Exercise 1. Installing IBM Installation Manager

What this exercise is about

This exercise covers the installation of IBM Installation Manager.

What you should be able to do

At the end of this exercise, you should be able to:

- Install IBM Installation Manager
- View the installation log file
- Confirm the installation of Installation Manager

Introduction

IBM Installation Manager is an installation management tool that installs and maintains Installation Manager-based software packages. It is the Eclipse-based tool that provides you the ability to install and modify packages, search for updates, uninstall, and roll back. Installation Manager makes it easier for you to download and install code for a number of IBM software packages.

IBM Installation Manager comes in the form of an installation kit, which contains a set of Installation Manager installation files and a flat-file repository for the product. The installation kit is used only for the setup and maintenance of Installation Manager. It is unnecessary to run Installation Manager except on those systems on which you install or update product code. You normally need only one Installation Manager on a computer because one Installation Manager can track any number of product installations.

Requirements

To complete this exercise, you need the IBM Installation Manager installation binary file.

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Exercise instructions

Section 1: Resetting the WebSphere environment

Note

To reset your WebSphere environment, read **Appendix A** for instructions on how to complete this procedure.

Section 2: Logging in

__ 1. When you start your computer, you are prompted for a user ID and password. At this prompt, enter:

- User ID: `root`
- Password: **`web1sphere`**

If you are already logged in, but not as `root`, then log off your current ID and log in as: `root`

Section 3: Installing IBM Installation Manager

Before you install IBM Installation Manager, you must first decide in which mode to run Installation Manager. The mode determines which user or user group can complete the installation. The choices are administrator, non-administrator, or group. Second, you must decide where the product files and runtime data are going to be located.

Information

You can find more details about the IBM Installation Manager in the information center at:

`http://pic.dhe.ibm.com/infocenter/install/v1r6/index.jsp`

__ 1. Locate the repository and package.

__ a. Open a terminal window. Click **Computer > Gnome Terminal** or click the **Gnome Terminal** icon in the bottom center of the image.

__ b. Navigate to the following directory:

`/usr/IBM-repositories/IIM162/`

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Note

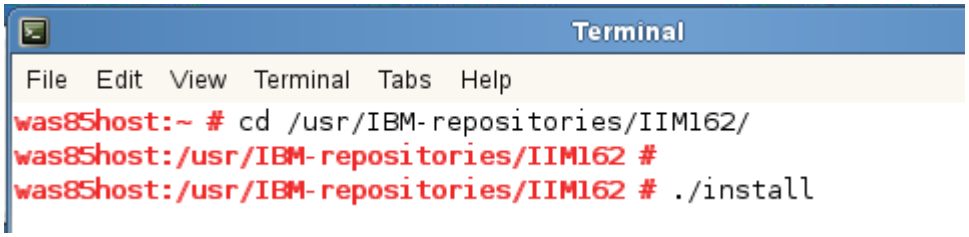
A **repository** is where the installable packages are found. The repository includes metadata that describes the software version and how it is installed. It has a list of files that are organized in a tree structure. The repository can be local or on a remote server.

A **package** is a software product that Installation Manager installs. It is a separately installable unit that can operate independently from other packages of that software.

A **package group** represents a directory that contains resources that packages share with other packages in the same group. Some packages support installing to the same package group, and others must be installed to a new package group.

__ c. Enter the following command to start the installation:

```
./install
```



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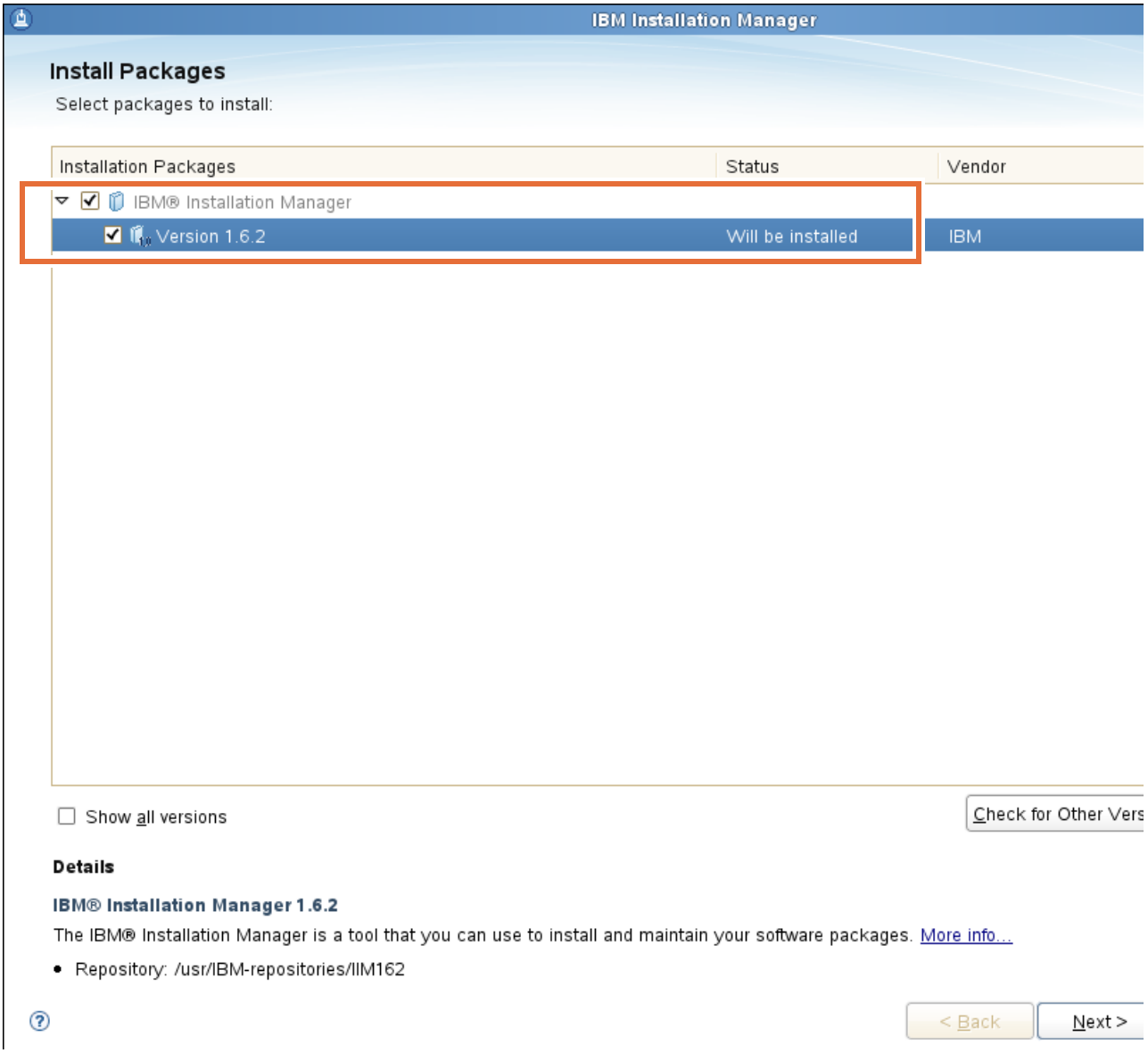
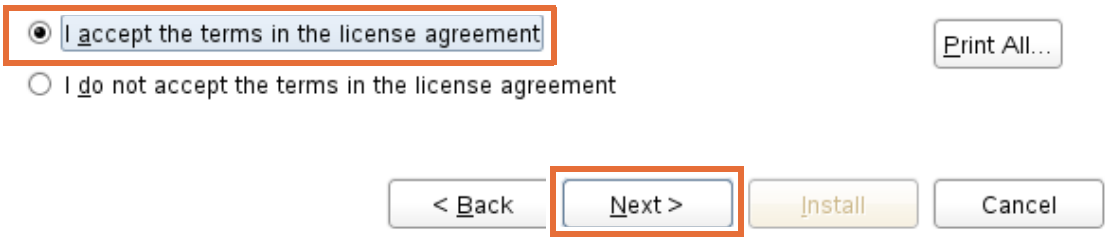
__ d. Since Installation Manager is not installed yet, the Installation Manager package is selected by default. The package is ready to install, as the status message indicates.



__ e. Click **Next**.

__ f. Select **I accept the terms in the license agreement**. Click **Next**.



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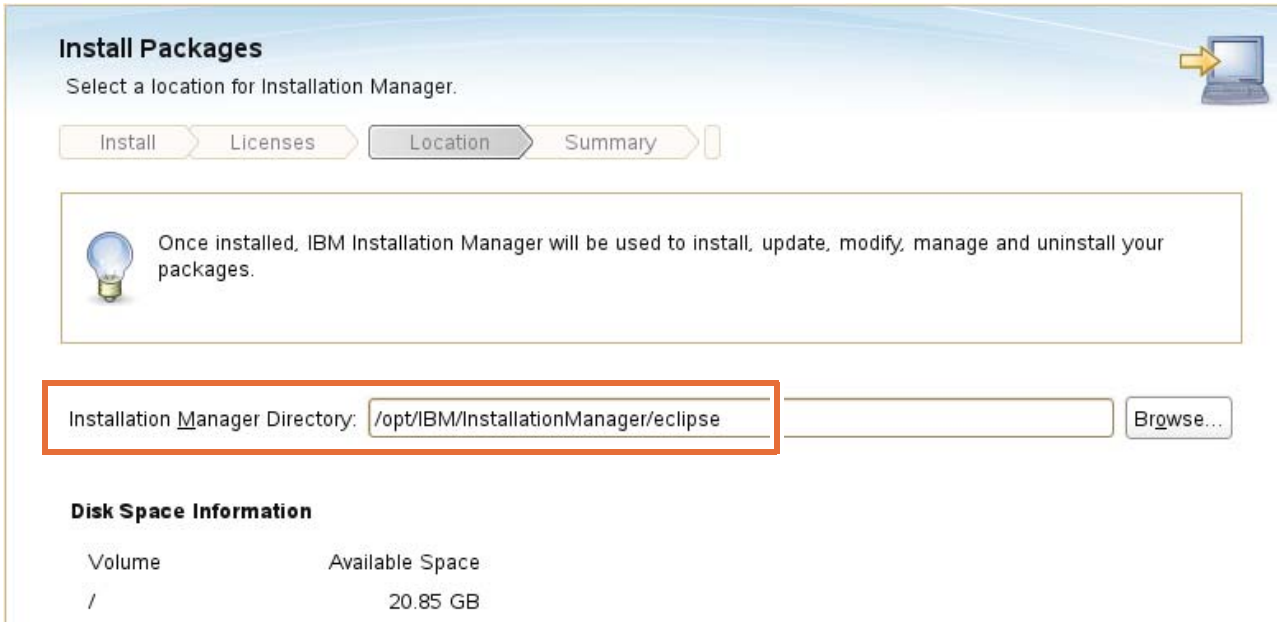
__ g. Accept `/opt/IBM/InstallationManager/eclipse` as Installation Manager Directory.



__ h. Click **Next**.

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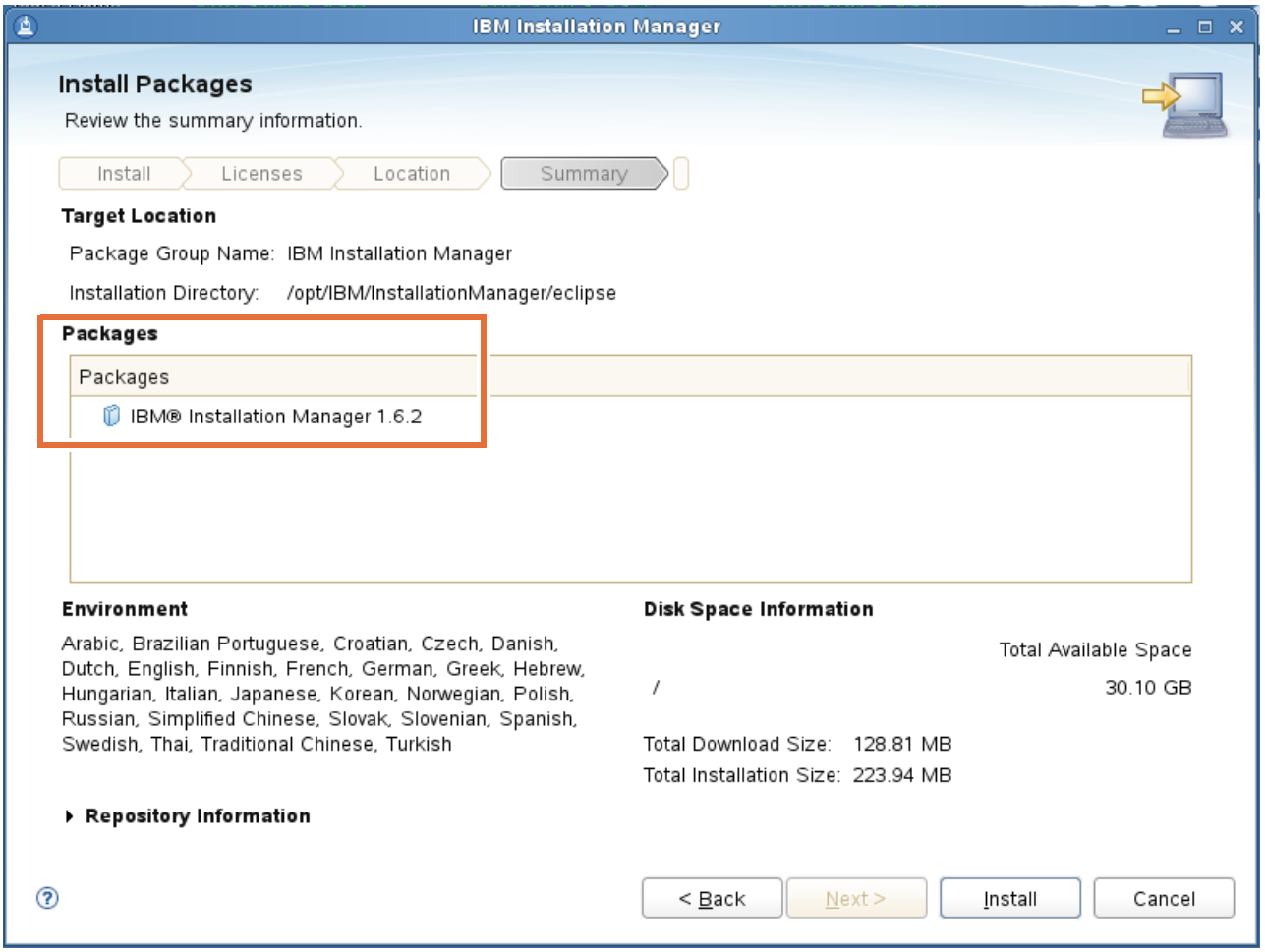
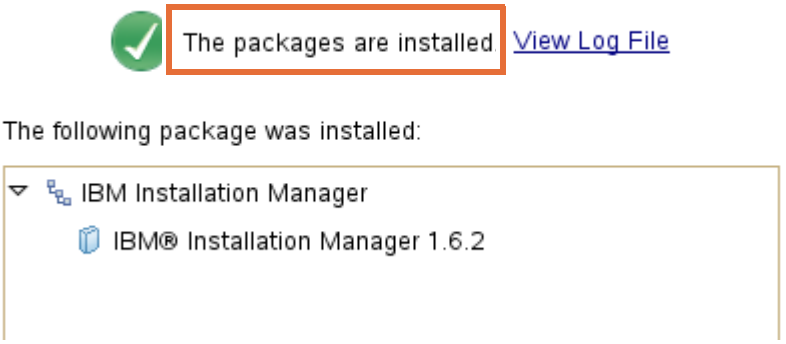
__ i. On the summary page, review the packages. Only one package is listed, IBM Installation Manager 1.6.2. Click **Install**.



__ j. At the bottom of the panel, observe the progress of the installation.

__ k. A message indicates that the packages are installed.



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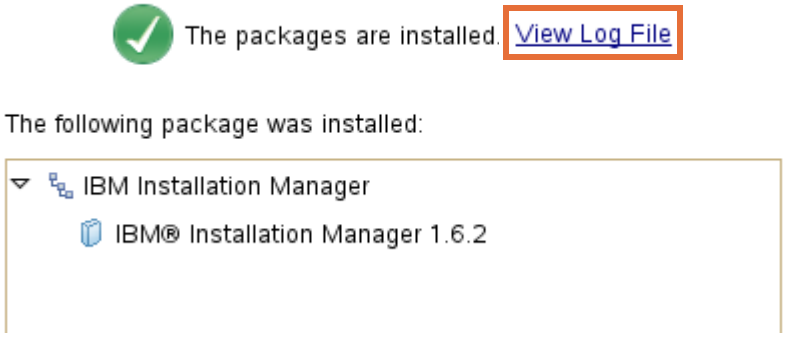
Section 4: Confirming installation of IBM Installation Manager

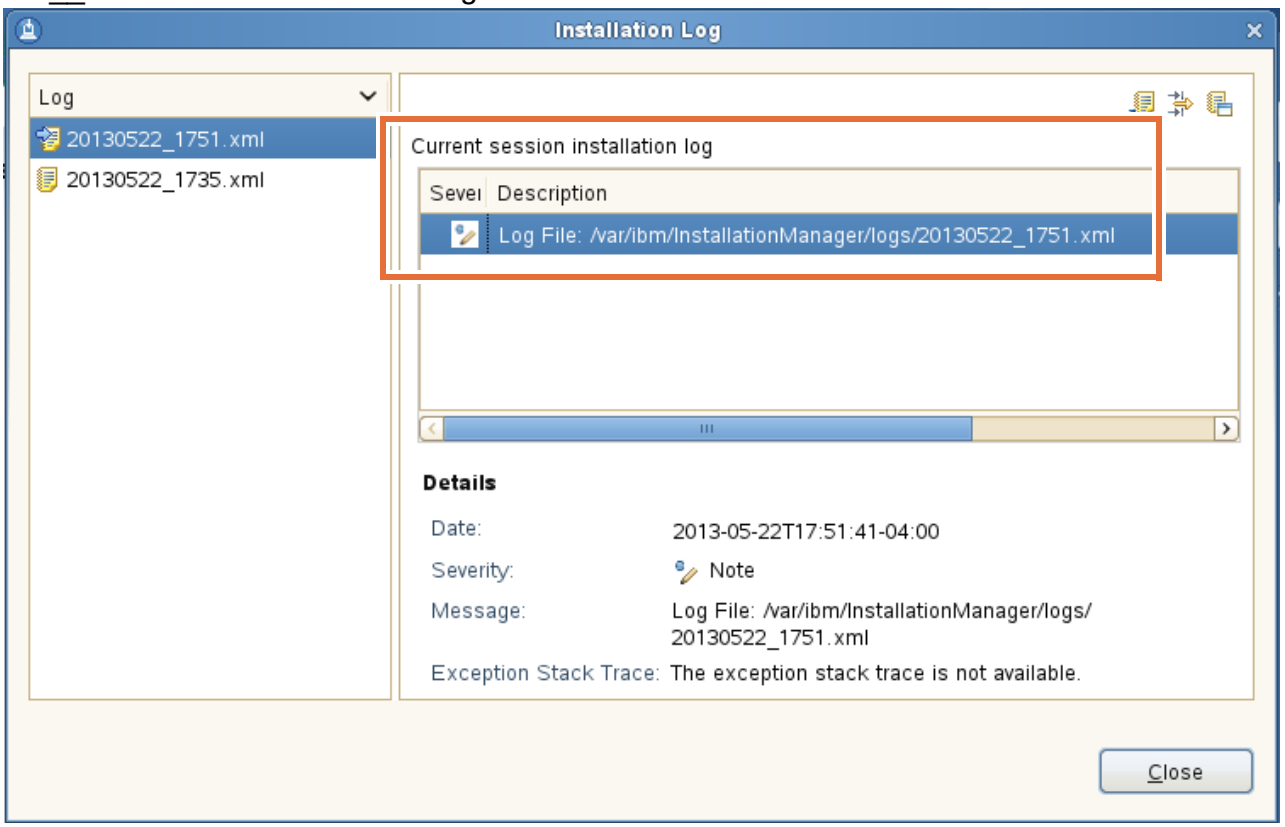
During installation, Installation Manager creates a session installation log file. This file is useful to either confirm a successful installation or to check for installation problems.

__ 1. View the installation log file.

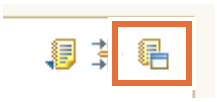
__ a. Click **View Log File**.



__ b. The current session log file is listed.



__ c. Click the **Open log file** icon.



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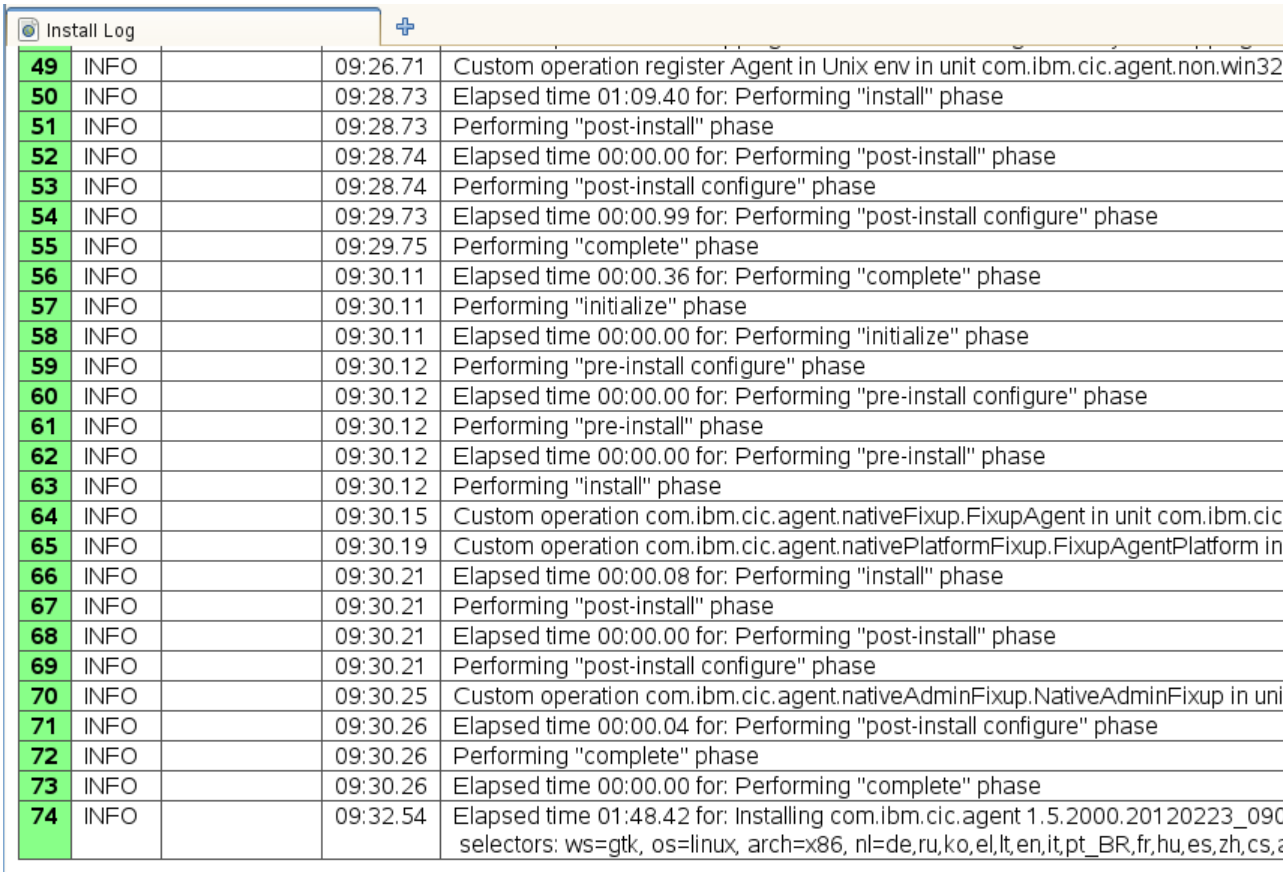
__ d. The Install Log page opens in a browser window. Scan the page for any obvious error messages. Messages in the file indicate “complete”, “install”, “post-install”, and other installation phases. These messages are indicators that the installation proceeded normally without errors.


Install Log

49	INFO		09:26.71	Custom operation register Agent in Unix env in unit com.ibm.cic.agent.non.win32
50	INFO		09:28.73	Elapsed time 01:09.40 for: Performing "install" phase
51	INFO		09:28.73	Performing "post-install" phase
52	INFO		09:28.74	Elapsed time 00:00.00 for: Performing "post-install" phase
53	INFO		09:28.74	Performing "post-install configure" phase
54	INFO		09:29.73	Elapsed time 00:00.99 for: Performing "post-install configure" phase
55	INFO		09:29.75	Performing "complete" phase
56	INFO		09:30.11	Elapsed time 00:00.36 for: Performing "complete" phase
57	INFO		09:30.11	Performing "initialize" phase
58	INFO		09:30.11	Elapsed time 00:00.00 for: Performing "initialize" phase
59	INFO		09:30.12	Performing "pre-install configure" phase
60	INFO		09:30.12	Elapsed time 00:00.00 for: Performing "pre-install configure" phase
61	INFO		09:30.12	Performing "pre-install" phase
62	INFO		09:30.12	Elapsed time 00:00.00 for: Performing "pre-install" phase
63	INFO		09:30.12	Performing "install" phase
64	INFO		09:30.15	Custom operation com.ibm.cic.agent.nativeFixup.FixupAgent in unit com.ibm.cic
65	INFO		09:30.19	Custom operation com.ibm.cic.agent.nativePlatformFixup.FixupAgentPlatform in
66	INFO		09:30.21	Elapsed time 00:00.08 for: Performing "install" phase
67	INFO		09:30.21	Performing "post-install" phase
68	INFO		09:30.21	Elapsed time 00:00.00 for: Performing "post-install" phase
69	INFO		09:30.21	Performing "post-install configure" phase
70	INFO		09:30.25	Custom operation com.ibm.cic.agent.nativeAdminFixup.NativeAdminFixup in uni
71	INFO		09:30.26	Elapsed time 00:00.04 for: Performing "post-install configure" phase
72	INFO		09:30.26	Performing "complete" phase
73	INFO		09:30.26	Elapsed time 00:00.00 for: Performing "complete" phase
74	INFO		09:32.54	Elapsed time 01:48.42 for: Installing com.ibm.cic.agent 1.5.2000.20120223_090 selectors: ws=gtk, os=linux, arch=x86, nl=de,ru,ko,el,lt,en,it,pt_BR,fr,hu,es,zh,cs,a

__ e. Close the browser window.

__ f. Close the Installation Log window.

__ g. Close IBM Installation Manager.

End of exercise

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Exercise review and wrap-up

In this exercise, you installed IBM Installation Manager. Installation Manager is the software that is used to install WebSphere Application Server and other tools.

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Exercise 2. Installing WebSphere Application Server

What this exercise is about

In this exercise, you install WebSphere Application Server Network Deployment V8.5.5. In version 8.5.5, the installation of WebSphere Application Server Network Deployment is a two-step process. The first step uses IBM Installation Manager to install a set of shared product binary files. The second step uses the Profile Management Tool, part of the WebSphere Customization Toolbox, to create an application server profile.

After installation, you test the product to ensure that WebSphere Application Server was installed successfully. You also examine several log files to verify installation.

What you should be able to do

At the end of the exercise, you should be able to:

- Use IBM Installation Manager to install WebSphere Application Server Network Deployment
- Use IBM Installation Manager to modify a product feature
- Use the Profile Management Tool to create a profile
- Verify that the installation was successful by examining log files
- Start and stop the application server

Introduction

In this exercise, you install WebSphere Application Server Network Deployment V8.5.5. WebSphere Application Server relies on TCP/IP networking, so you must have TCP/IP correctly configured, and it is important that the host name of the computer remains unchanged.

The lab computer must be configured appropriately. Make sure that you know the host name of the computer because you need it for this exercise.

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Requirements

This exercise requires that the IBM Installation Manager is already installed.

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Exercise instructions

Preface

To do this exercise, you must complete the Installing IBM Installation Manager exercise.

Section 1: Resetting the WebSphere environment

Note

To reset your WebSphere environment, read **Appendix A** for instructions on how to complete this procedure.

Section 2: Install WebSphere Application Server

In this part of the exercise, you use the IBM Installation Manager to install WebSphere Application Server. Before the WebSphere Application Server installation can be started, an installation repository that contains the WebSphere Application Server installation binary files must be defined.

Information

You can find more details about WebSphere Application Server V8.5 in the information center at:

`http://publib.boulder.ibm.com/infocenter/wasinfo/v8r5/index.jsp`

__ 1. Start IBM Installation Manager.

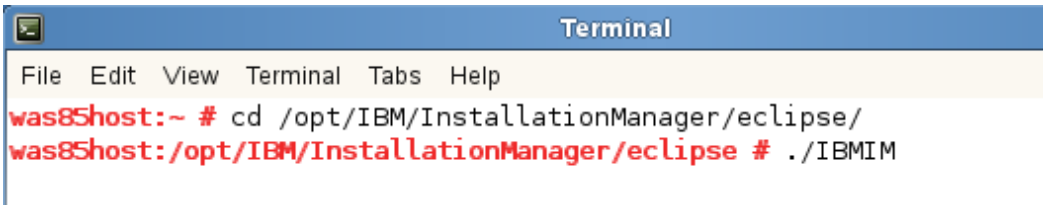
__ a. Open a terminal window.

__ b. Navigate to the following directory:

`/opt/IBM/InstallationManager/eclipse/`

__ c. Use the following command to start the IBM Installation Manager:

`./IBMIM`



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__ d. Installation Manager starts and shows the available wizards. Installation Manager contains a number of wizards to help install and maintain various packages.

Information

Installation Manager uses repositories to identify the packages or updates to install. A repository is a location that stores data for installing, modifying, rolling back, updating, or uninstalling packages. Each installed package has an embedded location for its default update repository. You can add, edit, or remove repositories for use by Installation Manager.

By default, Installation Manager is configured to use a service repository that is made up of repositories at `ibm.com`. In this case, Internet access is required. If a computer does not have Internet access, Installation Manager can be configured to look for a local repository. Updates can be downloaded and placed in a temporary directory on the computer. Installation Manager looks in this directory for installable updates. You must manually configure local repositories.

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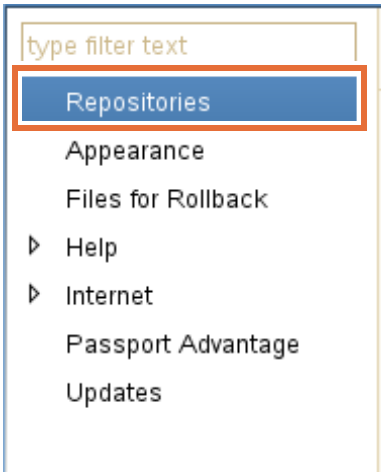
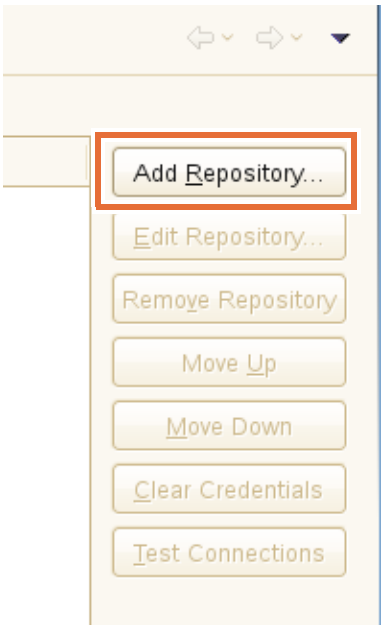
__ 2. The Install Packages wizard takes you through the installation process for one or more packages. To locate the packages, you must configure the repository.

__ a. Click **File > Preferences**.

__ b. Select **Repositories**.



__ c. Click **Add Repository**.



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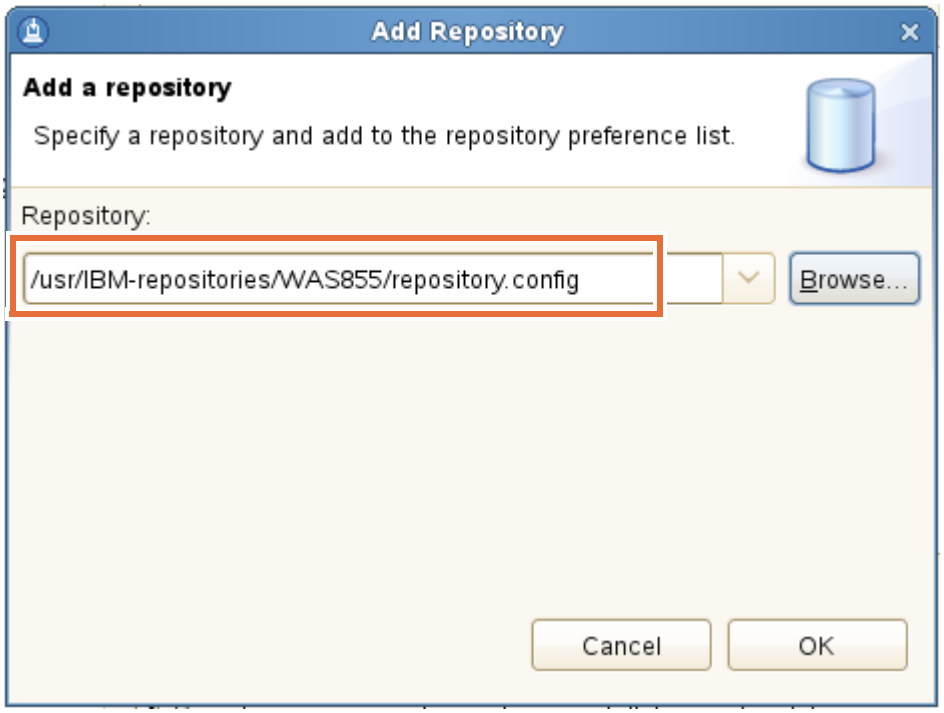
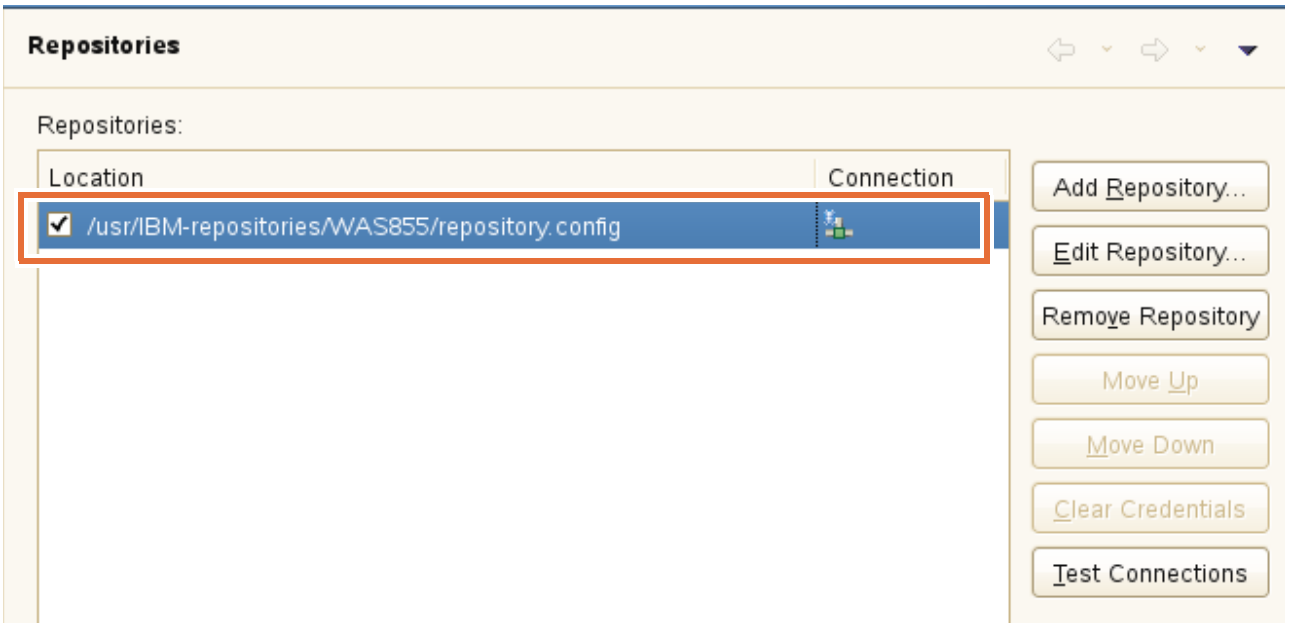
__ d. Browse to `/usr/IBM-repositories/WAS855/repository.config` and click **Open**.



__ e. Click **OK**.

__ f. The repository is added to the list of repositories. Click **Apply**.



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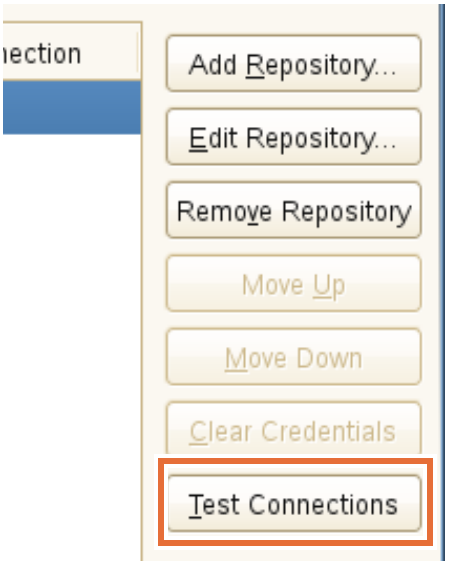
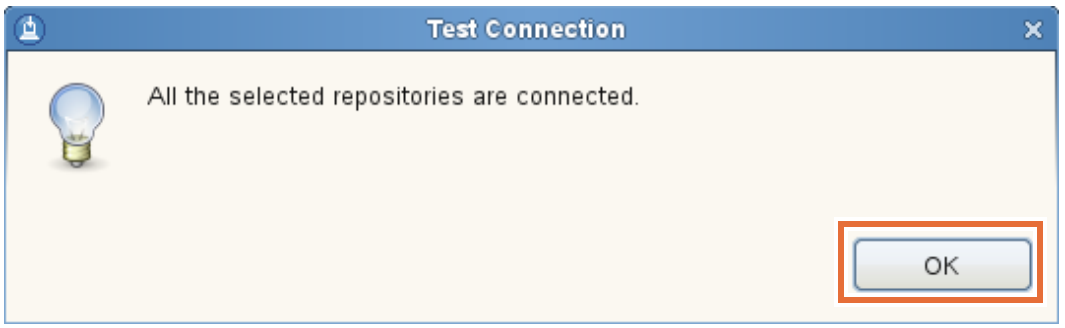
__ 3. Test the connection to the local repository. This step is more important when you configure remote repositories and need access to the repository to complete a product installation.

__ a. Click **Test Connections**.



__ b. A message indicates that the repository is connected. Click **OK** to close the dialog box.



__ c. Click **OK** to close the preferences page.

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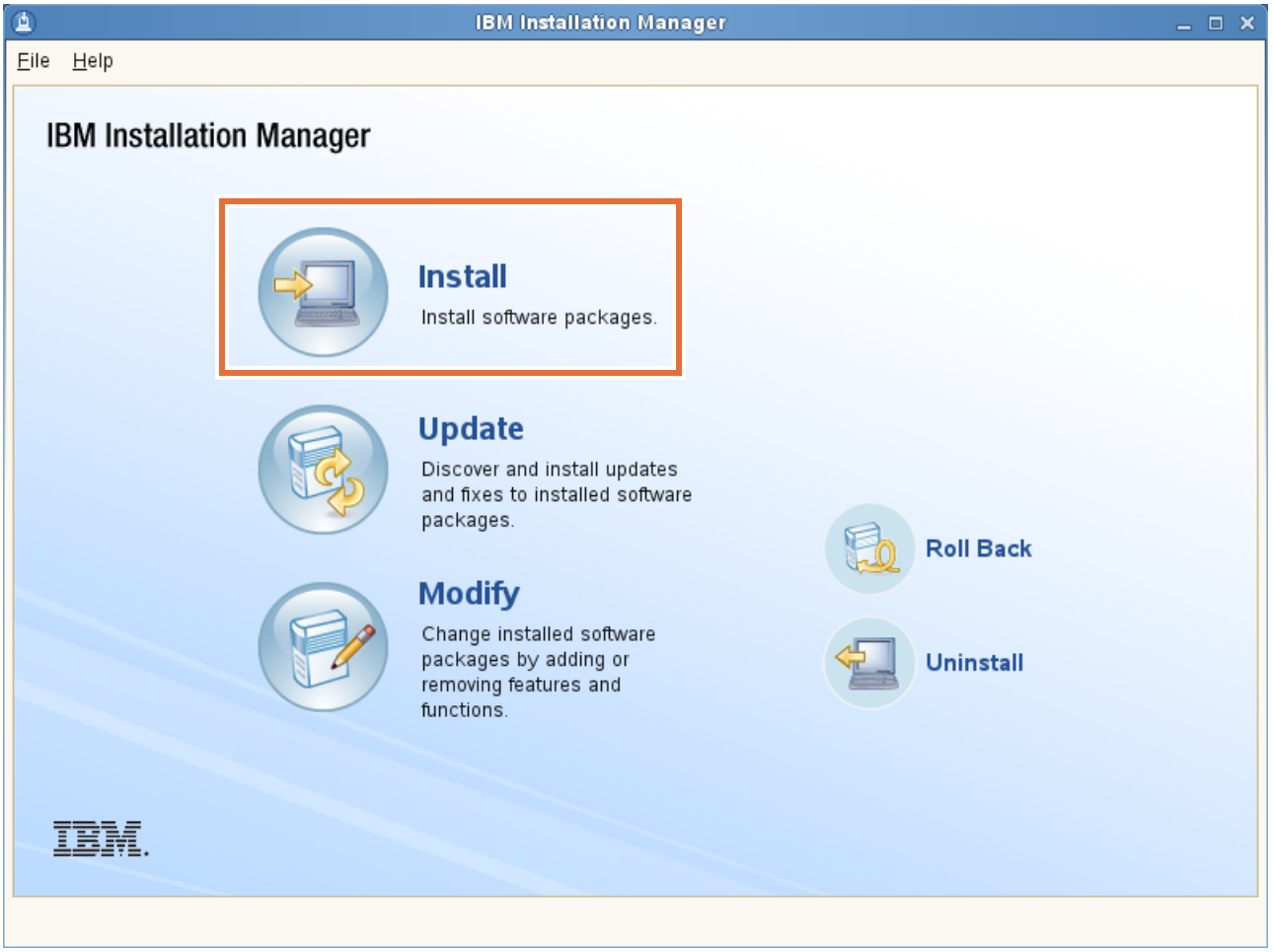
__ 4. Install WebSphere Application Server.

__ a. Click the **Install** icon.



__ b. Installation Manager lists all the packages that it finds in the configured repositories. In this case, it searched the repository and found the following packages. Select **IBM WebSphere Application Server Network Deployment**.

__ c. The Install Packages panel is updated to indicate the status for Version 8.5.5.0 as *Will be installed.* Click **Next**.

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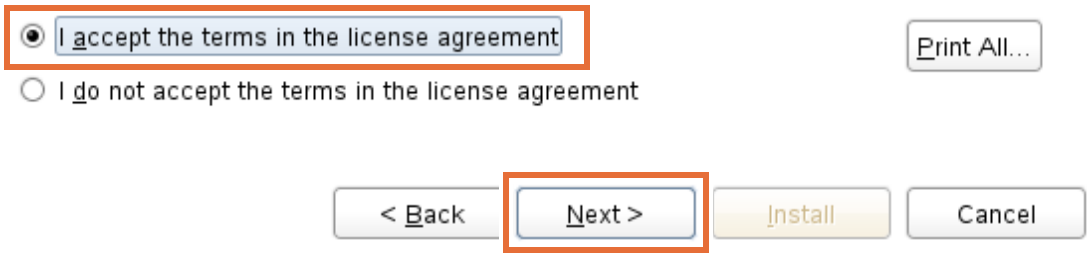
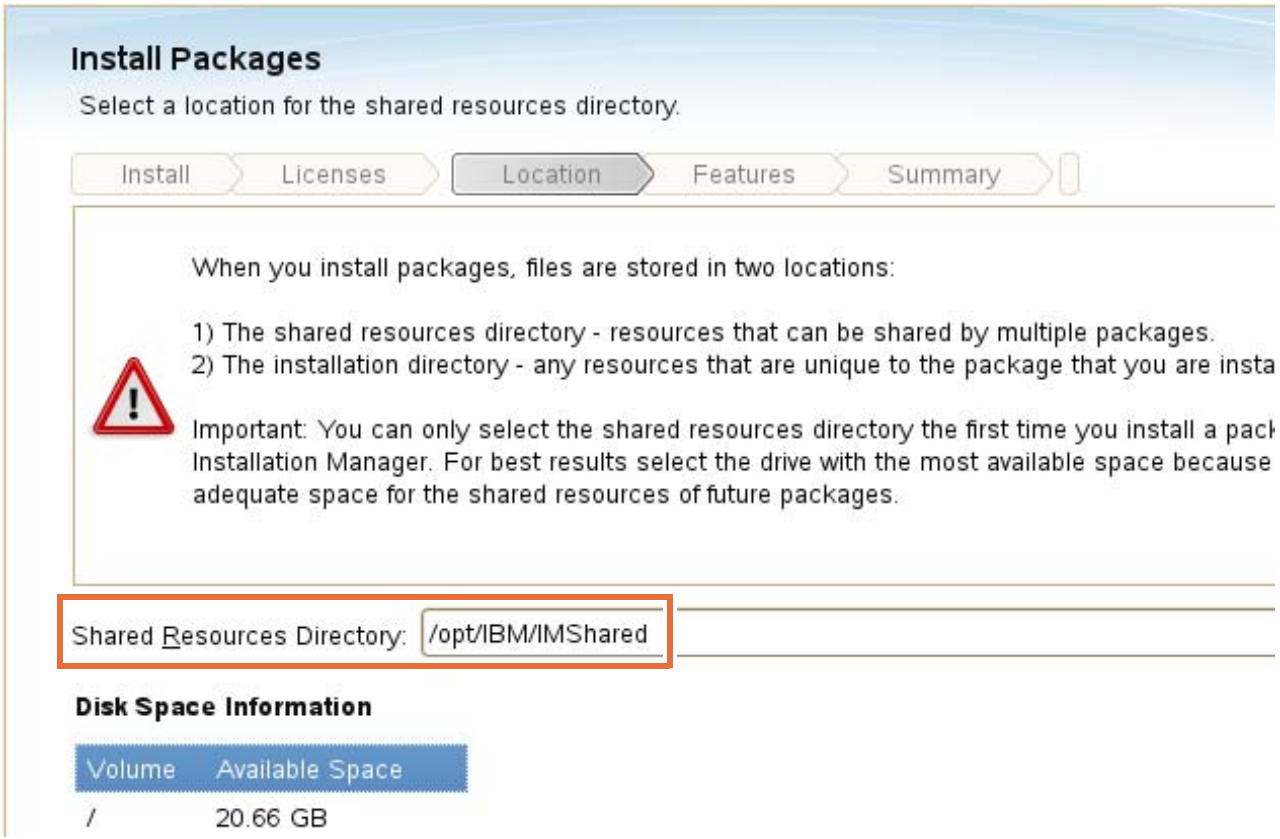
__ d. The Licenses panel opens. You can read the license agreements for any of the packages. Select **I accept the terms in the license agreement** and click **Next**.



__ e. On the Install Packages panel, accept the default location of `/opt/IBM/IMShared` for the Shared Resources Directory, and click **Next**.



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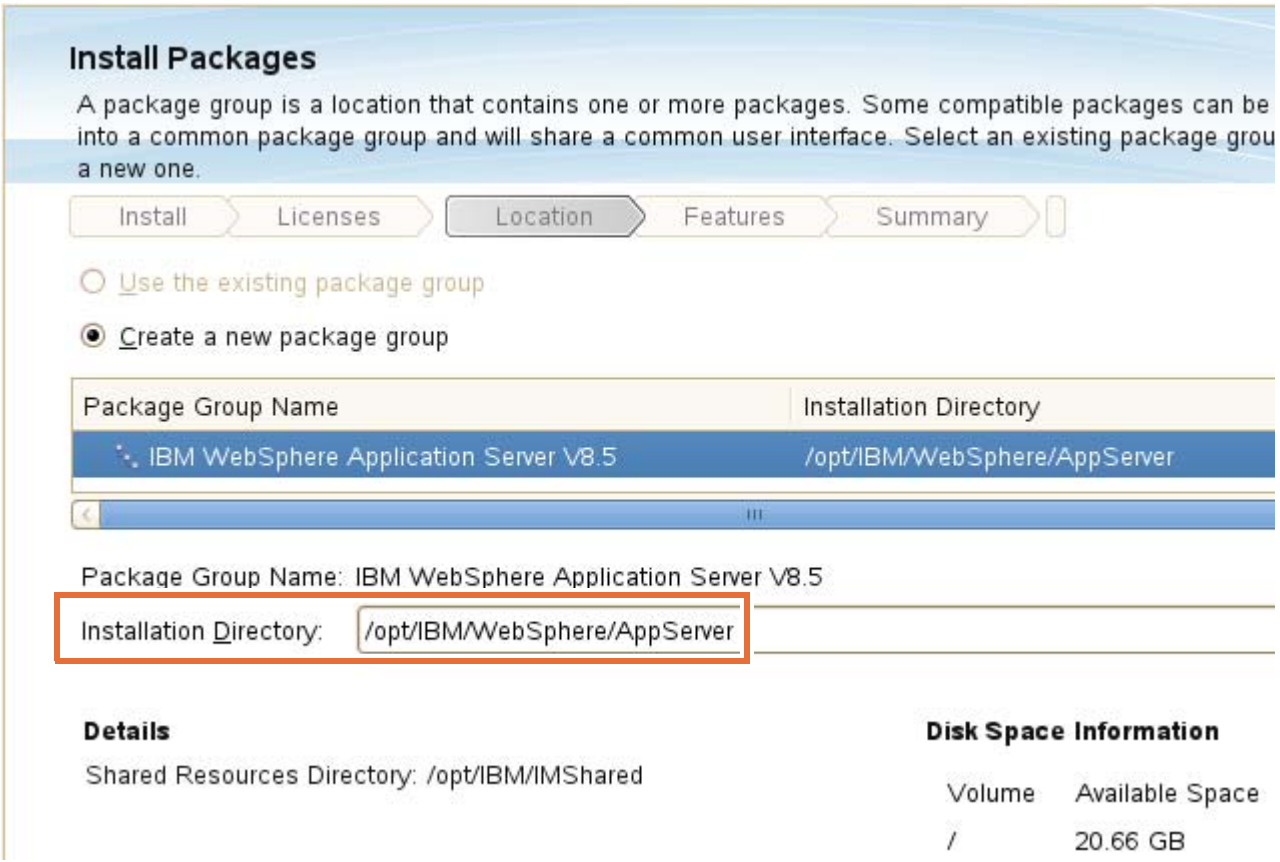
__ f. On the Location panel, the package for WebSphere Application Server Network Deployment V8.5 is selected along with **Create a new package group**. Verify that the Installation Directory is `/opt/IBM/WebSphere/AppServer`. The package group name is automatically modified to be unique. Click **Next**.



__ g. The Features panel indicates the individual language packs for the WebSphere Application Server runtime environment and administrative console. Keep the default setting and click **Next**.

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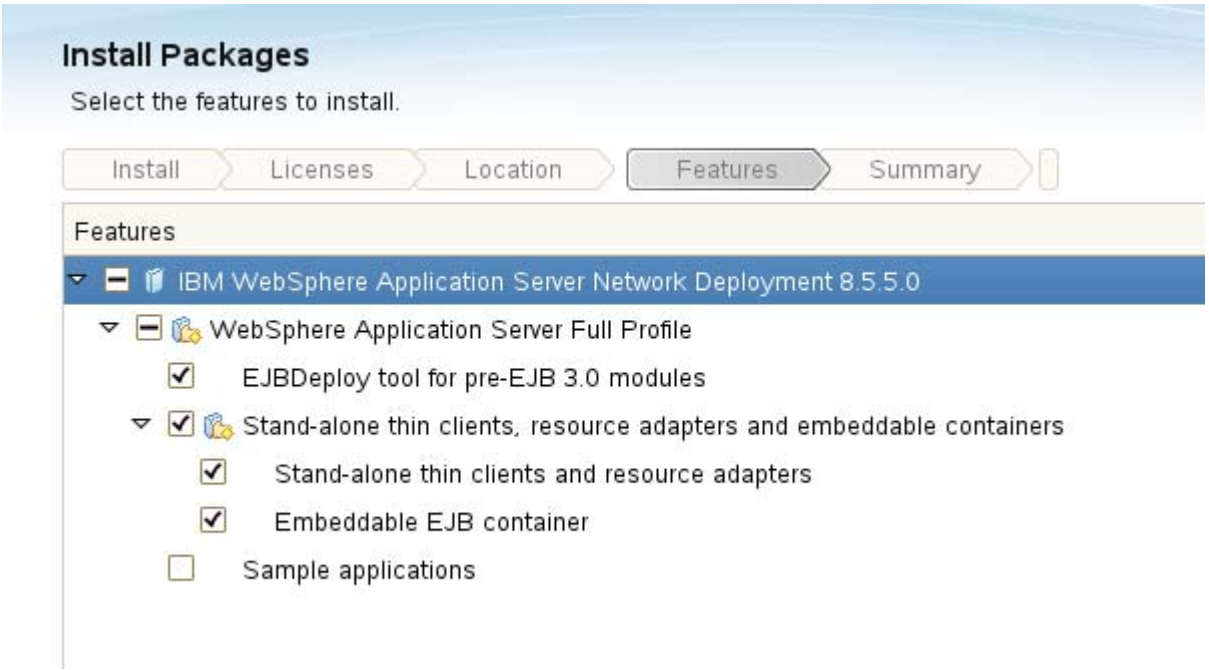
__ h. The Features panel lists more features for installation. Note the default selections and click **Next**.



Note

Do not select the Sample application feature. This feature is added to the installation later in this exercise.

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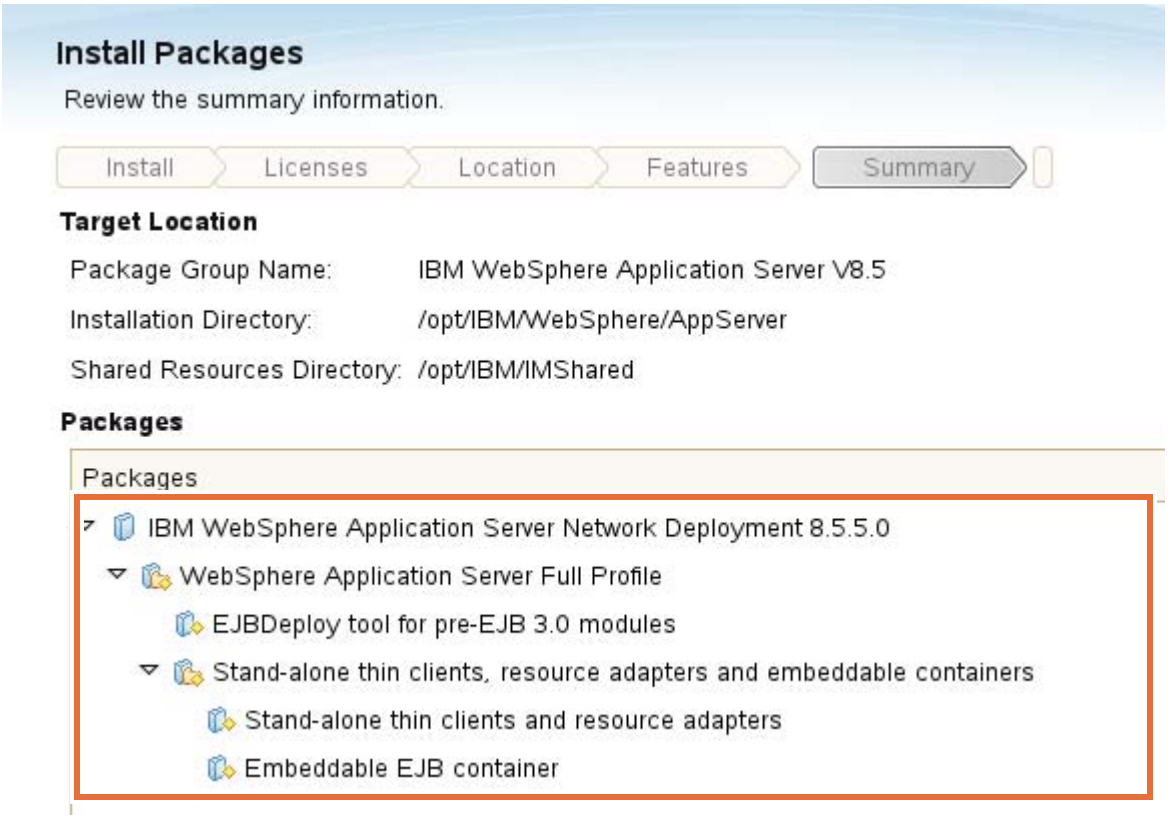
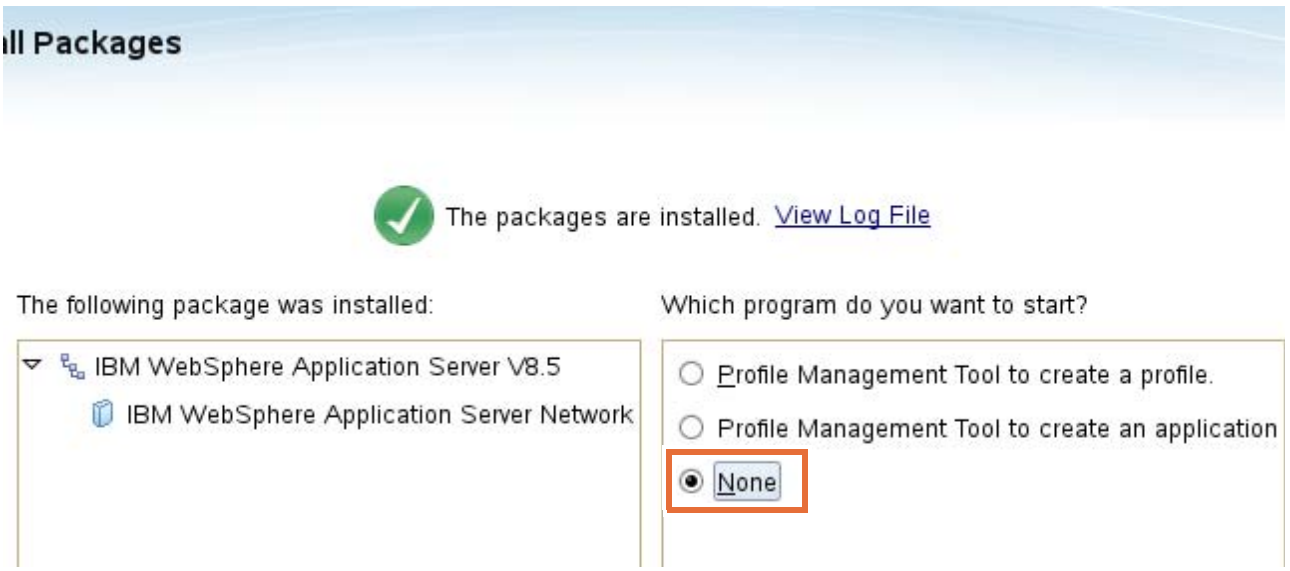
__ i. On the Summary panel, confirm your previous choices. Verify your information with the following figure. If necessary, you can click **Back** to modify any choices.



__ j. Click **Install** to begin the installation. Depending on system resources, the installation takes several minutes. During the installation, verify the progress with the progress bar at the bottom of the window.

__ k. When the installation completes, the installation results are displayed at the top of the panel. Select **None** in the area that indicates programs to start. Click **Finish**.



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__ l. Do not close Installation Manager as it is used in the next section of the exercise.

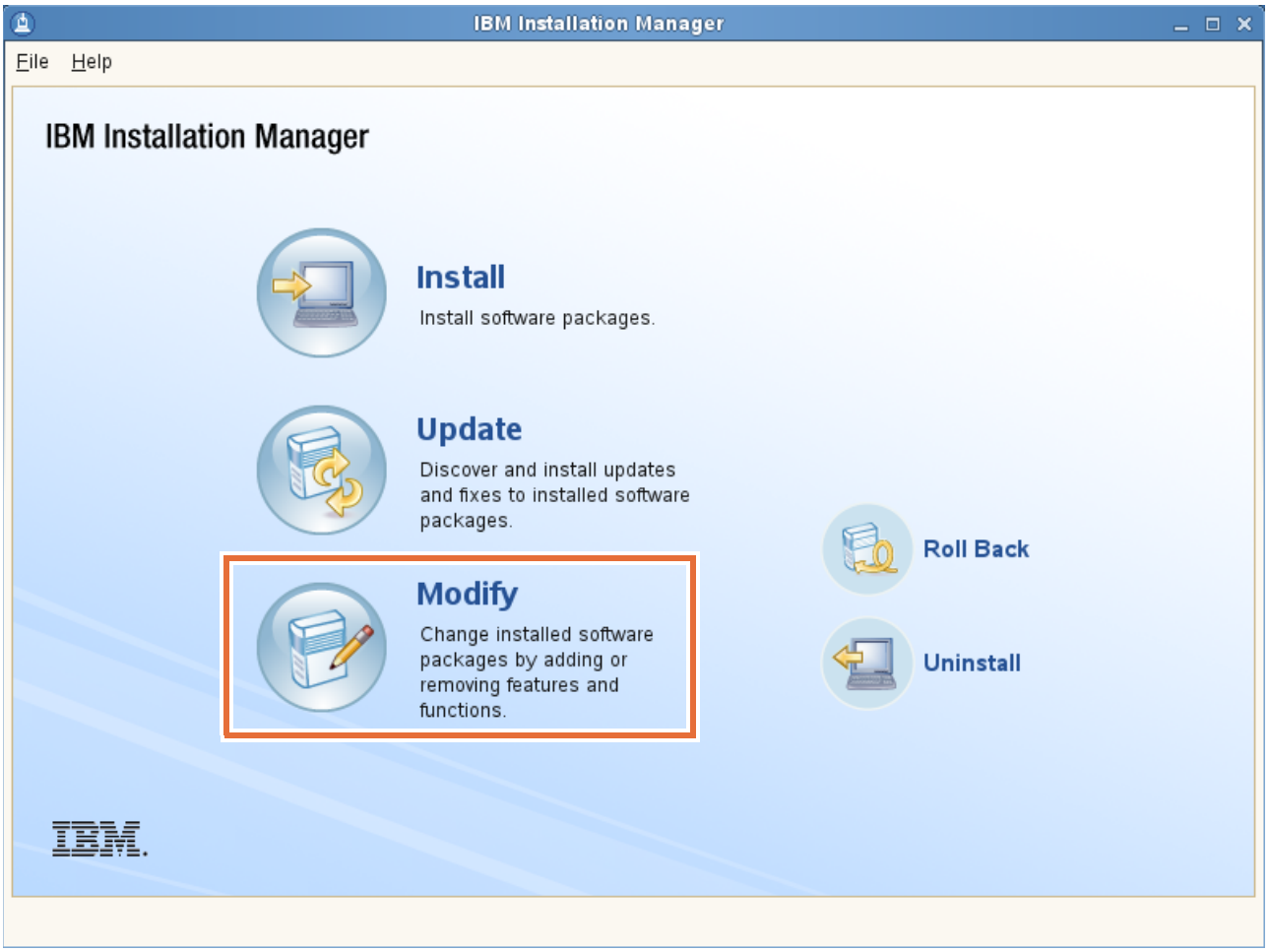
Section 3: Modify WebSphere Application Server

You can use Installation Manager to add or remove a product feature from an installed package. To modify an installed package, Installation Manager must have access to the repository that contains the package installation files.

In this part of the exercise, you modify the WebSphere Application Server installation from Section 1 to include the sample applications.

__ 1. Modify the installation to include the sample applications.

__ a. From the main panel of Installation Manager, click **Modify**.



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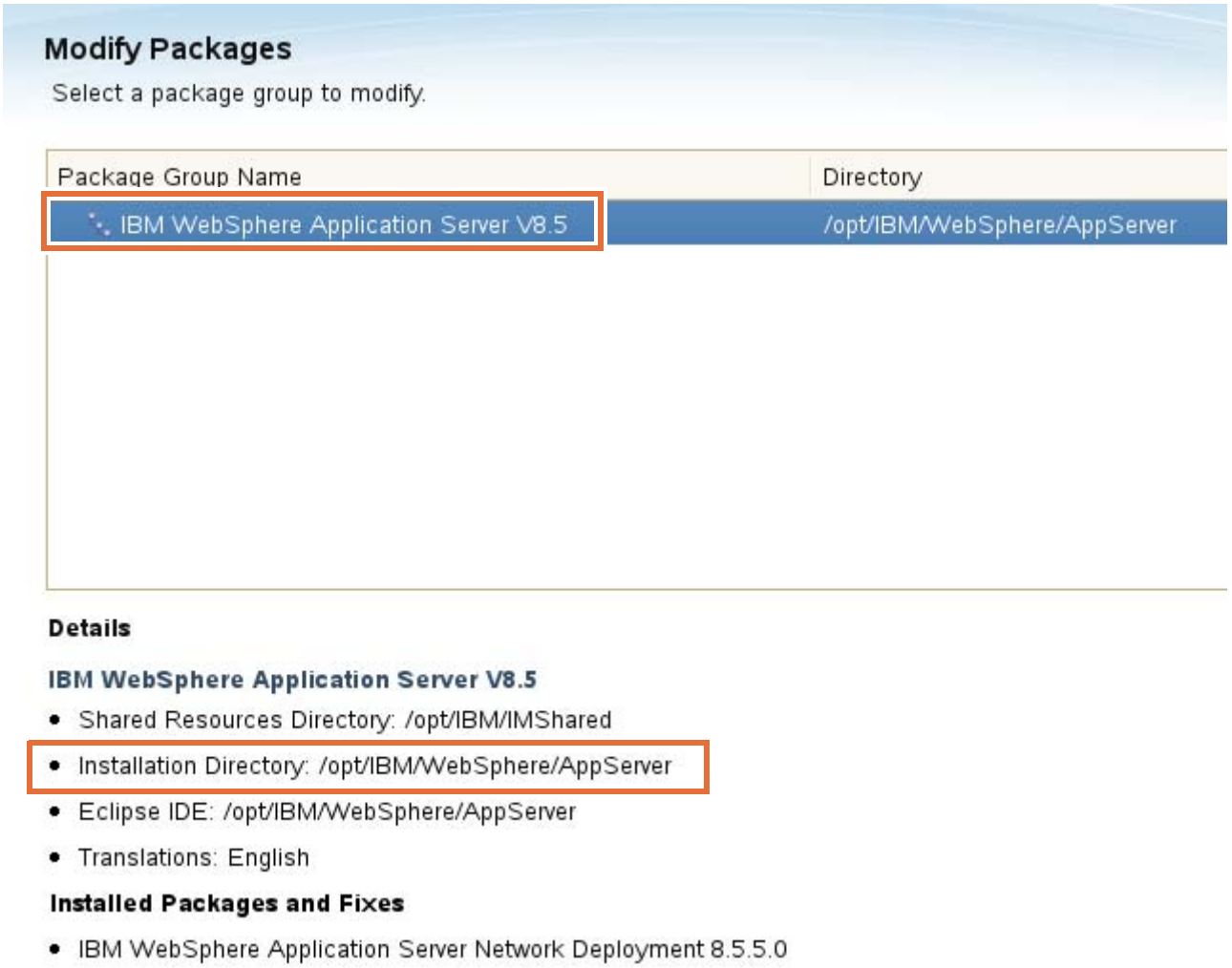
__ b. The Modify Packages panel is displayed. This panel lists the packages that are installed and can be modified. Select **IBM WebSphere Application Server Network Deployment V8.5**, which is installed in the `/opt/IBM/WebSphere/AppServer` directory. Click **Next**.



__ c. On the Features panel, you see a listing of individual language packs. Keep the default values and click **Next**.

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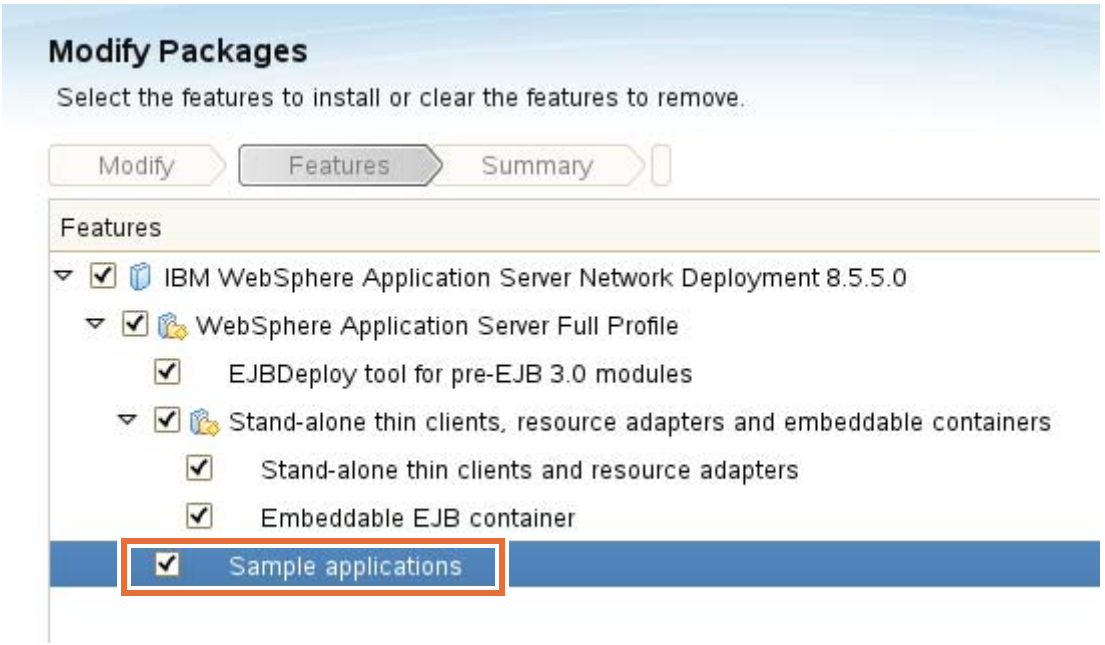
__ d. The Features page lists the features for installation. Select **Sample applications** and click **Next**.



Information

In version 8.5, the only sample application that is included with the product is PlantsByWebSphere (PBW). PlantsByWebSphere is updated to use Java Platform, Enterprise Edition 6 technology. The PlantsByWebSphere sample application is available at `/opt/IBM/WebSphere/AppServer/samples` after installation.

All previous samples included in version 7 that are still relevant are online along with several new samples. You can obtain information about the samples in the WebSphere Application Server Information Center.

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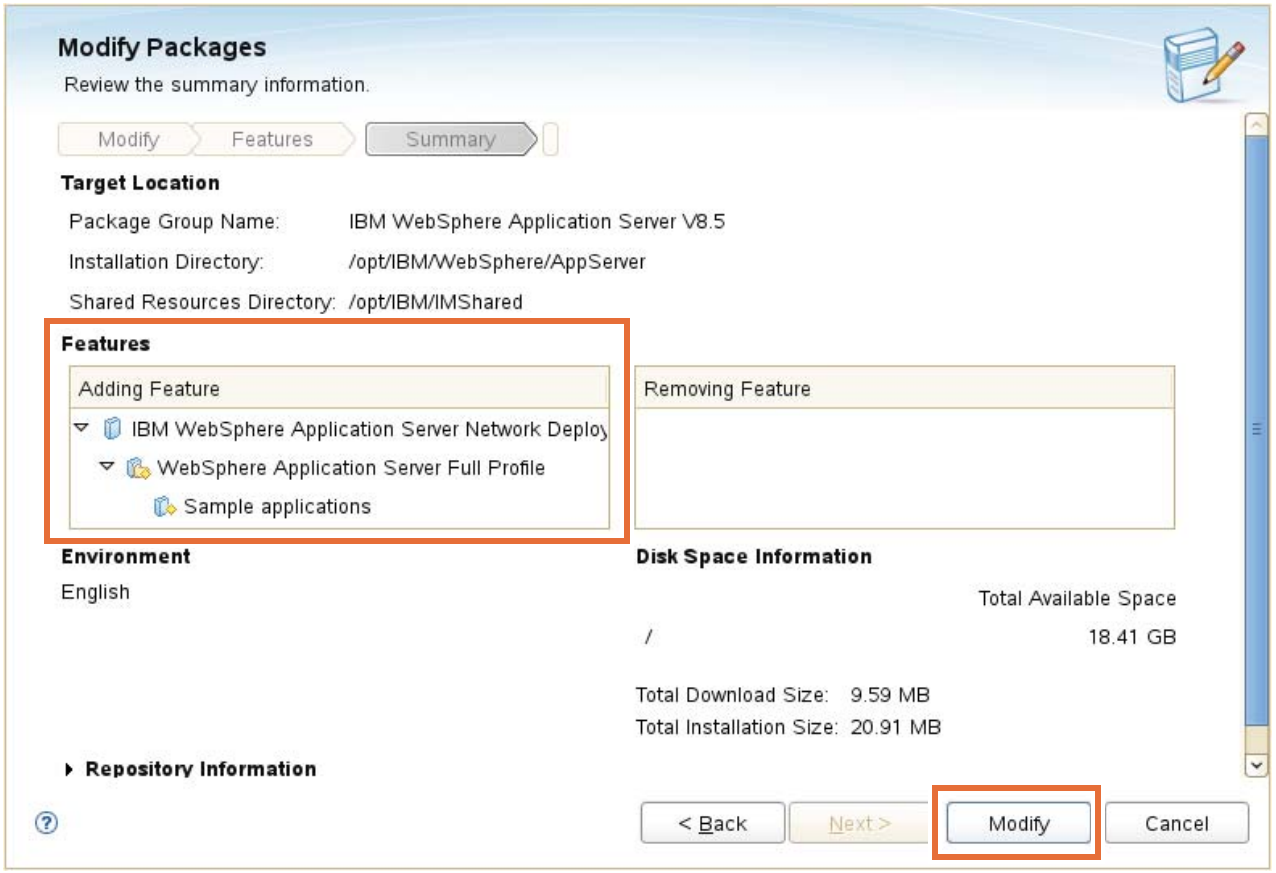
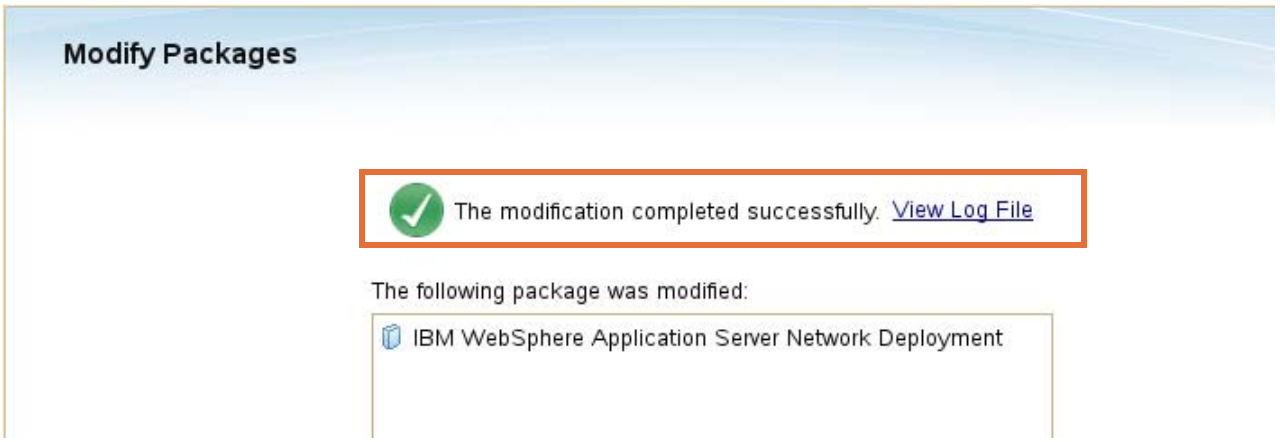
__ e. In the Summary panel, verify that the added features include the sample applications. Click **Modify**.



__ f. When the installation completes, the installation results are displayed at the top of the panel. Click **Finish**.



__ g. Close Installation Manager.

__ 2. Verify the application installation.

__ a. Open a terminal and navigate to the following directory:

`/opt/IBM/WebSphere/AppServer/samples`

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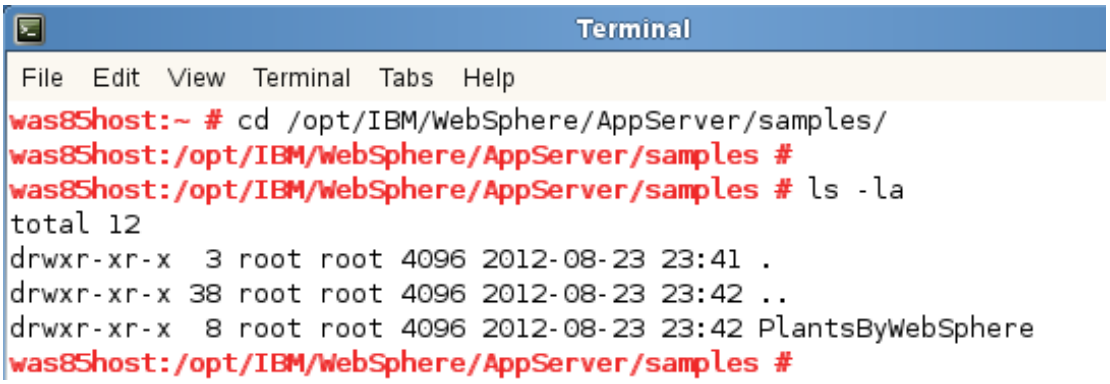
__ b. Verify that the PlantsByWebSphere sample application is in the directory by entering the following command:

```
ls -la
```



Section 4: Create a profile with the Profile Management Tool

After the core product files for WebSphere Application Server are installed, you must create a profile to make the product functional. In this part of the exercise, you create an application server profile named `profile1` with the Profile Management Tool in the WebSphere Customization Toolbox. The Profile Management Tool is added to the WebSphere Customization Toolbox during the installation of WebSphere Application Server.

Information

Note the profile that is created is called profile1, which is profile number ***one***. The name does not contain the character `l` or `L` (capital or lowercase “L”).

__ 1. Create an application server profile with the Profile Management Tool in the WebSphere Customization Toolbox.

__ a. In a terminal window, navigate to the following directory:

```
/opt/IBM/WebSphere/AppServer/bin/ProfileManagement
```

__ b. Enter the following command to start the WebSphere Customization Toolbox:

```
./wct.sh
```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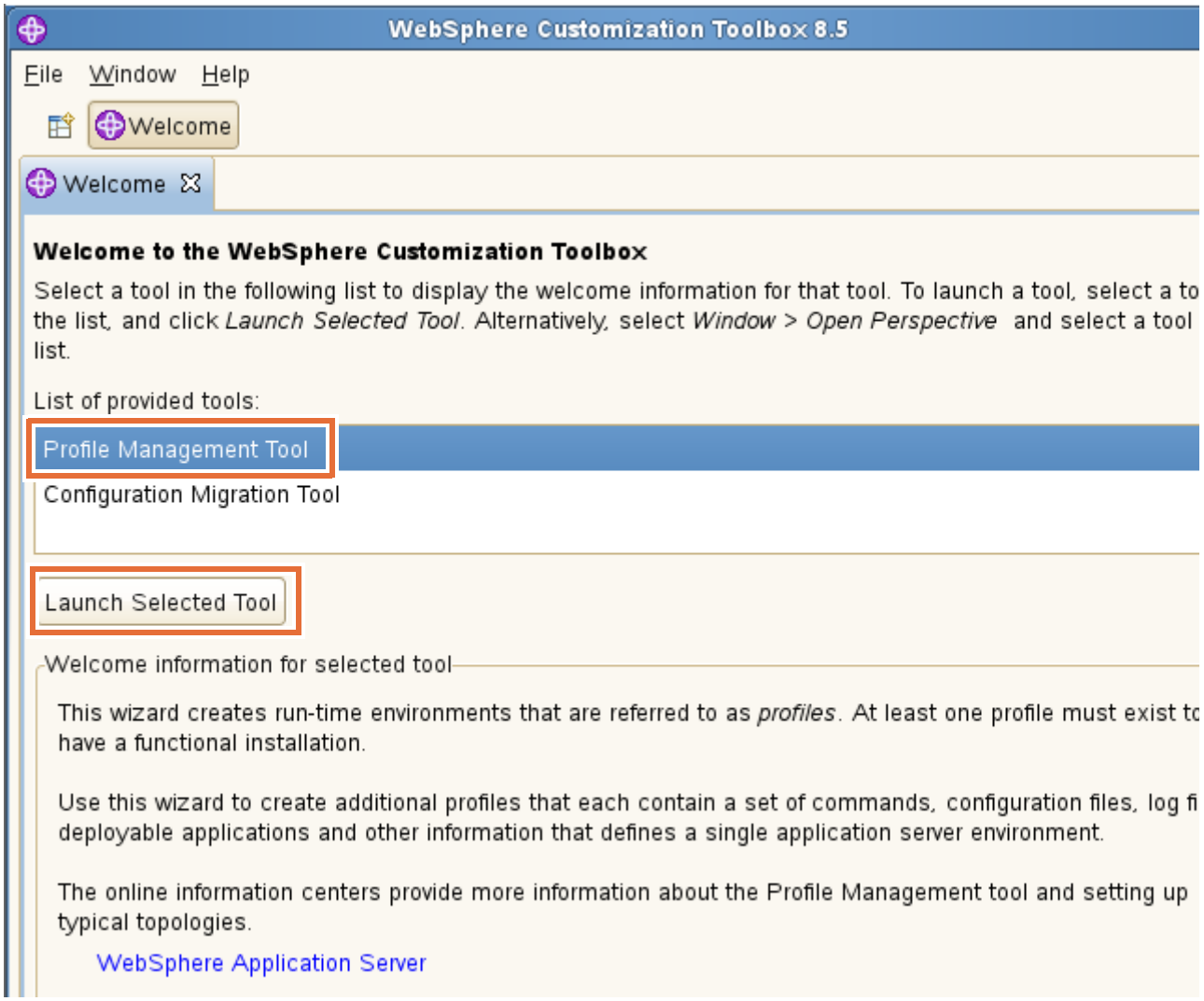
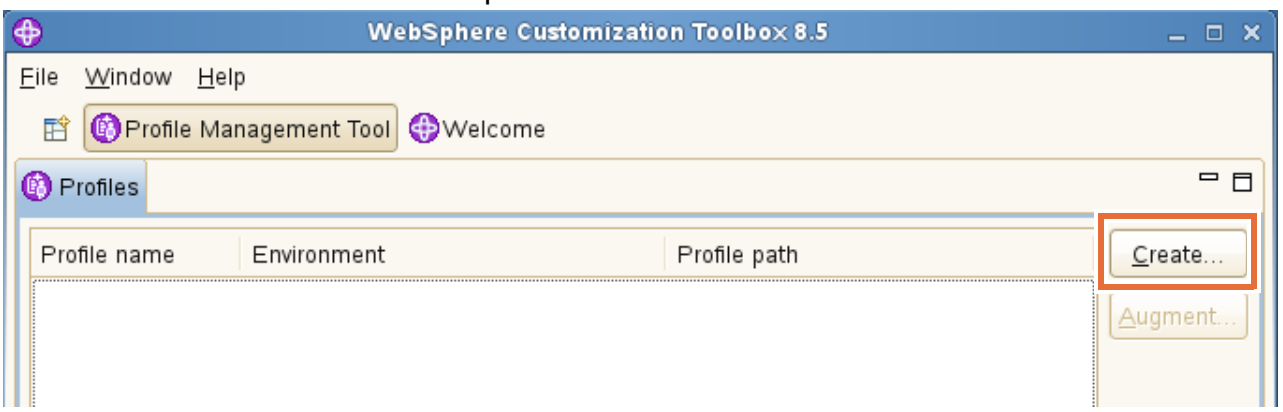
__ c. The WebSphere Customization Toolbox opens. Select **Profile Management Tool**, and click **Launch Selected Tool**.



__ d. The WebSphere Customization Toolbox opens the Profile Management Tool. Notice that there are no profiles in the list. Click **Create**.



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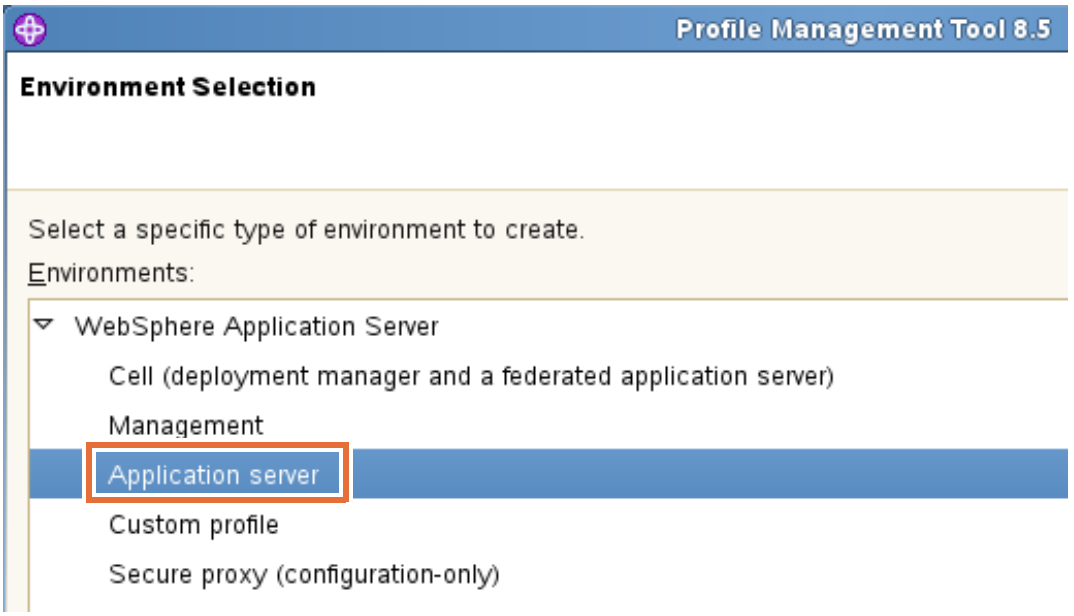
__ e. In the Environment Selection panel, select **Application server** and click **Next**.



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Information

By creating profiles, you can create multiple runtime environments on a system without installing the core product files again. When you use the Profile Management Tool, several types of profiles can be created:

- **Cell** (deployment manager and a federated application server)
  A cell creates two profiles: a management profile with a deployment manager and an application server profile. The application server is federated to the cell of the deployment manager.
- **Management**
  A management profile provides the server and services for managing multiple application server environments. The administrative agent manages application servers on the same computer. A job manager provides loosely coupled management of topologies that are distributed over multiple computers. The Network Deployment edition also includes a deployment manager for tightly coupled management. Each instance of the deployment manager defines a unique cell.
- **Application server**
  An application server environment runs your enterprise applications. An application server is managed from its own administrative console and functions independently from all other application servers. A new instance of a stand-alone node with a single application server is created. Stand-alone nodes have only one application server.
- **Custom profile**
  A custom profile contains an empty node, which does not contain an administrative console or servers. The typical use for a custom profile is to federate its node to a deployment manager. After you federate the node, you use the deployment manager to create a server or a cluster of servers within the node.
- **Secure proxy** (configuration-only)
  A secure proxy profile is for use with a DMZ secure proxy server. You cannot start the secure proxy server on the Network Deployment installation. This configuration-only profile is intended to be used only to configure the profile with the administrative console. After you configure the profile, you can export the profile configuration and then import it into the secure proxy profile in your DMZ.

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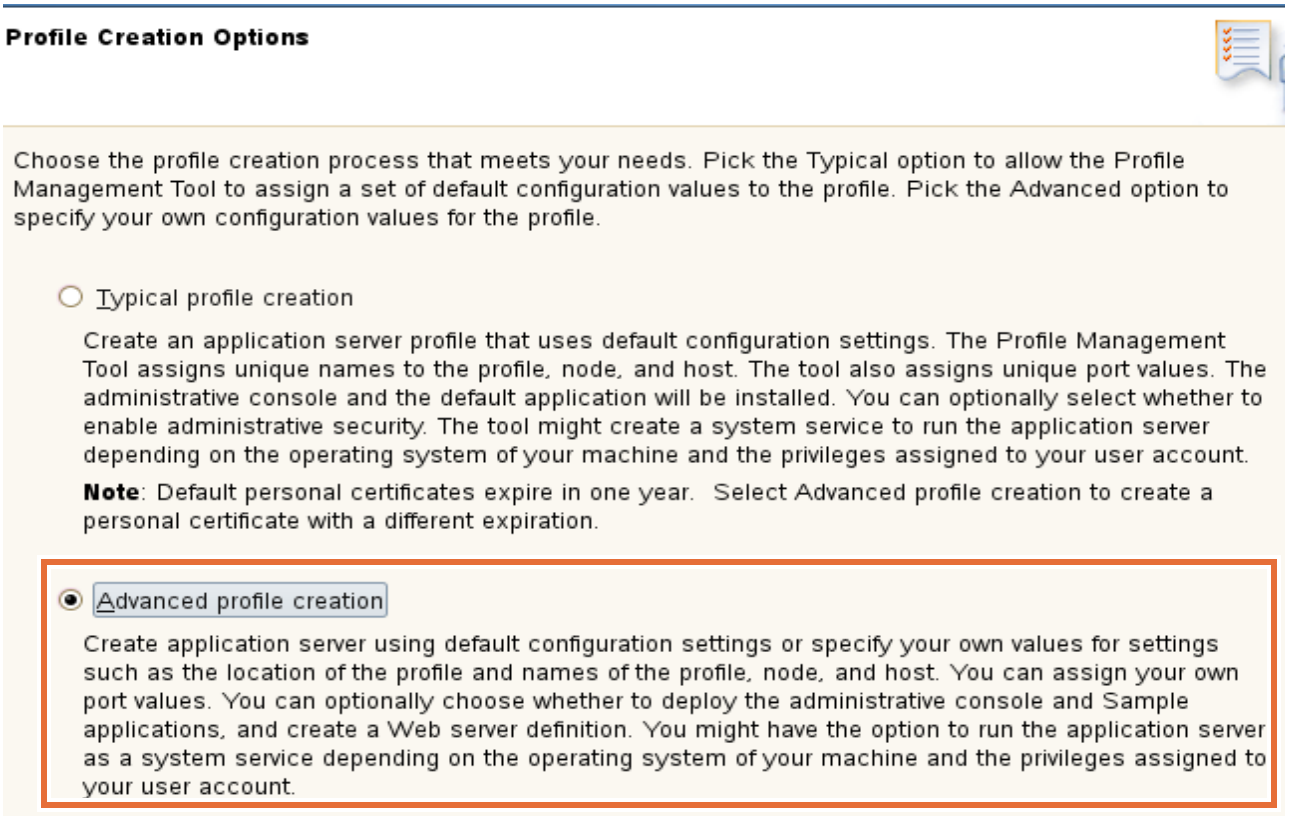
__ f. In the Profile Creation Options panel, select **Advanced profile creation**. This selection is where you can specify your own values for some settings. Click **Next**.



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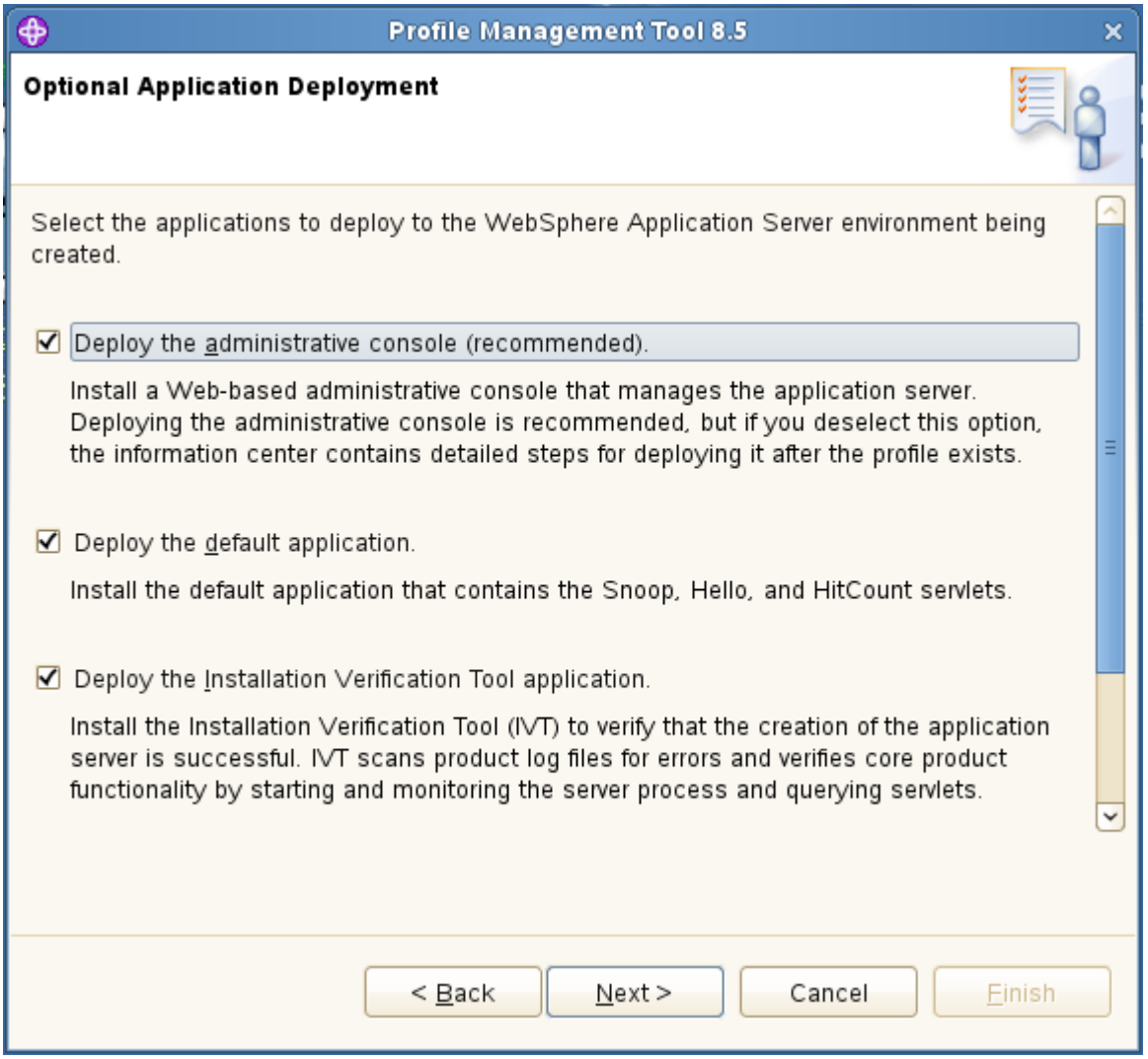
__ g. In the Optional Application Deployment panel, keep the default selections. Click **Next**.



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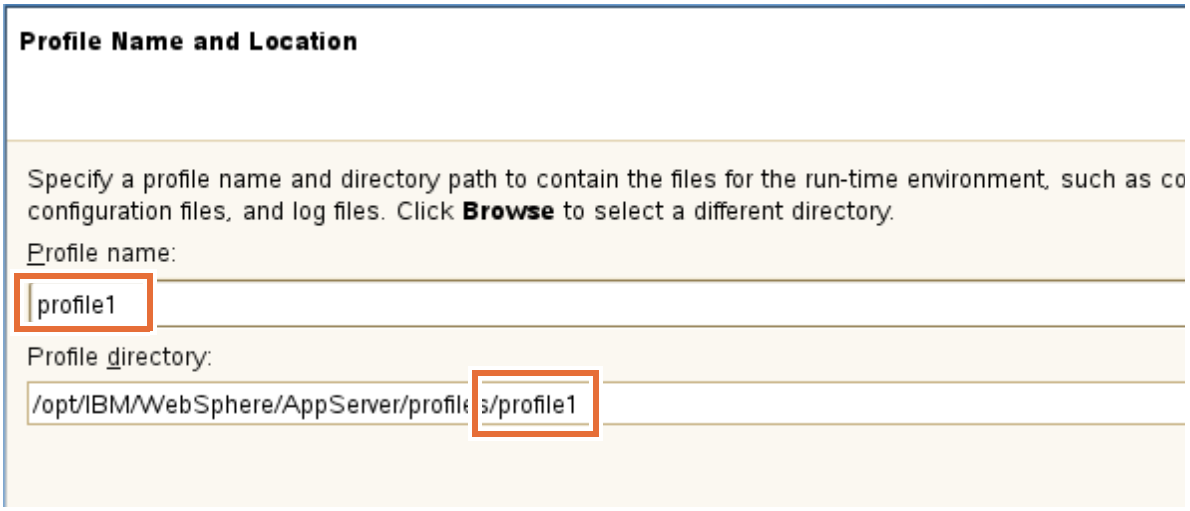
__ h. In the Profile Name and Location panel, make the following modifications (the values that are entered are not the default values):

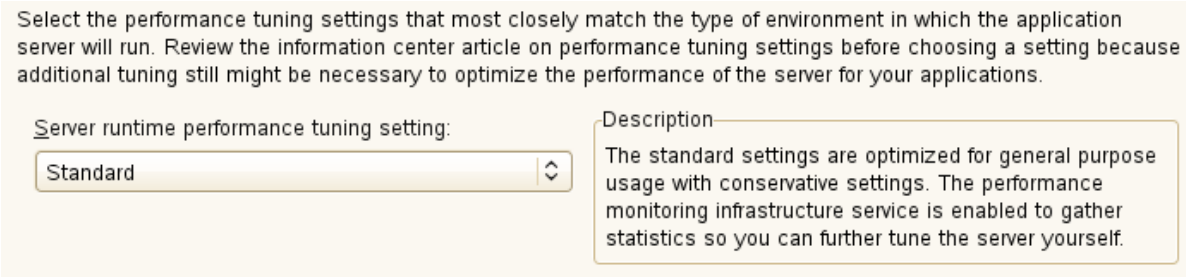
- **Profile name**: `profile1` (`profile` and the number *one*)
- **Profile directory**: `/opt/IBM/WebSphere/AppServer/profiles/profile1`



Information

Server runtime performance tuning settings is a new feature in version 8. The performance monitoring infrastructure service is enabled to gather statistics so you can further tune the server yourself. Settings include:

- **Standard**: The standard settings are optimized for general-purpose usage with conservative settings.
- **Peak**: The peak settings are optimized for runtime performance in environments where updates to applications are infrequent.
- **Development**: The development settings are optimized for environments with less powerful hardware and where updates to applications are frequent.



__ i. Click **Next**.

__ j. In the Node and Host Names panel, enter the following values (the default values must be changed for the course exercises):

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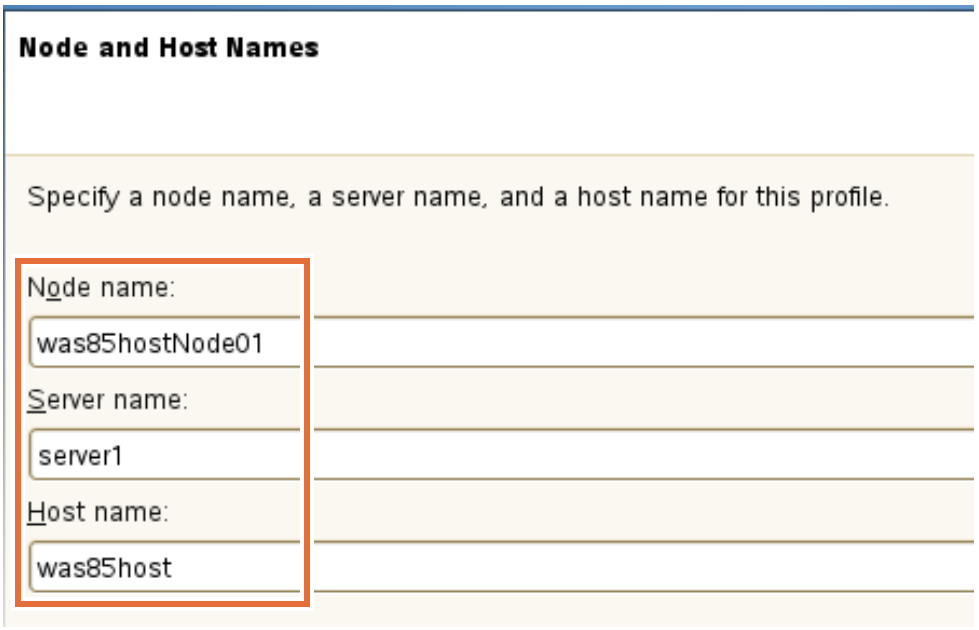
- **Node name**: `was85hostNode01`
- **Server name**: `server1`
- **Host name**: `was85host`



__ k. Click **Next**.

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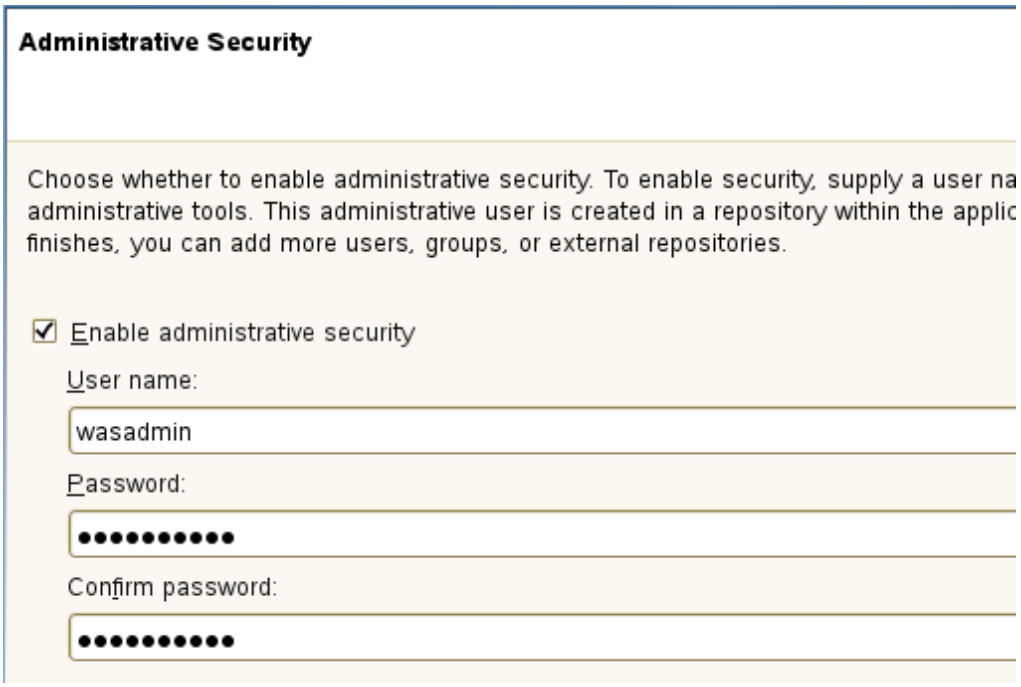
__ l. The Administrative Security panel specifies whether to use initial administrative security. If selected, you specify an initial administrative user name and password, which are used for administrative activities such as console access. Verify that **Enable administrative security** is selected. Enter the following values:

- **User name**: `wasadmin`
- **Password**: `web1sphere`
- **Confirm password**: `web1sphere`



__ m. Click **Next**.

__ n. In the **Security Certificate (Part 1)** panel, accept the default selection. Click **Next**.

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__ o. In the **Security Certificate (Part 2)** panel, accept the default selection. Click **Next**.

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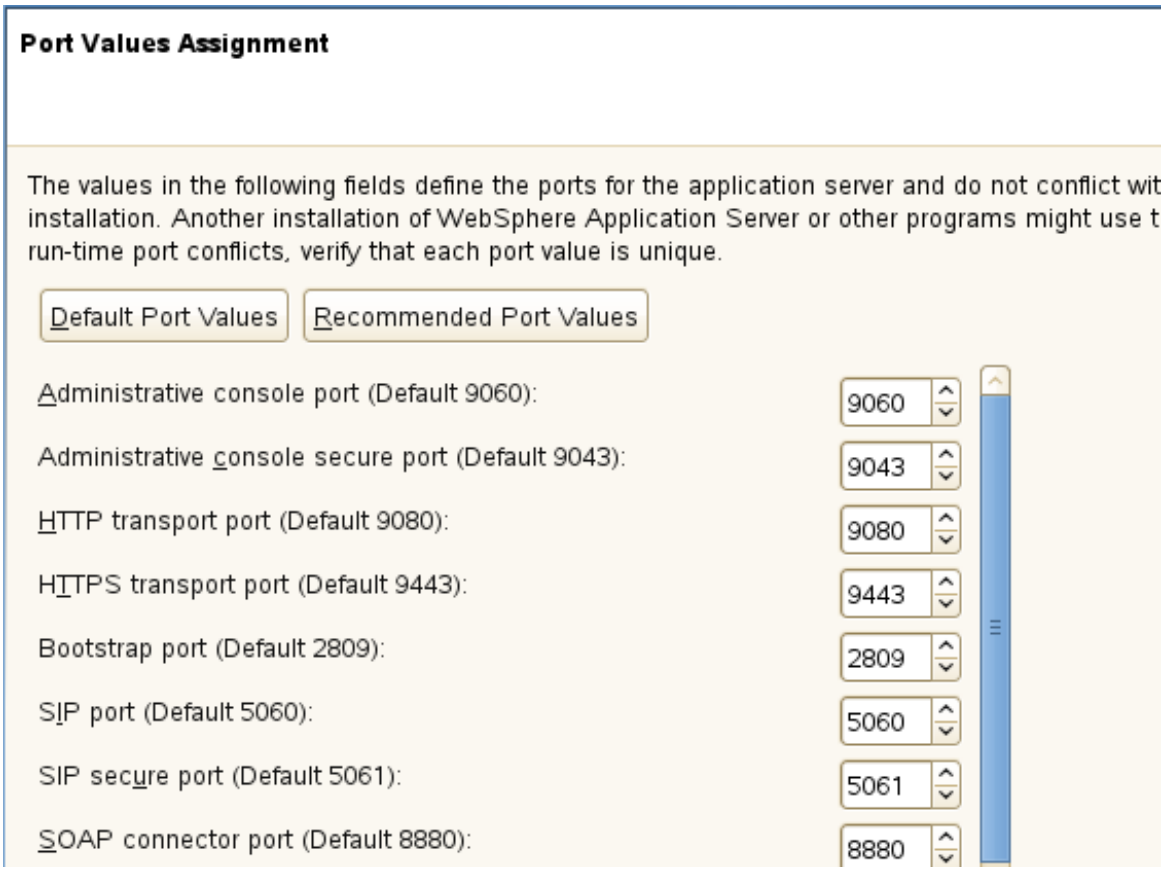
__ p. In the Port Values Assignment panel, accept the default values. Click **Next**.



__ q. In the Linux Service Definition panel, accept the default value. Do not run the application server process as a Linux service. Click **Next**.

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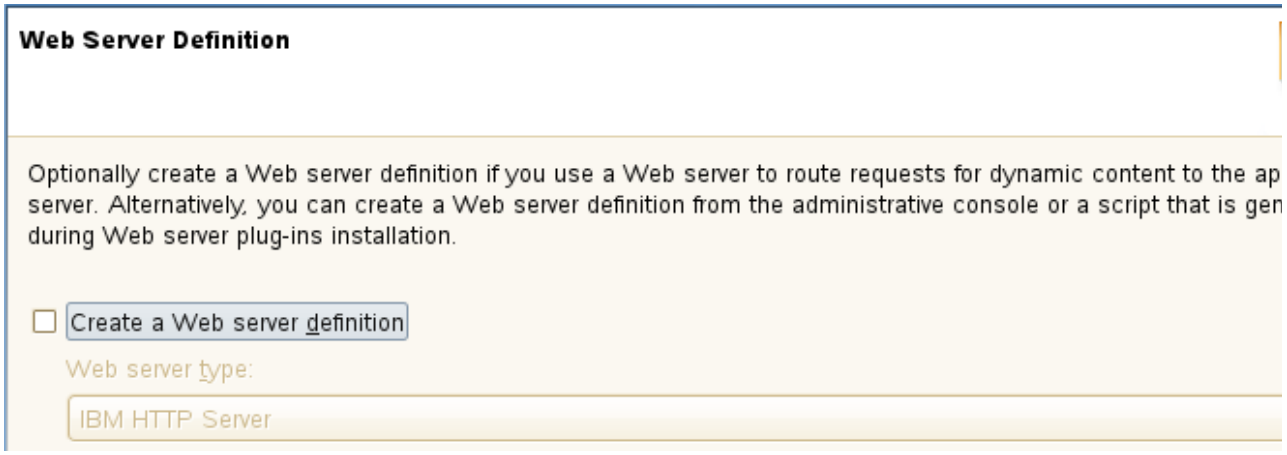
__ r. In the Web Server Definition panel, accept the default value. Do not create a web server definition. Click **Next**.



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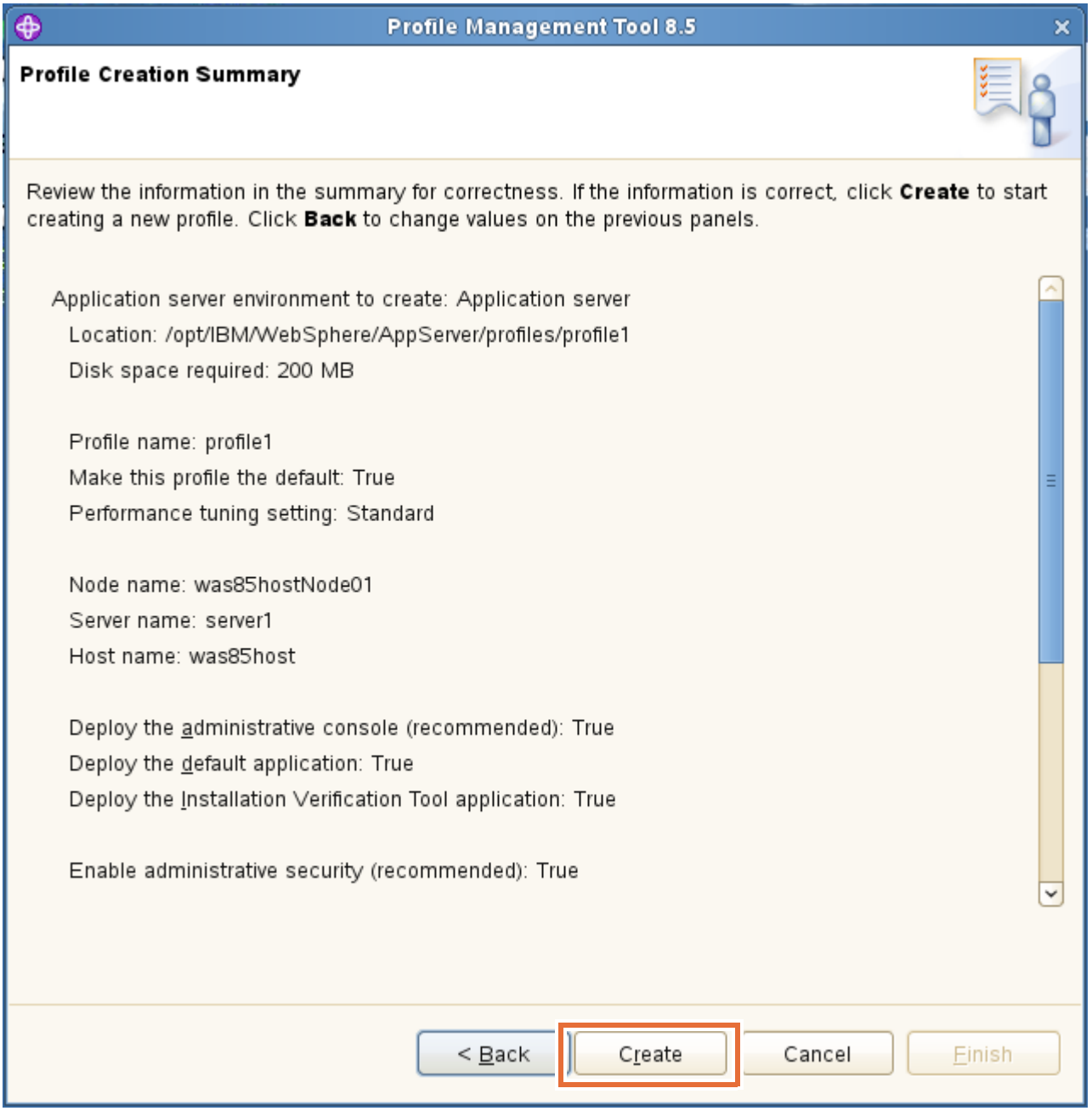
__ s. Review the Profile Creation Summary panel. Click **Create**.



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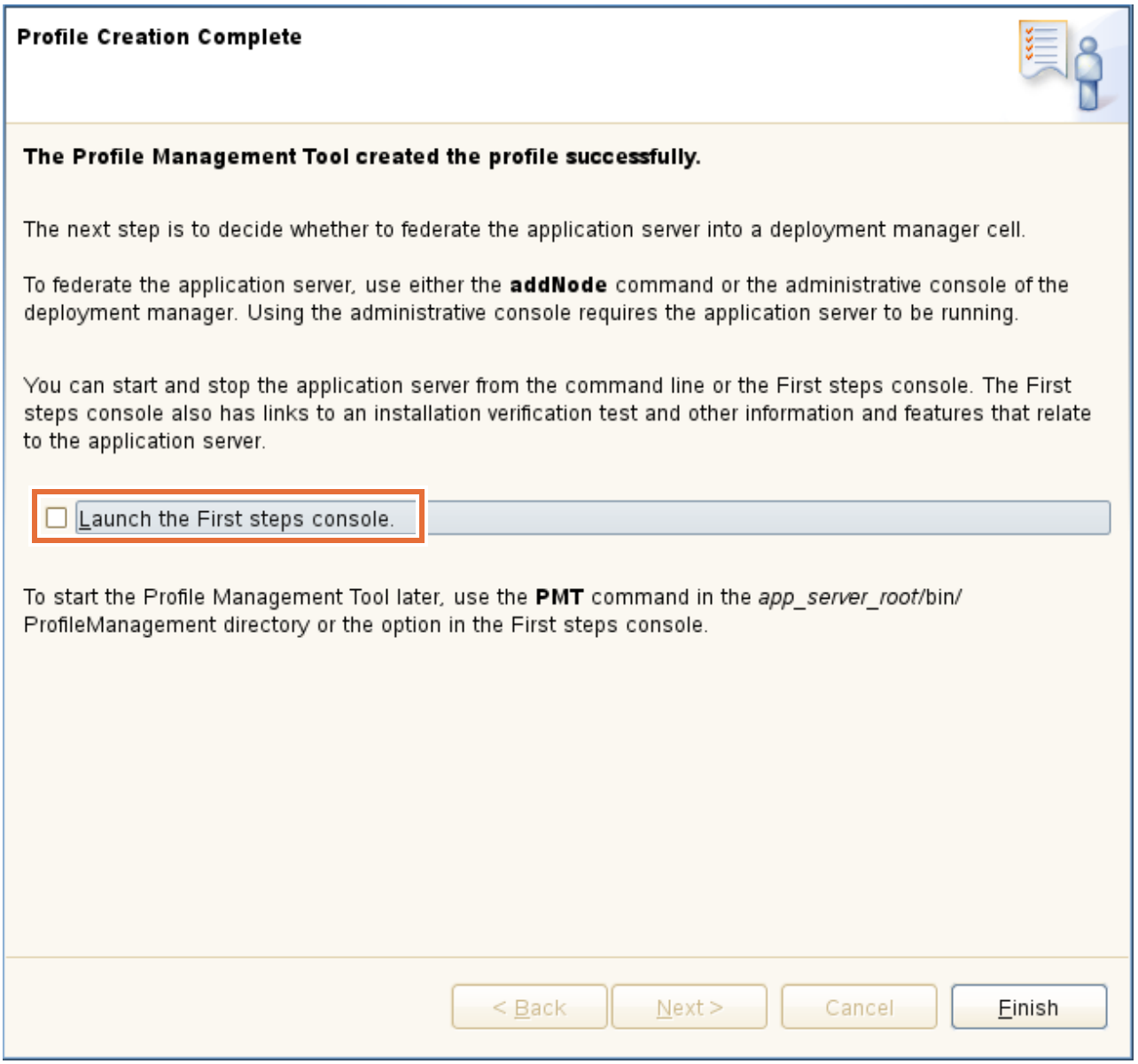
__ t. The profile creation completes successfully in several minutes. In the Profile Creation Complete panel, clear the check box for **Launch the First steps console** and click **Finish**.



__ u. The newly created profile is listed in the Profile Management Tool.

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__ v. Exit the WebSphere Customization Toolbox by clicking **File > Exit**.

Section 5: Verify installation of WebSphere Application Server

The First steps console is where you can start or stop the server, access the WebSphere Information Center, and start various tools. Each application server profile has an associated First steps console.

__ 1. Start the First steps console for profile1.

__ a. From a terminal window, navigate to the following directory:

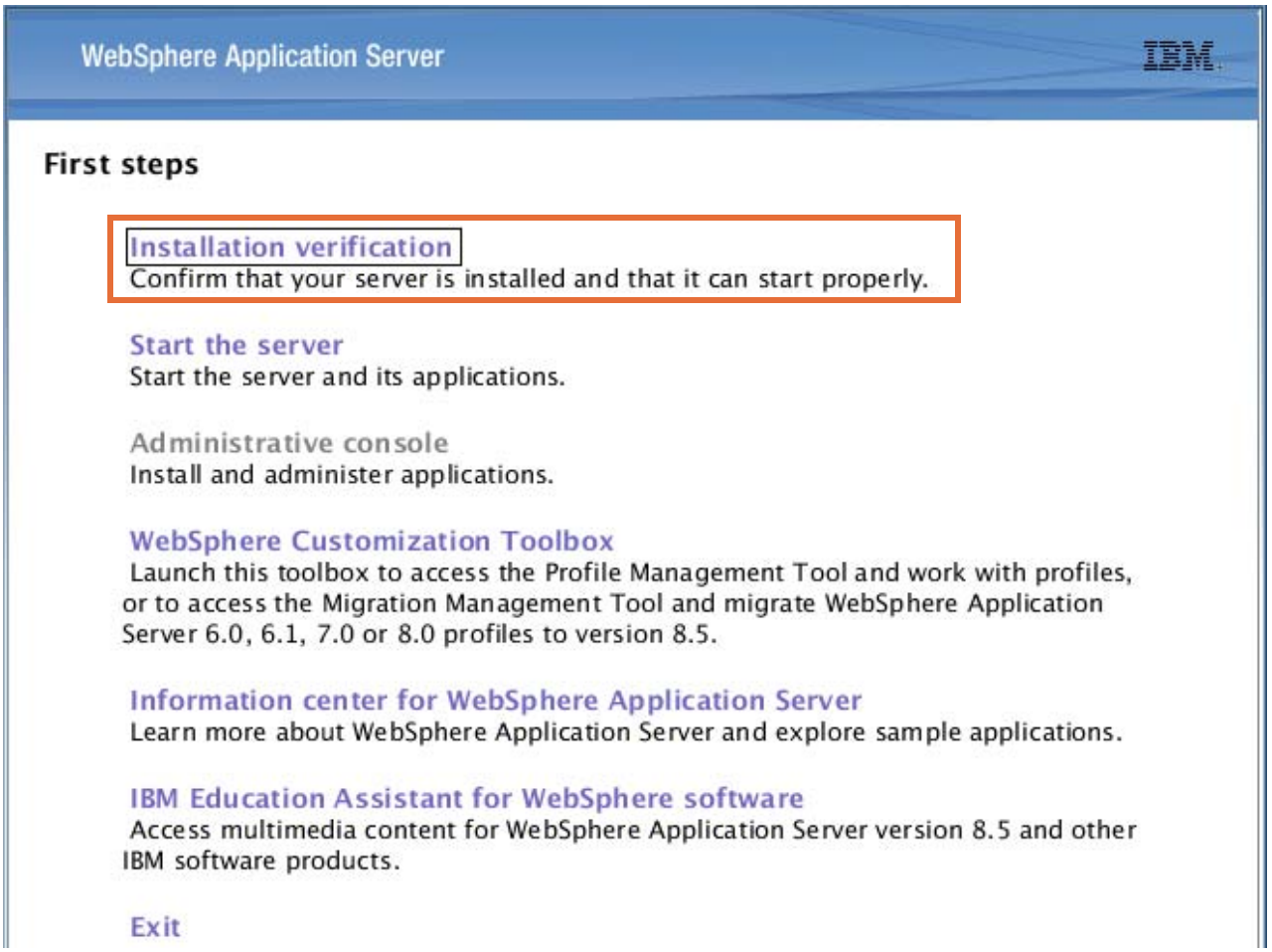
`/opt/IBM/WebSphere/AppServer/profiles/profile1/firststeps`

__ b. Enter the following command to start the First steps console:

`./firststeps.sh`

__ 2. Verify that the server is created and starts properly.

__ a. Click **Installation verification**.



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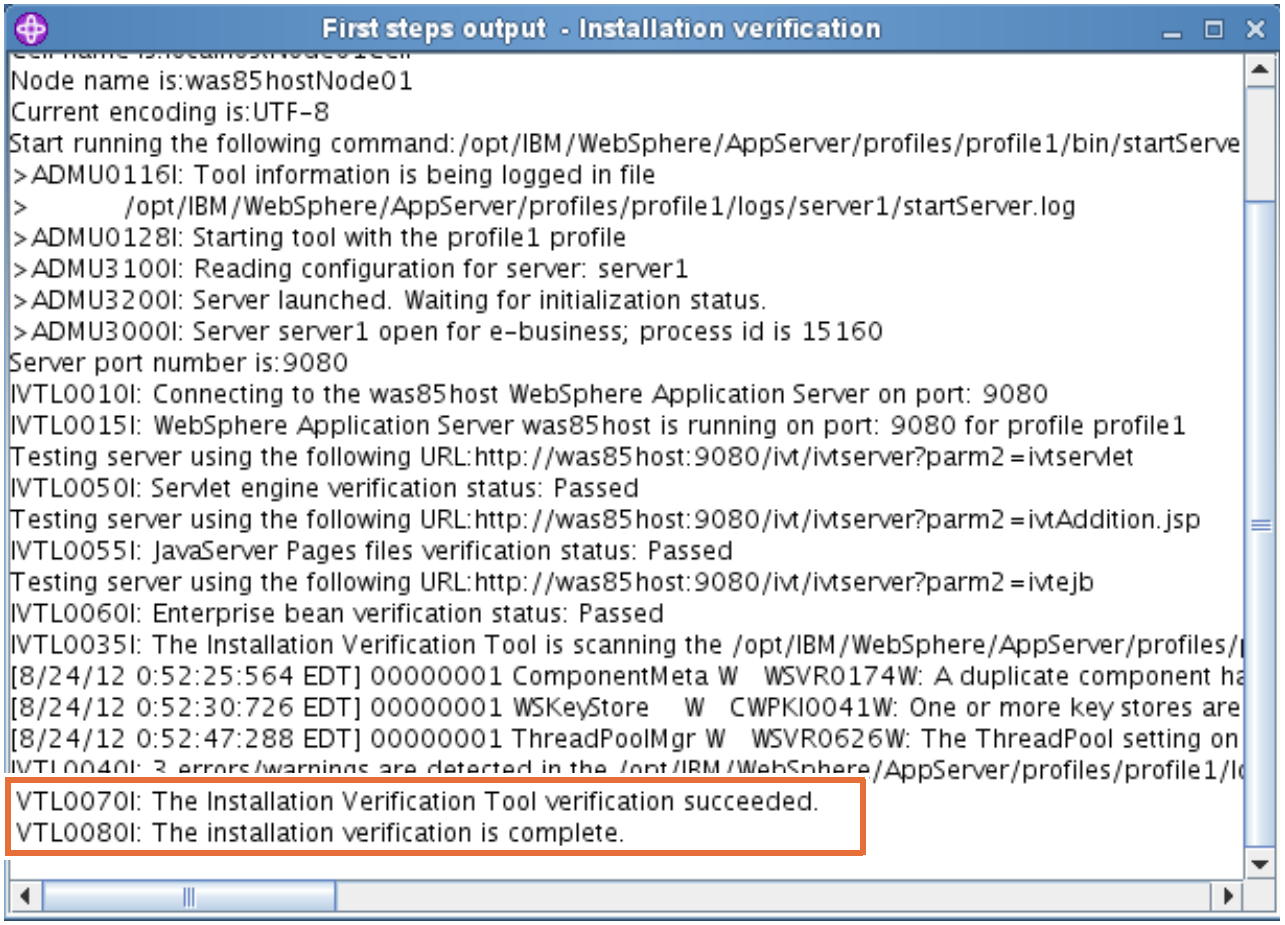
__ b. The installation verification test tool runs and displays messages to indicate the verification status. Use the scroll bar to view all messages. At the bottom of the message list are the messages (some errors and warnings before the final success messages are expected):

```
IVTL0070I: The Installation Verification Tool verification succeeded.
IVTL0080I: The installation verification is complete.
```



__ c. Close the “First steps output - Installation verification” window.

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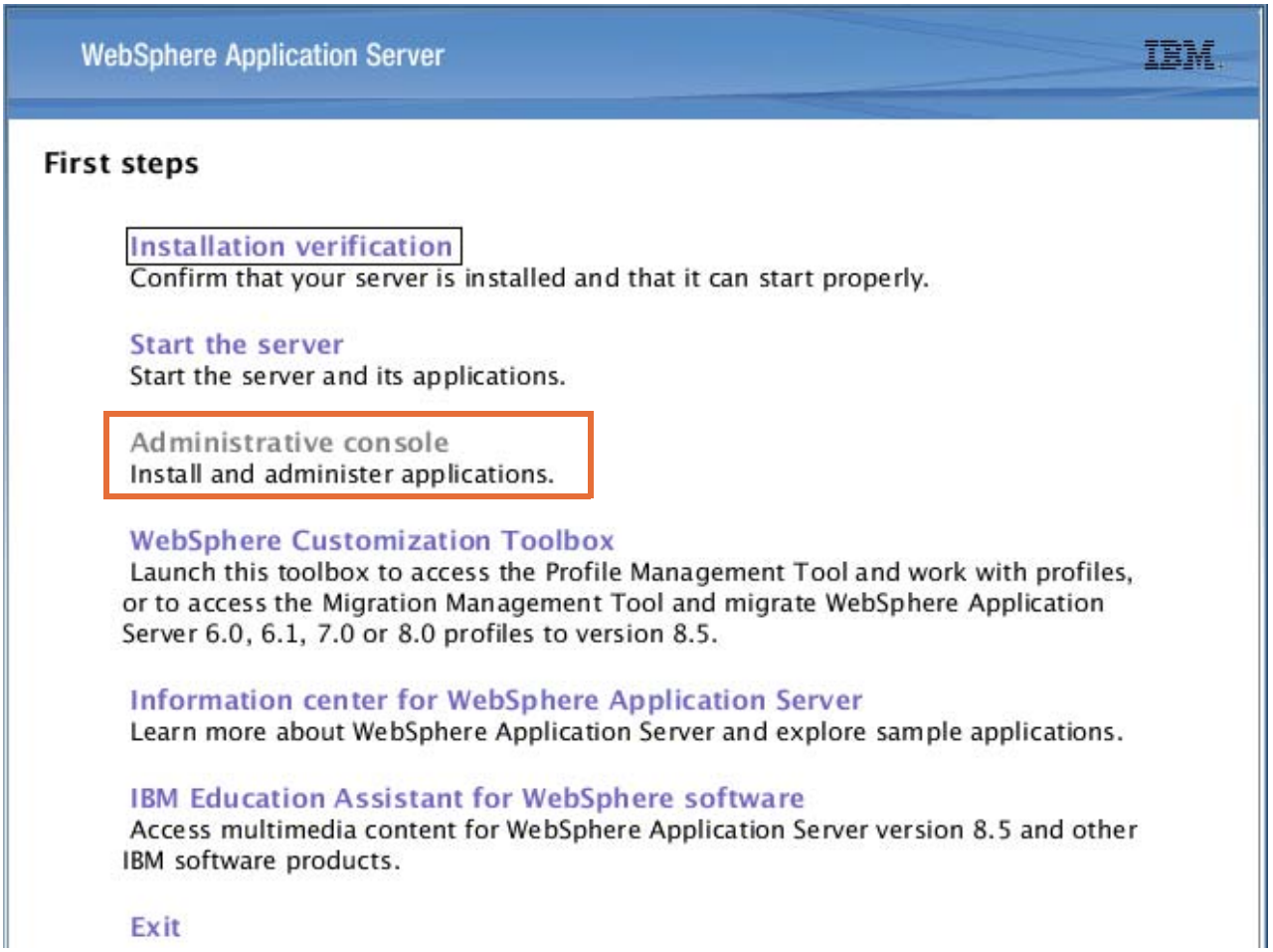
__ d. From the First steps console, click **Administrative console** to start the administrative console for profile1. The application server from profile1 is started in the previous step during the installation verification test. Since the server is started, the administrative console is able to connect to the running application server.



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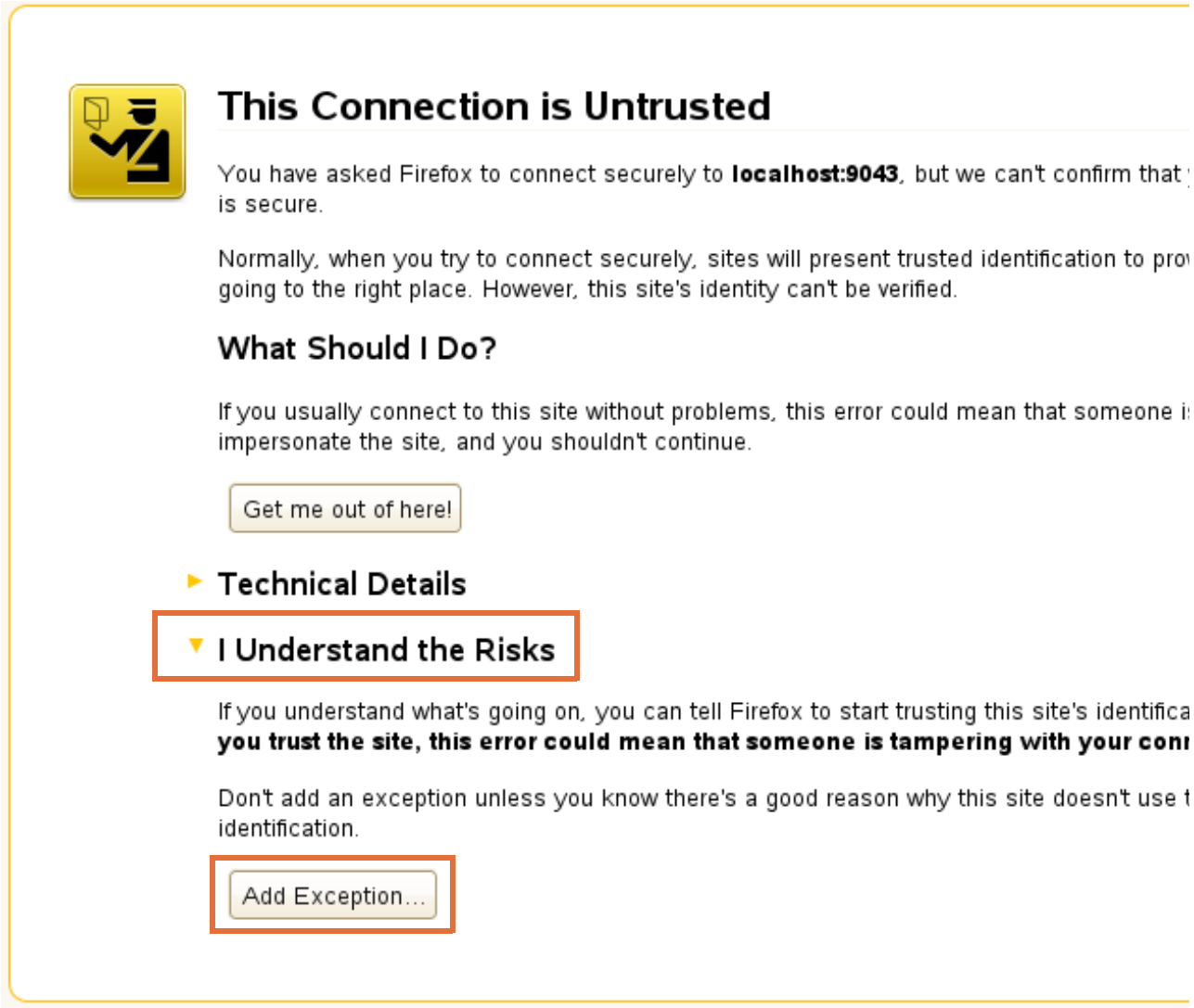
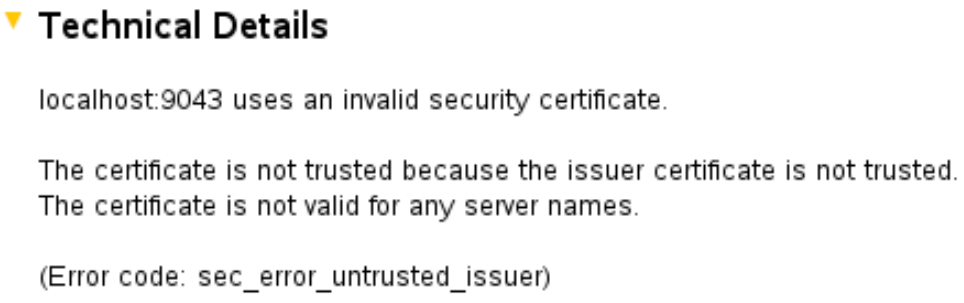
__ e. A window opens with a warning of an untrusted connection. Expand **I Understand the Risks**. Click **Add Exception**.



Note

If you expand the Technical Details section, you see more information about the warning.



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__ f. Click **Confirm Security Exception**.

Information

There are two issues here, and both involve the fact that the browser is using SSL to communicate with the administrative console application. To establish the SSL connection, the application server presents a certificate to the browser. The browser gives messages about two aspects of this certificate and asks if you want to continue. The two issues are as follows:

- **The host name for the certificate does not match what you entered in the URL**. In this case, the URL might use localhost, and the certificate was created (during profile creation) with a mapping to the host IP address. To resolve this issue, you can specify an appropriate host name during the certificate creation. You can also use the host name in the certificate when you enter the URL into the browser.
- **An unknown certificate authority signed the certificate that is presented to the browser**. By default, internal self-signed certificates are created for the

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WebSphere cell. As such, the browser does not necessarily trust this unknown certificate authority and therefore asks the user if it is appropriate to proceed.

__ g. Log in to the administrative console with the following details:

- User ID: **wasadmin**
- Password: **web1sphere**

__ h. Click **Log in**.

Information

The user ID **wasadmin** was created during the profile creation process. It does not exist in the operating system registry or an LDAP registry, but instead exists in a file-based registry within the application server configuration. Now that the profile is created, security can be reconfigured to use any user registry.

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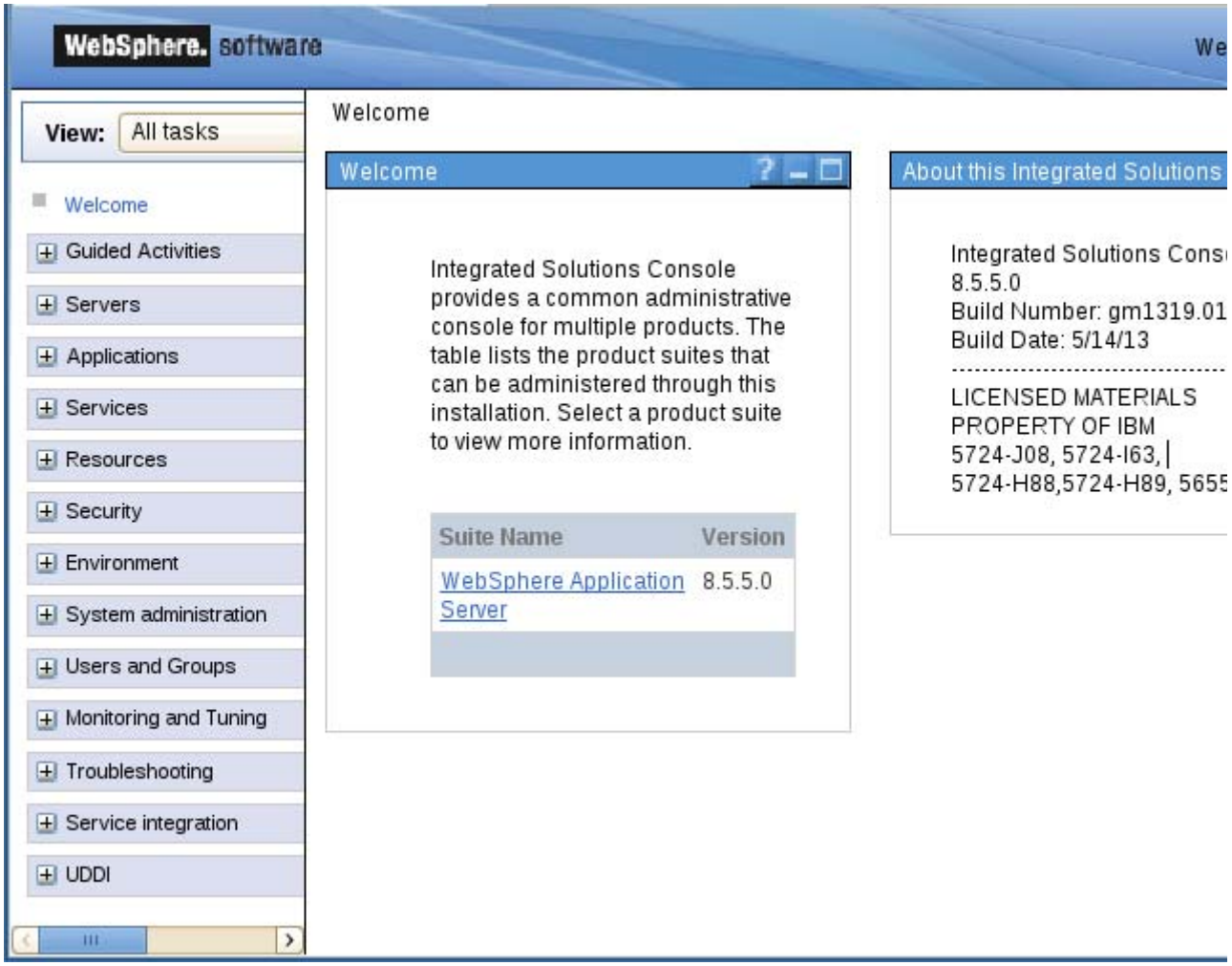
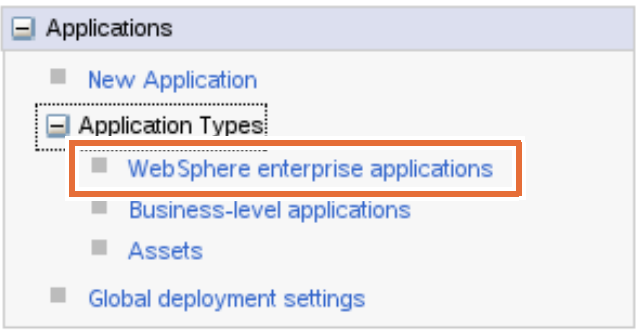
__ 3. The main page for the WebSphere Integrated Solutions Console is displayed and looks like the following screen capture:



__ 4. Verify that the DefaultApplication is installed and is running.

__ a. Using the administrative console navigation tree, click **Applications > Application Types > WebSphere enterprise applications**.



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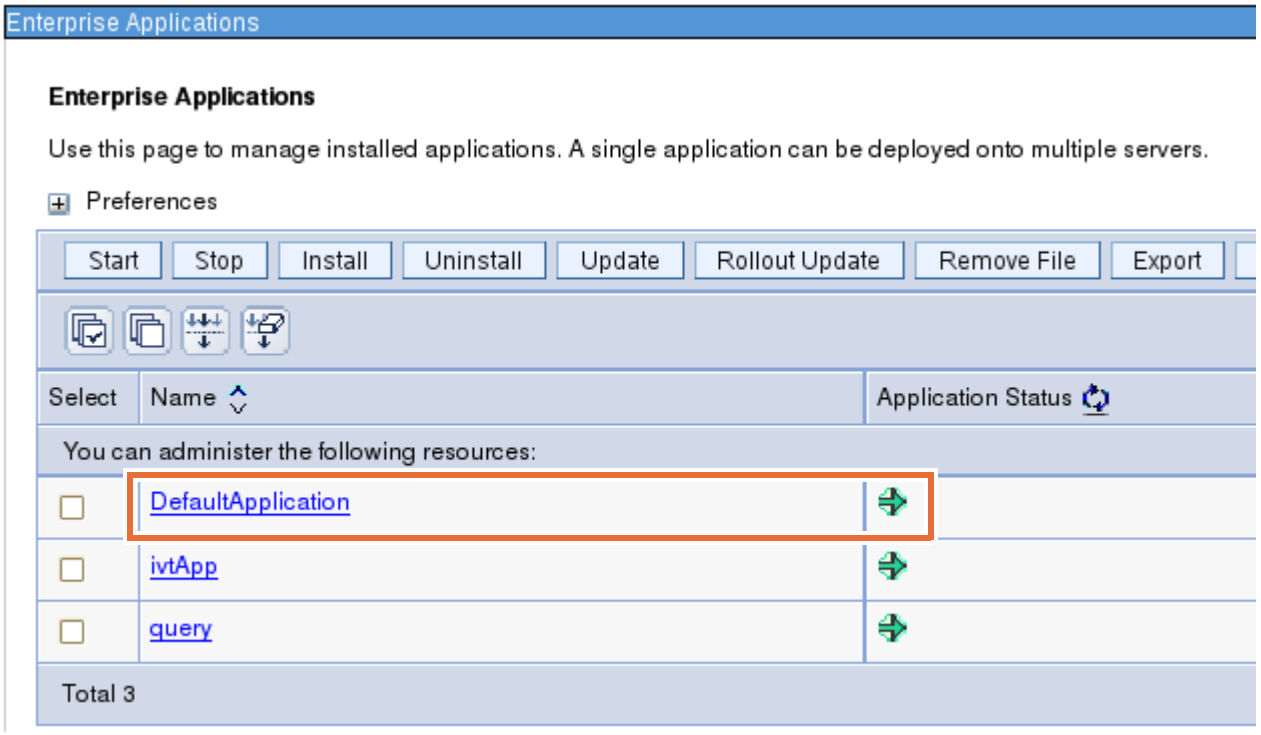
The application status for the DefaultApplication is displayed as a green arrow to indicate that the application is running. If you place your cursor over the arrow, a message indicates that the application is started.



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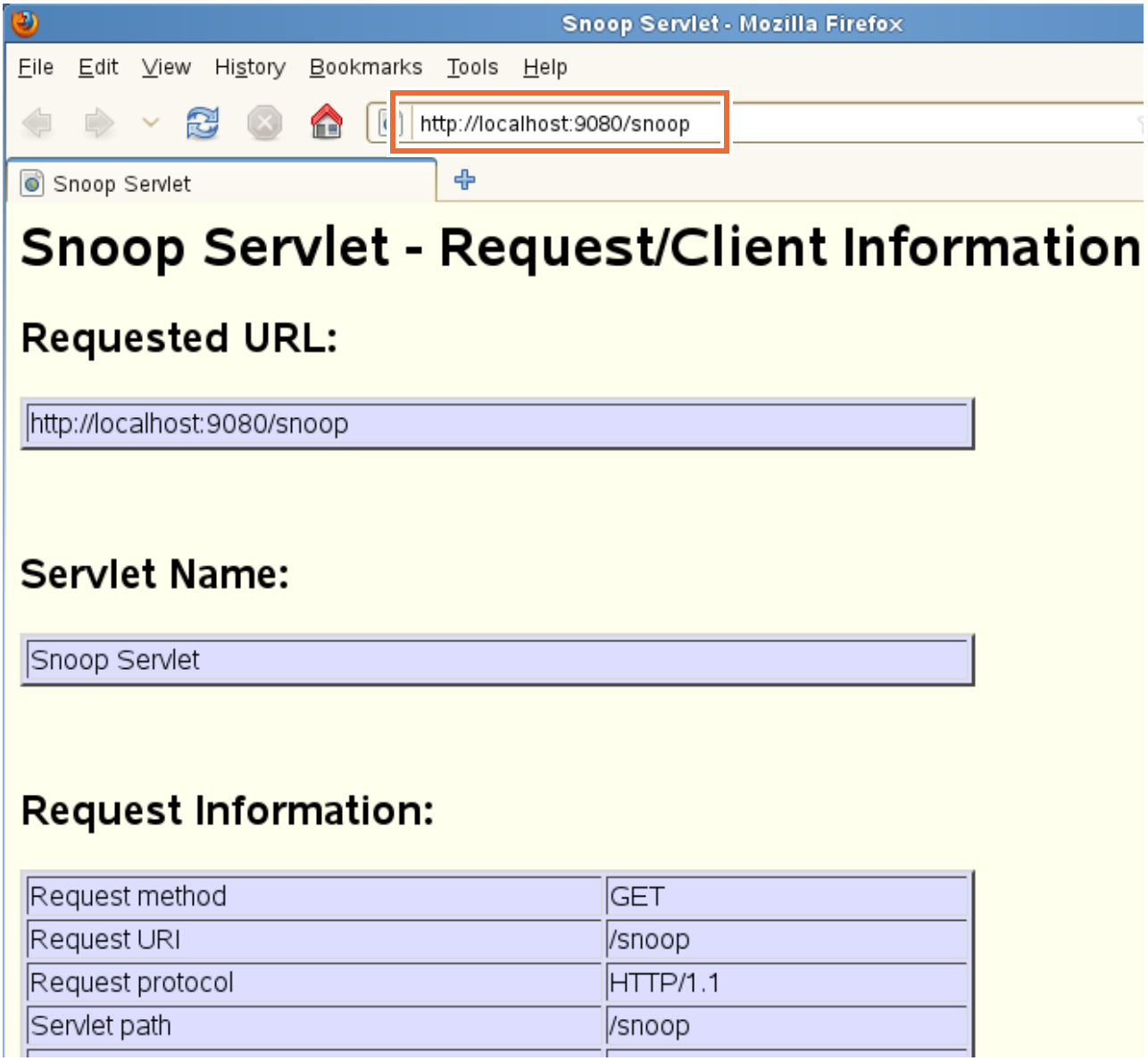
__ b. Open another browser window and enter the following URL:

`http://localhost:9080/snoop`

The URL runs a servlet that is called Snoop, which comes with the DefaultApplication. Snoop displays a page with information about the runtime environment of the server. The page provides further confirmation that the application server is operating correctly.



__ c. Close the browser that is running Snoop servlet.

__ d. Close the administrative console by clicking **Logout**. The administrative console is examined more in later exercises. Close the browser.

__ 5. Exit from the First steps console.

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Section 6: Create a backup of profile1

__ 1. Before you continue, create a backup of profile1 with the `backupConfig` command. The `backupConfig` command is a utility to back up the configuration of your profile to a compressed file. You can later restore this configuration if needed. When the `backupConfig` command runs, it first stops the application server before you create the backup file.

__ a. Run the `backupConfig` command. From a terminal window, navigate to:

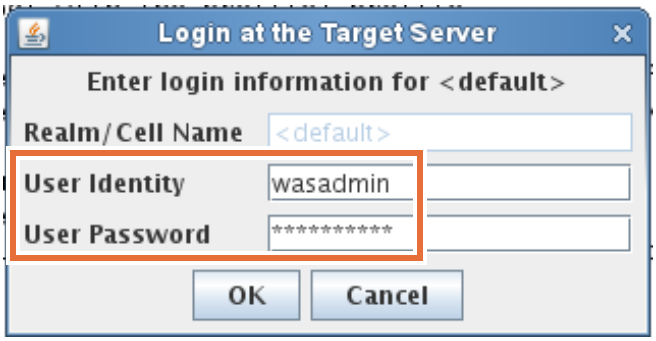
```
/opt/IBM/WebSphere/AppServer/profiles/profile1/bin
```

__ b. Create the backup by entering the following command:

```
./backupConfig.sh
```

__ c. As the backup process starts, you are challenged for a user ID and password. Provide the following values:

- For **User Identity**, enter: **`wasadmin`**
- For **User Password**, enter: **`web1sphere`**



__ d. Click **OK**.

Information

You are prompted for credentials because administrative security is enabled during the creation of the profile by default. As such, all administrative functions, including backups, administrative console access, and wsadmin scripts, require authentication.

During the rest of the labs, enter the administrative user ID and password when prompted. The lab instructions do not always indicate this step.

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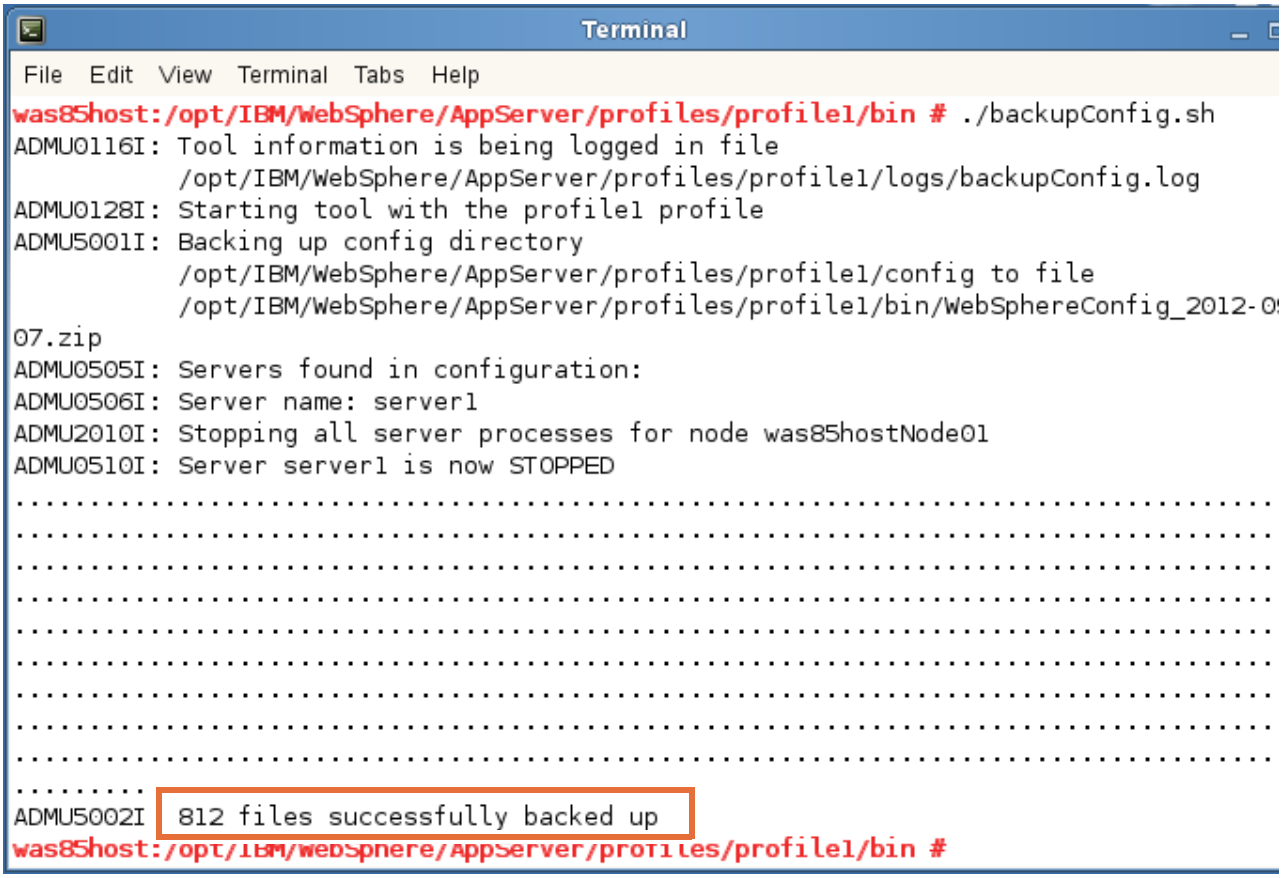
__ e. When the backup finishes, a message indicates the number of files that were backed up successfully.



Information

By default, all servers on the node are stopped before the backup is made to prevent partially synchronized information from being saved. The `-nostop` option can be used with the `backupConfig` command to prevent the servers from being stopped before you back up the configuration.

__ 2. Verify that the backup completed.

The command creates a backup file that is called `WebSphereConfig_<date>.zip` with the current date and places the compressed file in the `/opt/IBM/WebSphere/AppServer/profiles/profile1/bin/` directory. To distinguish between multiple backups, modify the name with something more descriptive, such as the name of the profile.

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__ a. Copy the backup file to another directory for safe keeping. Enter the following command:

```
cp WebSphereConfig_<YYYY-MM-DD>.zip
/usr/software/backups/backup_profile1.zip
```

```
was85host:/opt/IBM/WebSphere/AppServer/profiles/profile1/bin # cp WebSphereConf:
-09-07.zip /usr/software/backups/backup_profile1.zip
was85host:/opt/IBM/WebSphere/AppServer/profiles/profile1/bin #
```

Information

If you want to restore the configuration directory structure later, you can use the `restoreConfig` command. You must specify the name of the backup file. The command restores the directory:

```
/opt/IBM/WebSphere/AppServer/profiles/profile1/config
```

Section 7: Start and stop the WebSphere Application Server

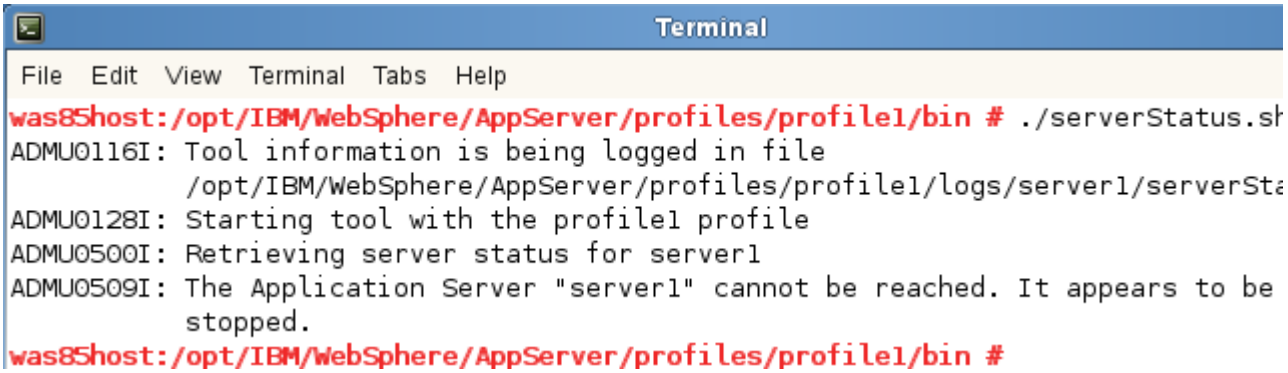
Use the command line to start and stop the WebSphere Application Server in profile1. A number of command-line scripts can help you manage the application server. Three of the most useful are `startServer`, `stopServer`, and `serverStatus`.

__ 1. Check the status of the application server.

__ a. Using the command line, navigate to the `bin` directory from profile1.

__ b. Use the following command to verify that server1 is running:

```
./serverStatus.sh server1
```



Information

You can also run the `serverStatus` command with the `-all` option to give more details on all application servers on the node.

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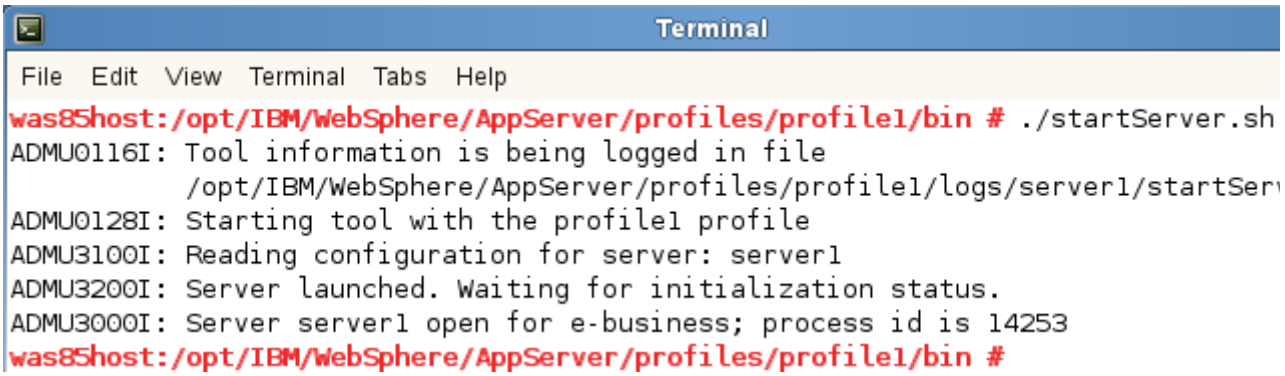
__ 2. Start the application server.

__ a. Enter the following command to start server1:

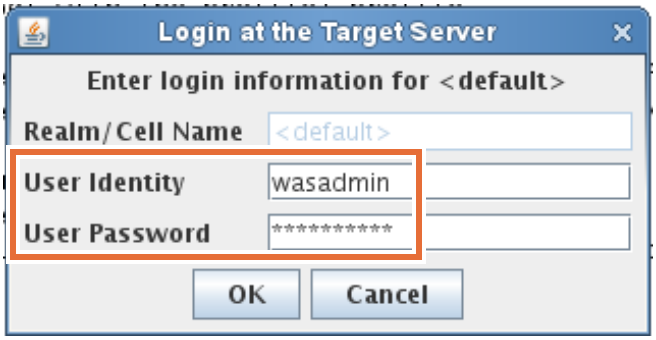
```
./startServer.sh server1
```



__ b. Enter the following the command to verify the status:

```
./serverStatus.sh server1
```

__ c. When prompted to authenticate, use `wasadmin` for User Identity and `web1sphere` for User Password.



Information

In the previous use of the `serverStatus` command, you are not prompted to authenticate. The application server was not running and therefore did not challenge the client when it attempted to retrieve information from the server. Since server1 is now running, it challenges the client application before you provide any information.

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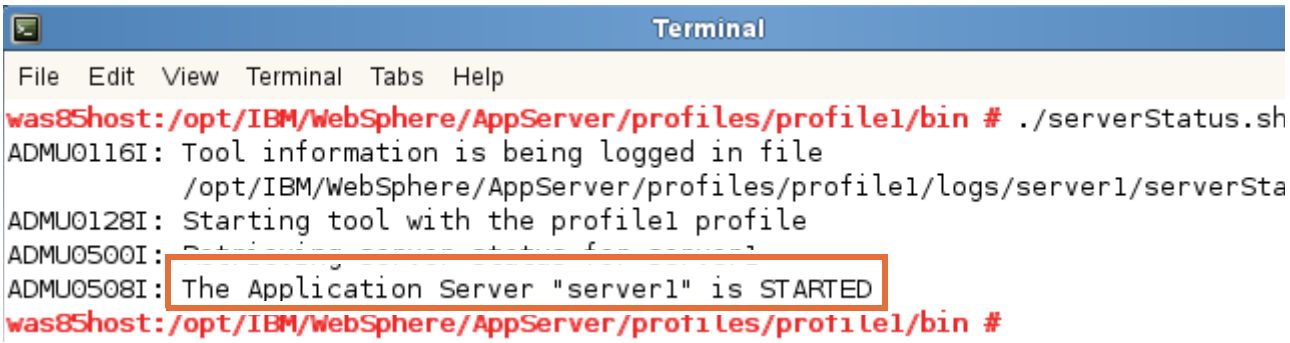
__ d. After the authentication is complete, the server status is displayed indicating that server1 is started.



__ 3. Stop the server.

__ a. Enter the following command to start server1 (use `wasadmin` and `web1sphere` when prompted to authenticate):

```
./stopServer.sh server1
```

__ b. Enter the following the command to verify the status:

```
./serverStatus.sh server1
```

Section 8: Explore the directory structure of WebSphere Application Server

Now that WebSphere Application Server is installed, examine the directory structure and review what you installed.

__ 1. Explore the WebSphere Application Server `profile1` directory.

__ a. Using a terminal window, navigate to the following directory:

```
/opt/IBM/WebSphere/AppServer/profiles/profile1
```

__ 2. Review the subdirectories and their contents:

- `bin`: programs, scripts, and DLLs
- `config`: configuration files
- `configuration`: configuration settings
- `consolepreferences`
- `etc`: dummy key ring, keytab files, plug in keys
- `firststeps`: firststeps utility
- `installableApps`: applications that can be installed
- `installedApps`: applications that are installed in application server
- `installedConnectors`: installed resource adapters
- `installedFilters`

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- logs: trace and log files
- properties: configuration property files that WebSphere uses
- servers: server configuration
- temp: temporary area for files that are created during JSP processing
- tranlog: transaction log files
- wstemp: temporary area for events

Section 9: Check the installation log files

A number of log files are created during the installation and profile creation process. It is useful to check these files to verify that the installation completed successfully.

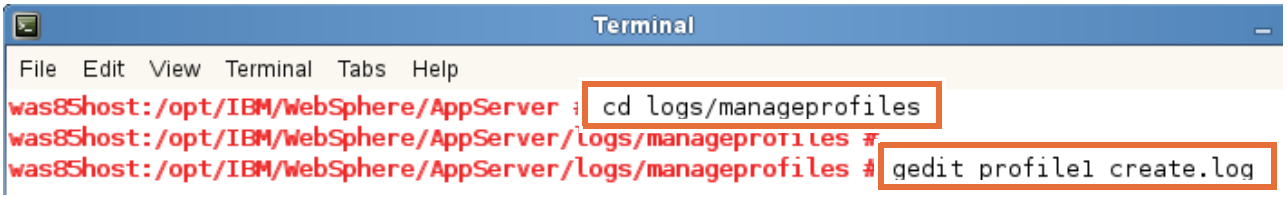
__ 1. View the log file for the profile creation. This log file shows the results for the creation of profile1.

__ a. In a terminal window, navigate to the following directory:

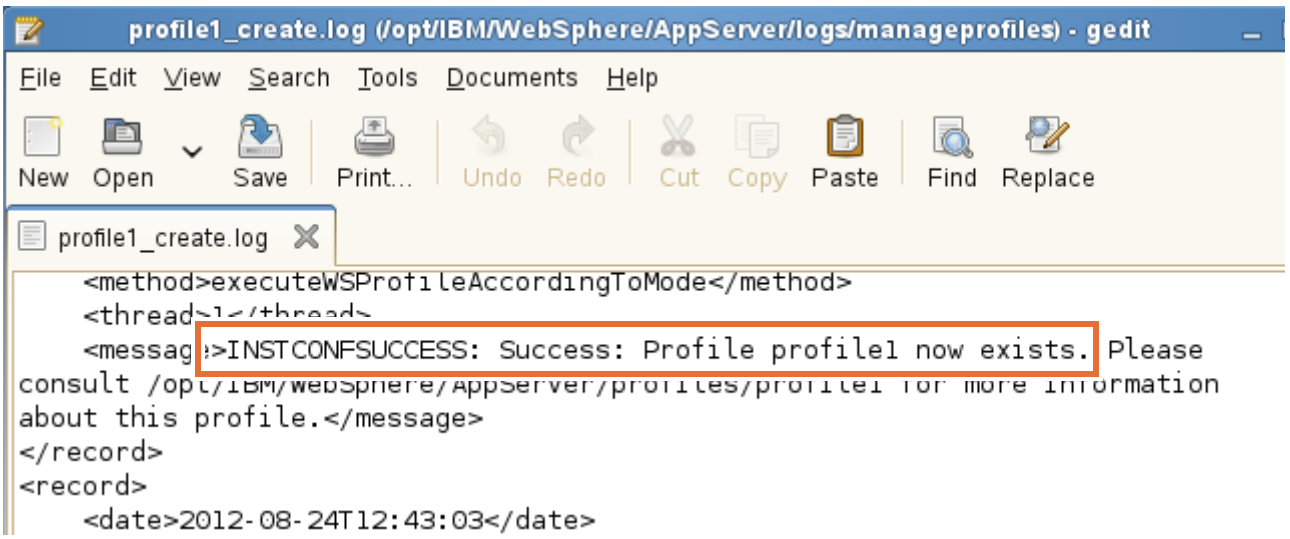
```
/opt/IBM/WebSphere/AppServer/logs/manageprofiles
```

__ b. Using an editor such as gedit, view the `profile1_create.log` file. This log file records creation events that occurred when you created profile1.

```
gedit profile1_create.log
```



__ c. Look near the end of the file for the log message "`INSTCONFSUCCESS: Success: Profile profile1 now exits`" to verify that profile1 was created successfully.



__ 2. View the log files in the profile log directory.

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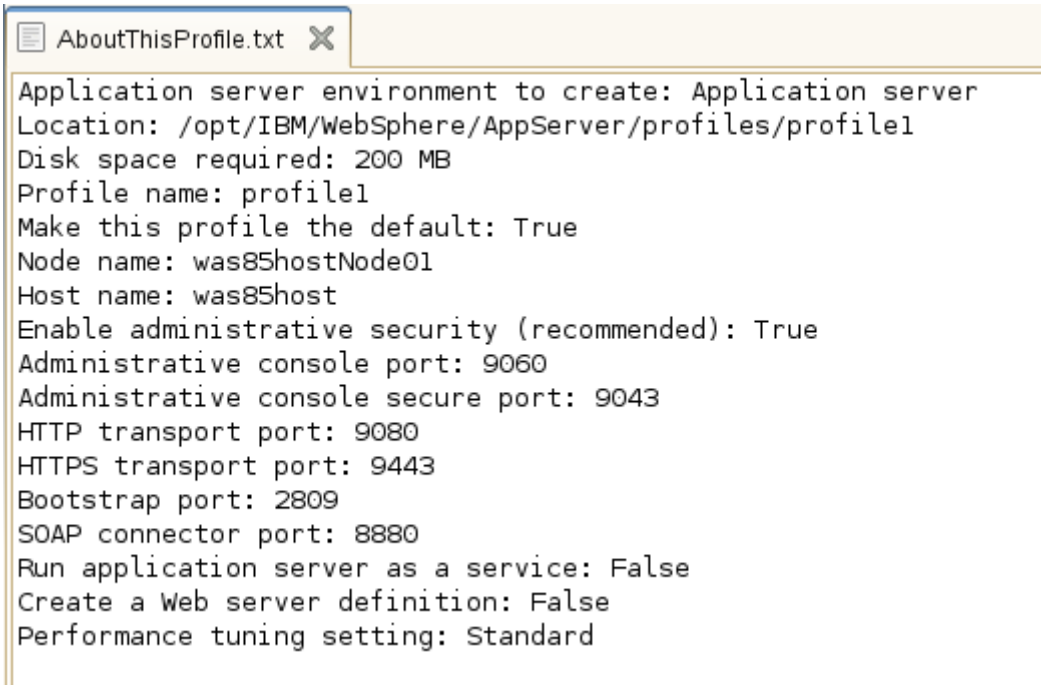
__ a. In the terminal window, use the following command to navigate to the log directory for profile1:

```
cd /opt/IBM/WebSphere/AppServer/profiles/profile1/logs
```

__ b. Using gedit, open and view the backupConfig.log file. This log records events that occur when you create a backup of the configuration directory structure.

__ c. Using gedit, open and view the ivtClient.log file. This file logs results from the installation verification command.

__ d. Using gedit, open and view the AboutThisProfile.txt file. This file logs information about the profile, including the profile name, the node and host names, and a number of other items.



Section 10:Check the application server log files

Start WebSphere Application Server in profile1 and view the log files.

__ 1. View the log file for the application server startup. This log file shows the startup activities for the application server.

__ a. In a terminal window, navigate to the following directory:

```
/opt/IBM/WebSphere/AppServer/profiles/profile1/logs/server1
```

__ b. Using an editor such as gedit, view the startServer.log file. This log file records creation events that occurred during the server startup.

```
gedit startServer.log
```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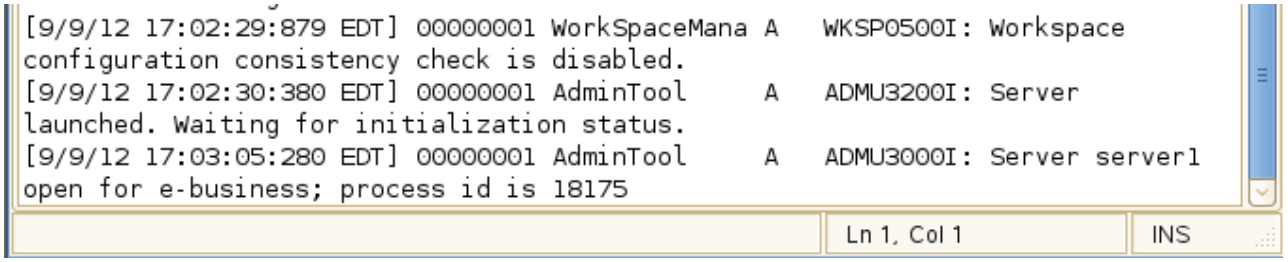
__ c. Look through the contents of the file. Look for the message that indicates the server is open for e-business.



__ 2. Open the `SystemOut.log` file for server1 and view the contents.

Information

The `SystemOut.log` file contains the standard output from the Java virtual machine (JVM) running the application server. The log file contains more detailed messages, indicating the steps that are completed during startup of the server. Steps that are documented in the log include security initialization, messaging initialization, registering resources in the JNDI namespace, EJB initialization, and many others. The log file also contains messages from application `System.out` print line code.

__ a. From the same directory, use an editor such as gedit to open the `SystemOut.log` file.

__ b. Look through the contents and notice that the startup log entries that are in the `startServer.log` file are also in the `SystemOut.log` file.

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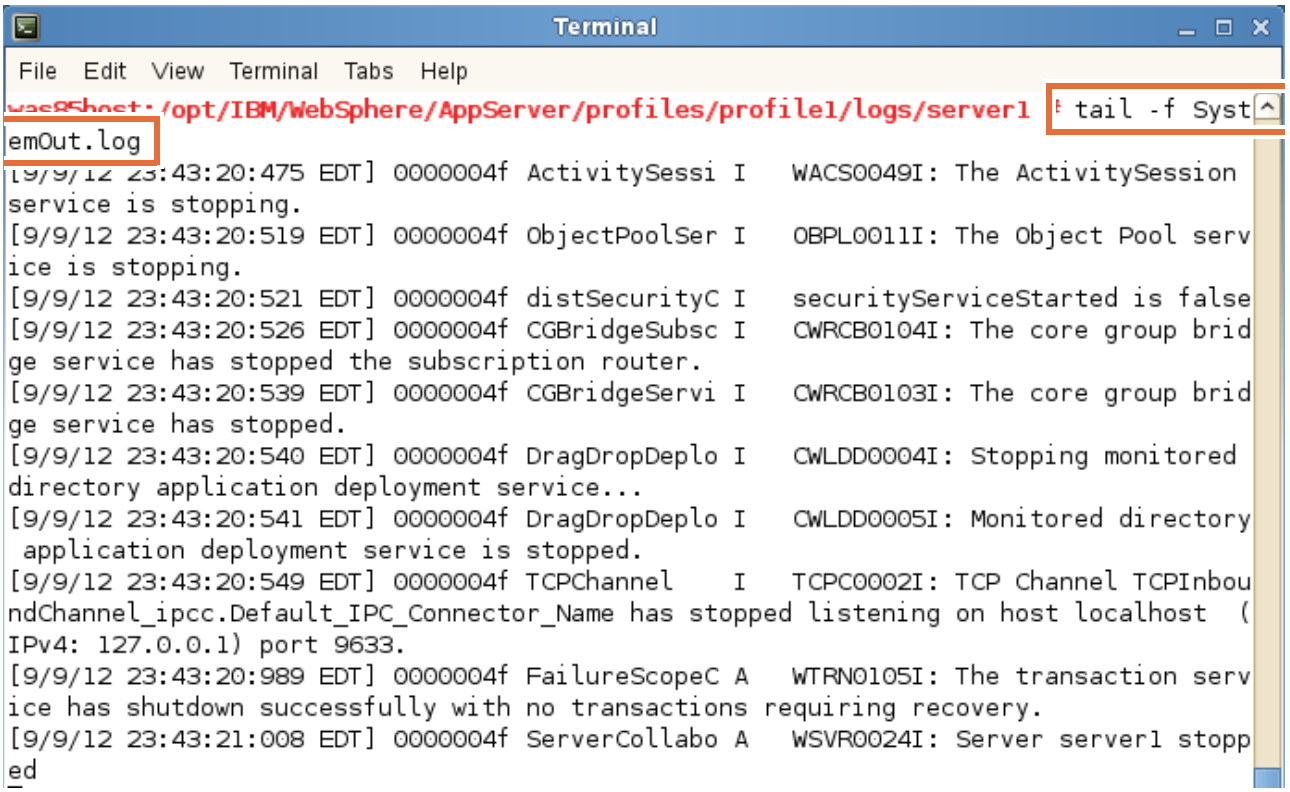
__ 3. Start the application server while you watch the server log file.

__ a. In the same directory, use the following command to watch the server log file:

```
tail -f SystemOut.log
```



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Information

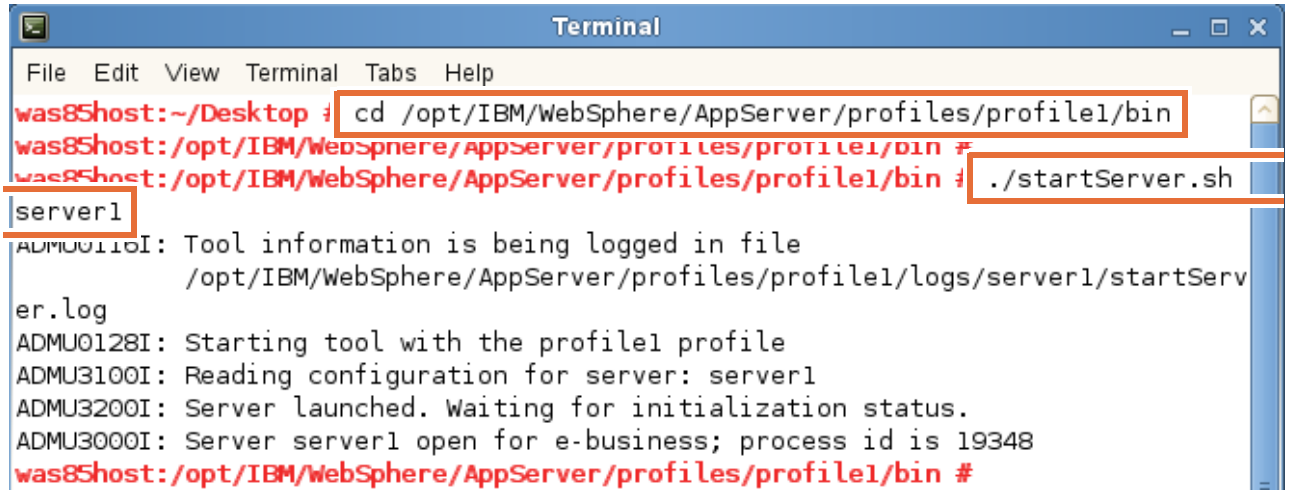
The tail utility makes it easy to monitor what is being actively written to a text-based log file.

- Command: `tail <filename>`
  This command displays the last few lines of the file `<filename>`.
- Command: `tail - f <filename>`
  This command continuously updates your display when new messages are added to the file.

__ b. Open a second terminal window and navigate to the `bin` directory for profile1.

__ c. Use the following command to start the application server:

```
./startServer.sh server1
```



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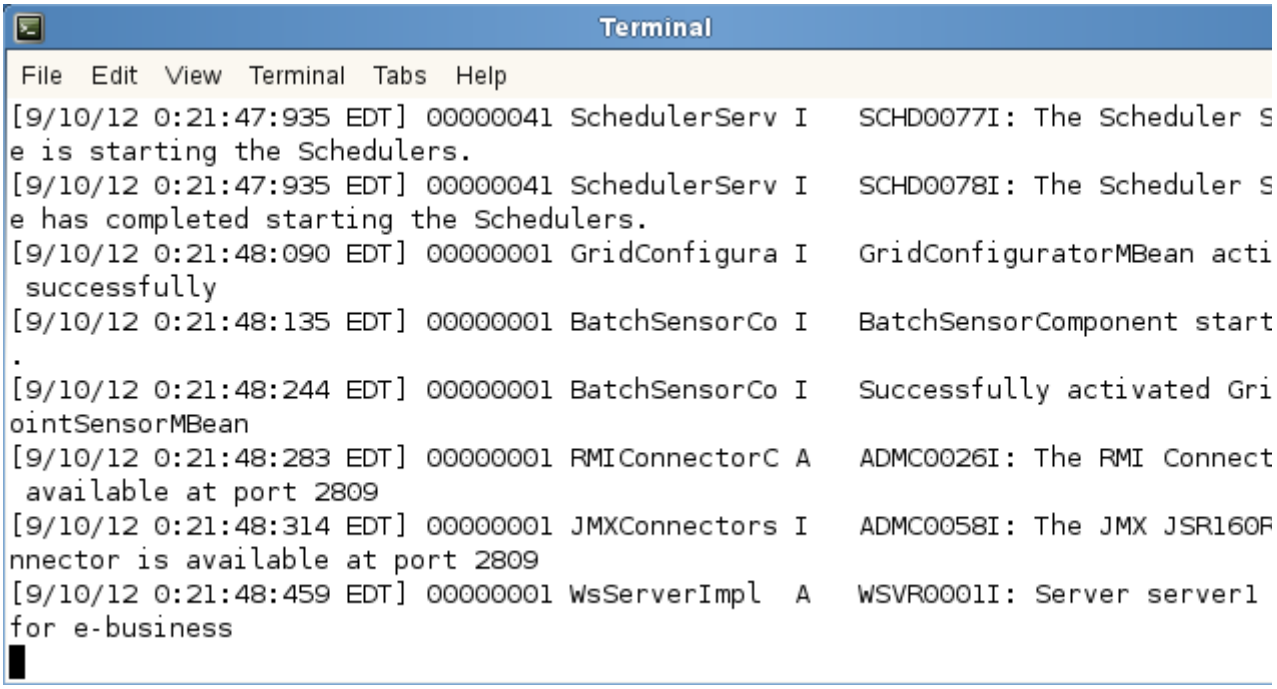
__ d. Return to the other terminal that is running the `tail` command. Notice that as the application server starts, the log messages are constantly added to the end of the window. Look for the message "`Server server1 open for e-business`", which indicates the server is ready.



__ e. When you are done with using the `tail` command, end it by entering **Ctrl-C** in the terminal window.

__ 4. Open and view the `SystemErr.log` file. This log contains the standard error output from the Java virtual machine (JVM) running the application server. This file can have numerous messages, but does not include any error messages if the server started correctly.

Section 11:Correct the website security certificate error (optional)

When you first open the administrative console after installation, you might receive a website security certificate error window. As is mentioned earlier, there are two reasons for seeing this warning. This part of the exercise examines the process of exploring and correcting the causes for the warning.

__ 1. Remove the certificate exception from your Firefox browser. In a previous section, you added an exception in your browser to remove the warning. For this part of the exercise, you want to see the exception.

__ a. Open a Firefox window and use the following URL to browse to the administrative console:

`http://localhost:9060/ibm/console`

__ b. If you see a warning message, proceed to the next step.

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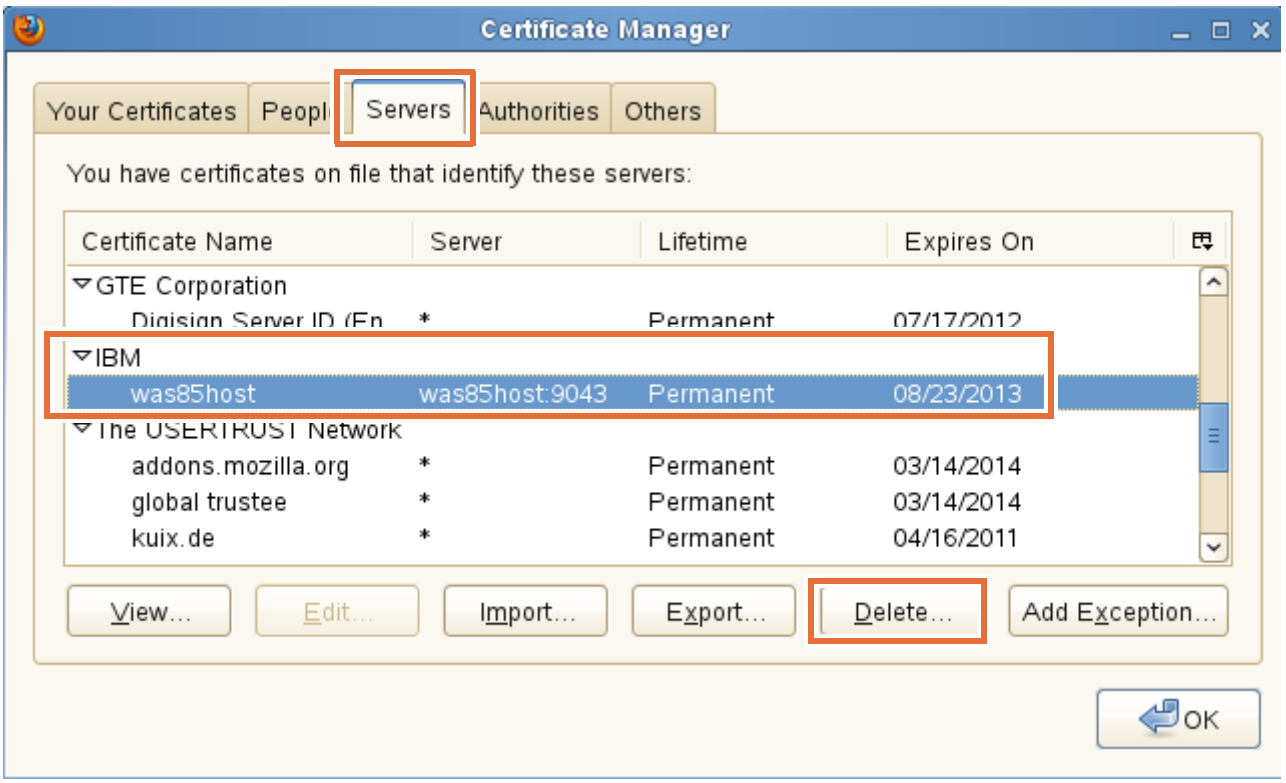
__ c. If you see the administrative console login screen, an exception is added and must be removed. From the Firefox window menu, click **Edit > Preferences**.

__ d. Select the **Advanced** icon and the **Encryption** tab. Click **View Certificates**.

__ e. In the **Certificate Manager** window, select the **Servers** tab. Scroll down and select all certificates named **was85host** (under **IBM**). Click **Delete**.



__ f. Click **OK** in the confirmation dialog box.

__ g. Click **OK** to close the Certificate Manager dialog box.

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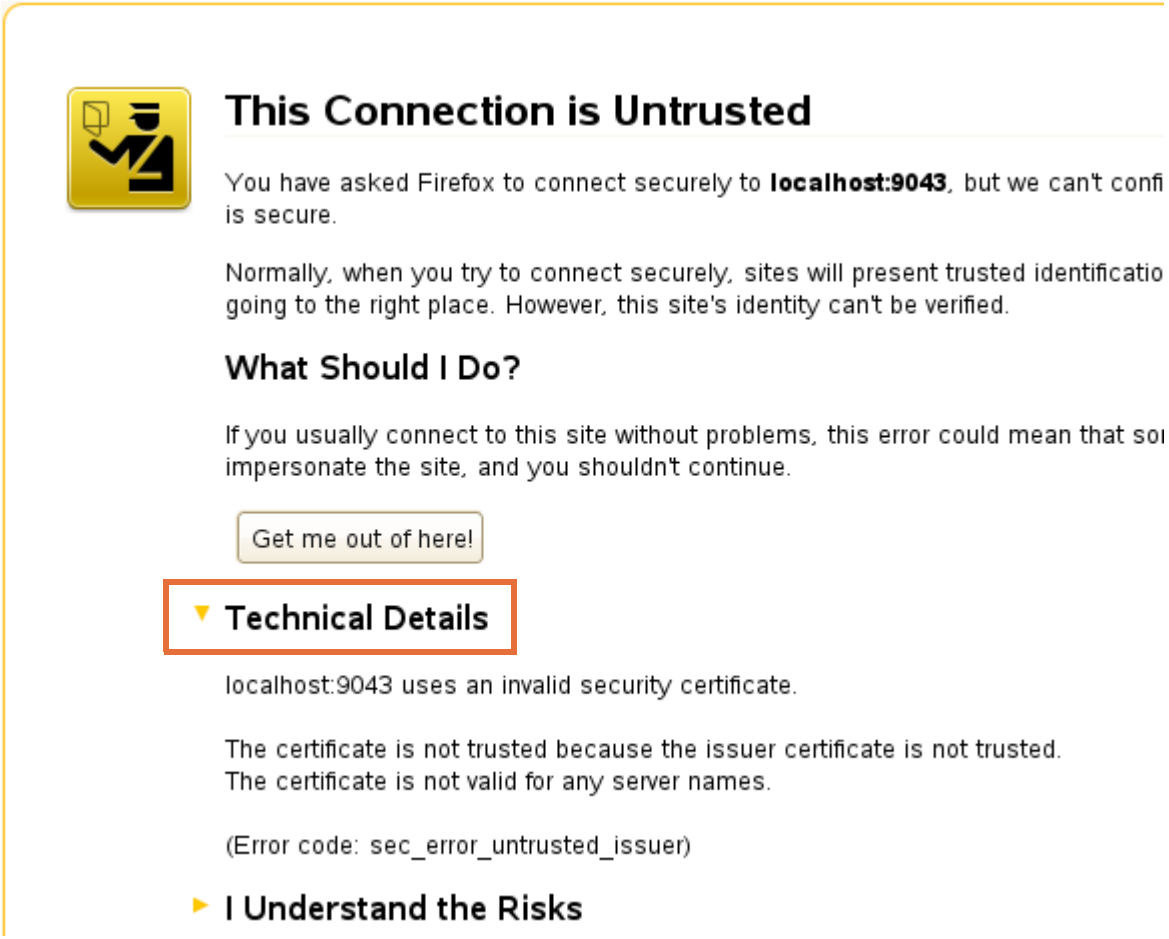
__ h. Click **Close** to close the Firefox Preference window.

__ 2. Add a certificate exception for localhost.

__ a. Open a Firefox window and use the following URL to go to the administrative console:

`http://localhost:9060/ibm/console`

__ b. Now you see a warning of an untrusted connection. Expand **Technical Details**.



__ c. Notice that the connection is coming into **localhost** (not **was85host**) and that two issues are listed:

- The certificate is not trusted because the issuer certificate is not trusted.
- The certificate is not valid for any server names.

The first is because the certificate is signed by (issued by) someone the browser does not know about (not a known certificate authority). The second is because the host name associated with the certificate (was85host) does not match the host name in the URL (localhost).

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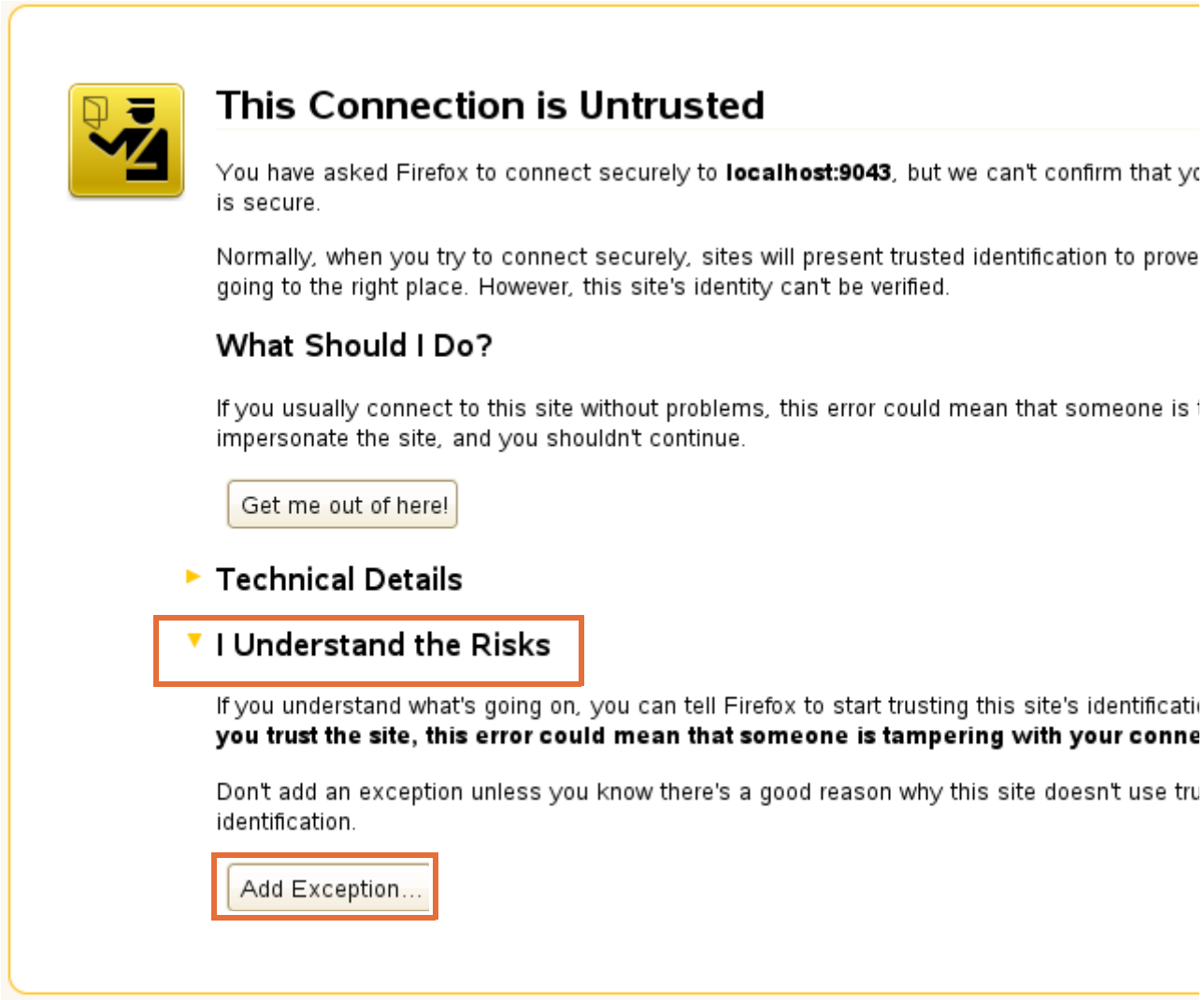
__ d. Expand **I Understand the Risks** and click **Add Exception**.



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__ e. Click **View** to see the details for the certificates.

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__ f. In the **Certificate Viewer**, notice that the certificate is issued to the host name **was85host**. It is also interesting to note that was85host (and not a known certificate authority) issued it.

__ g. Click **Close** to exit the Certificate Viewer.

__ h. On the Add Security Exception window, click **Confirm Security Exception** to add the certificate to the list of certificates that the browser trusts.

__ i. The console login window is displayed.

__ j. Return to the Firefox preferences by clicking **Edit > Preferences**.

__ k. Select the **Advanced** icon and the **Encryption** tab.

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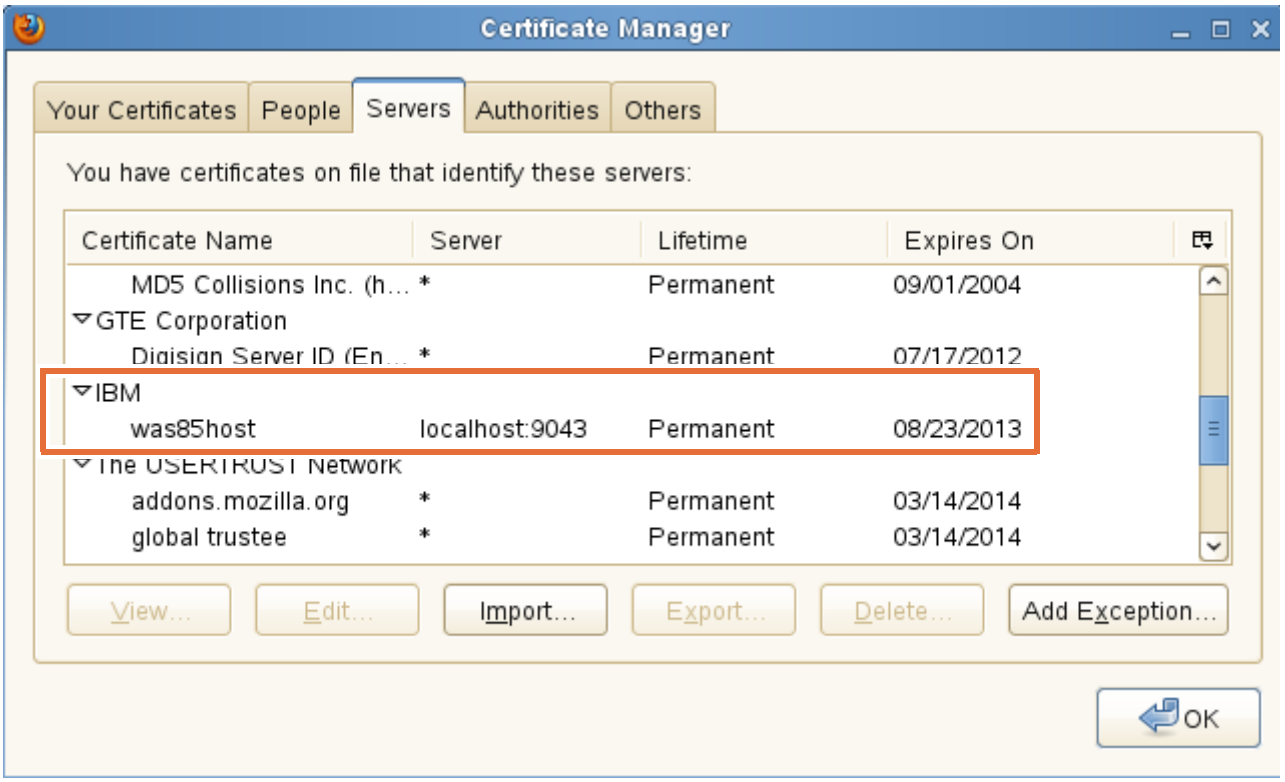
__ l. Click **View Certificates** and the **Servers** tab. Scroll down and look for the certificate named was85host under IBM. Notice that now an exception is listed for server **localhost**.



__ m. Close out of the open dialog boxes.

__ 3. Add a certificate exception for was85host.

__ a. Open a Firefox window and use the following URL to go to the administrative console:

`http://was85host:9060/ibm/console`

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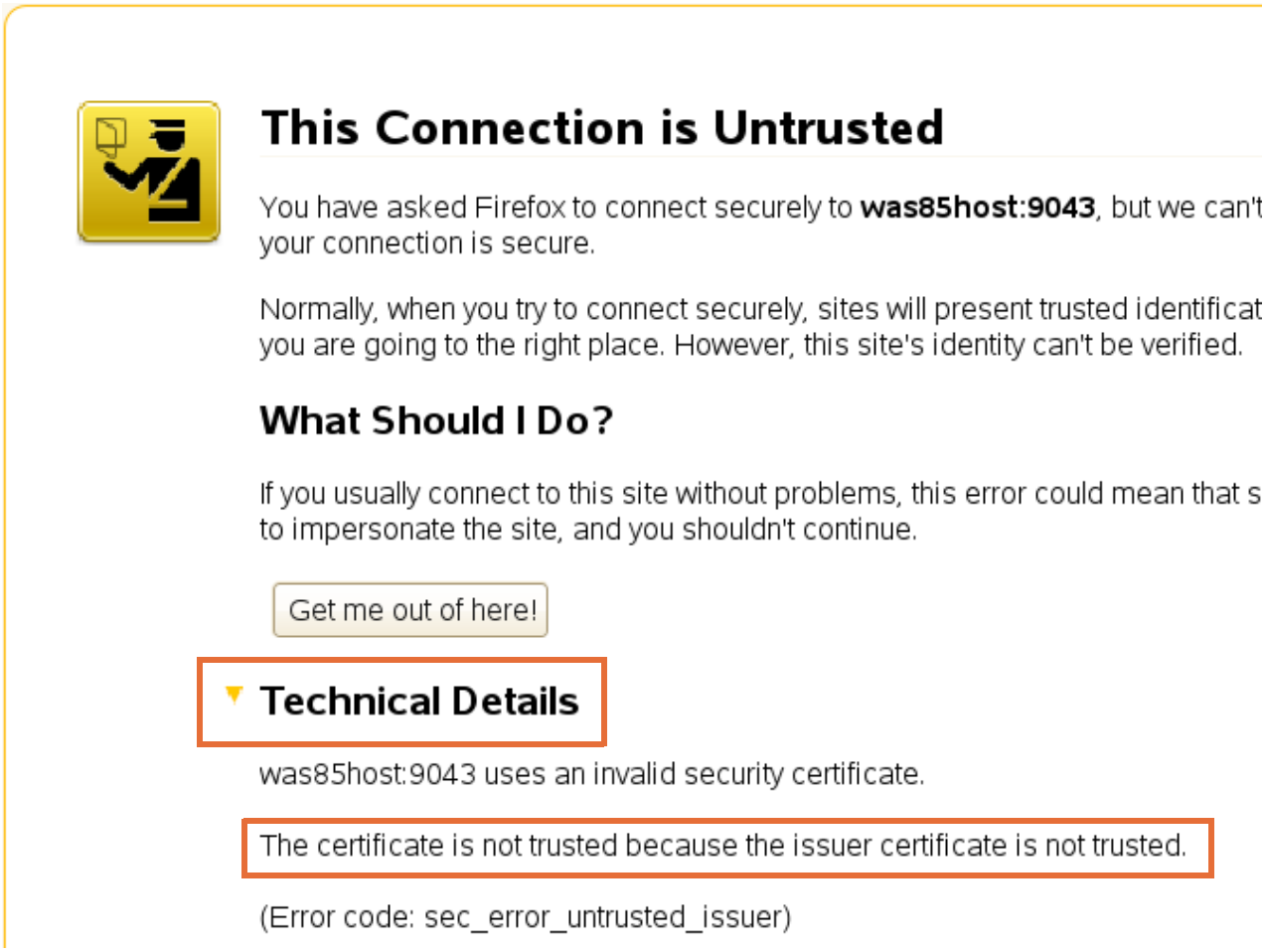
__ b. Now you see a warning of an untrusted connection. Expand **Technical Details**.



__ c. Notice that the connection is coming into **was85host** (not **localhost**) and that there is only one issue listed:

- The certificate is not trusted because the issuer certificate is not trusted.

The second issue that localhost had is no longer there since the host name in the URL matches the host name in the certificate.

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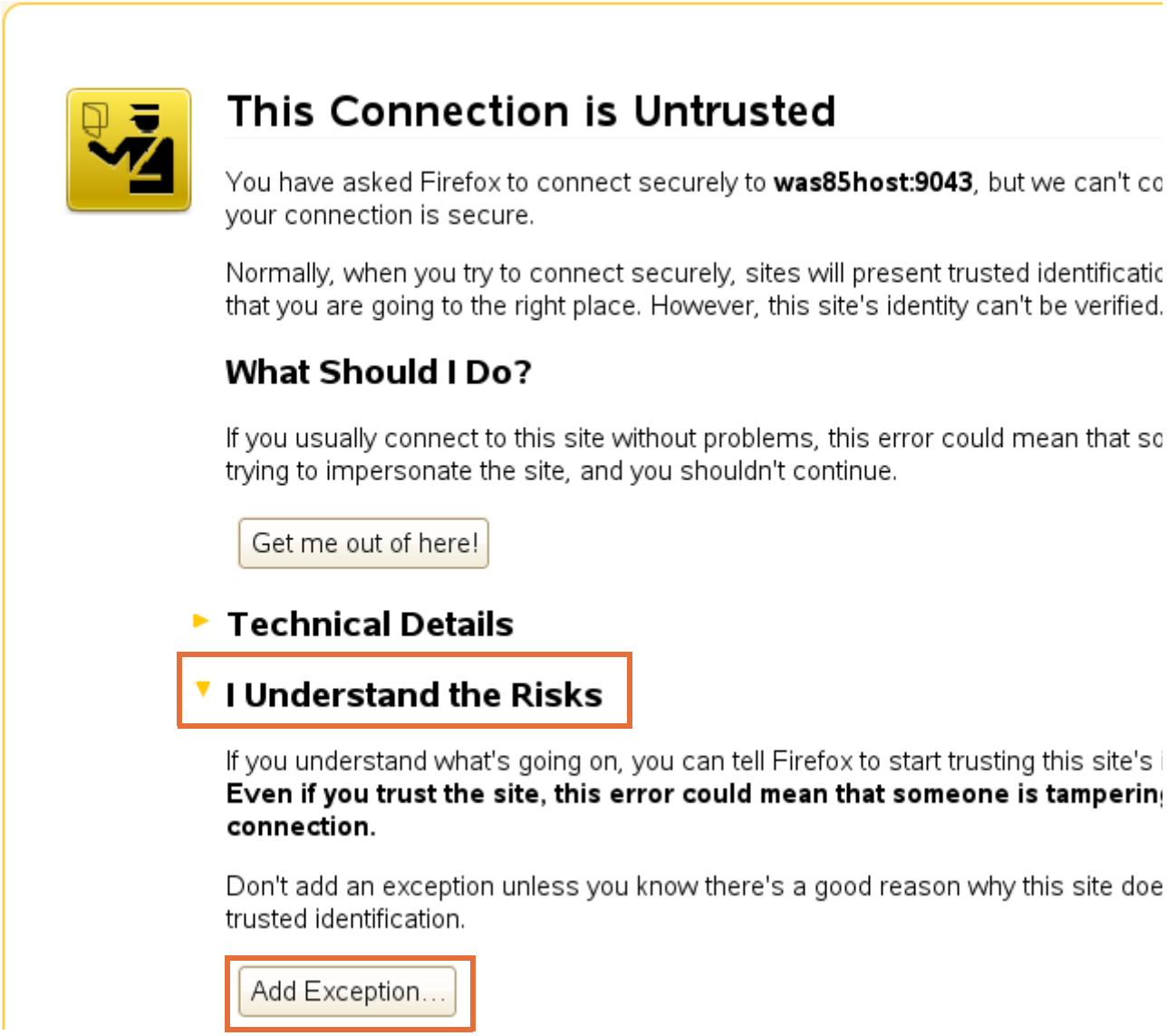
__ d. Expand **I Understand the Risks** and click **Add Exception**.



__ e. On the Add Security Exception window, click **Confirm Security Exception** to add the certificate to the list of certificates that the browser trusts.

__ f. The console login window is displayed.

__ g. Return to the Firefox preferences by clicking **Edit > Preferences**.

__ h. Select the **Advanced** icon and the **Encryption** tab.

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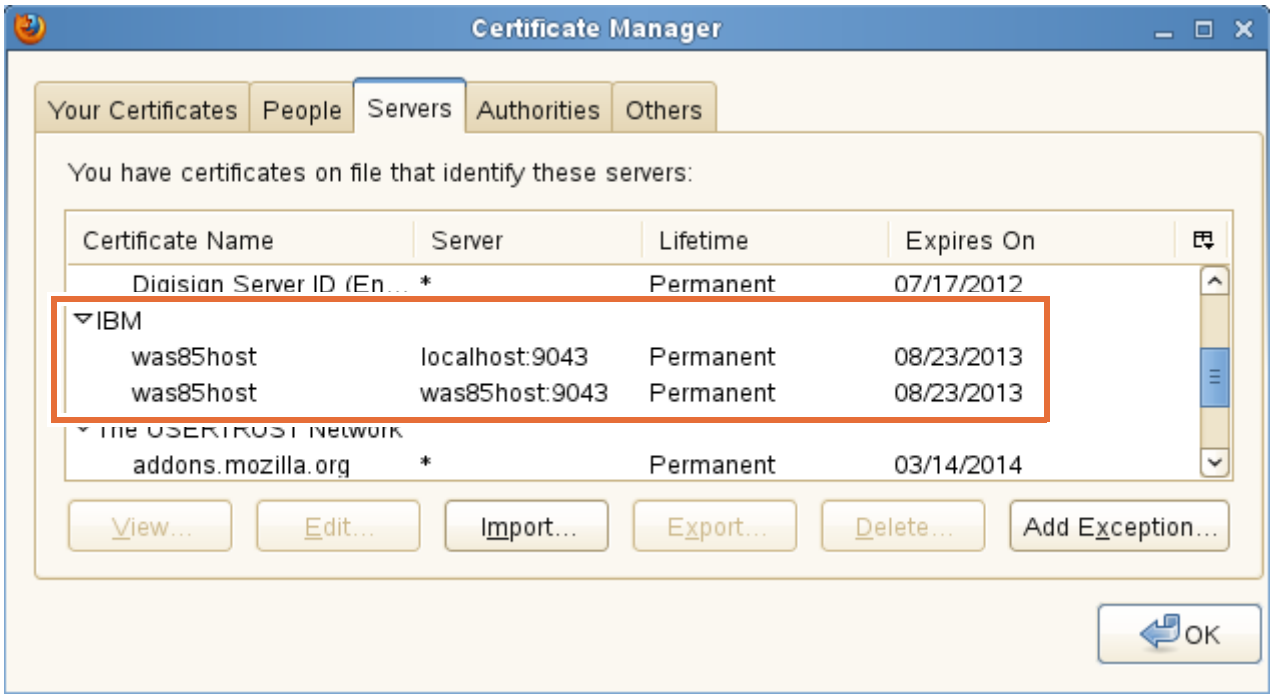
__ i. Click **View Certificates** and the **Servers** tab. Scroll down and look for the certificates named **was85host** under IBM. Notice that there are now two exceptions listed (one for localhost and one for was85host).



__ j. Close all of the open dialog boxes.

End of exercise

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Exercise review and wrap-up

This exercise looked at the installation of WebSphere Application Server V8.5. The Profile Management Tool was used to create an application server profile called profile1.

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Exercise 3. Installing IBM HTTP Server

What this exercise is about

This exercise covers the installation and configuration of IBM HTTP Server and its WebSphere Application Server plug-ins.

What you should be able to do

At the end of the exercise, you should be able to:

- Install IBM HTTP Server with IBM Installation Manager
- Confirm and test the installation of IBM HTTP Server
- Install Web Server Plug-ins for WebSphere Application Server
- Install WebSphere Customization Toolbox
- Configure the Web Server Plug-ins for WebSphere Application Server
- Examine the installed directories and files for IBM HTTP Server and the plug-ins

Introduction

A main theme in this release is the separation of installation from configuration. IBM Installation Manager is the installation technology of choice. Installation Manager is a program that helps you install, import, update, modify, and uninstall packages on your computer. Installation Manager also provides tools for managing licenses for the packages that it installs, and for updating and modifying packages. If Installation Manager is installed on your computer, it is updated to ensure that the computer has the latest version installed.

In this exercise, you use IBM Installation Manager to install IBM HTTP Server and WebSphere Application Server plug-ins. The plug-ins are configured with the Web Server Plug-ins Configuration Tool. In WebSphere Application Server V8, installation and configuration are separated into two different steps. The HTTP Server and the Plug-ins installers do not offer the configuration steps that existed in v7.0. Instead, administrators use the Web Server Plug-ins Configuration Tool to complete a plug-in configuration for various web server plug-ins. Administrators can also configure IBM HTTP Server Admin server.

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Requirements

To do this exercise, you must complete the Installing IBM Installation Manager and Installing WebSphere Application Server exercises.

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Exercise instructions

Section 1: Resetting the WebSphere environment

Note

To reset your WebSphere environment, read **Appendix A** for instructions on how to complete this procedure.

Section 2: Installation of the IBM HTTP Server

__ 1. Start IBM Installation Manager.

__ a. Open a terminal window and navigate to the following directory:

`/opt/IBM/InstallationManager/eclipse/`

__ b. Enter `./IBMIM` to start IBM Installation Manager.

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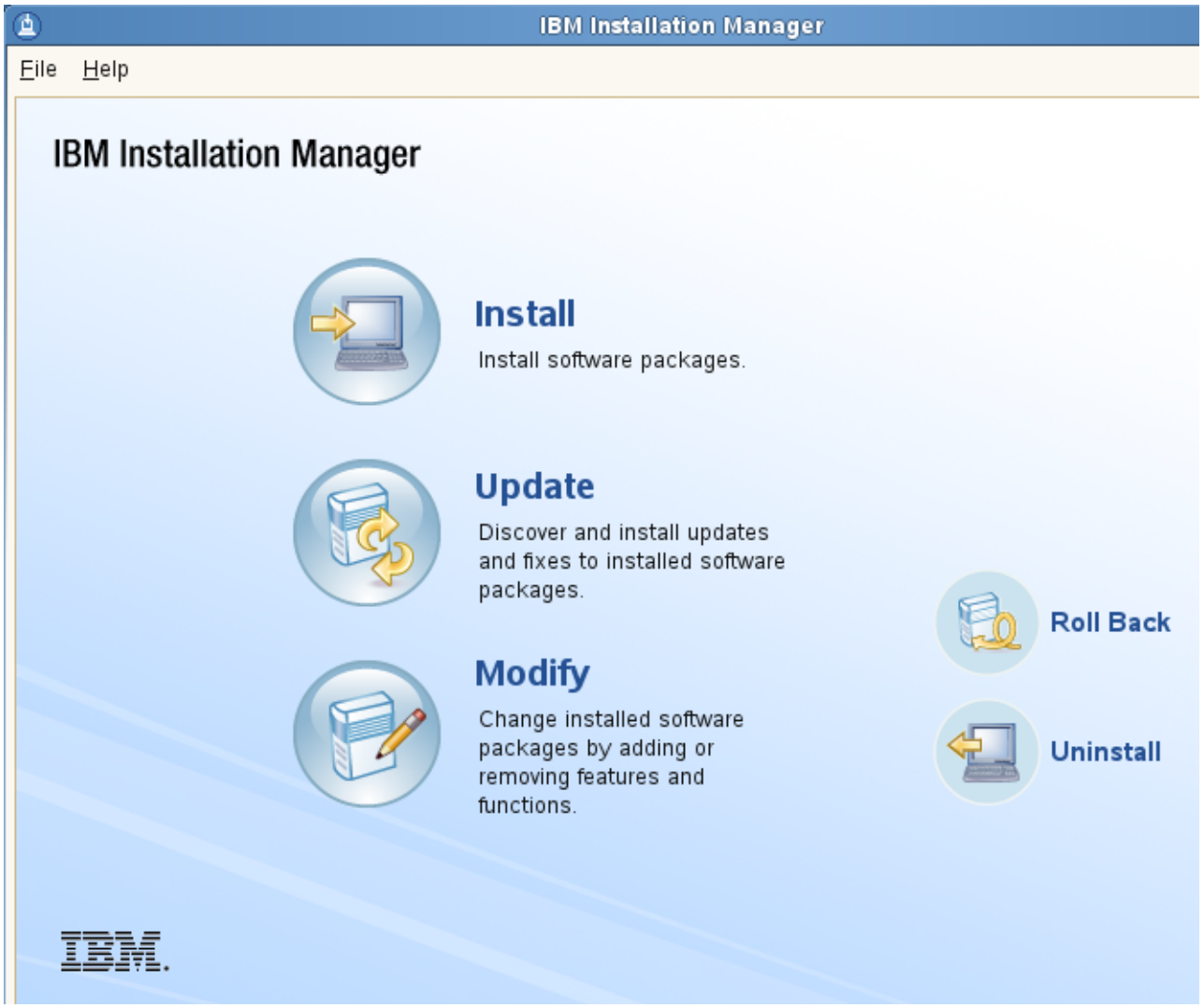
__ c. Installation Manager opens to the main page.



__ 2. Configure a repository for the IBM HTTP Server package files.

__ a. Click **File > Preferences**.

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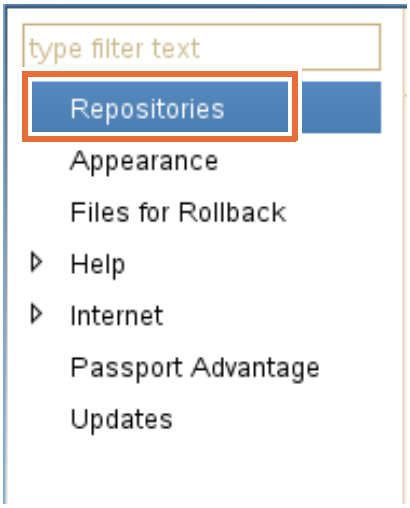
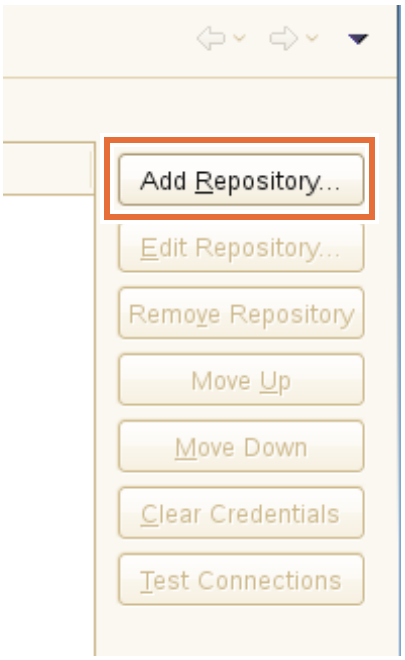
__ b. Select **Repositories**.



__ c. Click **Add Repository**.



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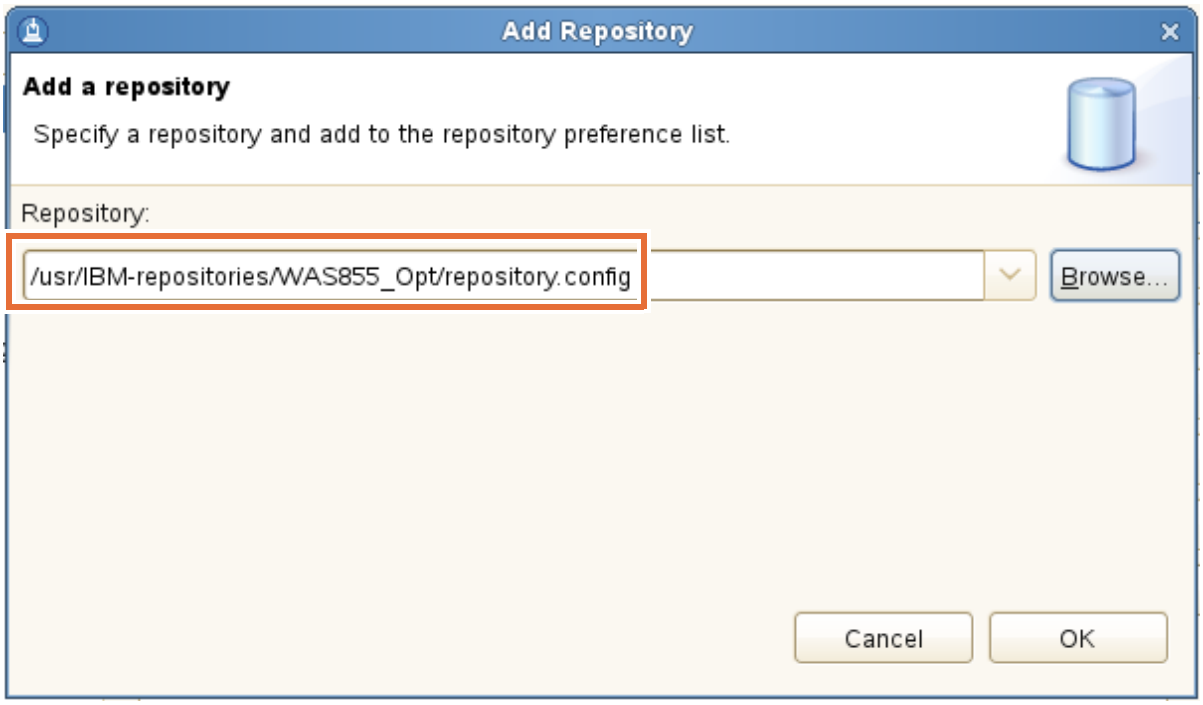
__ d. Click **Browse** and select the following file:

`/usr/IBM-repositories/WAS855_Opt/repository.config`

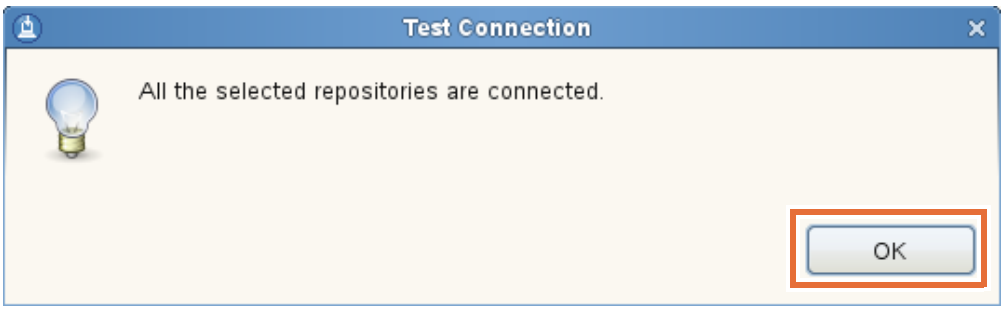


__ e. Click **OK** to add the repository to the list of repositories.

__ 3. Test the connection to the local repository. This step is more important when you configure remote repositories and need access to the repository to complete a product installation.

__ a. Click **Test Connections**.

__ b. A message indicates that the repository is connected. Click **OK**.



__ c. Click **OK** to close the Preferences window.

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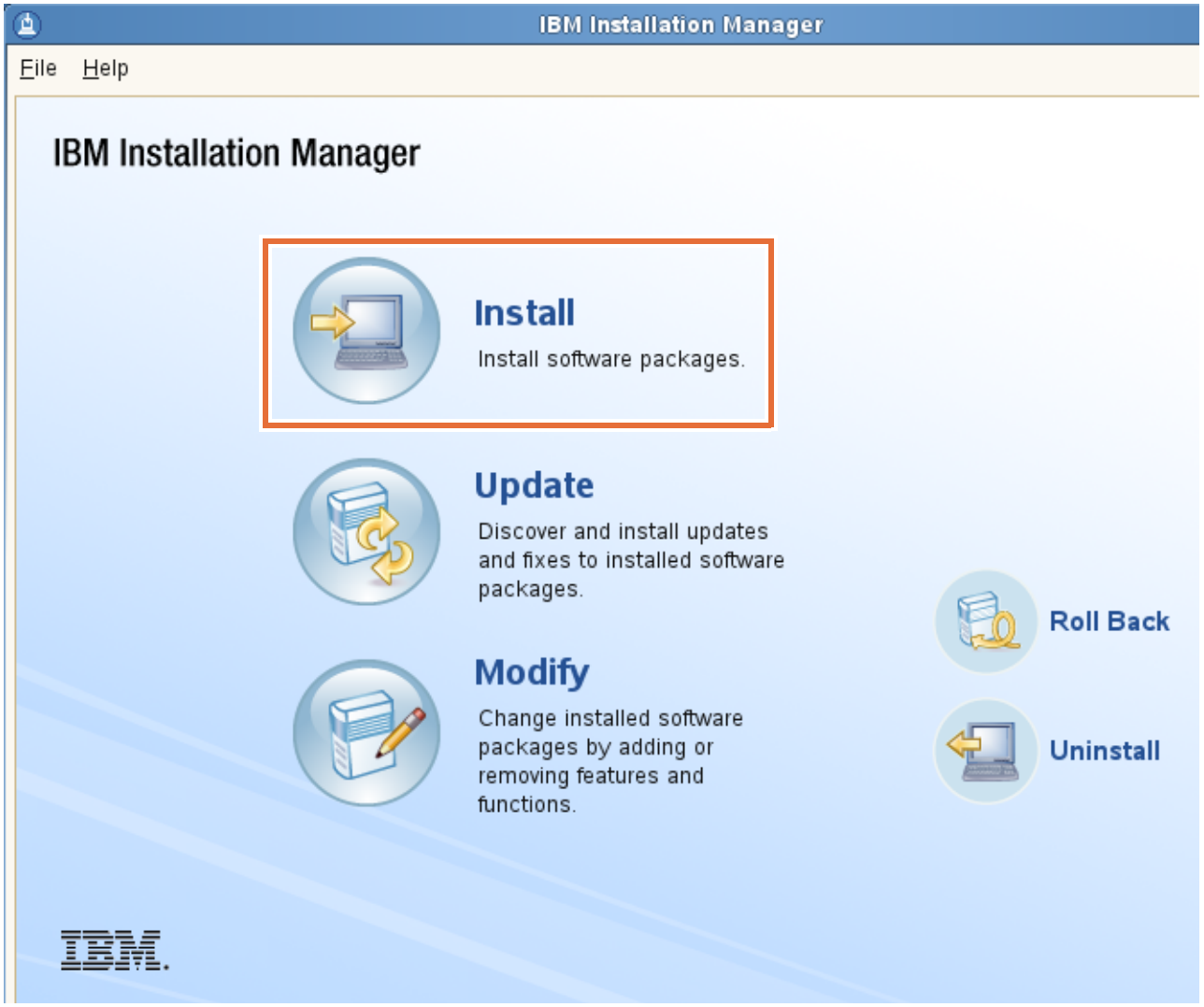
__ 4. Start the installation of IBM HTTP Server packages.

__ a. From the main page of Installation Manager, click **Install**.



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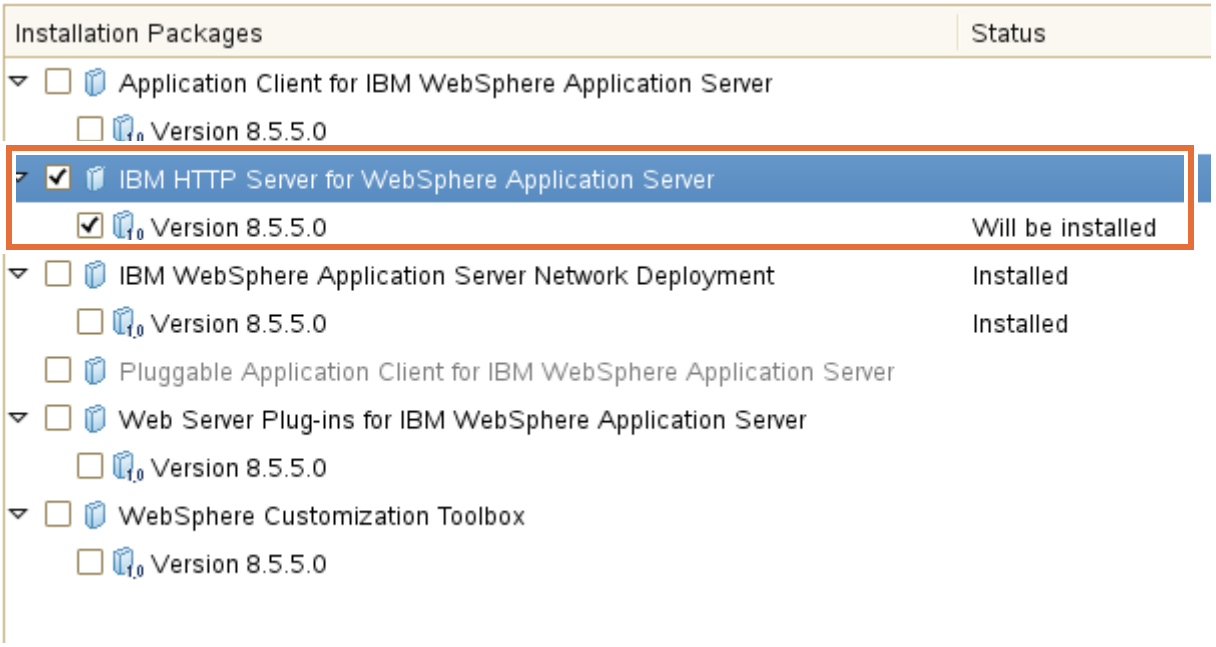
__ b. From the list of installation packages, select only **IBM HTTP Server for WebSphere Application Server**, which also selects Version 8.5.5.0.



__ c. Click **Next**. This action retrieves and validates the package files from the repository.

__ d. Select **I accept the terms in the license agreement** and click **Next**.

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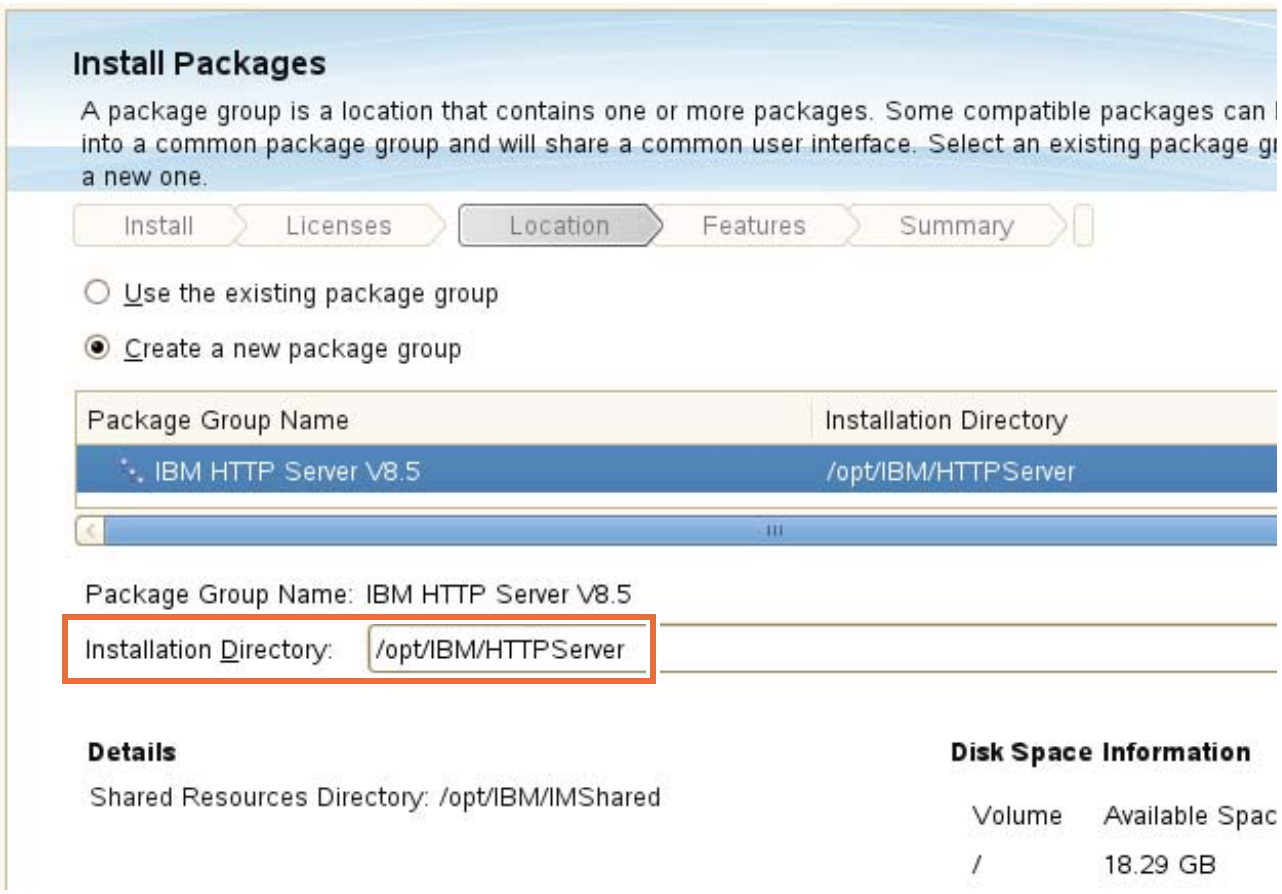
__ e. On the Location panel, accept the default of **Create a new package group** and the default Installation Directory path of `/opt/IBM/HTTPServer`.



__ f. Click **Next**.

__ g. On the next panel, accept the default selection **IBM HTTP Server for WebSphere Application Server 8.5.5.0** as the feature to install.

__ h. Click **Next**.

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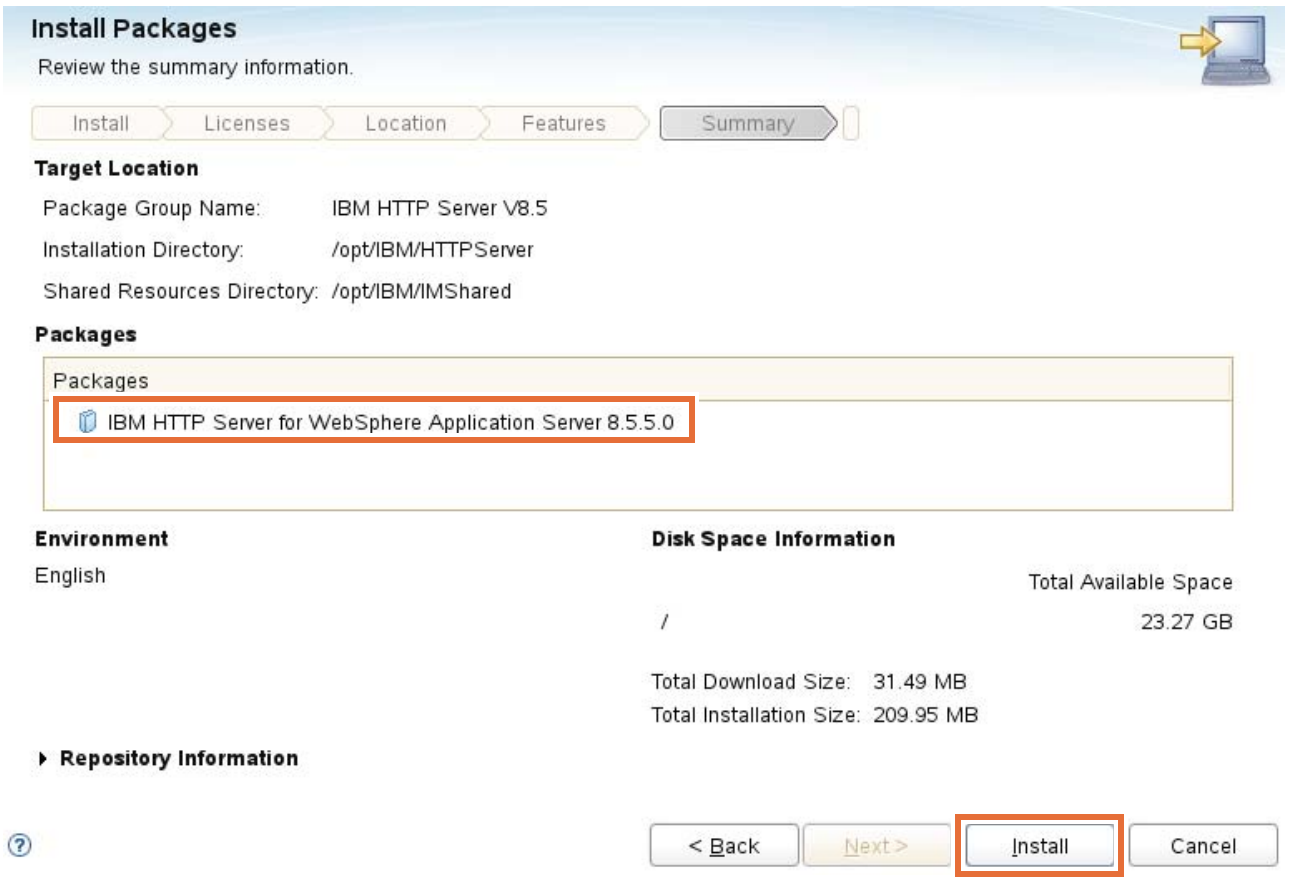
__ i. On the Features panel for Configuration for IBM HTTP Server for WebSphere Application Server 8.5.5.0, enter `80` as the HTTP port.

__ j. Click **Next**.

__ k. On the Summary panel, verify that IBM HTTP Server for WebSphere Application Server 8.5.5.0 is the package for installation. Click **Install**.



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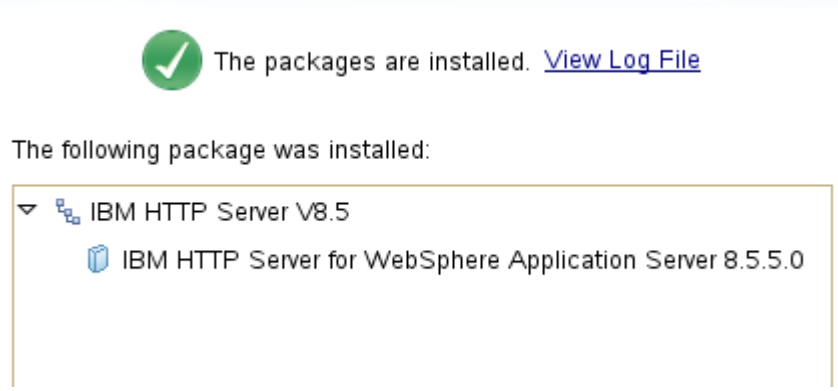
__ l. When the installation of the packages is complete, a message is shown.



__ m. Click **Finish**.

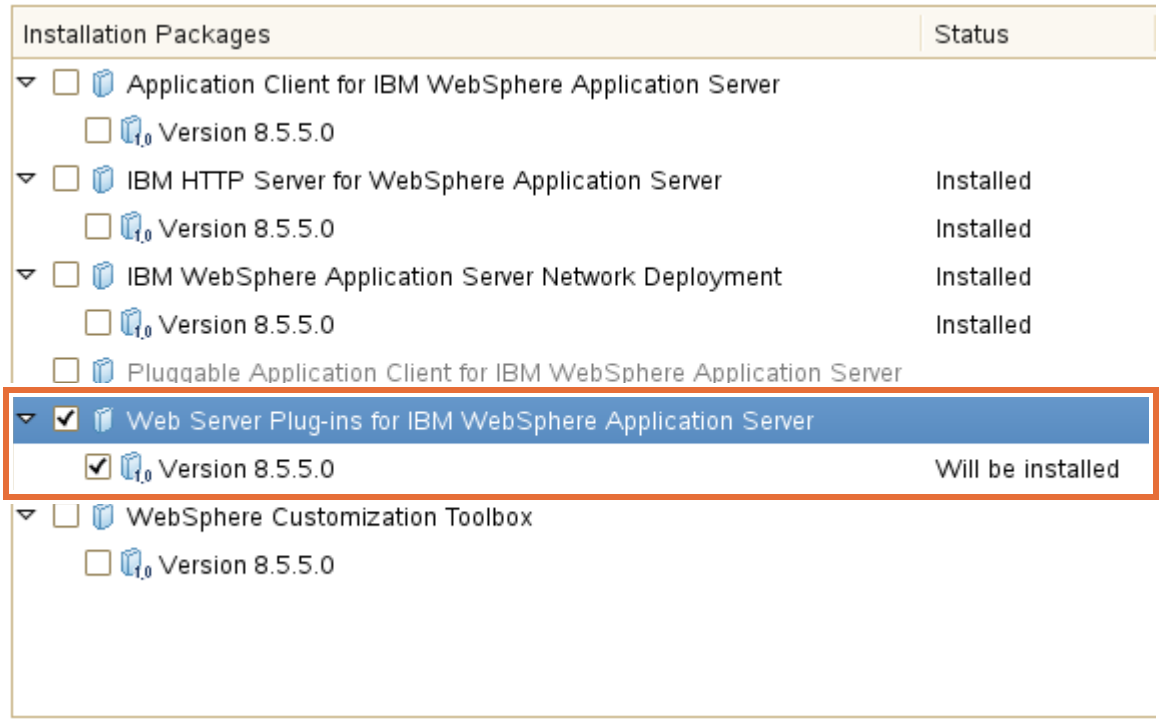
Section 3: Install IBM HTTP Server plug-in

The plug-ins are necessary for routing requests from the web server and WebSphere Application Server.

__ 1. Start the installation of the Web Server Plug-ins for IBM WebSphere Application Server.

__ a. From the main page of Installation Manager, click **Install**.

__ b. From the list of installation packages, select only **Web Server Plug-ins for IBM WebSphere Application Server**. This action also selects Version 8.5.5.0.



__ c. Click **Next**. This action retrieves and validates the package files from the repository.

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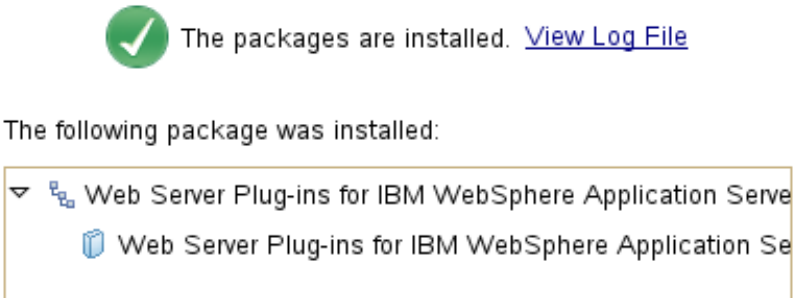
__ d. Select **I accept the terms in the license agreement** and click **Next**.

__ e. Select **Create a new package group** and accept the default Installation Directory of `/opt/IBM/WebSphere/Plugins`. Click **Next**.

__ f. On the Features panel, select **Web Server Plug-ins for WebSphere Application Server 8.5.5.0** as the feature for installation. Click **Next**.

__ g. On the Summary panel, click **Install**.

__ h. When the installation of the packages is complete, a message is shown.



__ i. Click **Finish**.

Section 4: Install WebSphere Customization Toolbox

The WebSphere Customization Toolbox includes tools for managing, configuring, and upgrading various parts of the WebSphere Application Server environment. Three tools are included:

- Profile Management Tool for z/OS only
- z/OS Migration Tool
- Web Server Plug-ins Configuration Tool

In this part of the exercise, the Web Server Plug-ins Configuration Tool (PCT) is installed as part of the WebSphere Customization Toolbox. The PCT includes both browser-based and command-line options. The other tools are not necessary for the lab exercise environment.

The Web Server Plug-ins Configuration Tool is needed in the next section to configure the web server plug-in. The plug-in configuration allows the web server to connect correctly with the application server.

__ 1. Install the WebSphere Customization Toolbox.

__ a. From the main page of Installation Manager, click **Install**.

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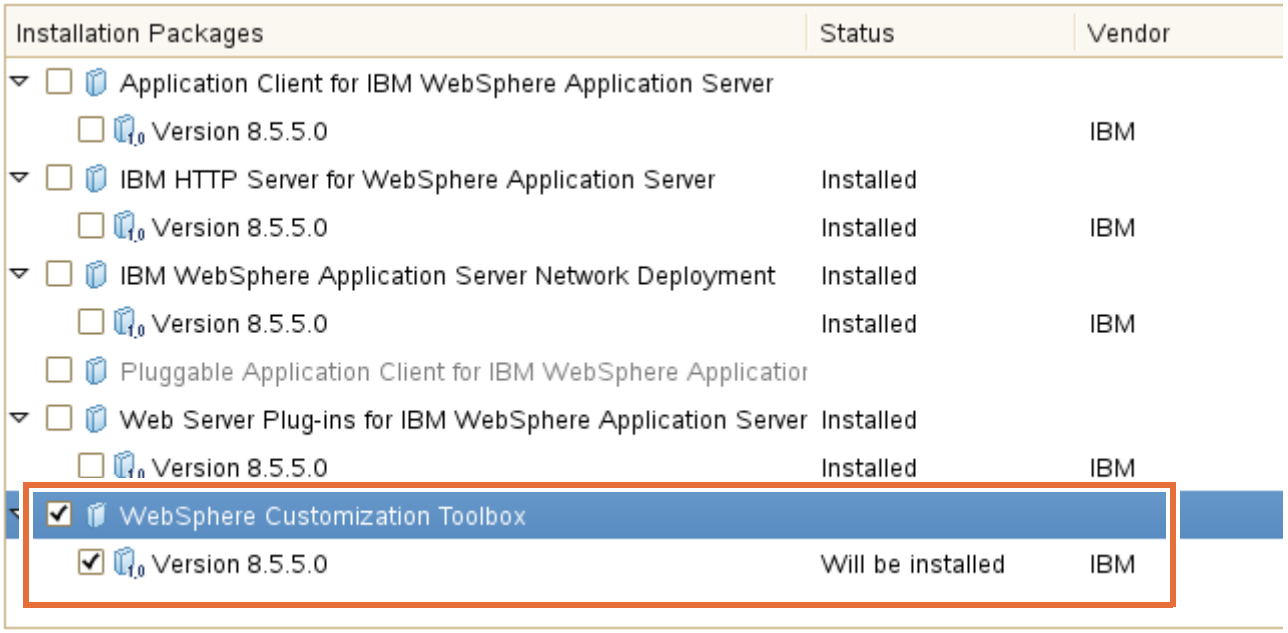
__ b. From the list of installation packages, select **WebSphere Customization Toolbox**. This action also selects Version 8.5.5.0.

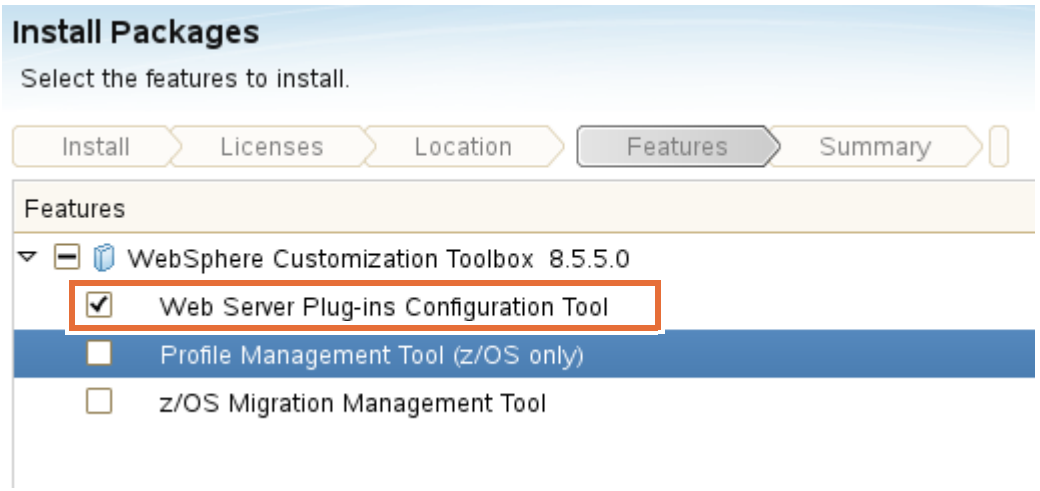


__ c. Click **Next**. This action retrieves and validates the package files from the repository.

__ d. Select **I accept the terms in the license agreement** and click **Next.**

__ e. Accept `/opt/IBM/WebSphere/Toolbox` as the Installation Directory and click **Next**.

__ f. On the Features panel, select **Web Server Plug-ins Configuration Tool**. Clear any other check boxes and click **Next**.



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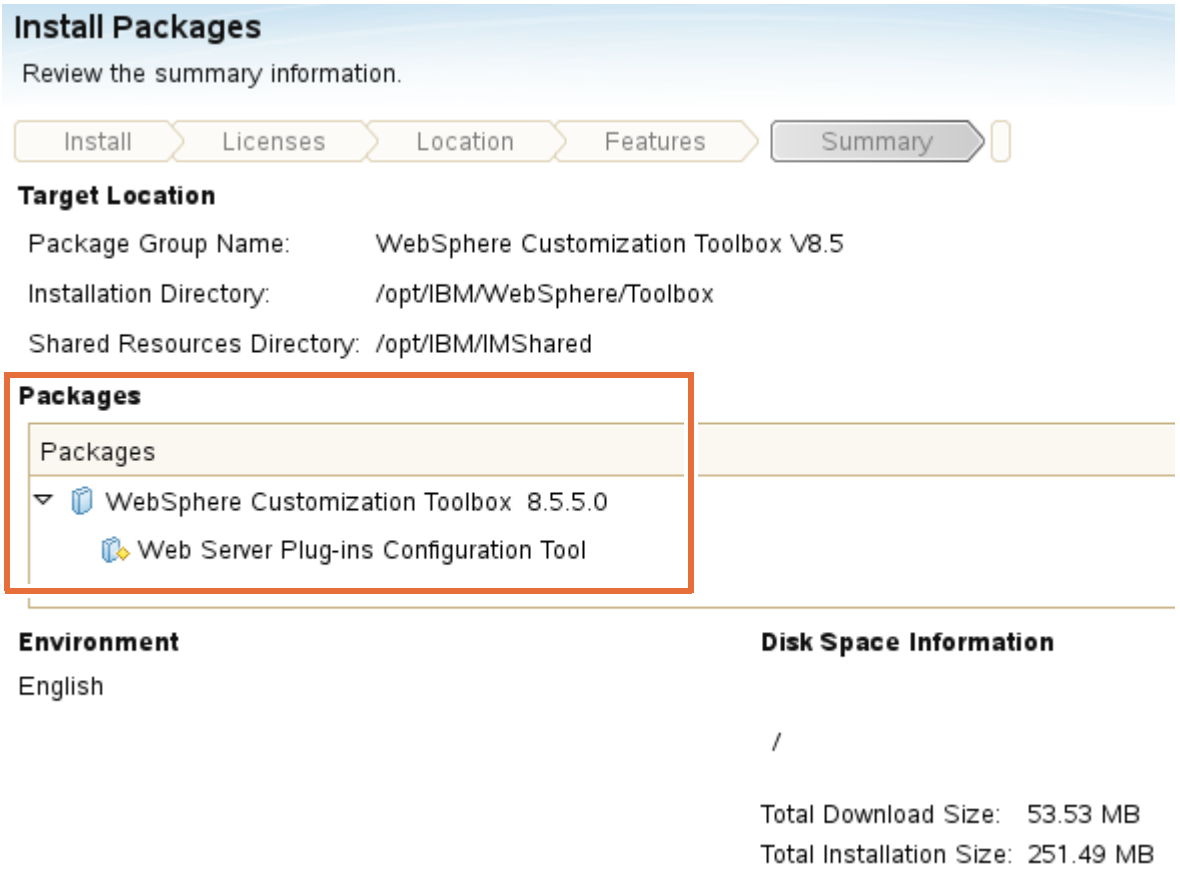
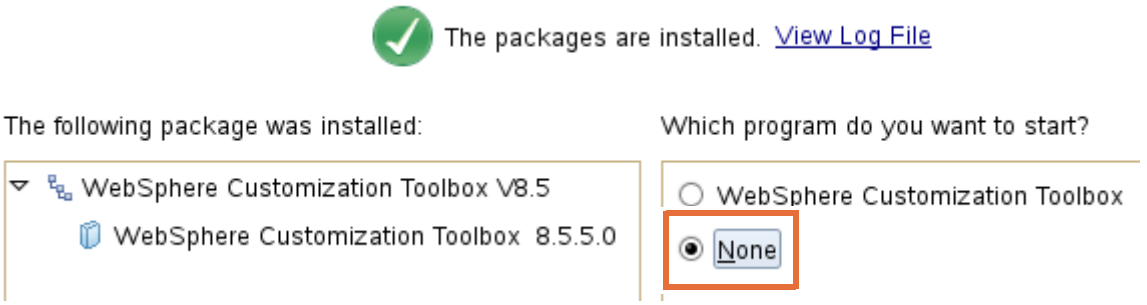
__ g. On the Summary panel, verify that the only package that is listed under the **WebSphere Customization Toolbox 8.5.5.0** is the Web Server Plug-ins Configuration Tool.



__ h. Click **Install**.

__ i. When the installation of the packages is complete, select **None** under "Which program do you want to start?"



__ j. Click **Finish**.

__ k. Close IBM Installation Manager.

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Section 5: Configuring the web server plug-in

After the products are installed with the IBM Installation Manager, other tools are used to complete the configuration processes. The Web Server Plug-ins Configuration Tool is available for configuring web server plug-ins. The Web Server Plug-ins Configuration Tool creates one or more configurations for the web server plug-ins that can direct requests from a web client through the web server. The tool edits the configuration files for a web server by creating directives that point to the location of the binary plug-in module. The tool also creates a directive to the plug-in configuration file.

In this part of the exercise, the Web Server Plug-ins Configuration Tool (PCT) is used to configure the web server plug-in.

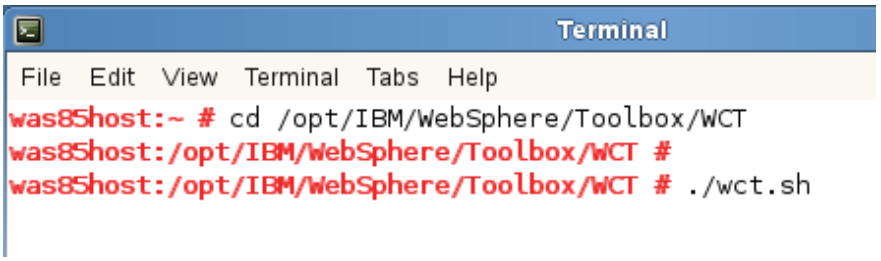
__ 1. Start the WebSphere Customization Toolbox.

__ a. Using a terminal window, navigate to the following directory:

`/opt/IBM/WebSphere/Toolbox/WCT`

__ b. Enter the following command to start the WebSphere Customization Toolbox:

`./wct.sh`



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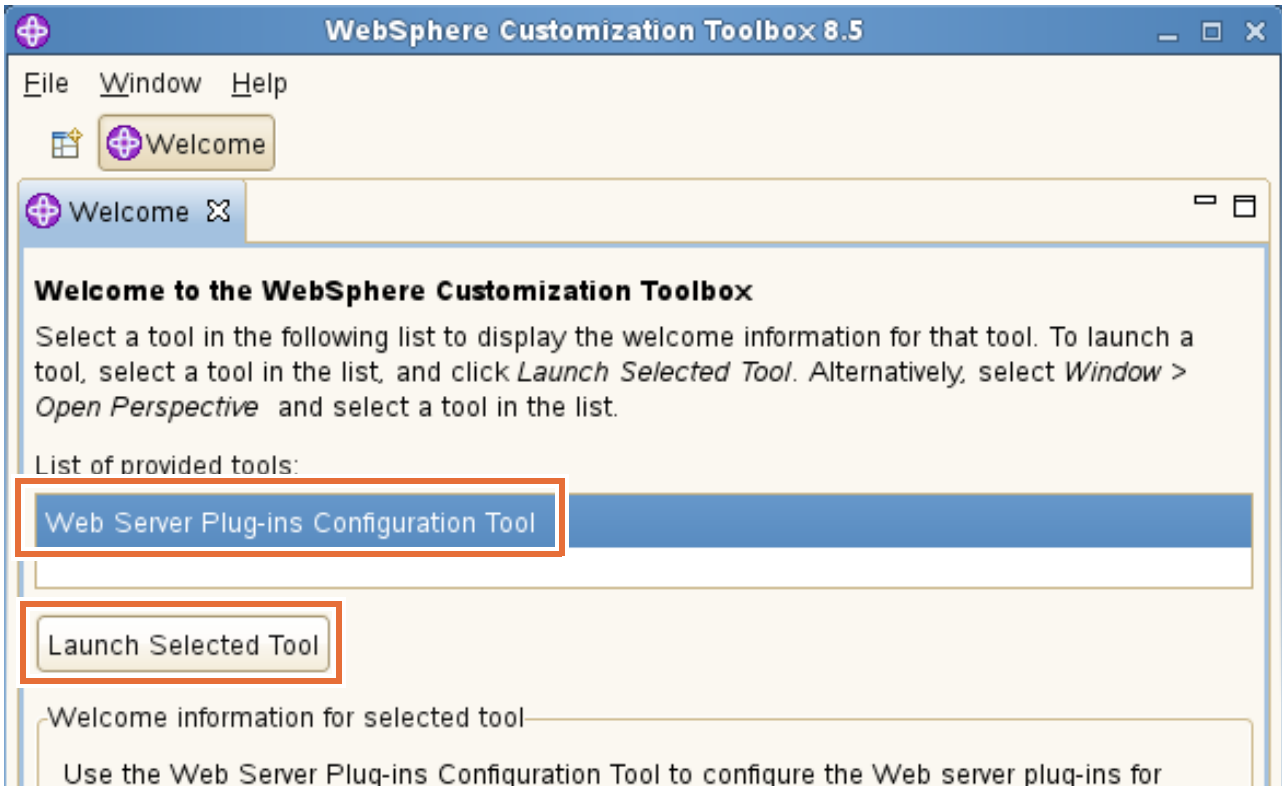
__ c. Select **Web Server Plug-ins Configuration Tool** and click **Launch Selected Tool**.



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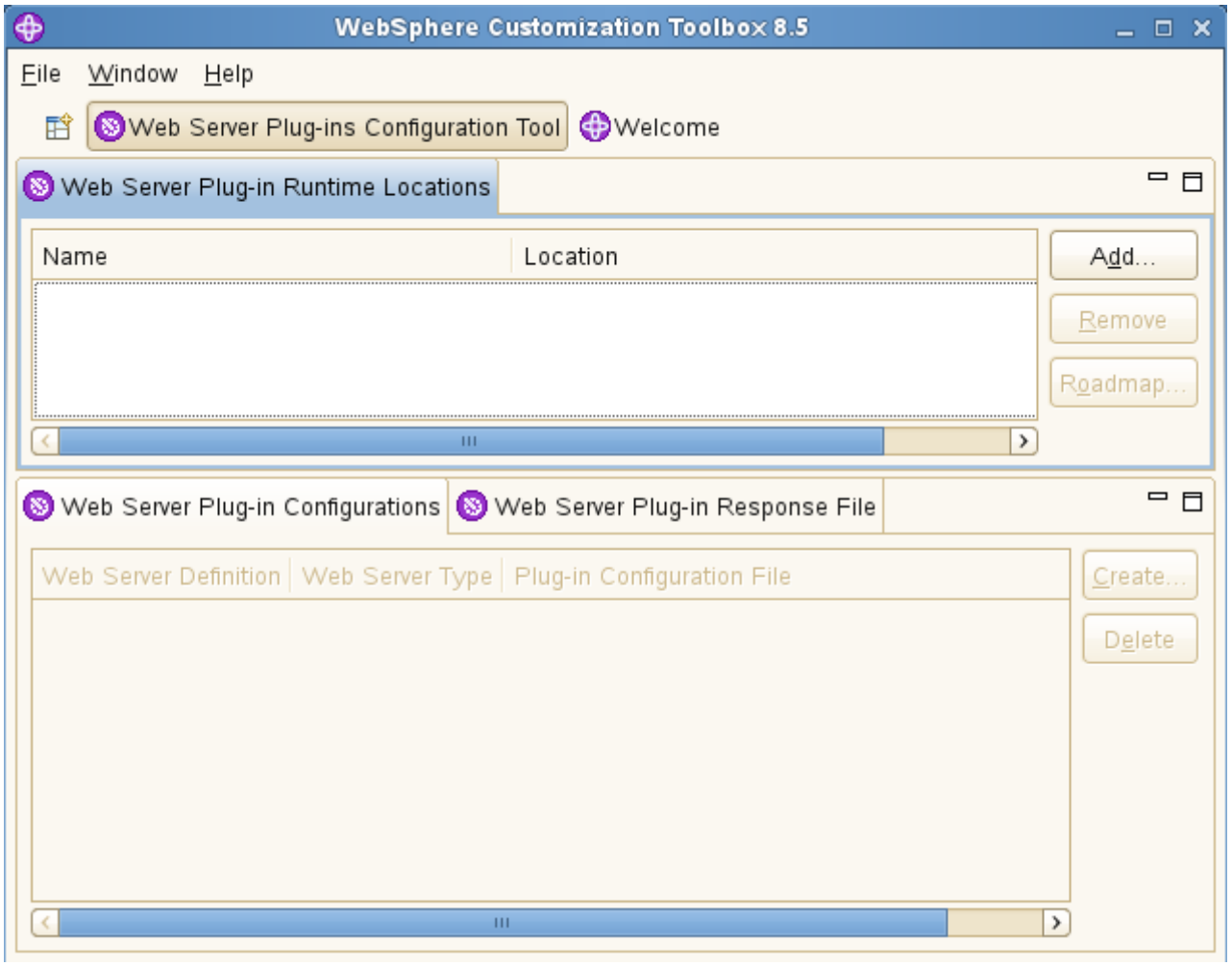
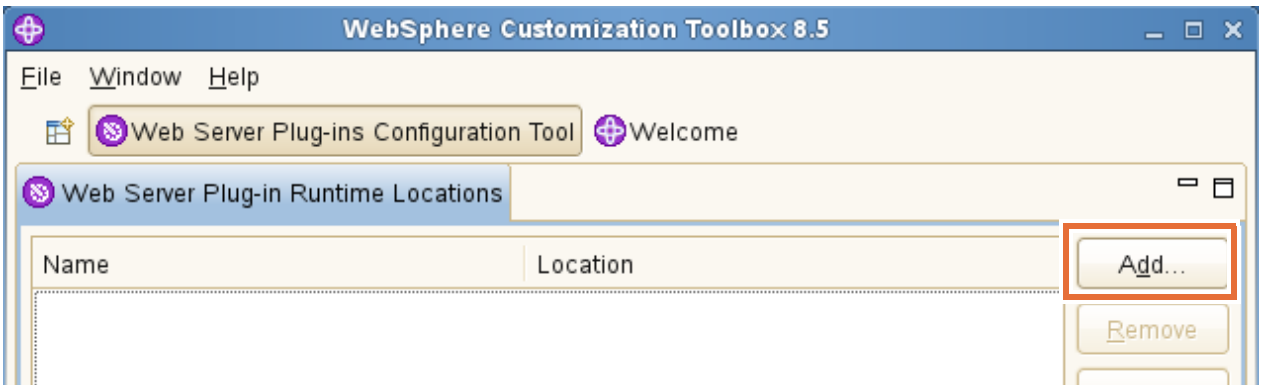
__ d. The WebSphere Customization Toolbox opens and looks like the following screen capture:



__ 2. Add the location of the web server plug-in runtime files. Since the installed web server plug-in that you want to use is not in the list, you must add it.

__ a. In the Web Server Plug-in Runtime Locations panel, click **Add**.



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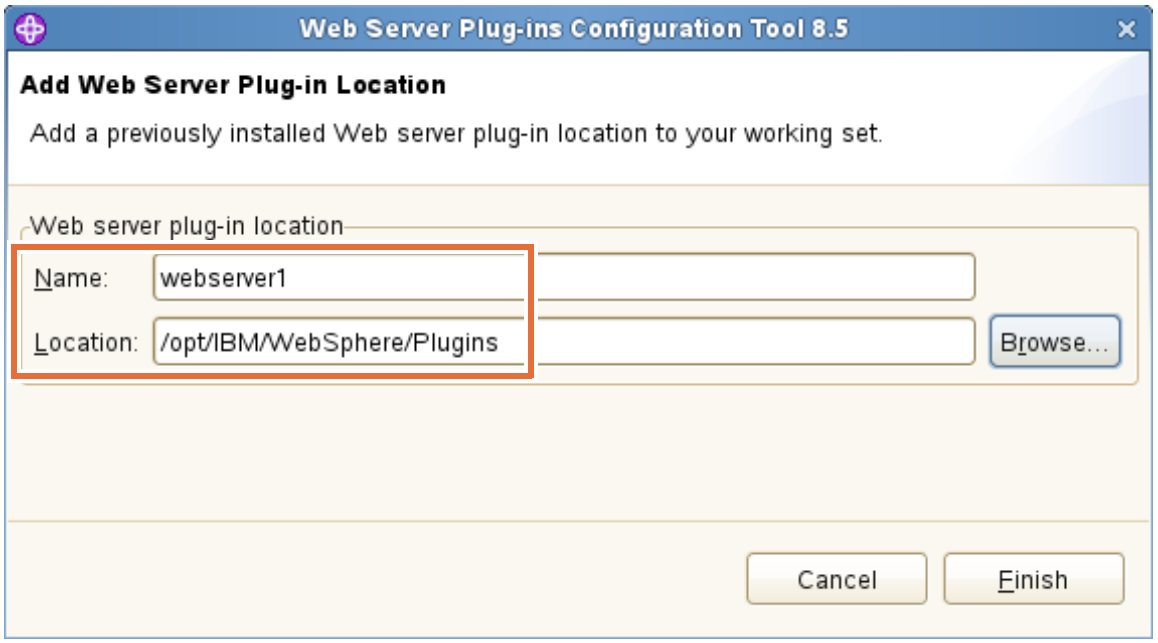
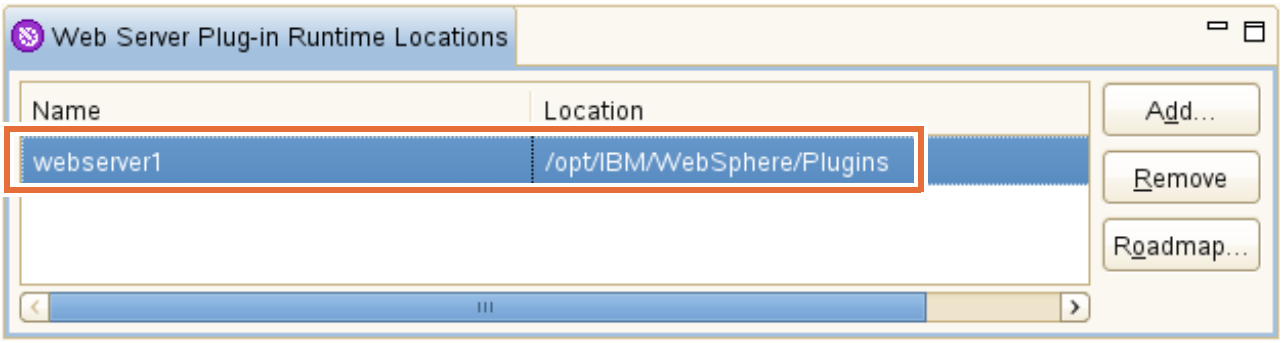
__ b. In the Add Web Server Plug-in Location panel, enter the following values:

- In the **Name** field, enter: `webserver1`
- In the **Location** field, **Browse** to: `/opt/IBM/WebSphere/Plugins`



__ c. Verify the settings and click **Finish**.

__ d. The web server plug-in runtime is added to the location list.



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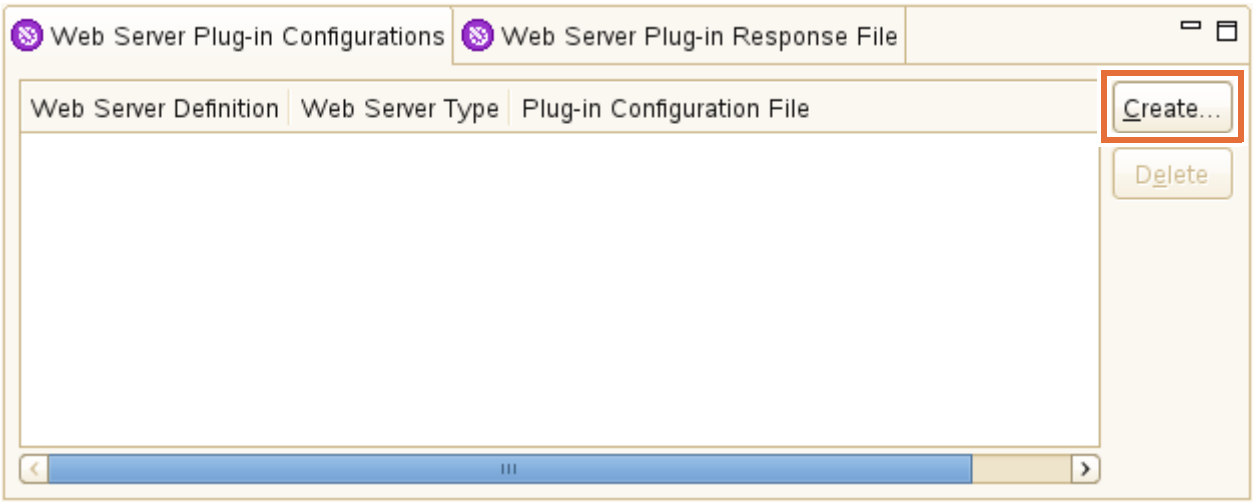
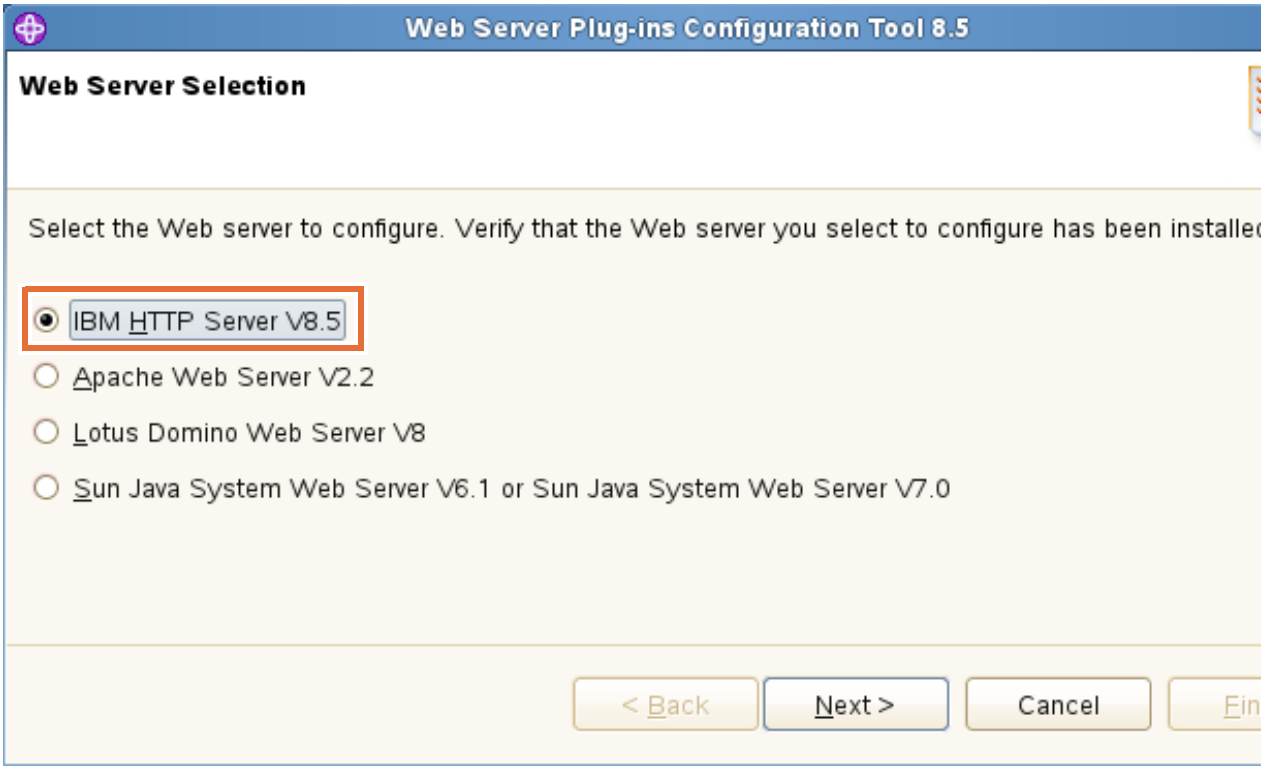
__ e. In the Web Server Plug-in Configurations panel, click **Create**.



__ f. Verify that **IBM HTTP Server V8.5** is selected and click **Next**.



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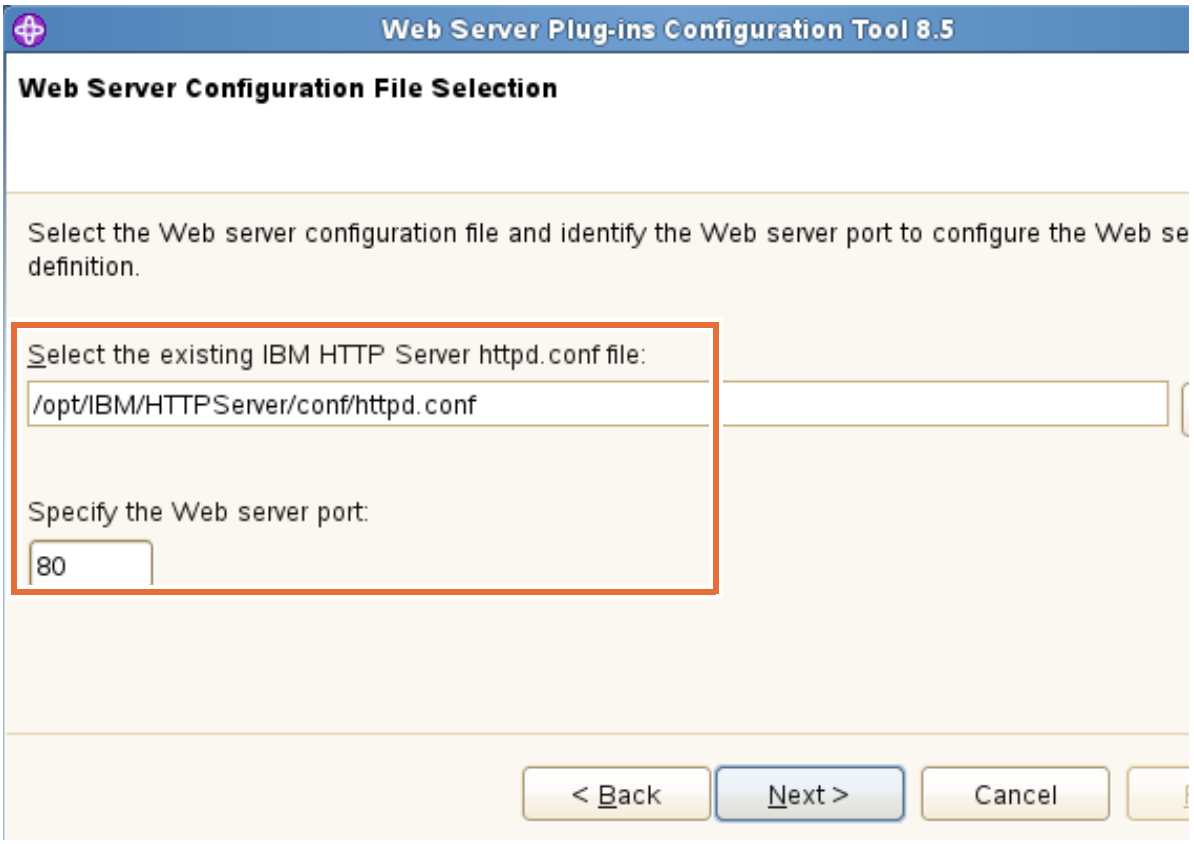
__ g. In the Web Server Configuration File Selection panel, accept the following default values:

- Select the existing IBM HTTP Server `httpd.conf` file: `/opt/IBM/HTTPServer/conf/httpd.conf`
- Specify the Web server port: `80`



__ h. Click **Next**.

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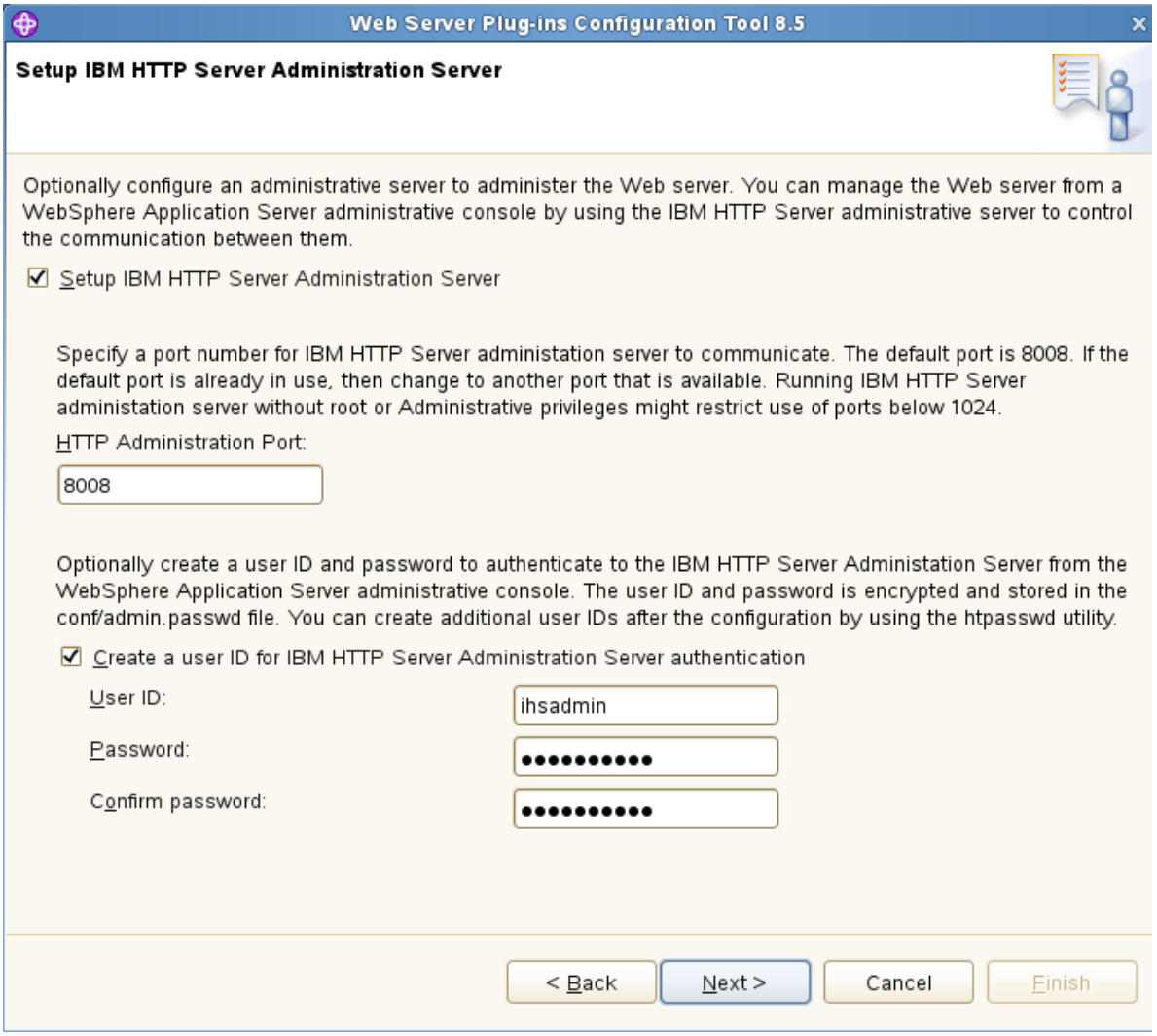
__ i. In the Setup IBM HTTP Server Administration Server panel, enter the following values (note: expand the dialog box to see all the fields):

- Verify that the **Setup IBM HTTP Server Administration Server** check box is selected.
- HTTP Administration Port: `8008`
- Verify that the **Create a user ID for IBM HTTP Administration Server authentication** check box is selected.
- User ID: `ihsadmin`
- Password: `web1sphere`
- Confirm password: `web1sphere`



__ j. Click **Next**.

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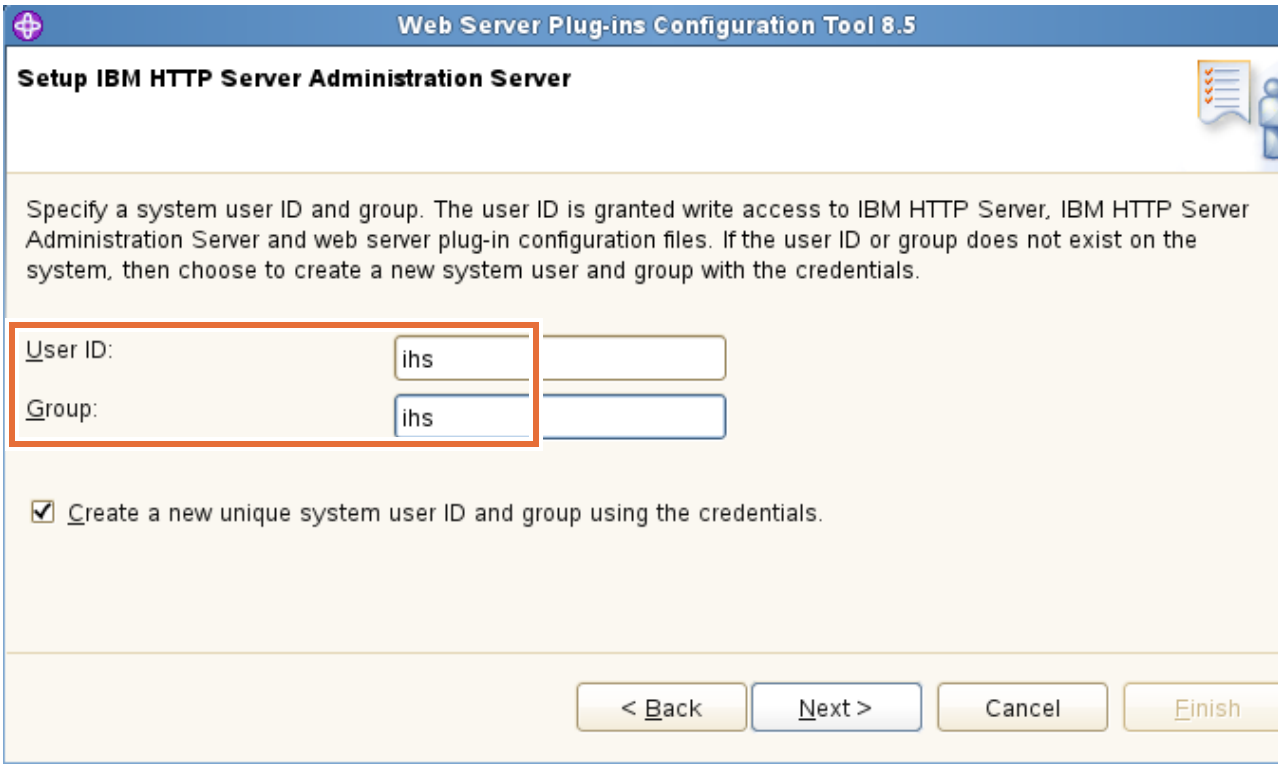
__ k. On the Setup IBM HTTP Server Administration Server panel, enter `ihs` in the **User ID** and **Group** fields.



__ l. Click **Next**.

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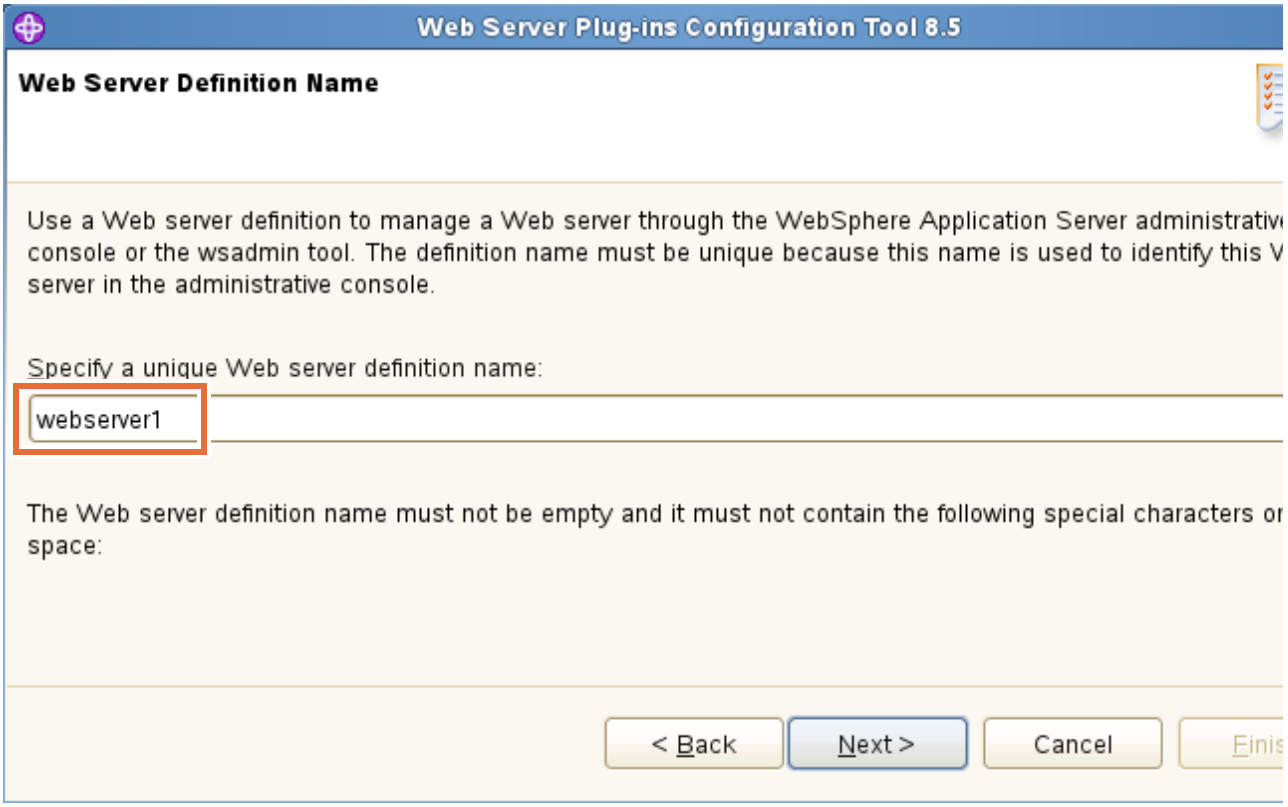
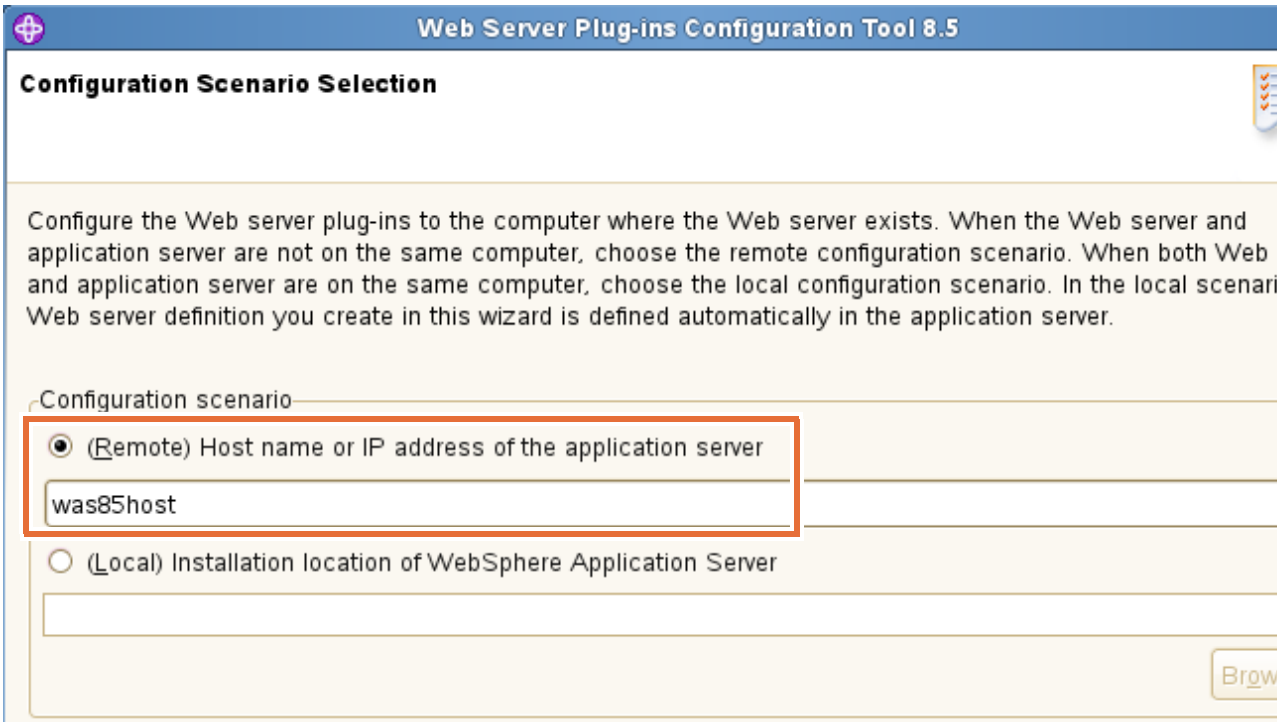
__ m. In the Web Server Definition Name panel, verify that the unique name for the web server is `webserver1` and click **Next**.



__ n. On the Configuration Scenario Selection panel, select the **Remote** option and enter the host name: `was85host`



__ o. Click **Next** to continue.

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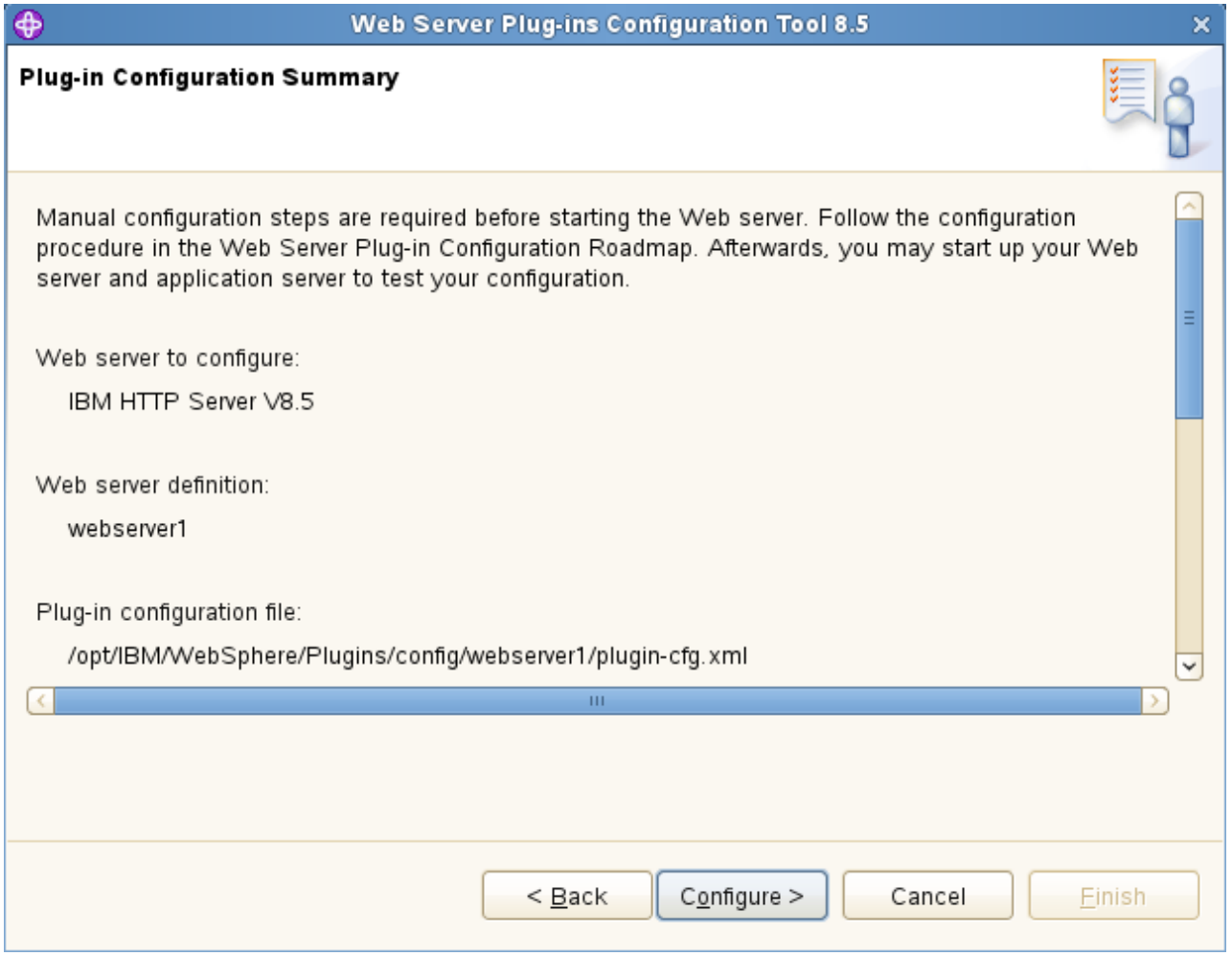
Note

For a **remote** configuration, the Web Server Plug-ins Configuration Tool configures the web server to use the `plugin-cfg.xml` file that is maintained on the web server machine. The file is in the `plugins_root/config/web_server_name` directory. This file requires periodic propagation. Propagation means copying the current `plugin-cfg.xml` file from the application server machine to replace the `plugins_root/config/web_server_name/plugin-cfg.xml` file.

For a **local** configuration, the Web Server Plug-ins Configuration Tool configures the web server to use the `plugin-cfg.xml` file that is within the application server profile. The stand-alone application server regenerates the `profile_root/config/cells/cell_name/nodes/web_server_name_node/servers/web_server_name/plugin-cfg.xml` file whenever a change occurs in the application server configuration that affects deployed applications.

__ p. On the Plug-in Configuration Summary panel, review your settings. Click **Configure**.



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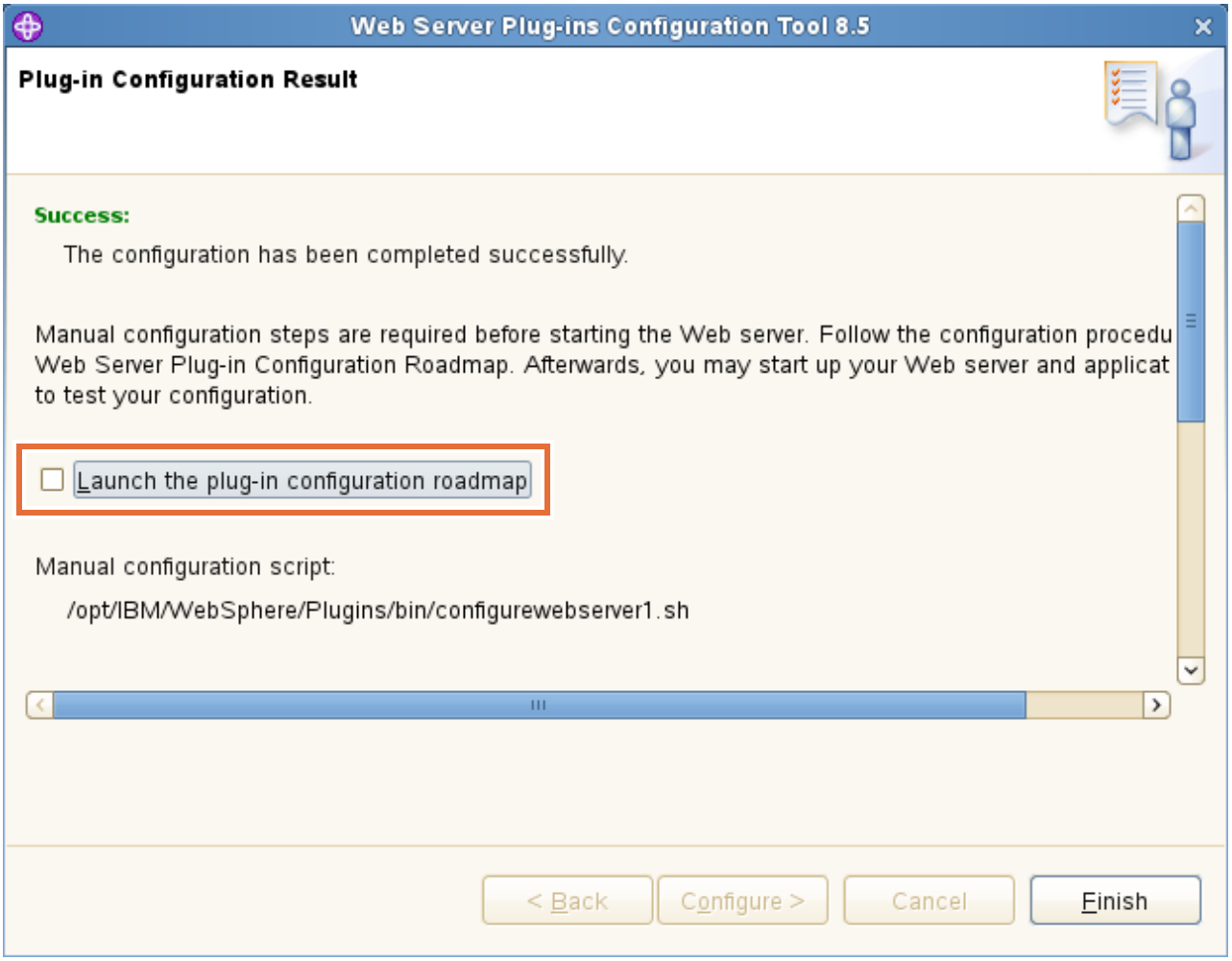
__ q. When the configuration is complete, the Plug-in Configuration Result panel displays the results. Clear the check box next to **Launch the plug-in configuration roadmap**.



__ r. Click **Finish**.

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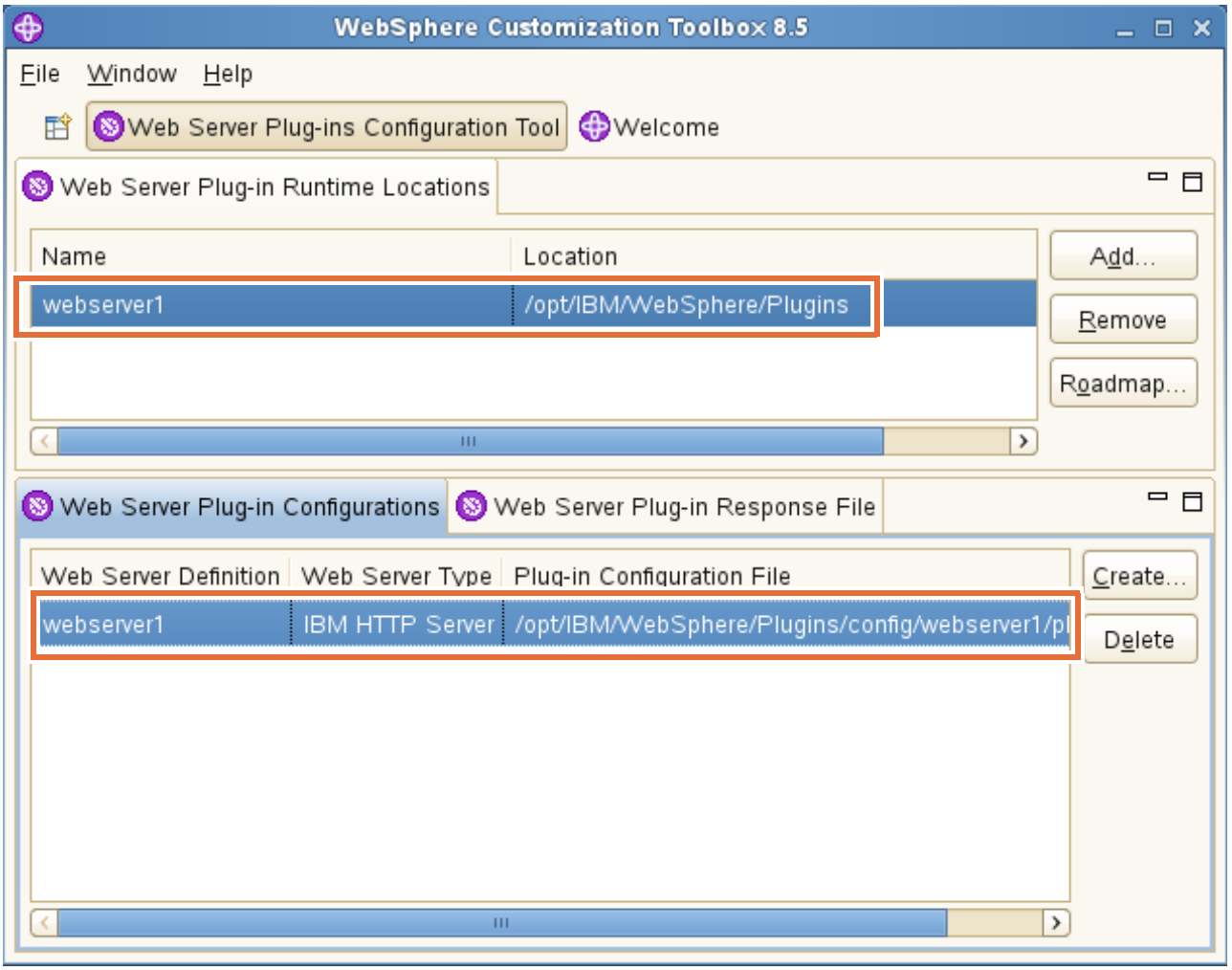
__ s. The configuration looks like the following screen capture:



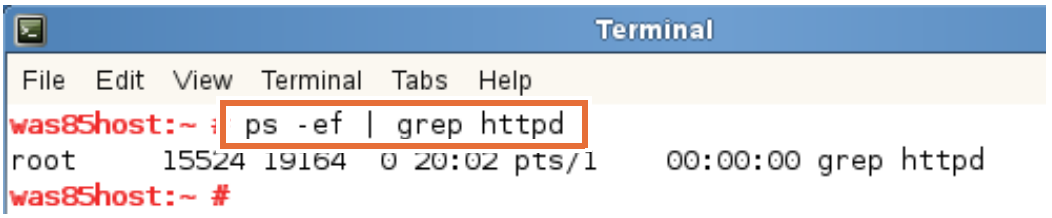
__ t. Exit the WebSphere Customization Toolbox.

Section 6: Confirm and test installation of IBM HTTP Server and plug-ins

__ 1. Verify that IBM HTTP Server is started.

__ a. From a terminal window, use the following command to check to see whether any `httpd` processes are running:

```
ps -ef | grep httpd
```



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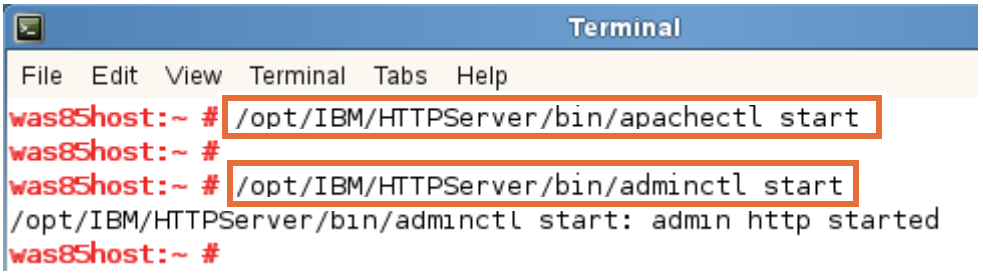
__ b. If no `httpd` processes are started, start both the HTTP Server and the HTTP Administrative Server with the following commands:

```
/opt/IBM/HTTPServer/bin/apachectl start
/opt/IBM/HTTPServer/bin/adminctl start
```



__ 2. Check the status of the IBM HTTP Server with a web browser.

__ a. Open a browser and enter the following URL:

`http://was85host`

__ b. If the IBM HTTP Server is started, the default IBM HTTP Server window opens.

__ c. Close the browser.

Section 7: Explore the IBM HTTP Server and plug-in installation

Now that IBM HTTP Server is installed, examine the directory structure and review what you installed.

__ 1. Explore the IBM HTTP Server directory.

__ a. Open a terminal window.

__ b. Navigate to the following directory:

`/opt/IBM/HTTPServer`

__ c. Review some of the subdirectories and their contents:

- `bin`: programs, scripts, and shared libraries
- `conf`: configuration files
- `logs`: trace, error, and log files
- `properties`: messages, versions

__ 2. Explore the WebSphere Application Server plug-ins directory.

__ a. Navigate to the following directory:

`/opt/IBM/WebSphere/Plugins`

__ b. Review some of the subdirectories and their contents:

- `bin`: programs, scripts, and DLLs
- `config`: configuration directory for plug-in configuration file for your web server
- `logs`: configuration and web server files

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- plugins: JAR files
- properties: messages, versions

Section 8: Check installation log files

A number of log files are created during the installation process. It is useful to check these files to verify that the installation completed successfully.

__ 1. Navigate to the installation logs directory under the IBM HTTP Server installation directory.

__ a. Navigate to the following directory:

/opt/IBM/HTTPServer/logs/postinstall

__ b. Using a text editor (such as gedit, vi, or emacs), open the postinstall.log file. This file records installation status messages.

__ c. Look for the log message "INSTCONFSUCCESS" at the end of the log to verify that the installation was successful.

__ d. Close the log file.

__ 2. Change to the Plugins directory under the WebSphere directory.

__ a. Navigate to the following directory:

/opt/IBM/WebSphere/Plugins/logs/config

__ b. Open the installIHSPlugin.log file. This log records WebSphere Application Server plug-ins installation status messages.

__ c. Look for the log message "Install complete" to verify that the installation of the plug-ins was successful.

__ d. Close the log file.

Section 9: Review configuration and error files

No further configuration is required for this lab exercise. However, more configuration of the IBM HTTP Server and administration server is possible through configuration files that are in the conf directory of the web server.

__ 1. Examine the configuration directory under the IBM HTTP Server installation directory.

__ a. Navigate to the following directory:

/opt/IBM/HTTPServer/conf

__ b. Open the httpd.conf file with an editor. This file contains configuration data for the IBM HTTP Server.

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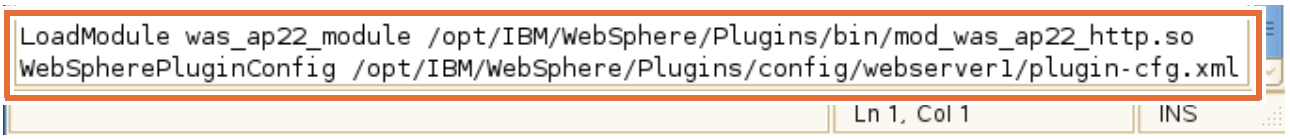
__ c. Scroll to the bottom of this file and notice the last two lines. They define the module that is loaded as the WebSphere plug-in and define the path to the `plugin-cfg.xml` file.



Information

The WebSpherePluginConfig line at the bottom of the `httpd.conf` is important as the entry is how the web server understands which configuration file to use for the WebSphere plug-in.

__ d. Close the file when you are finished with your review.

__ e. Notice the `httpd.conf.default` file. This file contains the original configuration parameters. It can be copied, if you want to restore or use the original configuration parameters.

__ f. Open the `admin.conf` file. This file contains configuration data for the administration server. Close the file when you are finished with your review.

__ g. Notice the `admin.conf.default` file. This file contains the original configuration parameters. It can be copied, if you want to restore or use the original administrative configuration parameters.

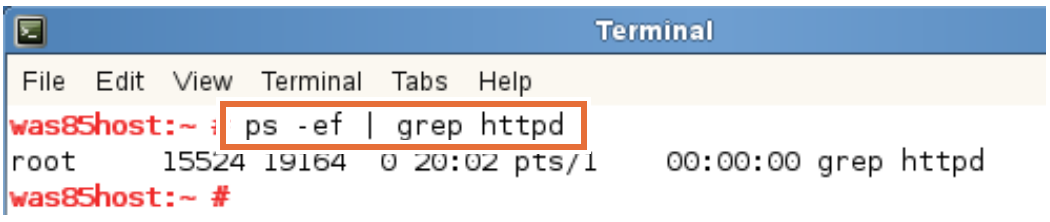
Section 10:Adding a web server as an IBM Installation Manager repository (optional)

IBM Installation Manager uses repositories to store product package files. Repositories can be located locally or remotely. In this part of the exercise, you configure a web server as a remote repository. Using a web server to host installation repositories can be useful. This approach enables enterprises to share single points of management for installation binary files.

__ 1. Verify that the web server is started.

__ a. From a terminal window, use the following command to check for the `httpd` process:

```
ps -ef | grep httpd
```



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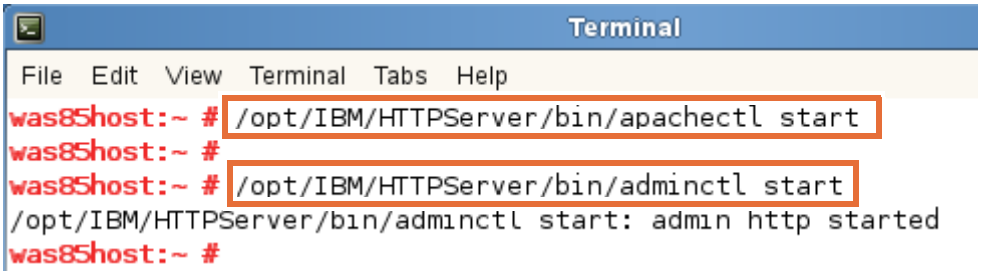
__ b. If no `httpd` processes are started, start both the HTTP Server and the HTTP Administrative Server with the following commands:

```
/opt/IBM/HTTPServer/bin/apachectl start
/opt/IBM/HTTPServer/bin/adminctl start
```



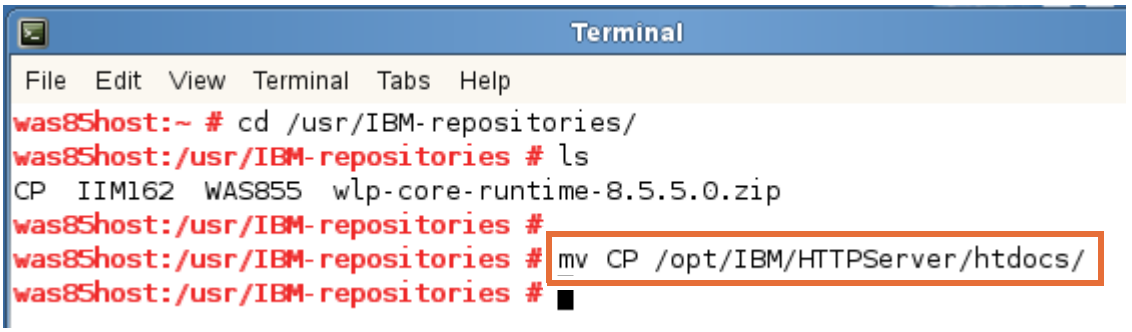
__ 2. Copy the Caching Proxy installation files to the web server.

__ a. In a terminal window, navigate to the following directory:

```
/usr/IBM-repositories
```

__ b. Move the CP (Caching Proxy) installation repository over to the `htdocs` directory for the web server:

```
mv CP /opt/IBM/HTTPServer/htdocs/
```



__ 3. Start IBM Installation Manager.

__ a. Open a terminal window and navigate to the following directory:

```
/opt/IBM/InstallationManager/eclipse/
```

__ b. Enter `./IBMIM` to start IBM Installation Manager.

__ 4. Add the web server as a repository.

__ a. Click **File > Preferences**.

__ b. Select **Repositories**.

__ c. Select each of the existing repositories and click **Remove Repository**.

__ d. Click **Add Repository**.

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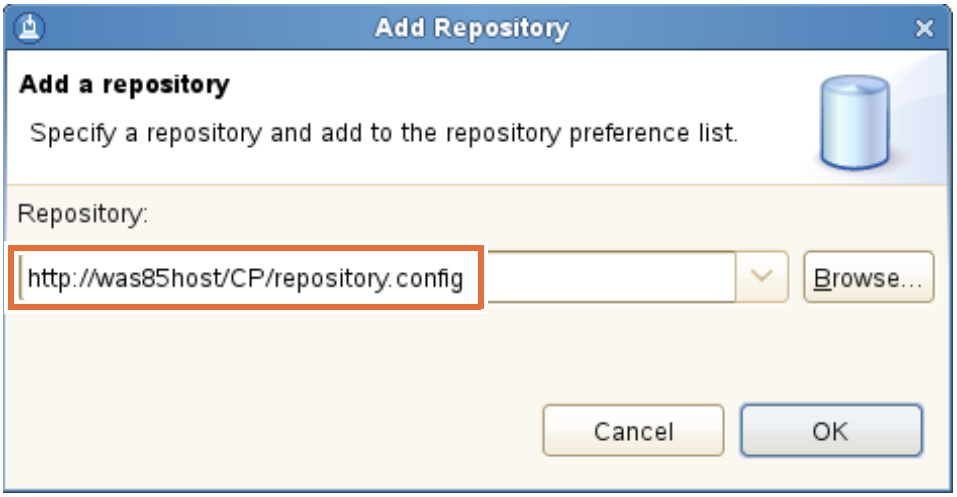
__ e. Enter `http://was85host/CP/repository.config` and click **OK**.



__ f. Click **Test Connections**. Verify that you receive a message that indicates the selected repositories are connected.

__ g. Click **OK**.

__ h. Click **OK** again.

Information

The new repository is now accessible not just though the local file system. It is also accessible to any client that has network access to the local web server.

This feature is significant as it allows administrators to share installation files through one central point on the network.

__ 5. Explore the Caching Proxy installation. In a normal environment, since the Caching Proxy package is added to the list of repositories, you can install it. For this exercise, you prove that the package is *ready* to install. You do not actually install the package since it is installed.

__ a. From the main IBM Installation Manager window, click **Install**.

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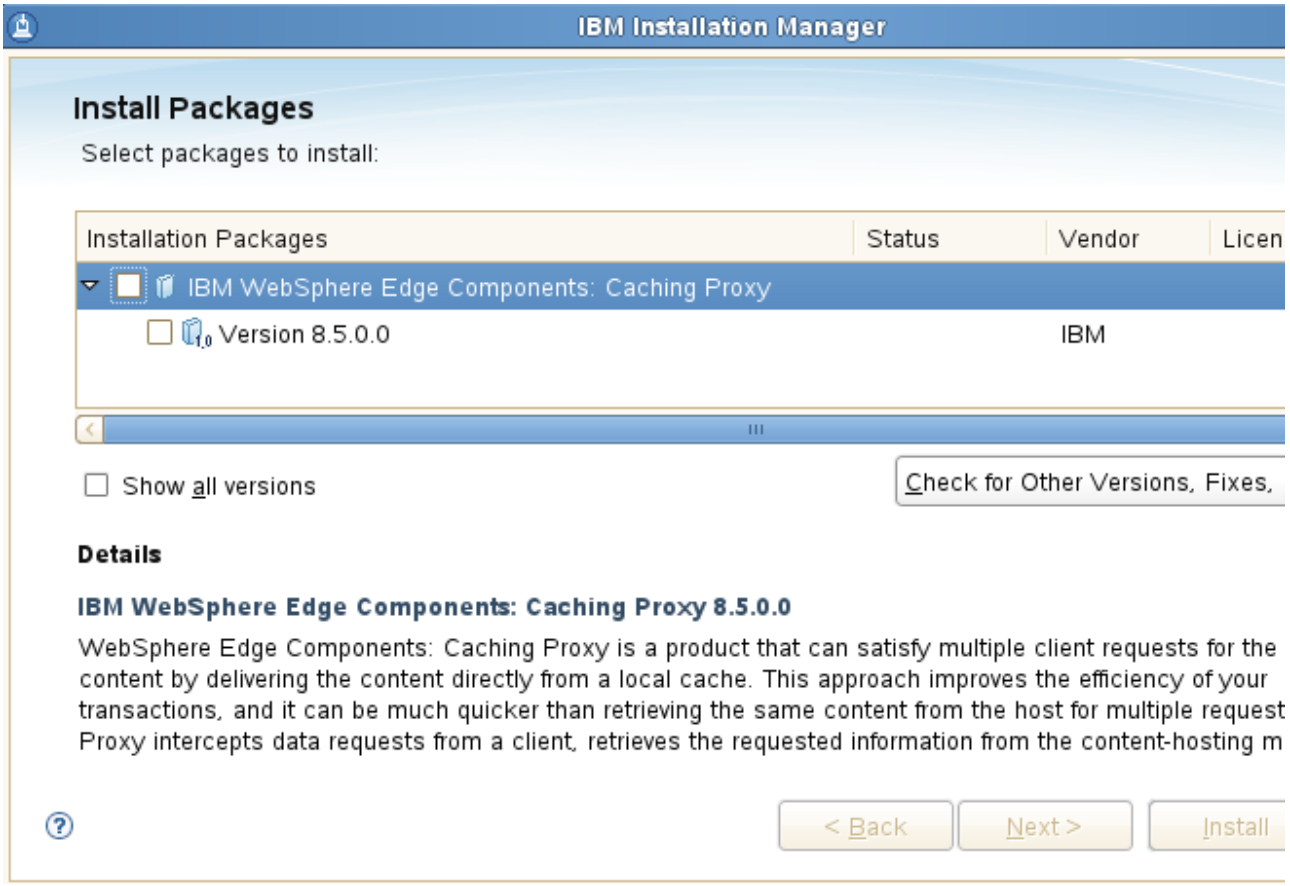
__ b. Although the local repositories are all removed, Installation Manager still displays the contents of the optional repository because the HTTP repository is defined and is being used.



__ c. Click **Cancel** to cancel the installation.

__ d. Close IBM Installation Manager.

Information

The IBM Packaging Utility was used to create the Caching Proxy repository. Not all repositories are usable through an HTTP transport without a minor conversion. The IBM Packaging Utility can modify repositories so that they are usable over an HTTP connection.

The IBM Packaging Utility can also be used to split or join existing repositories for your specific needs. For example, customers removed portions of repositories for unnecessary operating systems. In other cases, they joined repositories to include all the packages for specific environments.

End of exercise

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Exercise review and wrap-up

In the first part of the exercise, you installed IBM HTTP Server with Installation Manager and confirmed the installation. In the second part of the exercise, you installed the Web Server Plug-ins for WebSphere Application Server. Finally, you examined the installed directories, log files, and configuration files for IBM HTTP Server and plug-ins.

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