Installing the Advanced Edition using IBM HTTP Server and Informix 9.21 on Solaris

The steps that follow describe how to install a configuration of WebSphere Application Server Advanced Edition that uses the following--

- Solaris 7 or 8
- Java 2 Software Development Kit (SDK) 1.3 (version supplied with WebSphere Application Server)
- IBM HTTP Server 1.3.19
- Informix 9.21
- A single node

See the WebSphere Application Server Supported Hardware, Software, and APIs Web site at www.ibm.com/software/webservers/appserv/doc/latest/prereq.html to learn which products and fix levels are supported for your level of WebSphere Application Server.

Steps for installation

Deciding which steps to follow
Installing Informix 9.21
Configuring Informix 9.21 for use with WebSphere Application Server
Installing WebSphere Application Server--**Custom Installation** option
Testing the installation
Testing with an enterprise bean

Deciding which steps to follow

First, check the WebSphere Application Server Supported Hardware, Software, and APIs Web site at www.ibm.com/software/webservers/appserv/doc/latest/prereq.html to ensure that you have the correct prerequisites, including operating system patches. WebSphere Application Server comes with the Java 2 SDK and IBM HTTP Server. If you have not already done so, install Informix and then obtain the product CD-ROM for WebSphere Application Server or download the product from the Web site www.ibm.com/software/webservers/appserv/download.html. Information on installation follows:

1. Installing Informix 9.21
2. Configuring Informix 9.21 for use with WebSphere Application Server
3. Installing WebSphere Application Server--**Custom Installation** option
4. Testing the installation
5. Testing with an enterprise bean

Installing Informix 9.21

This article describes how to install the following on a local Solaris SPARC machine:

- Informix Dynamic Server
- Informix Type 4 JDBC Driver (required to use Informix with WebSphere Application Server)

The instructions assume the following:

- You do not have a previous version of Informix already installed on your machine. If you have a previous version of Informix installed, you might need to migrate databases, depending on the version installed. In this case, do not follow these instructions. Instead, refer to Informix product documentation on the Informix Dynamic Server Online Documentation Web site at www.informix.com/answers/english/pids92.htm.
- Your Informix database server will be located on the same machine as WebSphere Application Server. This configuration and the use of default settings documented in these instructions are appropriate only for development environments.
- You have checked the Informix product documentation on the Informix Dynamic Server Online Documentation Web site at www.informix.com/answers/english/pids92.htm to verify that you have enough memory and disk space for your installation.

Note: Install Informix and the JDBC driver before installing WebSphere Application Server. Also, when you later install WebSphere Application Server with the GUI installer, in the Database Options window, you will be instructed to enter the path of the directory containing the database software for the **DB Home** field. This value does not work if you are using Informix as your administrative database. If you are using Informix as your administrative database, enter the path of the directory containing the Informix Type 4 JDBC driver in the **DB Home** field, rather than the path to the directory containing the Informix database software. See the section Installing the Informix Type 4 JDBC Driver for information on how to install this driver.

Installing Informix

The Informix software CD-ROM contains the files necessary to install and configure Informix on a local Solaris SPARC machine.

Perform the following steps to install Informix from the product CD-ROM:

1. Ensure that you are logged into the machine with superuser (root) privileges.
2. Ensure that the DISPLAY and TERM environment variables are set correctly for your environment.
3. On the Informix Installation Resource Online Documentation Web site at www.informix.com/informix/resource/ids2000.htm, review the notes specific to your machine type. This information documents changes that the Informix software will make to particular kernel parameter values on your machine and lists the operating system patches needed to run Informix on your system. It is recommended that you review the kernel parameter settings and patch recommendations with your system administrator to ensure that they do not conflict with existing settings needed for other software on your system. To patch your operating system, refer to the documentation for your Solaris operating system.
4. Use operating system utilities to create the group informix and the user informix (who owns the Informix software after installation) by doing the following:
   a. Start the **admintool** utility, as follows:

      ```
      # admintool
      ```
   b. In the Admintool window, click **Browse > Groups**. The Admintool:Groups window opens.
   c. In the Admintool:Groups window, click **Edit > Add**. The Admintool:Add Group window opens.
   d. In the Admintool:Add Group window, do the following:
      1. In the **Group Name** field, type informix.
      2. Ensure that the default value for the **Group ID** field is greater than or equal to 100. If it is not, assign a Group ID greater than or equal to 100 to the group informix.
      3. In the **Members List** field, type root and click **OK**.
   e. In the Admintool:Groups window, click **Browse > Users**. The Admintool:Users window opens.
   f. In the Admintool:Users window, click **Edit > Add**. The Admintool:Add User window opens.
   g. In the Admintool:Add User window, do the following:
      1. In the **User Name** field, type informix.
      2. Ensure that the default value for the **User ID** field is greater than or equal to 100. If it is not, assign a User ID greater than or equal to 100 to the user informix.
      3. In the **Primary Group** field, type informix.
      4. Select the desired user login shell by clicking the button beside the **Login Shell** field, and then clicking the desired shell. These instructions assume that the Bourne shell is the login shell for the user informix. If you indicate a different shell for the user informix, change the shell-specific instructions within this article accordingly.
      5. Ensure that the radio button beside the **Create Home Dir** field is selected.
      6. In the **Path** field, type the desired home directory for the user informix.
      7. Accept the default values for the other fields and click **OK**.
   h. Exit from the **admintool** utility.
5. Ensure that the home directory for the user informix is owned by the user informix and the group informix.
6. Insert the Informix CD-ROM and, if necessary, mount the CD-ROM drive. In most Solaris systems, the Volume Management daemon (**vold**) mounts the CD automatically and immediately, as well as each time the machine is restarted. If the **vold** process is not running on your machine, see your Solaris documentation for instructions on how to mount the CD-ROM drive.

   The following steps assume that the CD-ROM is mounted at /cdrom.
7. Log in as the user informix. Performing this action places you automatically in the home directory of this user. The command prompt changes in appearance to indicate the change in your login identity.

   ```
   # su - informix
   ```
8. Ensure that the DISPLAY and TERM environment variables are still set properly.

9. Set the user mask value to `0` by entering the following command:

    ```
    $ umask 0
    ```

10. Set the terminal erase key to the backspace key by entering the following command:

    ```
    $ stty erase CTRL-h
    ```

11. Add the following information to the .profile file in the home directory for the user informix. You might need to create this file if it does not already exist. The variable *informix_installation_directory* specifies the location in which you want to install the Informix software. For this sample installation, use the home directory of the user informix. The *informix_installation_directory* must be owned by the user informix and group informix. The `onconfig.file` value is the name of a configuration file that you will create during configuration of the Informix server. The `was40` value is the name of your database server.

    ```
    #---------------------------------
    # Informix environment setup
    #---------------------------------
    #
    INFORMIXDIR=informix_installation_directory
    export INFORMIXDIR
    PATH=$INFORMIXDIR/bin:$PATH
    export PATH
    LD_LIBRARY_PATH=$INFORMIXDIR/lib:$LD_LIBRARY_PATH
    export LD_LIBRARY_PATH
    ONCONFIG=onconfig.file
    export ONCONFIG
    INFORMIXSERVER=was40
    export INFORMIXSERVER
    SQLEXEC=$INFORMIXDIR/lib/sqlrm
    export SQLEXEC
    echo 'The Informix environment is set'
    ```

12. Log out and then log in as the user informix to enable your changes to take effect.

13. Ensure that you are in the user informix home directory. For this sample installation, this directory is also the installation directory for the Informix software called *informix_installation_directory*.

14. Untar the file IDS.TAR, which is located in the directory /cdrom/cdrom0/IDS_2000 on the Informix CD-ROM, by entering the following command:

    ```
    $ tar xvf /cdrom/cdrom0/IDS_2000/IDS.TAR
    ```

15. Enter the following command to begin the installation process:

    ```
    $ ./installserver
    ```

16. Information about the prerequisites for installation is displayed. Press Enter to continue or the interrupt key (usually CTRL-C or DEL) to cancel the installation. For this example installation, press Enter.

17. You are prompted to enter the product serial number. In most cases, this number is supplied with the Informix software. The serial number consists of three uppercase letters and the symbol #, followed by one uppercase letter and six digits. Type the serial number at the prompt and press Enter.

18. You are prompted to enter the product serial number key. In most cases, this key is supplied with the Informix software. The serial number key consists of six uppercase letters. Type the serial number key at the prompt and press Enter. Information about your product licensing is displayed.

19. Press Enter to continue or the interrupt key (usually CTRL-C or DEL) to cancel. For this example installation, press Enter. Text describing the progress of the Informix installation is displayed.

20. At this point in the installation, you are prompted to run the script called **RUN_AS_ROOT.server**, which is located in the *informix_installation_directory*. This configuration script sets the necessary file permissions for Informix products. To run this script, perform the following steps:

    a. Log in as the user root, as follows:

       ```
       $ su - root
       ```

    b. Execute the **RUN_AS_ROOT.server** script by entering the following commands:

       ```
       # cd informix_installation_directory
       # ./RUN_AS_ROOT.server
       ```

       After the script runs, installation is complete.

21. Check the Informix product documentation on the Informix Dynamic Server Online Documentation Web site at www.informix.com/answers/english/pids92.htm to verify that your environment variables are set to optimize your particular installation.

22. As the user root, unmount any CD-ROM before removing it from the CD-ROM drive by entering the following command:

    ```
    # umount cdrom/cdrom0
    ```

You can then eject the CD-ROM.

Installing the Informix Type 4 JDBC Driver

In order to use Informix with WebSphere Application Server, you must install the Informix Type 4 JDBC Driver at level 2.20 JC2 or higher. The driver supplied with your Informix software might not be at the correct level. The correct driver is available from the Informix Software Product Download Web site at www.informix.com/evaluate/index.html.

Perform the following steps to download and install the driver:

1. Ensure that you are logged into the machine with superuser (root) privileges.
2. Go to the Informix Software Product Download Web site at www.informix.com/evaluate/index.html and click the entry **JDBC/EMBEDDED SQLJ 2.20.JC2 for ALL MAKERS ALL VERSIONS ALL**.
3. Log in to the site or, if you haven't already, create a login identity and then log in. The License Agreement window opens.
4. Read and fill out the appropriate fields in the licensing agreement and click **I Agree** if you accept it. The Informix Software Evaluation Download Site window opens.
5. Note the serial number and key value listed in this window. You will enter these values during installation of the driver.
6. Download the file to a temporary directory on your machine by clicking **Download Now!**.
7. Go to the directory on your machine containing the downloaded file.
8. Unzip the file to extract the Informix Java installation program called **setup.class**.
9. Create a directory into which to install the driver (for instance, /opt/informix/JDBC). This directory must not be the same as the temporary directory holding the downloaded software.
10. Ensure you are in the directory holding the downloaded software and enter the following command to begin the installation:

    ```
    # java setup
    ```
11. Click **Next** to pass the Welcome page. The Serial Number and Key window opens.
12. In the **Serial Number** field, type the serial number that you noted when downloading the file. In the **Key** field, type the key value that you noted when downloading the file. Then click **Next**. The README Information window opens.
13. After reading the information in the README, click **Next**. The Agreement for Software License window opens.
14. Read the licensing agreement. If you agree to the conditions, click the radio button beside the field **Accept all terms of the license** and then click **Next**. The Choose Destination Directory window opens.
15. In the **Primary destination directory** field, type the name of the directory into which you want to install the driver. Then click **Next** to begin the installation. The Installation Complete window opens when the installation process has completed.
16. Click **Finish**.
17. Proceed to the article "Configuring Informix 9.21 for use with WebSphere Application Server" to configure Informix for use with WebSphere Application Server.

Configuring Informix 9.21 for use with WebSphere Application Server

This article describes how to do the following:

- Create and configure an Informix server
- Verify the operation of an Informix server
- Create and configure a database named was40, which is used by WebSphere Application Server

The procedures in this article assume that you have installed Informix and the Informix Type 4 JDBC Driver.

Creating and configuring an Informix server

Create and configure an Informix server by performing the following steps:

1. Log in as the user informix. Performing this action places you automatically in the home directory of this user. The command prompt changes in appearance to indicate the change in your login identity.

   ```
   # su - informix
   ```
2. Ensure that the DISPLAY and TERM environment variables are set correctly for your environment.
3. Ensure that you are in the directory containing the Informix software (which is referred to as the *informix_installation_directory*). This sample installation assumes that the home directory of the user informix is also the *informix_installation_directory*.

4. Enter the following commands to create a file called work/data/root_chunk and grant the appropriate permissions to it. This file holds the root dbspace.

   Note: The directory and file names and permission levels shown in this example might not be appropriate for your system. Also, additional dbspaces might be needed for your installation. Check the Informix documentation and consult with your system administrator for more information.

   ```
   $ mkdir work
   $ chmod 774 work
   $ cd work
   $ mkdir data
   $ chmod 774 data
   $ cd data
   $ cat /dev/null > root_chunk
   $ chmod 774 root_chunk
   ```

5. Change to the directory *informix_installation_directory*/etc by entering the following command:

   ```
   $ cd informix_installation_directory/etc
   ```

6. Create the database configuration file by copying the configuration file template called onconfig.std and giving it another name (onconfig.file, for example), as follows:

   ```
   $ cp onconfig.std onconfig.file
   ```

7. Open the file you created (onconfig.file, for example) in a text editor and make the following changes:

   ```
   ROOTPATH            informix_installation_directory/work/data/root_chunk
   ROOTSIZE            10000
   MSGPATH             informix_installation_directory/online.log
   ALARMPROGRAM        informix_installation_directory/etc/log_full.sh
   SERVERNUM           1
   DBSERVERNAME        was40
   ```

   Save your changes and close the text editor.

8. Create a file called sqlhosts by copying the sqlhosts.std file template and giving it the name sqlhosts, as follows:

   ```
   $ cp sqlhosts.std sqlhosts
   ```

9. Open the file *informix_installation_directory*/etc/sqlhosts in a text editor and add the following line:

   ```
   was40     onsoctcp        hostname        was40
   ```

   In this example:
   - ❍ the first `was40` is the Informix instance name.
   - ❍ `onsoctcp` is the connection type. In this example, the connection is set for a database server using sockets with the TCP/IP network communications protocol. This value can differ based on your system; see the Informix documentation for possible values.
   - ❍ `hostname` is your host name.
   - ❍ the second `was40` is the service name. It must match the service name that you enter in the /etc/services file in Step 12.

   Save your changes and close the text editor.

10. Log in as the user root, as follows:

    ```
    $ su - root
    ```

11. Change to the /etc directory, as follows:

    ```
    # cd /etc
    ```

12. Open the file /etc/services in a text editor. Add an entry to this file for the Informix server called `was40`, as follows:

    ```
    was40     17011/tcp       # Informix server
    ```

    The service name (was40, for example) must match the service name that you entered in the sqlhosts file in Step 9. The port number (17011, for example) must be appropriate for your system. Save your changes and close the text editor.

13. Log in as the user informix. Performing this action places you automatically in the home directory of this user. The command prompt changes in appearance to indicate the change in your login identity.

    ```
    # su - informix
    ```

14. Start the server by using the following command:

    ```
    $ oninit -i
    ```

    A message warns you that if you proceed, any existing Informix databases will not be accessible. When you specify the **-i** option,

you are initializing the disk space. This action destroys all of the existing data in the database server. Initialize disk space only when you are starting a new database server.

15. Type `y` and press Enter to continue.

When you want to take the server offline, enter the following command:

```
$ onmode -k
```

To restart the server, enter the **oninit** command without the **-i** option.

Verifying the operation of Informix

To demonstrate that Informix is functioning correctly, perform the following steps:

1. Log in as the user informix. Performing this action places you automatically in the home directory of this user. The command prompt changes in appearance to indicate the change in your login identity.

2. Ensure that your DISPLAY and TERM environment variables are set properly.

3. Change to the /tmp directory, as follows:

```
$ cd /tmp
```

4. Execute the **dbaccessdemo** script to create the sample database called stores_demo by entering the following command:

```
$ dbaccessdemo
```

A message informs you that the sample database has been created and asks whether you want to copy the examples into your current directory.

5. Type `y` and press Enter.

6. To test access to the stores_demo database, enter the following command:

```
$ dbaccess stores_demo
```

If the **dbaccess** utility menu appears with the stores_demo database selected, as displayed in the following screen output, Informix is operating correctly.

```
DBACCESS:   Query-language  Connection  Database  Table  Session  Exit
Use SQL query language.

---------------------- stores_demo@was40 ------ Press CTRL-W for Help --------
```

7. To close the database and exit from the **dbaccess** utility, do the following:

a. Highlight the **Database** option and press Enter. Use the arrow keys to move among and highlight the various menu options.

b. Highlight the **Close** option and press Enter.

c. Highlight the **Exit** option and press Enter.

d. Highlight the **Exit** option and press Enter.

Creating the was40 database

Create a database called `was40` and configure it for use with WebSphere Application Server by performing the following steps:

1. Log in as the user informix. Performing this action places you automatically in the home directory of this user. The command prompt changes in appearance to indicate the change in your login identity.

2. Ensure that your DISPLAY and TERM environment variables are set properly.

3. Use the **dbaccess** command to start the **dbaccess** utility, as follows:

```
$ dbaccess
```

The **dbaccess** menu opens. Use the arrow keys to move among and highlight the various menu options.

4. To create the database called `was40` and set up buffered logging, do the following:

a. Highlight the **Database** option and press Enter.

b. Highlight the **Create** option and press Enter.

c. At the prompt `CREATE DATABASE >>`, enter the database name `was40` and press Enter.

d. Highlight the **Log** option and press Enter.

e. Highlight the **Buffered_log** option and press Enter.

f. Highlight the **Exit** option and press Enter.

5. To select the database `was40`, do the following:

   a. Highlight the **Create-new-database** option and press Enter.

   b. Highlight the **Select** option and press Enter.

   c. Highlight the database `was40@was40` and press Enter.

   d. Highlight the **Exit** option and press Enter.

6. To grant access to the database `was40` to the user root, do the following:

   a. Highlight the **Query-language** option and press Enter.

   b. Ensure that the **New** option is highlighted and press Enter.

   c. Type the following:

      `grant resource to root`

   d. Press Escape (ESC).

   e. Ensure that the **Run** option is highlighted and press Enter. The message `Permission granted` alerts you that the procedure was performed successfully.

   f. Highlight the **Exit** option and press Enter.

   g. Highlight the **Exit** option and press Enter.

Installing WebSphere Application Server 4.0--Custom Installation option

This article describes how to install WebSphere Application Server on a local Solaris SPARC machine. These instructions assume the following:

- Your machine has enough memory and disk space for your installation. See the WebSphere Application Server Supported Hardware, Software, and APIs Web site at www.ibm.com/software/webservers/appserv/doc/latest/prereq.html for the requirements.

- You do not have a previous version of WebSphere Application Server already installed. If you do have a previous version of WebSphere Application Server installed, do not follow these instructions. Instead, refer to the article "Migration overview."

- You have installed and configured your database.

- If you are using IBM HTTP Server as your Web server, you will install it at the same time and onto the same node as you install WebSphere Application Server. If you are using another supported Web server with WebSphere Application Server, you have already installed it onto the same node as WebSphere Application Server.

  Note: You must purchase and install any Web server except IBM HTTP Server *before* you install WebSphere Application Server. IBM HTTP Server is supplied with WebSphere Application Server and can be installed automatically during installation of WebSphere Application Server.

To install WebSphere Application Server, do the following:

1. Ensure that you are logged onto the host machine with superuser (root) privileges.

2. If a preexisting Web server on your system is running, stop the Web server. If you plan to install IBM HTTP Server 1.3.19 as part of the WebSphere Application Server installation and a version of IBM HTTP Server prior to 1.3.19 is already installed on your system, you must uninstall it in order for the WebSphere Application Server installation program to successfully install IBM HTTP Server 1.3.19.

3. Insert the WebSphere Application Server CD-ROM and, if necessary, mount the CD-ROM drive. (On most Solaris systems, the Volume Management daemon (**vold**) mounts the CD-ROM automatically and immediately, as well as each time the machine is restarted. If the **vold** process is not running on the local machine, see your Solaris documentation for instructions on how to mount the CD-ROM drive.) The following steps assume that the CD-ROM drive is mounted at /cdrom.

4. Navigate to the correct directory on the WebSphere Application Server CD-ROM by entering the following command:

   `# cd /cdrom/cdrom0/sun`

5. Ensure that the directory /usr/ucb exists in the PATH environment variable for the *root* login. If it does not, you must edit the **install.sh** script. To edit this script, do the following:

   a. Copy the **install.sh** script from the /cdrom/cdrom0/sun directory to the /tmp directory on the machine on which you will install WebSphere Application Server.

   b. Open this script in a text editor and find the line `USERNAME=`/usr/ucb/whoami``.

   c. Add the following line *before* the line `USERNAME=`/usr/ucb/whoami``:

      `export PATH = $PATH:/usr/ucb`

   d. Save the edited **install.sh** script.

6. If the supported Web server or database you plan to use with WebSphere Application Server is newer than the version currently required by WebSphere Application Server, you must update the prereq.properties file or disable the prerequisite checking functionality before installing WebSphere Application Server.

   To obtain an updated prereq.properties file, download the latest version from the WebSphere Application Server Tools Web site at www.ibm.com/software/webservers/appserv/tools.html. Ensure that the updated prereq.properties file is downloaded or copied into the local /tmp directory.

   To disable the prerequisite checking functionality, perform the following steps:

   a. Copy the prereq.properties file from the /cdrom/cdrom0/sun directory to the /tmp directory on the machine on which you plan to install WebSphere Application Server.

   b. Open the prereq.properties file in a text editor and disable prerequisite checking for an individual component by changing the value of the specific key from `1` to `0`.

   c. Save the edited prereq.properties file.

7. Run the installation script in one of following ways depending on the actions you have taken in Step 5 and Step 6:

   ❍ If you *have* edited the **install.sh** script as detailed in Step 5 but have *not* downloaded a new prereq.properties file or disabled prerequisite checking functionality as detailed in Step 6, run the installation script file by entering the following commands:

   ```
   # cd /cdrom/cdrom0/sun
   # /tmp/install.sh
   ```

   ❍ If you *have* edited the **install.sh** script as detailed in Step 5 and *have* downloaded a new prereq.properties file or disabled the prerequisite checking functionality as detailed in Step 6, run the installation script file by entering the following commands:

   ```
   # cd /cdrom/cdrom0/sun
   # /tmp/install.sh -prereqfile /tmp/prereq.properties
   ```

   ❍ If you have *not* edited the **install.sh** script as detailed in Step 5 and have *not* downloaded a new prereq.properties file or disabled the prerequisite checking functionality as detailed in Step 6, run the installation script file by entering the following command:

   ```
   # /cdrom/cdrom0/sun/install.sh
   ```

   ❍ If you have *not* edited the **install.sh** script as detailed in Step 5 and *have* downloaded a new prereq.properties file or disabled the prerequisite checking functionality as detailed in Step 6, run the installation script file by entering the following command:

   ```
   # /cdrom/cdrom0/sun/install.sh -prereqfile /tmp/prereq.properties
   ```

8. Click **Next** to pass the introductory page.

9. The Install Options window opens. Select **Custom Installation** and then click **Next**.

10. The Choose Application Server Components window opens. Select the components you want to install and deselect the components you do not want to install. Note the following information:

    ❍ The Java 2 Software Development Kit (SDK) is installed by default.

    ❍ The **Server**, **Admin**, **Samples**, **Application Assembly and Deployment Tools**, **IBM HTTP Server 1.3.19**, and **WebServer Plugins** components are selected for installation by default.

    ❍ If you plan to use WebSphere Application Server with IBM HTTP Server, ensure that the **IBM HTTP Server 1.3.19** and **Web Server Plugins** options are selected.

    ❍ If you plan to use WebSphere Application Server with a different supported Web server, ensure that the **Web Server Plugins** option is selected.

    Note: No plug-ins are required to launch the Application Server or the administrative console. However, for production applications, you will not be able to serve servlets without having installed a supported Web server and corresponding Web server plug-in. For non-production applications, you can use the internal HTTP transport system to serve servlets without installing a Web server plug-in by using the internal HTTP transport port `9080`. For example, to serve the sample snoop servlet by using the internal HTTP transport, enter the URL

    ```
    http://machine_name:9080/servlet/snoop
    ```

    In this command, *machine_name* represents the name of the machine on which WebSphere Application Server is running. The internal HTTP transport mechanism is not designed for use in a production environment.

    ❍ If you plan to install the Web server plug-in for IBM HTTP Server, you must select the **IBM HTTP Server 1.3.19** option, or have it already installed on the machine.

    ❍ These instructions assume that you are installing all of the components.

    Click **Next** to continue.

11. A window opens that lets you select the plug-in. In this window, do the following:

    a. Select the plug-in option for your Web server.

    b. Click **Next**.

    Only IBM HTTP Server 1.3.19 is provided with WebSphere Application Server. You must separately purchase and install the other supported Web servers.

12. The Database Options window opens. From the information that is displayed, do the following:

    a. For **Database Type**, select your database from the drop-down list.

    b. Ensure that **Remote DB** is not selected. For this example, you will install WebSphere Application Server on the same node as the database.

    c. For **Database Name (Database SID)**, enter the name of the database to use. This value is the name of the database that you created when you configured your database (for instance, **orcl** for Oracle or **was40** for DB2 UDB).

    d. For **DB Home**, specify the path of the directory containing the database software.

    e. For **DB URL**, specify the URL for accessing the database. In most cases, accept the default. (If you are using DB2, Sybase, Merant, or Informix, this field cannot be edited.)

    f. For **Server Name**, specify the name of the host machine on which the database is located. In most cases, accept the default. (Do not edit this parameter if you are using DB2. To edit this parameter when using another database type, the database must be installed remotely and you must have clicked the **Remote DB** button.)

    g. For **Port Number**, specify the port number of the host machine on which the database is located. In most cases, accept the default. (Do not edit this parameter if you are using DB2. To edit this parameter when using another database type, the database must be installed remotely and you must have clicked the **Remote DB** button.)

    h. For **Database User ID**, specify the database user name. Ensure that you specify the same user name that you specified when configuring your database for use with WebSphere Application Server.

    i. For **Database Password**, enter the database password. Ensure that you specify the same password that you specified when installing your database. If you are using DB2 UDB, your password must be eight or fewer characters in length. If you are using Sybase, your password must be six or more characters in length.

    j. Click **Next**.

13. The Select Destination Directory window opens. Specify the directory into which you want to install WebSphere Application Server. You can either accept the default destination directory or specify a different one by typing the full pathname or by clicking **Browse**. Note that if you've selected IBM HTTP Server for installation, you cannot modify its destination directory. Click **Next** to continue.

14. A window opens that lists the options you have selected to install. Click **Install** to begin the installation.

15. If you are installing IBM HTTP Server automatically at the same time as you install WebSphere Application Server, a window opens, prompting you for the full pathname and file name of the configuration file for the IBM HTTP Server, httpd.conf. Type the location of this file and click **OK**.

16. The Setup Complete window opens. To view the ReadMe file, ensure that **Yes, I want to view the ReadMe File** is selected and click **Finish**; the ReadMe file is displayed in a default browser window. To view the ReadMe file at a later time, deselect **Yes, I want to view the ReadMe File** and click **Finish** to exit from the WebSphere Application Server installation program.

17. The WebSphere Application Server - First Steps window opens. You can use the GUI to access product information in the InfoCenter, start the administrative server, launch the administrative console, or launch the application assembly tool. Because you must first start and possibly configure your Web server, close this window for now. If you later want to access the First Steps window, do the following:

    a. Navigate to the directory containing the **firststeps.sh** script (by default, /opt/WebSphere/AppServer/bin) by using the **cd** command, as follows:

    ```
    # cd /opt/WebSphere/AppServer/bin
    ```

    b. Execute the **firststeps.sh** script, as follows:

    ```
    # ./firststeps.sh
    ```

18. Unmount the CD-ROM by entering the following command:
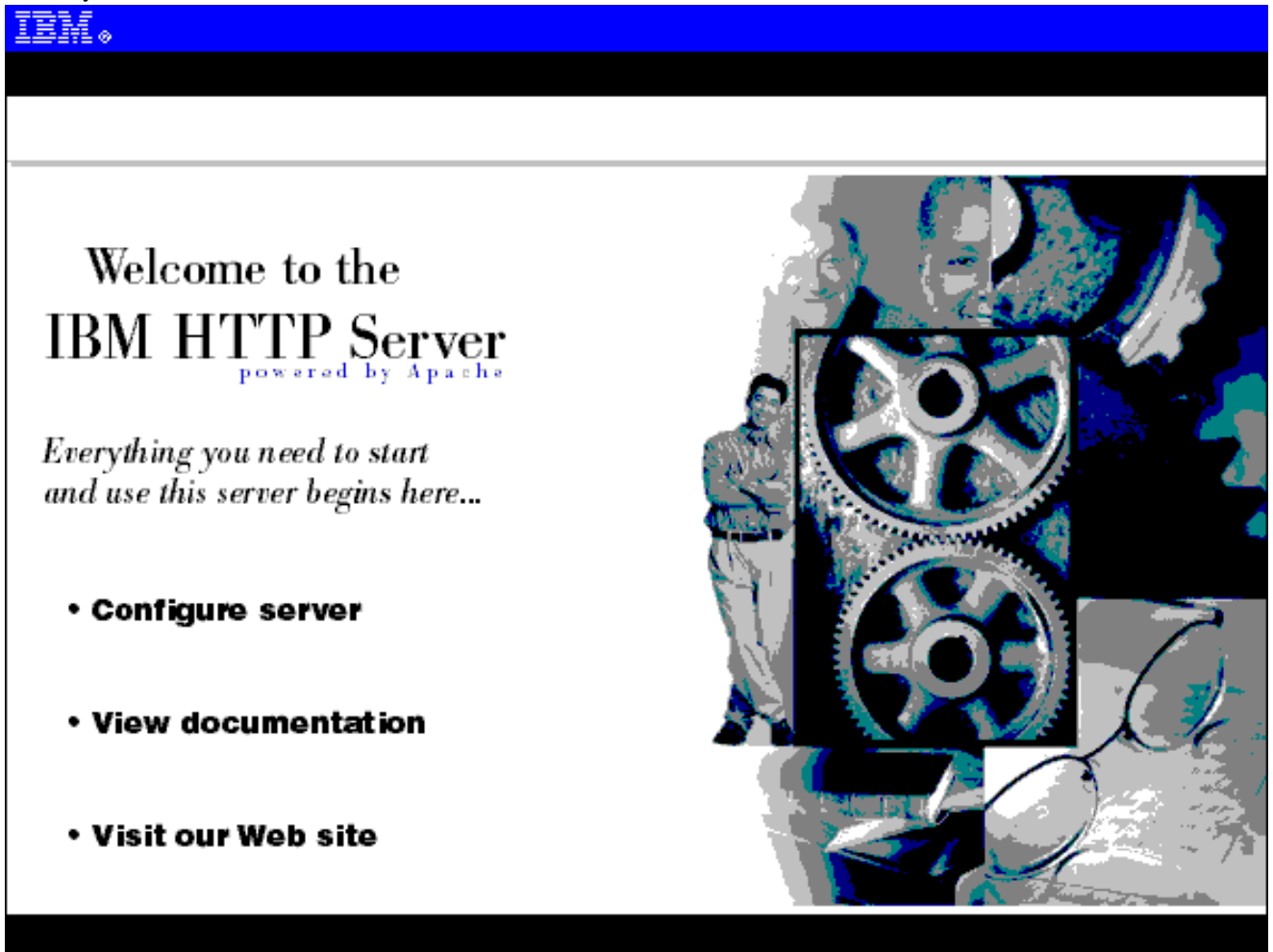
    ```
    # umount cdrom/cdrom0
    ```

    You can now eject the CD-ROM.

19. If you are using a Web server other than IBM HTTP Server, start the server. If you installed IBM HTTP Server as part of the WebSphere Application Server installation, you might need to configure it. Perform the following steps to verify that the IBM HTTP Server is installed correctly:

    a. Ensure that the Web server is running or start it by entering the following command:

    ```
    # /opt/IBMHTTPD/bin/apachectl start
    ```

b. Open a Web browser window and type the name of the host machine as the Universal Resource Locator (URL) (http://*host_machine* or *localhost*). If you see the Welcome to the IBM HTTP Server page, the server has been installed correctly.

Note that you might need to make configuration adjustments to the server in order to run it successfully on your system. See the IBM HTTP Web Server documentation at www.ibm.com/software/webservers/httpservers/library.html for more information.

To enable the Secure Sockets Layer (SSL) on IBM HTTP Server, see the IBM HTTP Server documentation at www.ibm.com/software/webservers/httpservers/doc/v1319/9atstart.htm for more information.

Testing the installation

This article describes how to test your installation and configuration of WebSphere Application Server. These instructions assume that you have installed a supported Web server, database, and WebSphere Application Server. Perform the following steps to test your WebSphere Application Server installation:

1. Ensure that you are logged into the host machine with superuser (root) privileges.
2. Navigate to the directory containing the **startupServer.sh** script (located by default in the /opt/WebSphere/AppServer/bin directory) by using the **cd** command, as follows:

```
# cd /opt/WebSphere/AppServer/bin
```

3. Start the WebSphere Administrative Server by running the script **startupServer.sh**, as follows:

```
# ./startupServer.sh
```

Ensure that the server has started successfully by checking the file named tracefile located in the /opt/WebSphere/AppServer/logs directory. Use the **tail** command to check the file, as follows:

```
# tail -f tracefile
```

The message ...open for e-business appears in this file when the server has started successfully.

4. Navigate to the directory containing the **adminclient.sh** script (located by default in the /opt/WebSphere/AppServer/bin directory) by using the **cd** command, as follows:

```
# cd /opt/WebSphere/AppServer/bin
```

5. Start the administrative console by running the script **adminclient.sh**, as follows:

```
# ./adminclient.sh
```

6. When the console displays the message `Console Ready`, administer the application server by doing the following:

    a. When the administrative console opens, a tree view is displayed. Click the plus sign (+) next to the **WebSphere Administrative Domain** entry to expand the view.

    b. Click the plus sign (+) next to the **Nodes** entry to expand the view.

    c. Identify the name of your host machine and expand the view of that entry.

    d. Click the plus sign (+) next to the **Application Servers** entry to expand the view.

    e. Select the **Default Server** entry and click the **Start** icon on the toolbar. An information window opens stating that the server has started. Click **OK** to close this window.

    After the default server is started initially, it will start automatically if it stops or if you restart the machine. Even if the administrative server fails, the application server continues to run.

7. Test the server by doing the following:

    a. Ensure that the Web Server is running. If it is not running, start it.

    b. Open a Web browser window and enter the URL for the snoop servlet, which is a standard sample servlet installed by default, as follows:

```
http://machine_name/servlet/snoop
```

    In this command, *machine_name* represents the name of the machine on which WebSphere Application Server is running. Information on /servlet/snoop is displayed.

8. To stop the Default Server, do the following:

    a. Highlight the entry **Default Server** and click the **Stop** icon on the tool bar. An information window opens stating that the server has stopped.

    b. Click **OK** to close this window.

Testing with an enterprise bean

This article describes how to test your WebSphere Application Server installation by using an enterprise bean and the Increment sample. These instructions assume that you have installed and tested your WebSphere Application Server system. Perform the following steps:

1. Ensure that you are logged into the host machine with superuser (root) privileges.

2. Navigate to the directory containing the **startupServer.sh** script (located by default in the /opt/WebSphere/AppServer/bin directory) by using the **cd** command, as follows:

```
# cd /opt/WebSphere/AppServer/bin
```

3. Start the WebSphere Administrative Server by running the script **startupServer.sh**, as follows:

```
# ./startupServer.sh
```

Ensure that the server has started successfully by checking the file named tracefile located in the /opt/WebSphere/AppServer/logs directory. Use the **tail** command to check the file, as follows:

```
# tail -f tracefile
```

The message `...open for e-business` appears in this file when the server has started successfully.

4. Navigate to the directory containing the **adminclient.sh** script (located by default in the /opt/WebSphere/AppServer/bin directory) by using the **cd** command, as follows:

```
# cd /opt/WebSphere/AppServer/bin
```

5. Start the administrative console by running the script **adminclient.sh**, as follows:

```
# ./adminclient.sh
```

6. When the console displays the message `Console Ready`, administer the application server by doing the following:

    a. When the administrative console opens, a tree view is displayed. Click the plus sign (+) next to the **WebSphere Administrative Domain** entry to expand the view.

    b. Click the plus sign (+) next to the **Nodes** entry to expand the view.

    c. Identify the name of your host machine and expand the view of that entry.

    d. Click the plus sign (+) next to the **Application Servers** entry to expand the view.

    e. Select the **Default Server** entry and click the **Start** icon on the toolbar. An information window opens stating that the server has started. Click **OK** to close this window.

After the default server is started initially, it will start automatically if it stops or if you restart the machine. Even if the administrative server fails, the application server continues to run.

7. Ensure that the Web Server is running. If the Web server is not running, start it.

8. Start a Web browser and specify the following URL:

   `http://machine_name/webapp/examples/HitCount`

   In this command, *machine_name* represents the name of the machine on which WebSphere Application Server is running. When the Web page opens, several selection options are displayed.

9. Under the heading **Generate hit count using**, click the radio button for the option **Enterprise Java Bean**.

10. Under the heading **Transaction Type**, click the radio button for the option **None**.

11. Click **Increment**.

   If the number of hits is displayed, WebSphere Application Server is operating properly.

Uninstalling WebSphere Application Server

Perform the following steps to uninstall WebSphere Application Server from a UNIX machine:

1. Ensure that you are logged into the machine with superuser (root) privileges.

2. If IBM HTTP Server or another Web server is running on your system, stop the Web server.

   Note: Although IBM HTTP Server can be installed using the WebSphere Application Server installation program, it is not uninstalled when you uninstall WebSphere Application Server. It must be uninstalled separately. See the IBM HTTP Server Library Web site at www.ibm.com/software/webservers/httpservers/library.html for more information.

3. Ensure that your DISPLAY and TERM environment variables are set properly.

4. Navigate to the root installation directory (/opt/WebSphere/AppServer on HP-UX, Linux, and Solaris; /usr/WebSphere/AppServer on AIX) and execute the **uninstall.sh** script as follows:

   `# ./uninstall.sh`

5. The uninstallation program starts and the Uninstall dialog box opens. Click **Uninstall** to remove WebSphere Application Server from the machine.

6. To ensure that subsequent installations of WebSphere Application Server do not conflict with files left on the machine from a previous installation, use the **rm -r** command to remove the WebSphere directory structure. Use caution when executing this command to prevent the unintentional removal of portions of the file system.