).
Do not specify a number that exceeds the purchased limit because doing so violates the IBM purchase agreement.
6. On the Change License Information display, press **F9 (All parameters)**.
7. Specify ***USGLMT** for the Threshold (THRESHOLD) prompt, then press **Enter**.
Do not leave the threshold set to zero.

Results

The usage limit changes to the value that you specified.

If the following message is displayed, type **G**.

```
CPA9E1B: Usage limit increase must be authorized.  
Press help before replying (C G)
```

After you respond to the CPA9E1B message, you must respond to the same message on the QSYSOPR message queue. Run the DSPMSG QSYSOPR command to see the message in the QSYSOPR message queue. When the message is displayed, type **G**.

What to do next

Go to “Configuring SQL jobs” to continue the installation.

Configuring SQL jobs

Choose either of two methods to change the maximum number of SQL server jobs allowed. Each Java Database Connector (JDBC) connection object requires one SQL server job.

Before you begin

If you are using the JDBC driver in the IBM Developer Kit for Java to access the IBM i database from your applications, you might need to change the maximum number of jobs allowed.

About this task

This procedure describes two methods for setting the number of SQL server jobs allowed to an adequate amount to handle the workload.

- Set the maximum number of jobs to ***NOMAX**.

Generally, it is easier to account for the number of jobs you need by setting the maximum number of jobs to ***NOMAX**. Use the Change Prestart Job Entry (CHGPJE) command to change the prestart job entry for the SQL server jobs.

```
CHGPJE SBSDB(QSYSWRK) PGM(QSQSRVR) MAXJOBS(*NOMAX)
```

- Set MAXJOBS to a large enough integer value for your applications to handle SQL server jobs.

If ***NOMAX** is not an appropriate setting for your IBM i environment, specify a large enough integer value for the MAXJOBS parameter so that your applications have enough SQL server jobs to handle the maximum number of JDBC connections required at any given time by your applications.

Results

After the maximum number of jobs is successfully changed, the following message is displayed:

```
Program QSQSRVR found in library QSYS.  
Active subsystem description QSYSWRK in QSYS changed.
```


What to do next

Go to “Configuring TCP/IP” to continue the installation.

Configuring TCP/IP

Configure TCP/IP to run WebSphere Application Server on IBM i.

Before you begin

Before you configure TCP/IP settings, ensure that your user profile has *IOSYSCFG special authority.

About this task

Use the Configure TCP/IP menu to access options that enable you to configure TCP/IP.

1. On a Control Language (CL) command line, enter the Configure TCP/IP (CFGTCP) command.
2. Verify that your TCP/IP address and LOOPBACK interface are active.
 - a. On the Configure TCP/IP menu, select option **1 (Work with TCP/IP interfaces)**.
 - b. Press **F11** to display the interface status.
 - c. Verify that the TCP/IP address is active. If it is not active, specify option **9 (Start)**.
 - d. Verify that the LOOPBACK interface at IP address 127.0.0.1 is active.
If 127.0.0.1 is not active, specify option **9 (Start)** next to the entry with IP address 127.0.0.1, then press **Enter**.
 - e. Press **F3** to return to the Configure TCP/IP menu.
3. Verify your TCP/IP host name.
 - a. On the Configure TCP/IP menu, select option **12 (Change TCP/IP domain information)**.
 - b. Verify that the TCP/IP host name is correct.
If the host name is not correct, type the correct host name in the Host name field, then press **Enter**. If the host name is correct, press **F3** to return to the Configure TCP/IP menu.
The host name cannot be *NONE.
 - c. Press **F3** to return to the command line.
4. Start TCP/IP.
If TCP/IP is not started or if you do not know if TCP/IP is started, enter the Start TCP/IP (STRTCP) command on the CL command line.
5. Verify that the server IP address is associated with the host name.

Issue the following command on the CL command line:

```
ping host_name
```

The following sample output is from a successful ping command:

```
Verifying connection to host system MYSYSTEM.MYCOMPANY.COM at address
1.2.3.4.
PING reply 1 from 1.2.3.4 took 0 ms. 256 bytes. TTL 64.
PING reply 2 from 1.2.3.4 took 0 ms. 256 bytes. TTL 64.
PING reply 3 from 1.2.3.4 took 0 ms. 256 bytes. TTL 64.
PING reply 4 from 1.2.3.4 took 0 ms. 256 bytes. TTL 64.
PING reply 5 from 1.2.3.4 took 0 ms. 256 bytes. TTL 64.
Round-trip (in milliseconds) min/avg/max = 0/0/0
Connection verification statistics: 5 of 5 successful (100 %).
```

If the ping fails, follow these steps:

- a. Enter the Configure TCP/IP (CFGTCP) command on the CL command line.
- b. On the Configure TCP/IP menu, select Option **10 (Work with TCP/IP host table entries)**.
- c. Configure the IBM i system short name to the active IP address that was listed in step 2:

- 1) Select Option **2 (Change)** and type your IP address in the Internet address field, then press **Enter**.
- 2) In the Change TCP/IP Host Table Entry (CHGTCPHTE) menu, edit the **Hostnames: Name** field to match the short name of your IBM i server, then press **Enter**.

Note: The *ADMIN instance of the HTTP server does not start without a host name.

6. Verify your system configuration.

The IPTest Java utility is shipped with the WebSphere Application Server product and can be used to debug TCP/IP configuration problems. To run this utility, run the IPTest command from the QShell command line.

The command file is in the *app_server_root/bin* directory:

```
app_server_root/bin/IPTest
```

Results

If TCP/IP has been configured successfully, the IPTest command output resembles the following example:

```
Local Address: 12.34.56.78
Local Name: MYSYSTEM.MYCOMPANY.COM
All addresses for MYSYSTEM.MYCOMPANY.COM:
12.34.56.78
```

The *Local Address* is the IP address for your IBM i server. This value must not be blank and must match the IP address verified in step 2. The *Local Name* is the domain-qualified host name for your IBM i server. If this value is blank, see the instructions in step 2. Press **F3** to exit.

If a host name has not been configured for your IBM i server, you receive an UnknownHostException message.

What to do next

Go to “Configuring an HTTP server instance” to continue the installation.

Configuring an HTTP server instance

Configure your IBM HTTP Server or Lotus Notes® Domino HTTP Server to use either Web server with WebSphere Application Server for IBM i.

Before you begin

Decide which HTTP Server you want to use to serve requests to WebSphere Application Server.

The following Web servers are supported on IBM i:

- IBM HTTP Server for IBM i, product 5722-DG1 for V5R4 and 5761-DG1 for V6R1
- Lotus Domino Web Server V6 or V6.5, product 5733-LD6 or 5733-L65

The IBM HTTP Server (original) is not supported for WebSphere Application Server. However, you can use the IBM i IBM HTTP Server (Powered by Apache) with your application server. Or, you can configure a remote HTTP server residing on a supported platform to route requests to WebSphere Application Server running on the i5/OS® server.

About this task

An HTTP server instance is not required to install or use WebSphere Application Server. However, it is recommended to support requests for servlets and JavaServer Pages (JSP) resources managed by WebSphere Application Server.

- Configure IBM HTTP Server for IBM i.
Go to “Configuring IBM HTTP Server for IBM i” if you plan to use IBM HTTP Server.
- Configure Lotus Domino HTTP Server.
Go to “Configuring Lotus Domino HTTP Server” on page 45 if you plan to use Lotus Domino HTTP Server.

Configuring IBM HTTP Server for IBM i

You must configure IBM HTTP Server for IBM i before using the Web server with WebSphere Application Server for IBM i.

Before you begin

This topic assumes that you have decided to use the IBM HTTP Server for IBM i to serve requests to WebSphere Application Server. “Configuring an HTTP server instance” on page 42 describes the HTTP servers available to WebSphere Application Server users.

About this task

An HTTP server instance is not required to install WebSphere Application Server. However, it is recommended to support requests for servlets and JavaServer Pages (JSP) resources managed by WebSphere Application Server.

Before you can use the IBM HTTP Server for IBM i, you must configure an instance of IBM HTTP Server to communicate with WebSphere Application Server.

1. Start the *ADMIN server instance of IBM HTTP Server to use the IBM HTTP Server for IBM i configuration and administration forms.
See “Starting the *ADMIN instance of IBM HTTP Server” for more information.
2. Create an HTTP server instance or select an existing instance, and configure it to work with WebSphere Application Server.
 - Create an HTTP server instance, and configure it to work with WebSphere Application Server.
Go to “Creating and configuring an HTTP server instance” on page 44 for more information.
 - Select an existing HTTP server instance, and configure it to work with WebSphere Application Server.
Go to the second step in “Creating and configuring an HTTP server instance” on page 44 for more information.

Starting the *ADMIN instance of IBM HTTP Server

This topic describes how to start the *Admin instance of IBM HTTP Server.

Before you begin

This article assumes that you have decided to use the IBM HTTP Server for IBM i to serve requests to WebSphere Application Server.

About this task

Start the *ADMIN server instance of IBM HTTP Server to create, change, or display an IBM HTTP Server instance configuration by using the IBM HTTP Server for IBM i Configuration and Administration forms.

You can start the *ADMIN server instance from a Control Language (CL) command line or from Navigator for i.

- Start the *ADMIN server instance from a CL command line.
Type the following command and press **Enter** to start the *ADMIN instance from the CL command line:

STRTCPSVR SERVER(*HTTP) HTTPSVR(*ADMIN)

- Start the *ADMIN server instance from the Navigator for i.

The iSeries Navigator is the graphical interface to the iSeries server. The Navigator for i is part of the iSeries Access for Windows product.

For more information about iSeries Access for Windows and Navigator for i, see the IBM i Access Family Web site.

To start the *ADMIN instance from Navigator for i:

1. Start Navigator for i.
2. Double-click your IBM i server.
3. Click **Network > Servers > TCP/IP**.
4. Right-click **HTTP Administration** in the right frame.
5. Click **Start**.

Do not select the **Start Instance** action from the menu. If the server is already started, the **Start** action is disabled on the menu.

What to do next

Go to “Creating and configuring an HTTP server instance” to continue the installation.

Creating and configuring an HTTP server instance

This topic describes how to create and configure an IBM HTTP Server instance.

Before you begin

This article assumes that you have started the *Admin instance of IBM HTTP Server. See “Starting the *ADMIN instance of IBM HTTP Server” on page 43 for more information.

About this task

Use this procedure to create and configure an instance of IBM HTTP Server.

If you have an existing instance that you want to use with WebSphere Application Server, skip directly to the configuration step.

1. Create a new instance of IBM HTTP Server.

To create a new instance of the IBM HTTP Server (powered by Apache) with a basic configuration, use the IBM HTTP Server for IBM i configuration and administration forms.

Perform the following steps:

- a. Using a Web browser, go to the IBM HTTP Server for IBM i configuration and administration forms.
 - 1) Open this URL in your browser:
`http://your.server.name:2001/`

The *your.server.name* variable is the name of your iSeries server.
 - 2) Enter a valid user ID and password for your iSeries server.
 - 3) Select **IBM Web Administration for IBM i** at the IBM i Tasks page.
- b. The IBM Web Administration for IBM i page is displayed.
 - 1) To create a new HTTP server, click the **Setup** tab.
 - 2) Expand **Common Tasks and Wizards**.
 - 3) Click **Create New HTTP Server**.
- c. Select **HTTP server (powered by Apache)**, then click **Next**.

- d. In the right frame, type a name for the HTTP server instance and an optional description, then click **Next**.
The name appears in the HTTPSVR subsystem when the job is running.
Write down the HTTP server instance name for use in later steps.
 - e. Type the server root, then click **Next**.
You can use default values or you can specify another server root or document root directory.
 - f. Set the document root in the next panel, then click **Next**.
 - g. Select the IP address and port.
 - 1) Select **All addresses** in the **IP address** field.
 - 2) Accept the default port, 80, for the port number that the HTTP Server instance uses to process requests or type a unique port number, then click **Next**.
 If you specify a port other than the default port, you must configure your virtual host Domain Name System (DNS) aliases in the administrative console to reflect your port number.
Write down the internal HTTP port number for use in later steps.
 - h. Select a logging option.
It is recommended that you select **Yes**. Logs are stored in the `/server_root/logs` directory, where `server_root` is the server root that you set earlier.
 - i. Specify how long you want to keep the error and access log files, then click **Next**.
 - j. Review your settings. To create the HTTP server instance, click **Finish**. To make changes, click **Back**.
 - k. After you click **Finish**, the configuration is created. The Manage Apache Server page is displayed.
2. Configure the HTTP server instance
- After you create the HTTP server instance, configure the instance so that it works with WebSphere Application Server.
- a. Click the **Manage** tab. In the Server list, select the HTTP server instance that you want to manage.
 - b. With your HTTP server selected, expand **Server Properties** in the left frame. Click **WebSphere Application Server**. Select the version of WebSphere Application Server to configure, and select the default WebSphere Application Server profile.
 - c. Click **OK** to write the changes to the configuration file and return to the main configuration page.

What to do next

You have completed step 3 of 5.

Go to Chapter 7, “Starting WebSphere Application Server,” on page 49 to continue the installation.

Configuring Lotus Domino HTTP Server

You must update the Lotus Domino Web server configuration before you can use the Web server with WebSphere Application Server.

Before you begin

See the WebSphere Application Server detailed system requirements page for information on the support levels of Lotus Domino Web Server.

Refer to the Administration Help for your version of Domino for information about installing and setting up Domino servers on IBM i.

The help database is shipped with Lotus Domino and is also available in the Notes.net Documentation Library.

About this task

Configure each instance of a Domino server on your IBM i server.

1. Define your Web server in the application server configuration.

- a. Start Qshell. On the CL command line, enter STRQSH.
- b. Move to the directory where the configuration resides.

At the Qshell prompt, run the command:

```
cd app_server_root/bin
```

- c. Specify a name and a port for your Domino Server.

At the Qshell prompt, run the command:

```
configureOs400WebServerDefinition -webserver.name yourDominoServer \  
                                -webserver.type DOMINO \  
                                -webserver.port
```

port

The *yourDominoServer* variable is the name of your Domino server. The *port* variable is the HTTP port for your Domino Server.

To use a non-default WebSphere Application Server profile, specify the `-profileName myProfile` parameter when you run the `configureOs400WebserverDefinition` script.

- d. Generate the plugin-cfg.xml file. From the Qshell prompt, run this command:

```
GenPluginCfg -webserver.name yourDominoServer
```

If you specified a profile name in the previous step, specify the `-profileName myProfile` parameter when you run the `GenPluginCfg` script.

- e. Write down the location of the plugin-cfg.xml file. You need this information in the next step.

2. Update the Domino server notes.ini file.

- a. Enter the Work with Domino Servers (WRKDOMSVR) command on the CL command line.
- b. For the appropriate Domino server instance, specify option 13 (**Edit NOTES.INI**) to edit the server notes.ini file.
- c. Add this line to the end of the notes.ini file:

```
WebSphereInit=plugin-file
```

The *plugin-file* variable is the fully-qualified path of the plugin-cfg.xml file that you generated in the previous step.

- d. Press **F3** twice to save and exit the notes.ini file

3. Start the Domino server.

- a. Verify that your user profile has *JOBCTL special authority.
- b. On the CL command line, enter the strdomsvr command.
- c. Press **F4** to have the system prompt you for the server name.
- d. Type the server name in the field provided.

If you are not sure of the name, press **F4** to display a list of Domino servers on your IBM i server.

- e. Press **Enter**.

While the system is starting the Domino server, you see a message indicating that the server is starting. If the message appears for more than 1 or 2 minutes, the server might be waiting for you to enter a password. To determine if the server is waiting for a password, use the WRKDOMCSL command to start a server console session for the server. You can enter the password in this console session.

4. Enable the WebSphere Application Server DSAPI filter.

- a. From a Lotus Notes client connected to the appropriate Domino server, edit the Domino document. The document is in the Domino server Domino Directory. The name of the file is names.nsf. For example, open your browser to `http://your.server.name:port/names.nsf`, where the *your.server.name* variable is the name of your IBM i server and the *port* variable is your Web server port.

Enter your Domino administrator user name and password. For additional techniques used to edit the Domino document, refer to the Domino documentation.

- b. Within the server document, select the **Internet Protocols** tab and then the **HTTP** tab.
 - c. For **DSAPI filter file names**, type:
`/QSYS.LIB/product_library.LIB/LIBDOMINO.SRVPGM`
Verify that you do not have a space before or after this command or the filter fails.
 - d. Save and exit the Domino server document.
To use the Lotus Domino Web server with WebSphere Application Server, you do not need to change the **Java servlet support** field in the Domino server document.
5. Stop and restart the Domino server HTTP task.
- a. Enter the Work with Domino Servers (WRKDOMSVR) command on the CL command line.
 - b. For your Domino server instance, specify option 8 (**Work console**) to select the Domino server console.
 - c. From the Domino server console, enter the following command to stop the Domino server HTTP task.
`tell http quit`
 - d. From the Domino server console, enter the following command to start the Domino server HTTP task.
`load http`

What to do next

You have completed step 3 of 5.

Go to Chapter 7, “Starting WebSphere Application Server,” on page 49 to continue the installation.

Chapter 7. Starting WebSphere Application Server

After installing, start the WebSphere Application Server environment to begin using it.

Before you begin

This topic assumes that you have configured your WebSphere Application Server for IBM i installation. See Chapter 6, “Configuring the product after installation,” on page 39 if you have not yet configured the product.

About this task

Use this procedure to start the WebSphere Application Server environment.

1. Start the default application server profile.
Start the default stand-alone application server, as described in “Starting the default stand-alone application server profile.”
Choose this task if you intend to run a stand-alone, unfederated application server.
2. Configure the virtual host, as described in “Configuring the virtual host” on page 55.
If your external HTTP server configuration uses ports other than the default ports, you must update the Host Aliases table for the virtual host to reflect the correct HTTP port number.
3. Start the HTTP server instance, as described in “Starting the HTTP server instance” on page 56.
Start the HTTP server so that your application server profile can receive and respond to client requests.

Results

If you have problems with any part of the installation, see “iSeries installation troubleshooting tips” on page 86.

What to do next

Go to “Starting the default stand-alone application server profile” to continue the installation.

Starting the default stand-alone application server profile

WebSphere Application Server provides a default application server profile that contains several example applications. The default stand-alone profile is ready to run after you install, configure, and start WebSphere Application Server. Start the default stand-alone application server profile to use it.

Before you begin

This topic assumes that you have configured your WebSphere Application Server for IBM i installation. See Chapter 6, “Configuring the product after installation,” on page 39 if you have not yet configured the product.

About this task

Use this procedure to start the default application server profile.

1. Start the default application server profile.
 - a. Run the Start Qshell (STRQSH) command from a Control Language (CL) command line.
 - b. At the Qshell prompt, run the following commands:

```
cd app_server_root/bin
startServer server1
```

The startServer command starts the QWAS7 subsystem if it is not already started.

2. Start the administrative console, as described in “Starting the administrative console” on page 51. Open the administrative console in a Web browser.

What to do next

Go to “Verifying that the application server is running” to continue the installation.

Verifying that the application server is running

Before you start the administrative console, verify that the application server is running.

Before you begin

This topic assumes that you are attempting to start your application server profile. See Chapter 7, “Starting WebSphere Application Server,” on page 49 if you have not yet attempted to start the application server.

About this task

When WebSphere Application Server is ready for use, a message is written to the job log of the application server job indicating that WebSphere Application Server is ready for use.

Issue all of the commands in this procedure from the Control Language (CL) command line.

1. Run the Work with Active Jobs (WRKACTJOB) command from the CL command line, specifying the proper subsystem on the subsystem (SBS) parameter:
`WRKACTJOB SBS(QWAS7)`
2. Find your application server job. The application server job for the default application server profile is named SERVER1.
3. Specify option **5 (Work with Job)** on the option line next to the job, then press **Enter**.
4. On the command line of the Work with Job display, specify option **10 (Display job log, if active)**, then press **Enter**.
5. Press **F10** to display all messages.

Look for this message:

```
WebSphere application server application_server ready.
```

The *application_server* variable is the name of your application server. The default application server is named SERVER1.

If the message is not displayed, press **F5** to refresh the job log messages until the message is displayed.

When the message is displayed, WebSphere Application Server has successfully started. It may take up to 20 minutes for the message to be displayed, depending on your iSeries server.

6. To display the port number on which the application server is listening for the administrative console, position the cursor on the last line of the message and press **F1**.

The following message is displayed:

```
WebSphere application server application_server
in job app_server_job is ready to handle administrative
requests on port port_number.
```

The *application_server* variable is the name of your application server, the *app_server_job* variable is the iSeries job name for your application server, and the *port_number* variable is the number of the port used by the administrative console.

If the administrative console application is not installed in the application server profile or if the administrative console port cannot be displayed, the port_number is *N.

Press **F3** twice to exit.

What to do next

Go to “Starting the administrative console” to continue the installation.

Starting the administrative console

The administrative console is a Web-based application that runs on any browser supported by WebSphere Application Server. Start the administrative console to begin administering the system.

Before you begin

This topic assumes that you have a running application server profile. See Chapter 7, “Starting WebSphere Application Server,” on page 49 if you have not yet attempted to start the application server.

The browser-based administrative console for WebSphere Application Server requires that cookies be enabled in the browser. This topic also describes how to enable cookies.

About this task

Use this procedure to start the administrative console on a workstation.

1. Open the following Web page in your browser:

```
http://your.server.name:port/ibm/console
```

The *your.server.name* variable is the host name of the iSeries server on which your application server is running. The *port* variable is the administrative console port as noted in the ready message in the joblog of your application server.

The administrative console port of the default application server profile is 9060. For more information about the ready message, see “Verifying that the application server is running” on page 50.

2. When prompted, enter a user ID.

The administrative console is displayed in the browser window.

The user ID does not need to be an iSeries user profile. This user ID is used only to track which users make changes to the application server configuration.

3. Enable cookies for your Web browser.

Microsoft Internet Explorer 6.0: Perform the following procedure:

- a. Click **Tools > Internet Options**.
- b. Click **Privacy > Advanced**.
- c. Click **Accept** to accept first-party and third-party cookies..
- d. Click **OK**.

What to do next

See your browser documentation for help enabling cookies for other supported Web browsers.

Some browsers provide advanced settings so that you can configure cookie settings separately for different domains, such as <http://mycompany.com>. For help with advanced features, see the documentation for your browser.

Next: Go to “Configuring the virtual host” on page 55 to continue the installation.

Starting and configuring the default deployment manager profile

WebSphere Application Server Network Deployment provides a configurable default deployment manager profile.

About this task

After you install WebSphere Application Server Network Deployment, you can start, configure and run the default deployment manager profile.

1. Start the default deployment manager.
 - a. On the Control Language (CL) command line, run the Start Qshell (STRQSH) command.
 - b. At the Qshell prompt, run the following commands:

```
cd app_server_root/bin
startServer dmgr
```

The startServer command starts the QWAS7 subsystem if it is not already started.

2. Verify that the deployment manager is running
Use the Work with Active Jobs (WRKACTJOB) command to determine when the deployment manager is ready to accept administrative requests through the administrative console.
3. Add a node to the network deployment profile, as described in “Adding a node to the deployment manager profile.”
Run the addNode command from the Qshell command shell to federate the default application server profile into the Network Deployment cell.
4. Verify that the node agent is running, as described in “Verifying that the node agent is running” on page 53.
Use the Work with Active Jobs (WRKACTJOB) command to determine when the node agent is ready to accept administrative requests through the administrative console.
5. Start the administrative console for the deployment manager.
Open the administrative console in a Web browser, as described in “Starting the administrative console for the deployment manager” on page 54.
6. Verify that the node exists, as described in “Verifying that the node exists” on page 55.
Use the administrative console to verify that the WebSphere Application Server node was successfully added to the deployment manager domain.

Results

The addNode command creates a new server, the node agent, under the application server profile being added to the Network Deployment domain. The node agent server is started as a side effect of adding the node to the domain.

What to do next

Repeat the previous steps for each node (or application server profile) that you want to manage using your deployment manager profile.

Adding a node to the deployment manager profile

You can add WebSphere Application Server nodes to the cell which your deployment manager profile is managing.

Before you begin

This article assumes that you are working on the IBM i server that hosts your WebSphere Application Server node.

About this task

Use the addNode command to add WebSphere Application Server nodes to the cell which your deployment manager profile is managing.

1. Run the Start Qshell (STRQSH) command from a Control Language (CL) command line.
2. At the Qshell prompt, issue the addNode command.

Specify the host name and Simple Object Access Protocol (SOAP) port for the deployment manager. For example:

```
app_server_root/bin/addNode
  host_name
  soap_port
  -includeapps
```

The *host_name* variable is the host name of the server on which you installed the Network Deployment product. The *soap_port* variable is the SOAP port for the deployment manager profile. For the deployment manager profile, the default soap port is 8879.

By default, any applications installed on the application server profile are removed from the application server profile when it is added to a cell. If this is the only node that you are adding, or if you know that there are no conflicts with applications installed on other nodes, you can specify the `-includeapps` parameter when invoking the addNode command. When this parameter is specified, the addNode command does not remove any installed applications.

The *host_name* and the *soap_port* variables are positional and must be the first two parameters. Additional parameters such as `-includeapps` must be specified after the *soap_port* value. See the addNode documentation for more information.

Results

The addNode command creates a new server, the node agent, under the application server profile being added to the Network Deployment domain. The nodeagent server is started as a side effect of adding the node to the domain.

What to do next

Repeat the previous steps for each node (or application server profile) that you want to manage using your deployment manager profile.

Verify that the node agent is running after adding the node, as described in “Verifying that the node agent is running.”

Verifying that the node agent is running

Verify that the node agent is running before you start the administrative console.

About this task

Use the addNode command to add WebSphere Application Server nodes to the cell which your deployment manager profile is managing.

1. Run the Work with Active Jobs (WRKACTJOB) command on the CL command line, specifying the proper subsystem on the subsystem (SBS) parameter:

```
WRKACTJOB SBS(QWAS7)
```

2. Find the server job for your deployment manager profile. The node agent job name is the same as the node name for the application server profile. For the default application server profile, the node name is the same as the host name of the IBM i sever.
3. Specify option **5 (Work with Job)** on the option line next to the job, then press **Enter**.

4. On the command line of the Work with Job display, specify option **10 (Display job log, if active)**, then press **Enter**. Press **F10** to display all messages.
5. Look for this message:
WebSphere application server nodeagent ready.
If the message is not displayed, press **F5** to refresh the job log messages until the message displays.

Results

When the message is displayed, the node agent has successfully started. It can take up to 20 minutes for the message to be displayed, depending on your IBM i server.

If the message does not display, see “iSeries installation troubleshooting tips” on page 86.

What to do next

Start the administrative console for the deployment manager, as described in “Starting the administrative console for the deployment manager.”

Starting the administrative console for the deployment manager

The administrative console is a Web-based application that runs on any browser supported by WebSphere Application Server. This topic describes how to start the administrative console for the deployment manager.

Before you begin

This topic assumes that you have a running deployment manager profile.

The browser-based administrative console for WebSphere Application Server requires that cookies be enabled in the browser. This topic also describes how to enable cookies.

About this task

Use this procedure to start the administrative console on a workstation.

1. Open the following Web page in your browser:

`http://your.server.name:port/ibm/console`

The *your.server.name* variable is the host name of the iSeries server on which your deployment manager is running. The *port* variable is the administrative console port as noted in the ready message in the joblog of your application server.

The administrative console port of the deployment manager profile is 9060.

2. When prompted, enter a user ID.

The administrative console is displayed in the browser window.

The user ID does not need to be an iSeries user profile. This user ID is used only to track which users make changes to the deployment manager configuration.

3. Enable cookies for your Web browser.

Netscape Navigator: Perform the following procedure:

- a. Click **Edit > Preferences**.
- b. Click **Advanced** in the left pane.
- c. The right pane shows settings for cookies. Verify that cookies are not disabled.

Microsoft Internet Explorer 4.0, 5.0, and 5.5: Perform the following procedure:

- a. Click **Tools > Internet Options**.
- b. Click **Security**.

- c. Click **Custom Level > Cookies > Enable**.
- d. Click **OK**.

Microsoft Internet Explorer 6.0: Perform the following procedure:

- a. Click **Tools > Internet Options**.
- b. Click **Privacy > Advanced**.
- c. Click **Accept** to accept first-party and third-party cookies..
- d. Click **OK**.

What to do next

See your browser documentation for help enabling cookies for other supported Web browsers.

Some browsers provide advanced settings so that you can configure cookie settings separately for different domains, such as `http://mycompany.com`. For help with advanced features, see the documentation for your browser.

Go to “Verifying that the node exists” to continue the installation.

Verifying that the node exists

This topic describes how to verify that the WebSphere Application Server node was successfully added to the deployment manager domain.

Before you begin

This topic assumes that you have already started the administrative console for the deployment manager. If you have not yet started the administrative console, see “Starting the administrative console for the deployment manager” on page 54.

About this task

Use this procedure to verify that the WebSphere Application Server node was successfully added to the Deployment Manager domain.

1. Click **System administration > Nodes** in the administrative console of the deployment manager.
2. Verify that the node is listed and that the status is Started. If the node does not exist, go to “Adding a node to the deployment manager profile” on page 52.

Results

Messages in the console panel of the deployment manager show the status of the application server. The **Servers > Application Servers** panel also shows the status of each defined application server.

What to do next

Go to “Configuring the virtual host” to continue the installation.

Configuring the virtual host

A virtual host is a configuration entity that allows WebSphere Application Server to treat multiple host machines or port numbers as a single logical host (virtual host) for configuration purposes. Each virtual host can be associated with multiple aliases. Each alias is a particular host name and port number. Configure the virtual host to make resources available for client requests.

Before you begin

This topic assumes that you have started the administrative console. See “Starting the administrative console” on page 51 if you have not yet attempted to start the application server.

You can use virtual hosts to combine multiple host machines into a single virtual host or to assign host machines to different virtual hosts. Virtual hosts separate and control WebSphere Application Server resources to make the resources available for client requests.

If your external HTTP server configuration uses ports other than the default ports, you must update the Host Aliases table for the virtual host to reflect the correct HTTP port number.

If your external HTTP server configuration uses the default port (80), skip these steps and go to “Starting the HTTP server instance” instead.

About this task

Use this procedure to update the Host Aliases table for the default_host virtual host from the administrative console.

1. Click **Environment > Virtual Hosts** in the left frame of the administrative console.
2. Click **default_host** in the right frame.
3. Click **Host Aliases**. The settings for default_host are displayed.
4. Click the **asterisk** in the row that has a Port of 80 in the Host Name list.
Host names are set to "*" when you install WebSphere Application Server.
5. Specify the correct port number for your HTTP server in the Port field.
6. Click **OK**, then click **Save** to save your configuration.
7. After you specify a new port number, you must regenerate the plug-in configuration:
 - a. Click **Servers > Web servers**.
 - b. Select your Web server.
 - c. Click **Generate Plug-in**.
 - d. Click **OK**.
8. After configuring the virtual host, start your HTTP server instance.

What to do next

For a standalone application server, restart the application server after you update the virtual host configuration.

Next: Go to “Starting the HTTP server instance” to continue the installation.

Starting the HTTP server instance

IBM HTTP Server for iSeries runs in the QHTTSPSVR subsystem, and each HTTP Server instance starts multiple jobs. The WebSphere Application Server code that plugs into IBM HTTP Server for iSeries runs in the HTTP Server job that communicates with one or more application servers. Start the HTTP Server instance to enable communication with the application server.

Before you begin

This topic assumes that you have already created an HTTP server instance. If you have not yet created an HTTP server instance, see “Configuring IBM HTTP Server for IBM i” on page 43.

About this task

Use this procedure to start the HTTP Server instance for the HTTP Server you are using.

- Start IBM HTTP Server.

Enter the following command on the CL command line:

```
STRTCPSVR SERVER(*HTTP) HTTPSVR(myinst)
```

The *myinst* variable is the name of your HTTP server instance. This is the HTTP instance that you configured in “Configuring IBM HTTP Server for IBM i” on page 43.

If you change your HTTP server instance configuration, stop and then start your HTTP server instance.

To stop your HTTP server instance, enter this command from the CL command line:

```
ENDTCPSVR SERVER(*HTTP) HTTPSVR(myinst)
```

The *myinst* variable is the name of your HTTP server instance. This is the HTTP instance that you configured in “Configuring IBM HTTP Server for IBM i” on page 43.

You can also stop and start your HTTP server instance from the IBM HTTP Server for iSeries Configuration and Administration forms in the browser-based interface. For instructions on using the browser-based interface, see “Configuring IBM HTTP Server for IBM i” on page 43.

The Configuration and Administration forms provide the option of restarting, as opposed to starting and stopping, your HTTP server instance. When restarting, the HTTP server recognizes all configuration changes except changes to the Basic and Security configuration forms.

- Start Lotus Domino HTTP Server

If you have not yet configured the Lotus Domino Web server, see “Configuring Lotus Domino HTTP Server” on page 45.

Perform the following procedure to start the Domino server Web task:

1. Enter the Work with Domino Servers (WRKDOMSVR) command on a Control Language (CL) command line.
2. For your Domino server instance, specify option **8** to select the Domino server console.
3. From the Domino server’s console, enter this command to restart the Domino server HTTP task:

```
tell http restart
```

What to do next

You have completed step 4 of 5. **Next:** Go to Chapter 8, “Verifying the installation,” on page 59 to continue the installation.

Starting the default application server node

Start the default application server node from the deployment manager administrative console.

Before you begin

This topic assumes that you have already started the HTTP server instance. If you have not yet started the HTTP server instance, see “Starting the HTTP server instance” on page 56.

About this task

Use this procedure to start the application server for a node from the administrative console of the deployment manager.

1. Click **Servers > Application Servers** in the administrative console of the deployment manager.
2. Select the check box next to the application server you intend to start.
3. Click **Start**.

Results

Messages in the console panel of the deployment manager show the status of the application server. The **Servers > Application Servers** panel also shows the status of each defined application server.

What to do next

You have completed step 4 of 5.

Go to Chapter 8, “Verifying the installation,” on page 59 to continue the installation.

Chapter 8. Verifying the installation

After installing and configuring WebSphere Application Server, verify that the product performs as desired.

About this task

You can verify your product installation by invoking a verification script or by invoking example browser-based applications.

- Run the install verification script.

One way to verify the installation of the product is to call the `ivt` script from Qshell.

1. On the Control Language (CL) command line, run the Start Qshell (STRQSH) command.
2. From the Qshell prompt, run the `ivt` command to verify the internal HTTP instance:

```
app_server_root/bin/ivt server1 default
```

If the script runs successfully, the following message is displayed. Note that this example is for WebSphere Application Server.

```
Server name is:server1
Profile name is:default
Profile home is:profile_root
Profile type is:default
Cell name is:MYISERIESCell
Node name is:MYISERIES
Current encoding is:IS08859_1
Server port number is:9080
IVTL0015I: WebSphere Application Server MYISERIES is running on port 9080 for profile default
IVTL0010I: Connecting to the WebSphere Application Server MYISERIES on port: 9080
IVTL0015I: WebSphere Application Server MYISERIES is running on port 9080 for profile default
IVTL0015I: WebSphere Application Server MYISERIES is running on port 9080 for profile default
Testing server using the following URL:http://MYISERIES:9080/ivt/ivtserver?par m2=ivtservlet
IVTL0050I: Servlet Engine Verification Status - Passed
Testing server using the following URL:http://MYISERIES:9080/ivt/ivtserver?par m2=ivtAddition.jsp
IVTL0055I: JSP Verification Status - Passed
Testing server using the following URL:http://MYISERIES:9080/ivt/ivtserver?par m2=ivtejb
IVTL0060I: EJB Verification Status - Passed
IVTL0035I: Scanning the file
profile_root/logs/server1/SystemOut.log for errors and warnings
IVTL0040I: 0 errors/warnings were detected in the file
profile_root/logs/server1/SystemOut.log
IVTL0080I: Installation Verification is complete
```

- Run a Sample application.

To call an example browser-based application to verify the installation, perform the following steps:

1. If the application server is not already running, see Chapter 7, "Starting WebSphere Application Server," on page 49.
2. Verify the internal HTTP transport.

Open the following Web address in your browser. The URL is case-sensitive. Also, the capitalization must be consistent.

```
http://your_server_name:9080/hitcount
```

The `your_server_name` variable is the name of your iSeries server. Port 9080 is the default internal HTTP port.

The panel that is displayed has the bold title "Hit Count Demonstration." If you see something similar, WebSphere Application Server is set up successfully to run using the internal HTTP server.

3. Verify the external HTTP server

Open the following Web address in a browser. The URL is case-sensitive. Also, the capitalization must be consistent.

```
http://your_server_name:80/HitCount.jsp
```

The *your_server_name* variable is the name of your IBM i server. Port 80 is the default port for the application server external HTTP server. If your HTTP server instance uses a different port, specify the appropriate port number.

The panel that is displayed has the bold title "Hit Count Demonstration." If you see something similar, WebSphere Application Server is set up successfully to run using the configured Web server.

You can also run sample Web applications that are included with WebSphere Application Server. For information about running the sample applications, see "Installing and accessing the Samples Gallery."

- Run the `installver` command. See "Verifying checksums of installed files" on page 61.

Results

If the verification indicates that WebSphere Application Server runs as desired, you do not need to perform additional steps.

What to do next

After you finish installing and configuring WebSphere Application Server, use resources in the IBM i information center to learn more about the product.

"Samples and applications"

This topic describes how to use the WebSphere Application Server samples gallery. The samples gallery provides a set of small, generic samples that show how to perform common enterprise application tasks.

IBM Business Solutions are business applications that you can use with WebSphere Application Server. They work in conjunction with your existing enterprise applications and server components to increase productivity in an easy-to-use environment.

"Developing and deploying applications"

This topic includes information about how to program server-side Java components that run in WebSphere Application Server.

Installing and accessing the Samples Gallery

If you install the Samples feature when you install the product, you can install the samples in the WebSphere Application Server Samples Gallery. The samples are included with the WebSphere Application Server on your IBM i server.

Before you begin

The Samples feature is not installed with the product by default. Use this procedure only if you changed the default and installed the Samples feature.

1. Create a standalone application server profile with the `manageprofiles` command or use the default application server profile.

By default, only the Samples Gallery and the Plants by WebSphere application are installed on the application server.

The samples are in the *profile_root/installedApps/cell_name* directory.

The *cell_name* variable is the name of your WebSphere Application Server - Express cell.

2. Start the application server.
3. Access the Samples Gallery.

Go to `http://your.server.name:port/WSsamples`.

The *your.server.name* variable is the name of your IBM i server and *port* is the port number for the internal HTTP transport of the application server.

4. Optional: Install additional samples.

Additional samples are initially listed as installable samples in the Samples Gallery. For further instructions on installing each sample, refer to the Installable Samples section of the Samples Gallery in your Web browser.

To installing additional samples on non-default profiles, you must specify the `-server myServer` parameter. Additional information about the `-server` parameter and other script values is in the Installable Samples section of the Samples Gallery, in the *Samples install help* section.

Results

If you can access the Samples Gallery, you installed them successfully. If you are unable to access the Samples Gallery, verify the following items:

- Verify that the application server is running.

On the CL command line, run the following command:

```
WRKACTJOB SBS(QWAS7)
```

Look for the name of your application server profile.

- Verify that the Samples are installed.

In the administrative console, expand **Applications** and click **Enterprise applications**. Confirm that the Samples Gallery is listed as an installed application.

- Verify the port number.

The default port for the default application server profile is 9080. To verify or change the port number, follow these steps:

1. In the administrative console navigation frame, expand **Servers** and click **Application servers**.
2. Click the name of the application server. For the default application server profile, the server name is `server1`.
3. Click **Ports**.
4. Verify the `WC_defaulthost` port number.
5. If you need to change the port number, click **WC_defaulthost**.
6. Type the new port number in the **Port** field.
7. Click **OK**.
8. To save the configuration changes, click **Save**.

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

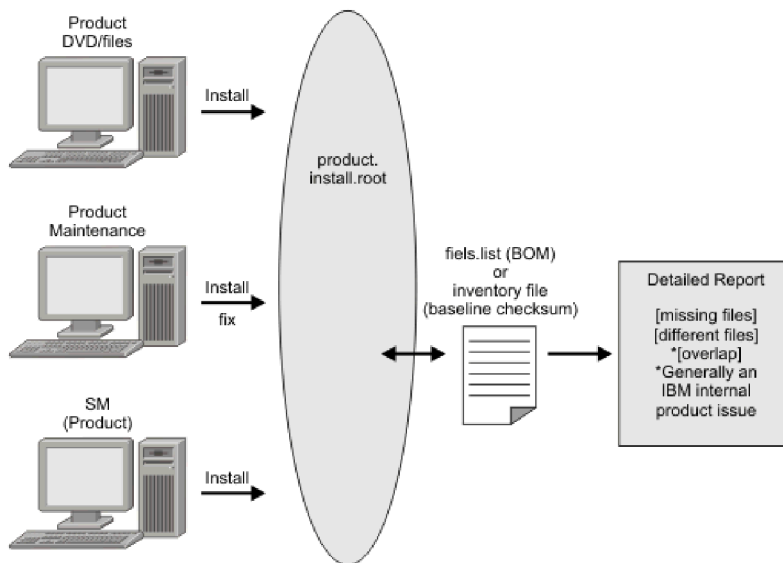
This topic describes using the **installver** command to compute a checksum on the installed files and compare the checksum to the product bill of materials.

The IVU tool is installed during the installation of the following product components:

- WebSphere Application Server - Express
- 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 63 for more information.
- Create and use a new baseline checksum.
See “Computing a new baseline checksum for an inventory of configured files” on page 67 for more information.
- Exclude files and components from the comparison.
See “Excluding files from a checksum comparison” on page 68 for more information.
- Include only specific files and components in the comparison.
See “Comparing specific file and component checksums” on page 71 for more information.
- Change the default message digest algorithm for computing checksums.
See “Changing the default message digest algorithm” on page 74 for more information.
- Handle out-of-memory conditions.
See “Handling out-of-memory situations” on page 74 for more information.
- Verify the installver command files.
See “Verifying the installver command” on page 75 for more information.

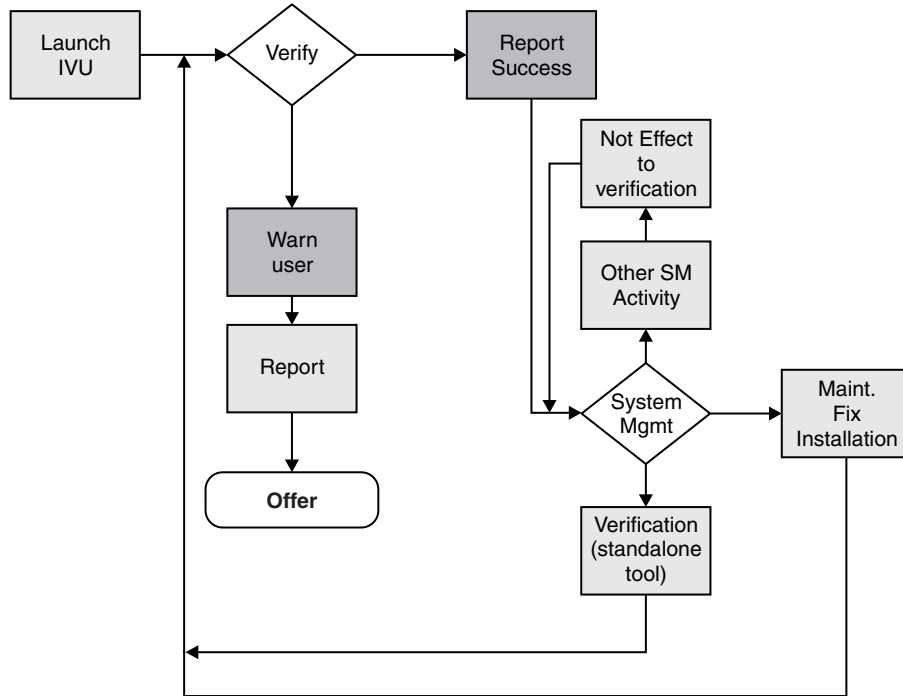
Results

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/systems/support/supportsite.wss/brandmain?brandind=5000027>

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:
 - `app_server_root/bin/installver`
- Compare checksums and display trace results:
 - `installver -trace`
- Display usage information:

- installver -help
- Compare checksums and include only specified files and components in the comparison:
See “Comparing specific file and component checksums” on page 71 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 68 for information about creating a list of user-excluded files.
Ignore the list of files to exclude and include the files in the comparison:
– installver -ignoreuserexclude
- Compare checksums and ignore IBM-excluded files:
Ignore the list of IBM-excluded files and include the files in the comparison:
– installver -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.

- installver

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:
                        missingfilebutwithbadirectory/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 76 for explanations of each parameter.

Go to “Computing a new baseline checksum for an inventory of configured files” on page 67 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:

```
– installver -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\dbghelp.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.
 - `installver -createinventory /tmp/system.inv`
- Compare the inventory list to files that are currently installed in the installation root directory:
 - `installver -compare`
 If you created the inventory file somewhere other than the default location, use the following syntax:
 - `installver -compare /tmp/system.inv`
- Compare and display trace results:
 - `installver -compare -trace`
- Compare and exclude specified files from the inventory comparison:
 - `installver -compare -exclude fn1;fn2;fn3;...`
- Compare and include only specified files in the inventory comparison:
 - `installver -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 76 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: 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:
 - `app_server_root/bin/installver -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.

```
- app_server_root/bin/installver -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 *profile_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:

```
– installver -includecomponent comp1;comp2;comp3;...
```

For example, you might include the activity component:

```
– installver -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:

```
– app_server_root/bin/installver -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” on page 74 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:
 - Edit the `app_server_root/bin/installver` file.
- Add or increase the maximum heap size setting:
 - Change the following line:

```
"$JAVA_HOME"/bin/java \
```

```
to:
"$JAVA_HOME"/bin/java -Xmx256M \
```

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`.
 - `cd app_server_root/bin`
2. Start the `verifyinstallver` command script from the command line.
 - `verifyinstallver`

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” on page 76 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:

- `app_server_root/bin/verifyinstallver`

Display verbose results:

```
verifyinstallver -trace
```

Display usage information:

```
verifyinstallver -help
```

The location of the verification program for installver command is:

- `app_server_root/bin/verifyinstallver`

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:

- `app_server_root/bin/installver`

-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>
    <installoperation>remove</installoperation>
  </file>
  <file>
    <relativepath>lib/activity.jar</relativepath>
    <checksum>2f056cc01be7ff42bb343e962d26328d5332c88c</checksum>
    <permissions>644</permissions>
    <installoperation>remove</installoperation>
  </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:

- *app_server_root\bin\installver*

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.

Use the following command to run the tool from a user profile that has `*ALLOBJ` authority on iSeries systems:

```
installver
```

See the following topics for more information about the purpose of the command:

- “Verifying against the bill of materials” on page 63
- “Computing a new baseline checksum for an inventory of configured files” on page 67
- “Excluding files from a checksum comparison” on page 68
- “Comparing specific file and component checksums” on page 71
- “Changing the default message digest algorithm” on page 74
- “Handling out-of-memory situations” on page 74
- “Verifying the installver command” on page 75

Syntax for displaying usage information

- `installver -help`

Syntax for listing all components

- `installver -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.

- `app_server_root/bin/installver`

See “Verifying against the bill of materials” on page 63 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:

- `installver -include fn1;fn2;fn3`

See “Comparing specific file and component checksums” on page 71 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:

- `installver -includecomponent comp1;comp2;comp3;...`

Compare checksums and exclude certain components from the comparison:

- `installver -excludecomponent comp1;comp2;comp3;...`

See “Excluding files from a checksum comparison” on page 68 for examples of using the command to exclude files from the comparison.

Compare checksums and ignore user-excluded files:

- `installver -ignoreuserexclude`

Compare checksums and ignore IBM-excluded files:

- `installver -ignoreibmexclude`

List all components only:

- `installver -listcomponents`

Create template (for listing excluded files) only:

- `installver -createtemplate`

Create template (for listing excluded files) only

```
installver -createprofiletemplate
```

Parameters

The following parameters are associated with the command.

-createprofiletemplate

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.

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.

Perform the following procedure:

1. `cd app_server_root/bin`
2. `installver -createprofiletemplate`

The installver tool creates the template properties file in the properties directory of the default profile:
profile_root/properties/ivu_user.template

-help

Displays usage information.

-verbose

Provides verbose console 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

- `installver -createinventory [path/file_name]`, such as `installver -createinventory user_data_root/system.inv`

Compare the inventory list to files that are currently installed in the installation root directory

- `installver -compare /path/file_name`

Compare and display trace results

- `installver -compare /path/file_name -trace`

Display usage information

- `installver -help`

Compare and exclude specified files from the inventory comparison

- `installver -compare /path/file_name -exclude fn1;fn2;fn3;...`

Compare and include only specified files in the inventory comparison

- `installver -compare /path/file_name -include fn1;fn2;fn3;...`

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 9. 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 WebSphere Application Server products on IBM i platforms, see “iSeries installation troubleshooting tips” on page 86. This topic does not describe IBM i systems.

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. Run the installation verification test (IVT).
 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 61 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
```

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 6. Installation log locations when installing IBM HTTP Server

Windows system log path name	Log path name on operating systems such as AIX or Linux

Log files for Application Client for WebSphere Application Server

The following table shows the installation log locations when installing the Application Client.

Table 7. 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

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 8. 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
<i>user_data_root</i> /profileRegistry/ logs/manageprofiles/create.log	<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 	INSTCONFFAIL Total profile creation failure. INSTCONFSUCCESS Successful profile creation. INSTCONFPARTIALSUCCESS Profile creation errors occurred but the profile is still functional. Additional information identifies the errors.
<i>app_server_root</i> /logs/install/ installconfig.log	<ul style="list-style-type: none"> Logs the activities of ANT configuration scripts that run at the end of the installation procedure 	Configuration action failed: Unsuccessful ANT script configuration. Configuration action succeeded: Successful ANT script configuration.

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 9. 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
collect_metadata.log	Collects metadata information about managed objects in the system to evaluate and prevent potential installation conflicts
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 10. Server logs for WebSphere Application Server - Express

Log	Description
startServer.log	Log of start server events
SystemErr.log	Record system errors

The following logs are created in the *profile_root/logs/ffdc* directory:

Table 11. First failure data capture logs for WebSphere Application Server - Express

Log	Description
server1_exception.log	First failure data capture log for server1 errors

Log files for Web server plug-ins for WebSphere Application Server

4. 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.
5. 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.
6. 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:

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:
7. Use the command line method to start the application server.
8. Verify whether the server starts and loads properly by looking for a running Java process and the *Open for e-business* message in the *SystemOut.log* and *SystemErr.log* files.
If no Java process exists or if the message does not appear, examine the same logs for any miscellaneous errors. Correct any errors and retry.
You can find the *SystemOut.log* and *SystemErr.log* files in the *profile_root/logs/server1* (platforms such as AIX or Linux) or *profile_root/logs\server1* (Windows platforms) directory in an Application Server profile.
9. 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.
 - a. Start the Application Server.
Change directories to the *profile_root/bin* directory and run the `startServer` command:

- startServer server1
- b. Start the IBM HTTP Server or the Web server that you are using.
Use either the 2001 page or use the STRTCPSVR SERVER(*HTTP) HTTPSVR(*instance_name*) command to start the IBM HTTP Server.
 - c. 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.
 - d. Verify that snoop is running.
Either Web address should display the Snoop Servlet - Request/Client Information page.
 - e. **Remote IBM HTTP Server only:**
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

Results

This procedure results in debugging errors that might occur during installation.

What to do next

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.

iSeries installation troubleshooting tips

This topic provides links to sources that may be helpful in troubleshooting an installation problem for a WebSphere Application Server product on the i5/OS operating system.

WebSphere Application Server offers several methods you can use to troubleshoot problems. Which method you use depends on the nature of the problem. Generally, you use a combination of these methods to determine the cause of a problem and then decide on an appropriate method for its resolution.

Troubleshoot Step 1: Refer to troubleshooting documentation for WebSphere Application Server for i5/OS

These resources provide general troubleshooting assistance:

- WebSphere Application Server FAQ database.
- WebSphere Application Server for i5/OS newsgroup. This iSeries Technical Support Web-based forum is dedicated to WebSphere Application Server for i5/OS.

Troubleshoot Step 2: Install WebSphere Application Server for i5/OS

- **Wrong version of i5/OS installed on your server.**

WebSphere Application Server runs on i5/OS V5R4 or V6R1. The product cannot be installed on prior releases of i5/OS.

- **IBM Development Kit for Java V1.6 is not installed.**

Local and remote command-line installations require JDK 1.6. Install product 5722-JV1 for V5R4 (5761-JV1 for V6R1), option 10, 11, or 12 to obtain JDK 1.6. After installing option 10, 11, or 12, you should reinstall the cumulative PTF package and Java group PTF to pick up any JDK 1.6 specific fixes.

- **Host servers are not started, or failed to start correctly.**

The installation process requires that the i5/OS host servers be running. To start the host servers, run this command from the CL command line.

```
STRHOSTSVR SERVER(*ALL)
```

If errors other than "Host server daemon jobs unable to communicate using IPX." occur when starting the host servers, follow the instructions in the error message to fix the problem. Once the problem is fixed, start the host servers and attempt to install WebSphere Application Server again.

- **Installation fails due to "Object not found" or "Not authorized" errors.**

The user profile of the user installing the product must have *ALLOBJ and *SECADM special authorities.

Troubleshoot Step 3: Start WebSphere Application Server for i5/OS

- **Server does not start.**

Prerequisite software may not be installed.

- **Port conflicts**

Port conflicts may exist if you have a previous version of WebSphere Application Server installed and running.

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/>.

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.

Chapter 10. 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.

1. Log on as a user profile with *ALLOBJ special authority.
2. Install the product that you intend to update.
If you already have the product installed, proceed to the next step.
3. Install the most recent version of the Update Installer. An existing Update Installer product can be updated to the most recent version without uninstalling. If you have installed the current level of the WebSphere Application Server group PTF, the update installer was updated to the most recent level for you and you do not need to perform this step.
 - a. Back up any files and subdirectories in the *updi_root/maintenance* directory if necessary.
 - b. Download, unpack, and install the Update Installer for WebSphere Software; or install the Update Installer that is on the WebSphere Application Server supplements disc.
 - c. Specify the same installLocation during a local installation; or apply the most recent Group PTF.
4. Download the maintenance package *.pak file from the Support Web site into the *updi_root/maintenance* directory. If you are installing the most current fix pack and you have installed the current level of the WebSphere Application Server group PTF, the maintenance package containing the fix pack is placed in the *updi_root/maintenance* directory for you and you do not need to perform this step.

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.

5. Stop all processes that use the WebSphere Application Server product.
Before installing or uninstalling interim fixes, fix packs, and refresh packs on a machine, stop all Java processes on the machine that use the WebSphere Application Server product.
WebSphere Application Server processes include application server processes, such as the process created when server1 is running.
6. Follow the instructions for installing the maintenance package. If you obtained the fix or refresh pack by installing the Websphere Application Server group PTF, the instructions for installing the fix or refresh pack can be found in file: *updi_root/ReadmeV7.html* or *updi_root/ReadmeV7.txt*.
If you downloaded the maintenance package from the Support site, the instructions are contained in the readme file link found on the download page.
7. For i5/OS, only the silent mode is supported.
`update -options responsefile`
There are three types of silent installation procedures:
 - a. Installing a fix pack or refresh pack, refer to “Installing a fix pack with silent install” on page 97 for more information.
 - b. Installing an interim fix, interim feature, or test fix, refer to “Installing an interim fix, interim feature, or test fix with silent install” on page 99 for more information.
 - c. Installing multiple maintenance packs, refer to “Installing multiple maintenance packs with silent install” on page 101 for more information.

Results

This procedure results in installing maintenance packages to update WebSphere software.

What to do next

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 in silent mode with a response file.

1. Ensure that the Update Installer for WebSphere Software is installed on your system. The Update installer can be installed from the WebSphere for i5/OS supplements disk, which is included with the installation media. Additionally, when you apply the latest WebSphere Application Server for i5/OS group PTF, the current level of the Update Installer is installed if it is not already installed on the system. The default install location for the Update Installer is */QIBM/ProdData/WebSphere/UpdateInstaller/V7/UPDI* . 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 *updi_root /maintenance* directory.

Note:

- The WebSphere Application Server for i5/OS group PTF always includes the most recent fix pack or refresh pack for the product. If you have applied the group PTF, there is no need to download the current fix or refresh pack level.

- 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.

Note:

- The WebSphere Application Server group PTF includes the most current fix or refresh pack for the product along with required PTFs for other products that Websphere relies on. For more information refer to “Installing the WebSphere Application Server group PTF” on page 33.
- The group PTFs do not contain any feature pack related items. You can download these items from the support site.

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)
```

- 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:

- JAR files in the lib directory
- Scripts in the bin directory
- Profile templates

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.

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.

Location of the response file

The sample response file is named `install.txt`. The file is in the `updi_root/responsefiles` directory after you apply the latest WebSphere Application Server for i5/OS group PTF or after you install the Update Installer for WebSphere Software.

Installing silently

The response file supplies the values to the Update installer.

The following command uses a copy of the response file named `myresponsefile.txt` to provide installation option responses during a silent installation:

```
update -options responsefiles/myresponsefile.txt
```

There is no need to specify the `-silent` parameter as it is already defined in the update script.

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 might set this directive to the location of the maintenance package PAK file. If you do not specify a value for this setting, the default is the maintenance package located under `updi_root/maintenance` that has the most recent time stamp. For example, you might specify the following location if you are installing the iFix for APAR PQ20029.:

```
/qibm/proddata/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 you want to update. For example, you might specify the following location:

/qibm/proddata/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 EDTF or WRKLNK on i5/OS or WordPad if you are editing from a mapped drive on a Windows platform.
- The file must exist to perform a silent installation. The Update installer reads this file to determine installation parameters.
- Save the copy of the response file in the responsefiles directory for best results.

Example install.txt 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/Upd
#
# 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.
- 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.
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 10, “Installing maintenance packages,” on page 89 for information about using the Update Installer to install maintenance packages.

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

There are two ways to get updates for the Update Installer for WebSphere Software:

- Apply the latest WebSphere Application Server for i5/OS group PTF. For more information on the i5/OS group PTF, refer to “Installing the WebSphere Application Server group PTF” on page 33.
- Download the latest Update Installer from the Support site.

Note: Install one copy of the Update Installer on your system for use with all products. You can use the Update Installer to update any installed product.

About this task

1. Download the latest Update Installer files from the product Support site.
See Recommended Updates for WebSphere Application Server. Look under your release of the WebSphere software for a link to 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. The Update Installer can be installed remote from a Windows workstation or locally from a Qshell session on your i5/OS system.
3. Install the new Update Installer.
 - For remote GUI installation, do the following:
 - a. Open Windows Explorer and select your disc drive.
 - b. Click the `downloaded_path\UpdateInstaller\install.exe` file to start the InstallShield for Multiplatforms (ISMP) program.
 - For local silent QSH installation, run the **INSTALL** command from Qshell.
 - a. On a CL command line, run the **STRQSH** command to start the Qshell command shell.
 - b. Issue the **INSTALL** command to start the installation program.

```
cd downloaded_path/UpdateInstaller
INSTALL -options path/responsefile
```

You can update an existing WebSphere Update Installer through the Windows GUI, or by specifying the same `installLocation` in the responsefile for a QSH local silent install.

Results

The Update Installer is installed under the root directory that you specify during installation. The update installer is installed to `/QIBM/ProdData/WebSphere/UpdateInstaller/V7/updi` unless you modify the `installLocation` option.

What to do next

See Chapter 10, “Installing maintenance packages,” on page 89 for information about using the Update Installer to install maintenance packages.

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.

Use the Update Installer program from a user profile with `*ALLOBJ` special authority.

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. Verify that the host server jobs are started on your iSeries server. The host server jobs allow the installation code to run on iSeries.
Enter this command on a CL command line:

STRHOSTSVR SERVER(*ALL)

4. 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.
5. Run the Update Installer.
For example:
`update -options "responsefiles/file_name"`
6. 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.

Use the Update Installer program from a user profile with *ALLOBJ special authority.

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. Verify that the host server jobs are started on your iSeries server. The host server jobs allow the installation code to run on iSeries.

Enter this command on a CL command line:

```
STRHOSTSVR SERVER(*ALL)
```

5. 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.

6. Run the Update Installer.

For example:

```
update -options "responsefiles/file_name"
```

7. 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.

Use the Update Installer program from a user profile with *ALLOBJ special authority.

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. Verify that the host server jobs are started on your iSeries server. The host server jobs allow the installation code to run on iSeries.

Enter this command on a CL command line:

```
STRHOSTSVR SERVER(*ALL)
```

5. 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.

6. Run the Update Installer.

For example:

```
update -silent -options "responsefiles/file_name"
```

7. 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"

```

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 10, “Installing maintenance packages,” on page 89 for information about using the command.

Command options

The following tables list commands for installing and uninstalling interim fixes.

Commands for installing interim fixes

Issue the following command to use the silent interface:

Table 12. Update installer command for installing in silent mode

Command example	Type of installation	Description
<code>update -options "responsefiles/file_name"</code>	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.

Commands for uninstalling interim fixes

Issue the following command to use the silent interface:

Table 13. Update installer command for installing in silent mode

Command example	Type of installation	Description
<code>update -options "responsefiles/file_name"</code>	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.

Installing multiple interim fixes

Use a script to issue more than one command. Each command identifies one maintenance package to install.

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-WAS-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 *updatetrace.log.gz* file, and the compressed *updateconfig.log.gz* file. The *updateconfig.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 *updatetrace.log.gz* file, and the compressed *updateconfig.log.gz* file. The *updateconfig.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.

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 11. Uninstalling the product on IBM i

You can uninstall a WebSphere Application Server for IBM i product by running commands from your iSeries server.

Before you begin

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.

About this task

Use this procedure to uninstall WebSphere Application Server - Express for IBM i.

1. Uninstall WebSphere Application Server - Express for IBM i from your iSeries server.

To uninstall the product, run the following command from the Qshell command line.

```
app_server_root/bin/uninstall
```

To uninstall the product and all user data (profiles), run the following command.

```
app_server_root/bin/uninstall  
-OPT removeProfilesOnUninstall="true"
```

After the uninstallation is complete, certain directories might not be completely removed. You must remove the product directory before you can reinstall to the same location. Do not remove installation root directories for products that you want to keep. To remove the product directory after uninstallation, run the following command.

```
rm -R app_server_root
```

Optional: Remove profiles and user data. Do not remove profiles and user data that you want to keep. To remove profiles and user data completely after uninstallation, run the command:

```
rm -R profile_root
```

Uninstalling WebSphere Application Server from the iSeries server removes all the product libraries and directories. If you do not specify the option to delete all the profiles when you invoke the **uninstall** command, the user-defined information is not removed and can be reused if you reinstall the product. If you later decide that you do not need the user-defined data, you can manually remove it.

User data consists of these items:

- Any HTTP server directives (such as LoadModule or Alias) that are in an HTTP Server Configuration file to enable WebSphere Application Server - Express for IBM i for that configuration. Remove the directives either manually or automatically using the following instructions.

2. Remove HTTP Server directives.

- a. Start your JavaScript-enabled browser.
- b. In the URL location or address window, type `http://your.server.name:2001`, where *your.server.name* is the host name of your iSeries server. Press **Enter**.
- c. Enter your iSeries user ID and password. Your user profile must have *ALLOBJ and *SECADM special authorities. The IBM i Tasks page is displayed.
- d. Click **IBM HTTP Server for i5/OS**. The IBM HTTP Server for IBM i page is displayed.
- e. Select **Manage**. In the **Server** drop-down list on the upper right, select the HTTP server instance to change.

- f. Expand **Server Properties** in the left navigation bar.
 - g. Scroll down and select **WebSphere Application Server**.
 - h. Select **Disable Servlets and JSPs**.
 - i. Click **OK**. This removes the WebSphere Application Server directives from the Apache configuration file and returns to the main configuration page.
3. Remove Lotus Domino Web server directives.
 - a. From a Lotus Notes client connected to the Domino server, edit the Domino document, which is found in the Domino server Domino Directory (names.nsf) to remove the DSAPI filter configuration from the Domino server document.
 - b. Within the server document, click the **Internet Protocols** tab and then click the **HTTP** tab.
 - c. Remove the following path entry from the **DSAPI filter file names** field: /QSYS.LIB/QWAS7.LIB/QSVTDOMINO.SRVPGM.
 - d. Save and exit the Domino Server document to complete the removal of the DSAPI filter configuration from the Domino server document.
 - e. Enter the Work with Domino Servers (WRKDOMSVR) command on a CL command line to remove the WebSphereInit directive from the notes.ini file.
 - f. For the appropriate Domino server instance, select option **13 (Edit NOTES.INI)** to edit the server notes.ini file.
 - g. Remove the WebSphereInit directive from the notes.ini file.
 - h. Restart the Lotus Domino Web server.

Results

After completing the procedure, the WebSphere Application Server product is uninstalled.

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:

- `installRegistryUtils/bin/installRegistryUtils`

To invoke the command file from the installed product, use the following command:

- `app_server_root/bin/installRegistryUtils`

The common location for the command file is /QIBM/WAS/bin/installRegistryUtils.

Syntax for the installRegistryUtils command

Clean up all accessible products and packages.

```
./installRegistryUtils -cleanAll
[-userHome user_home]
```

Clean up the specified product and all associated packages.

```
./installRegistryUtils -cleanProduct  
-offering offering_ID  
-installLocation installation_location  
[-userHome user_home]
```

Clean up the specified package.

```
./installRegistryUtils -cleanPackage  
-pakName package_name  
-installLocation installation_location  
[-userHome user_home]
```

List all visible products.

```
./installRegistryUtils -listProducts  
[-userHome user_home]
```

List all visible packages.

```
./installRegistryUtils -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 11, “Uninstalling the product on IBM i,” on page 107 for more information.

The command file is in the `app_server_root\uninstall` directory.

The command file is named:

- `uninstall`

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 14. 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:
 - `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:
 - `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:
 - `app_server_root/uninstall/uninstall -silent` (default behavior)
 - `app_server_root/uninstall/uninstall -silent -OPT removeProfilesOnUninstall="false"`

Uninstalling WebSphere Application Server from the IBM i server removes all the product libraries and directories. If you do not specify the option to delete all the profiles when you invoke the uninstall script, the user-defined information is not removed. If you later decide that you do not need the user-defined data, you can manually remove it.

Manually uninstalling the product for IBM i

After running the uninstaller program, complete manual steps to 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

This topic assumes that your user profile has *ALLOBJ and *SECADM special authorities. This topic also assumes that you have run the uninstaller program as described in Chapter 11, “Uninstalling the product on IBM i,” on page 107.

The uninstaller program leaves all profiles, including all of the configuration data, applications, and other user data in each profile, unless you use the `-OPT removeProfilesOnUninstall="true"` parameter on the uninstall command. If you did not include the parameter to delete the profiles and data and you want to delete them, you must delete them manually.

Back up all applications that are not stored in another location.

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
<i>app_server_root</i>	/QIBM/ProdData/WebSphere/AppServer/V7/Express
<i>profile_root</i>	/QIBM/UserData/WebSphere/AppServer/V7/Express/profiles/ <i>profile_name</i>
<i>plugins_root</i>	/QIBM/ProdData/WebSphere/Plugins/V7/webserver
<i>app_client_root</i>	/QIBM/ProdData/WebSphere/AppClient/V7/client

Perform the following procedure to produce a clean system.

1. If you are recovering from a failed installation, ensure that the /tmp/Installshield/cielInstall.lock file and its directories do not exist.

The existence of the file causes subsequent installations to fail, indicating an installation is already in progress.

If the file or its directories exist, do the following:

- a. Delete /tmp/Installshield/cielInstall.lock.
- b. Delete the installLocation directory:

```
rm -R installLocation
```

- c. Delete the defaultProfileLocation directory:

```
rm -R defaultProfileLocation
```

2. Remove the logs directory.

The uninstall command might not remove all logs. The logs/uninstall directory contains log files for the uninstallation. Remove the logs and the their directories.

3. Remove the product directory.

To remove the product directory after uninstallation, run the command:

```
rm -R app_server_root
```

You must remove the product directory before you can reinstall to the same location. Do not remove installation root directories for products that you want to keep.

4. Optional: Remove profiles and user data.

To remove profiles and user data completely after uninstallation, run the command:

```
rm -R profile_root
```

Do not remove profiles and user data that you want to keep.

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 5, "Task overview: installing," on page 13 to begin planning a new installation.

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