Installing the Advanced Edition using IBM HTTP Server and Oracle 8*i* on HP-UX

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

- HP-UX 11.0
- Java 2 Software Development Kit (SDK) 1.3 (version supplied with WebSphere Application Server)
- IBM HTTP Server 1.3.19
- Oracle 8*i* Release 3 (8.1.7)
- 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

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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. If you have not already done so, change kernel parameters as needed and install the database. 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. WebSphere Application Server comes with the Java 2 SDK and IBM HTTP Server. Instructions for installation follow:

1. Setting kernel parameters, as needed
2. Installing Oracle 8*i* Release 3 (8.1.7)
3. Configuring Oracle 8*i* Release 3 (8.1.7) for use with WebSphere Application Server
4. Installing WebSphere Application Server--**Custom Installation** option
5. Testing the installation
6. Testing with an enterprise bean

Setting kernel parameters

This article describes how to change particular operating system kernel parameters on an HP machine to make WebSphere Application Server run effectively. To set kernel parameters, perform the following steps:

1. Ensure that you are logged into the host machine with superuser (root) privileges.
2. Determine the machine's physical memory by doing the following. You will need this value when configuring kernel parameters:
   a. Start the HP-UX System Administration Manager (SAM) utility.
   b. Select **Performance Monitors**, then **System Properties**.
   c. Click the **Memory** tab and note the value for **Physical Memory**.
   d. Click **OK** and exit from the SAM utility.

3. In order to set the maxfiles and maxfiles_lim parameters to at least 4096, you must first edit the file /usr/conf/master.d/core-hpux to allow values greater than 2048 to be set by using the SAM utility. Do the following:

    a. Open the file /usr/conf/master.d/core-hpux in a text editor.
    b. Change the line

        ```
        *range maxfiles<=2048
        ```

        to

        ```
        *range maxfiles<=60000
        ```

    c. Change the line

        ```
        *range maxfiles_lim<=2048
        ```

        to

        ```
        *range maxfiles_lim<=60000
        ```

    d. Save these changes and close the file. The old values for these parameters might still be stored in the file /var/sam/boot.config. To force the SAM utility to create a new boot.config file, do the following:

        1. Move the existing version of the boot.config file located in the directory /var/sam to another location (the /tmp directory, for instance).
        2. Start the SAM utility.
        3. Select **Kernel Configuration**, then **Configurable Parameters**. When the Kernel Configuration window opens, a new boot.config file exists.

            Alternatively, you can enter the following command to rebuild the boot.config file:

            ```
            # /usr/sam/lbin/getkinfo -b
            ```

4. Set the parameters listed in Table 1 to the values listed by doing the following:
    a. Start the SAM utility.
    b. Select **Kernel Configuration**, then **Configurable Parameters**.
    c. Highlight a parameter that you want to change and select **Actions**, then **Modify Configurable Parameter**.
    d. Type the new value for the parameter in the **Formula/Value** field and click **OK**.
    e. Repeat these steps for each of the parameters listed in Table 1 .
    f. After you have set all of the parameters, select **Actions**, then **Process New Kernel**.
    g. An information window opens, confirming your decision to restart the machine. Click **Yes**.

    If other information windows open, requesting information particular to your installation, follow the on-screen instructions to restart your machine and to enable the new settings to take effect.

    Alternatively, use the **HPjconfig** configuration utility available from the Java products for HP-UX Web site at www.hp.com/go/java. This pure Java application provides kernel parameter recommendations tailored to your specific Java enterprise services and HP-UX hardware platform. It supports only selected machine types, however. Refer to the information on this Web site to verify that your machine is suppported and for instructions on downloading and installing the utility.

Table 1

Parameter	Value
maxfiles	4096
maxfiles_lim	4096

max_thread_proc	1024
maxuprc	512
nproc	1024
nflocks	8192
ninode	2048
nfile	4 * *ninode* value
msgseg	32767 (or less)
msgmnb	65 535
msgmax	65 535
msgtql	1024
msgmap	258
msgmni	256
msgssz	16
semmni	512
semmap	514
semmns	1024
semmnu	1020 (*nproc* value minus 4)
shmmax	483 183 821 (Ensure that this parameter is set to 483 183 821 or 90% of the physical memory (in bytes), whichever is higher. For example, if you have 512 MB of physical memory in your system, set shmmax to 483 183 821 (512 * 0.9 * 1024 * 1024).
shmseg	16
shmmni	300

5. If you plan to redirect displays to non-HP machines, do the following before running applications that have a graphical user interface, such as the WebSphere Application Server applications that are started with the scripts **install.sh** or **adminclient.sh**:

   a. Enter the following command to obtain information on all public locales accessible to your application:

   ```
   # locale -a
   ```

   b. Choose a value for your system from the output that is displayed and set the LANG environment variable to this value. Here is an example command that sets the value of LANG to `en_US.iso88591`:

   ```
   # export LANG=en_US.iso88591
   ```

Installing Oracle 8*i* Release 3 (8.1.7)

This article describes how to install and configure Oracle on a local HP machine. The instructions assume the following:

- You do not have a previous version of Oracle already installed on your machine. If you have a previous version of Oracle installed, you might need to migrate databases, depending on the version installed. In this case, do not follow these instructions. Instead, refer to Oracle product documentation on the Oracle Web site at docs.oracle.com/database_mp_8i.html.
- Your Oracle 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 and very small production environments. For information on more complicated scenarios, refer to the IBM Redbook *WebSphere V3.5 Handbook* at www.redbooks.ibm.com/redbooks/SG246161.html. Although this Redbook was written for the WebSphere Application Server Version 3.5 product, much of the conceptual information also pertains to the WebSphere Application Server 4.0 product.
- You have checked the Oracle product documentation on the Oracle Web site at docs.oracle.com/database_mp_8i.html to verify that you have enough memory and disk space for your installation.

Note: Install Oracle before installing WebSphere Application Server.

Perform the following steps to install Oracle 8*i* from the product CD-ROM:

1. Ensure that you are logged into the machine with superuser (root) privileges.
2. Ensure that you have set the following UNIX kernel, shared memory, and semaphore parameters properly:
   - SHMMAX
   - SHMMIN
   - SHMMNI
   - SHMSEG
   - SEMMNI
   - SEMMNS

   For more information on the proper values for these parameters, refer to the *Oracle 8i Installation Guide*. It is recommended that you review these settings with your system administrator to ensure that they do not conflict with settings necessary for other software programs on your system.

3. Ensure that the DISPLAY and TERM environment variables are set correctly for your environment.
4. Create a mount point for Oracle 8*i*. The mount point can be a directory in an existing volume, or you can set up a new logical volume by using the HP-UX System Administration Manager (SAM) utility.

   Note: If you plan to use Oracle in a production environment, it is recommended that you create a file system on a separate logical volume to store the database files. (If you are performing an Optimal Flexible Architecture (OFA)-compliant installation, you must create four mount points, one for Oracle 8*i* and three for the database files.) Refer to the *Oracle 8i Installation Guide* and your HP-UX system documentation for more information on creating and mounting file systems.

5. Use the SAM utility to create the following groups for database administrators: dba, osdba, osoper, and oinstall.
6. Use the SAM utility to create the user oracle, who owns the Oracle software after installation. Use the following entries:
   a. In the **Login Name** field, enter `oracle`.
   b. In the **User ID (UID)** field, accept the automatically generated ID.
   c. In the **Home Directory** field, enter the desired home directory for the user *oracle*.
   d. In the **Primary Group Name** field, enter `oinstall`.
   e. In the **Start-Up Program** field, enter the default shell. For example, to use the Bourne shell, enter `/usr/bin/sh`.
   f. Accept the default values for the other fields and click **OK**.
   g. Exit from the SAM utility.

   Note: Use the oracle account only for installing and maintaining Oracle software; do not log into a database as the user oracle.

7. Use the HP-UX command **newgrp** to enter `dba` as the Secondary Group Name for the user oracle. See HP-UX documentation for information on using this command.
8. Ensure that the home directory for the user oracle is owned by the user oracle and group oinstall.
9. Log in as the user oracle, as follows:

   ```
   # su - oracle
   ```

10. Ensure that the DISPLAY and TERM environment variables are still set properly.
11. Ensure that the user mask value is set to `022` by entering the following command:

    ```
    $ umask
    ```

    If the command does not return a value of `022`, set the value as follows:

    a. Edit the .profile file in the home directory of the user oracle by adding the line `umask 022` to this file and

then saving and closing it.
b. Enter the following command:

```
$ umask 022
```

12. Add the following information to the .profile file in the home directory for the user oracle. Your Oracle System Identifier (SID) can differ from the example shown, but it must be fewer than eight characters in length.

```
#---------------------------------
# Oracle environment setup
#---------------------------------
#
ORACLE_BASE=oracle_home_directory
export ORACLE_BASE
ORACLE_SID=orcl
export ORACLE_SID
ORACLE_HOME=$ORACLE_BASE/product/8.1.7
export ORACLE_HOME
PATH=$PATH:$ORACLE_HOME/bin
export PATH
ORACLE_DOC=$LD_LIBRARY_PATH:$ORACLE_HOME/lib
export ORACLE_DOC
echo 'The Oracle 8.1.7 environment is set'
```

13. Log in as user root, as follows:

```
# su - root
```

14. Insert the first Oracle 8*i* CD-ROM and, if necessary, mount it following the instructions in the article Mounting a CD-ROM on HP-UX.

    The following steps assume that the CD-ROM is mounted at /cdrom.

15. Oracle8*i* is provided on two CD-ROMs called Disk 1 and Disk 2. To avoid having to switch between these CD-ROMs to complete a full installation, Oracle recommends copying the contents of each CD-ROM to the hard drive of the machine on which you will install Oracle and running the Oracle Universal Installer from the new location. To perform these tasks, do the following:
    a. As user root, create a directory to hold the Oracle software, as follows:

    ```
    # mkdir software_source_directory
    ```

    b. Within the *software_source_directory*, create two subdirectories called Disk1 and Disk2, as follows:

    ```
    # cd software_source_directory
    # mkdir Disk1
    # mkdir Disk2
    ```

    c. Navigate to the directory /cdrom/cdrom0/, as follows:

    ```
    # cd /cdrom/cdrom0
    ```

    d. Copy the contents of the CD-ROM Disk 1 to the subdirectory Disk1, as follows:

    ```
    # cp -R * software_source_directory/Disk1
    ```

    e. Copy the contents of the CD-ROM Disk 2 to the subdirectory Disk2, as follows:

    ```
    # cp -R * software_source_directory/Disk2
    ```

     f.   Navigate to the *software_source_directory*, as follows:

```
# cd software_source_directory
```

     g.   Change the ownership of the Disk1 and Disk2 subdirectories to user oracle, group oinstall, as follows:

```
# chown -R oracle:oinstall Disk1
# chown -R oracle:oinstall Disk2
```

When copied in this fashion, the Oracle Universal Installer automatically finds the contents of each CD-ROM and does not prompt for the location of either CD-ROM during the course of installation.

16.   Log in as user oracle, as follows:

```
# su - oracle
```

17.   Ensure that the DISPLAY and TERM environment variables are still set properly.
18.   Enter the following commands to begin the Oracle installation process:

```
$ cd software_source_directory/Disk1
$ ./runInstaller
```

where *software_source_directory* is the directory into which you've copied the Oracle CD-ROMs.

The Oracle Universal Installer opens, displaying the Welcome window.

19.   Click **Next**. The File Locations window opens.
20.   Verify that the values in the **Source** and **Destination** fields are as follows:
      ○   The value of the **Source** field must be *software_source_directory*/**Disk1/stage/products.jar**. Do not change this field; it is the location of files for installation.
      ○   The value of the **Destination** field must be the same as the value you set for the ORACLE_HOME environment variable.
21.   Click **Next**. The UNIX Group Name window opens.
22.   Enter `oinstall` in the **UNIX Group Name** field, and then click **Next**.

Note: If the /var/opt/oracle directory does not exist or cannot be written to by the user oracle, you are prompted to run the */oracle_home_directory*/**product/8.1.7/oraInstRoot.sh** script at this point in the installation process. Switch to another terminal, log in as the user root, and execute the script. After the script has been executed, return to the Oracle Universal Installer to continue the installation process.

23.   In the Available Products window, verify that the **Oracle8i Enterprise Edition 8.1.7.0.0** option is selected, and then click **Next**.
24.   In the Installation Types window, choose the **Typical** option, and then click **Next**.
25.   In the Database Identification window, enter a global database name in the **Global Database Name** field (for example, **orcl.***machine_name*), and verify that the value in the **SID** field is the same as the value you set for the ORACLE_SID environment variable. Click **Next**.
26.   In the Database File Location window, specify the installation location for the Oracle database files in the **Directory for Database Files** field and then click **Next**.
27.   Verify the information in the Summary window, which summarizes all of the installation choices that you have made so far. When you determine that the information is correct, click **Install**. The Install window opens; it tracks the status of the Oracle installation.

Note: At this point in the installation, you are prompted to run the **root.sh** configuration script to set necessary file permissions for Oracle products. Switch to another terminal, log in as the user root, and execute the script. After the script runs, return to the Oracle Universal Installer to finish the installation process.

After the installation and linking processes finish, the Configuration Tools window opens. The Net8 Configuration

Assistant and Oracle Database Configuration Assistant are automatically configured, along with an Oracle database.

The Configuration Tools window identifies two user accounts and passwords automatically configured for the database by the Oracle Database Configuration Assistant. One is the `SYS` account with a password of `change_on_install` and the other is the `SYSTEM` account with a password of `manager`. Note these accounts and passwords for future use.

28. After the configuration process is complete, click **Next**. The End of Installation window opens.
29. Click **Exit** to close the Oracle Universal Installer. Click **Yes** to confirm the action.
30. Apply to the product any Oracle-supplied patches located in the *software_source_directory*/Disk1/patch, *software_source_directory*/Disk2/patch, *software_source_directory*/Disk1/opspatch, and *software_source_directory*/Disk2/opspatch directories. Review the README included with each patch for installation instructions.
31. At this point, check the Oracle product documentation on the Oracle Web site at docs.oracle.com/database_mp_8i.html to verify that your environment variables are set to optimize your particular installation.
32. Unmount any CD-ROM before removing it from the CD-ROM drive by following the instructions in the file "Mounting a CD-ROM on HP-UX."
33. Proceed to the article "Configuring Oracle 8*i* Release 3 (8.1.7) for use with WebSphere Application Server" to configure Oracle for use with WebSphere Application Server.

Configuring Oracle 8*i* Release 3 (8.1.7) for use with WebSphere Application Server

This article describes how to create the Oracle users required by WebSphere Application Server. The procedures in this article assume that you have installed Oracle 8*i*.

Perform the following steps to configure Oracle 8*i* for use with WebSphere Application Server:

1. Ensure that you are logged in as the user oracle.
2. Edit the initialization file $ORACLE_HOME/dbs/init*your_SID*.ora as follows:
    o Ensure that the line `open_cursors = 220` appears in the file. (The value for this parameter must be `220`.)
    o Ensure that the value for the `processes` parameter is sufficient for your database by reading the information within the init*your_SID*.ora file. To increase the value of this parameter, add comment markers to or remove comment markers from the specific lines related to processes within the file.
3. Restart your Oracle database by entering the following commands:

```
$ svrmgrl
SVRMGR> connect internal
SVRMGR> startup
```

Note: You might need to stop the database before you are able to restart it. To stop the database, enter the following commands:

```
$ svrmgrl
SVRMGR> connect internal
SVRMGR> shutdown
```

4. Ensure that the Oracle listener is started or start it by entering the following commands:

```
$ lsnrctl
LSNRCTL> start
```

5. You must create the Oracle users EJSADMIN and EJB required by WebSphere Application Server. You might or might not want to grant user EJSADMIN *dba* authority. Create the users EJSADMIN and EJB with the proper authorities by entering the following commands using these values: `SYSTEM` is a user account created by the Oracle Database Configuration Assistant; `manager` is the password for the `SYSTEM` account created by the Oracle Database Configuration Assistant; *EJSADMIN_password* is the password you assign to the user EJSADMIN.

If you **do** want to grant *dba* authority to the user EJSADMIN, enter the following commands:

```
$ sqlplus SYSTEM/manager
SQL> create user EJSADMIN identified by EJSADMIN_password;
SQL> grant connect, resource, dba to EJSADMIN;
SQL> create user EJB identified by EJB;
SQL> grant connect, resource to EJB;
SQL> quit
```

If you do **not** want to grant *dba* authority to the user EJSADMIN, enter the following commands:

```
$ sqlplus SYSTEM/manager
SQL> create user EJSADMIN identified by EJSADMIN_password quota 100M \
     on SYSTEM;
SQL> create user EJB identified by EJB quota 100M on USERS;
SQL> grant connect, resource to EJSADMIN;
SQL> grant connect, resource to EJB;
SQL> quit
```

6. If any of your applications use JTA datasources, enter the following commands using these values: SYS is a user account created by the Oracle Database Configuration Assistant; change_on_install is the password for the SYS account created by the Oracle Database Configuration Assistant.

    ```
    $ sqlplus SYS/change_on_install
    SQL> grant select on dba_pending_transactions to EJB;
    SQL> quit
    ```

7. Test access to the new database with the user ID EJSADMIN by doing the following:
    a. Enter the following command:

        ```
        $ sqlplus ejsadmin/EJSADMIN_password
        ```

        A message is displayed indicating a successful connection.

    b. Enter the following command to log out as the user EJSADMIN:

        ```
        $ exit
        ```

Installing WebSphere Application Server 4.0--Custom Installation option

This article describes how to install WebSphere Application Server on a local HP 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. Ensure that the **swagentd** daemon is running by entering the following command:

   ```
   # ps -ef | grep swagentd
   ```

   - If the **swagentd** daemon is running, output similar to the following is displayed:

     ```
     root    10431    10128   0   10:43:33 pts/0    0:00   grep swagentd
     root     1391        1   0    May  9 ?        0:00   /usr/sbin/swagentd -r
     ```

   - If the **swagentd** daemon is not running, start it by entering the following command:

     ```
     # swagentd -r
     ```

3. 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.
4. Insert the WebSphere Application Server CD-ROM into the CD-ROM drive.
5. Mount the CD-ROM by following the instructions in the file "Mounting a CD-ROM on HP-UX." The following steps assume that the CD-ROM drive is mounted at /cdrom.
6. Navigate to the correct directory on the WebSphere Application Server CD-ROM by entering the following command:

   ```
   # cd /cdrom/hp
   ```

7. 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/hp 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.

8. If you have *not* downloaded a new prereq.properties file or disabled the prerequisite checking functionality as detailed in Step 7, run the installation script file by entering the following command:

   ```
   # /cdrom/hp/install.sh
   ```

   If you *have* downloaded a new prereq.properties file or disabled the prerequisite checking functionality as detailed in Step 7, run the installation script file by entering the following command:

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

9. Click **Next** to pass the introductory page.
10. The Install Options window opens. Select **Custom Installation** and then click **Next**.
11. 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.

12. 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.

13. 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.
    j. Click **Next**.
14. 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.

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

16. 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**.

17. 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.

18. 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
    ```
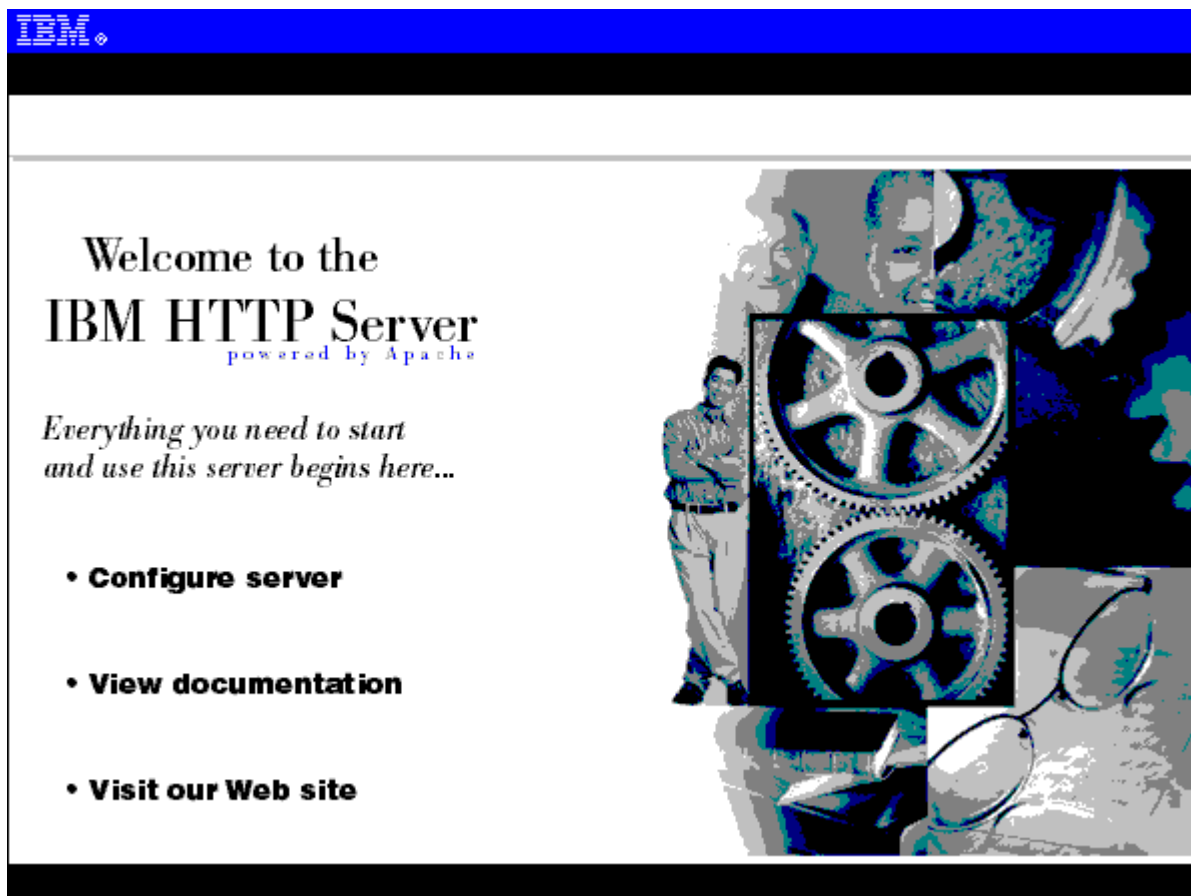
    b. Execute the **firststeps.sh** script as follows:

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

19. Unmount the CD-ROM before removing it from the CD-ROM drive by following the instructions in the file "Mounting a CD-ROM on HP-UX."

20. 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/HTTPServer/bin/apachectl start
    ```

    b. Open a Web browser window and type the name of the host machine as the 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 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 onto 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.

Mounting a CD-ROM on HP-UX

This article describes how to mount and unmount a CD-ROM on HP-UX. To mount a CD-ROM, as the user root, perform the following steps one time:

1. Determine the device address for the CD-ROM by entering the following command:

```
# ioscan -C disk -f -n
```

Output similar to the following is displayed. This output example indicates that the CD-ROM device file is /dev/dsk/c1t2d0:

```
Class I H/W Path      Driver  S/W State  H/W Type  Description
=======================================================================
disk  0 8/0/19/0.6.0  sdisk   CLAIMED     DEVICE    IBM      DDRS-39130WS
                      /dev/dsk/c0t6d0   /dev/rdsk/c0t6d0
disk  1 8/16/5.2.0    sdisk   CLAIMED     DEVICE    TOSHIBA CD-ROM XM-6201TA
                      /dev/dsk/c1t2d0   /dev/rdsk/c1t2d0
```

2. Create a new directory called /cdrom at the root of the file system. This directory becomes the CD-ROM mount point; all CD-ROM files appear under this directory.
3. Determine whether the **pfs** daemon is running by entering the following command:

```
# ps -ef | grep pfs
```

If the **pfs** daemon is running, output similar to the following is displayed:

```
root  1681  1651  0 11:39:20 pts/ta    0:00 /usr/sbin/pfs_mountd
root  1682  1681  0 11:39:20 pts/ta    0:00 pfs_mountd.rpc
```

If the **pfs** daemon is running, go to Step 6. If the **pfs** daemon is not running, complete Step 4 and Step 5 before trying to complete Step 6.

4. Edit the file /etc/pfs_fstab by adding a line similar to the following to indicate the hardware path for the CD-ROM:

```
/dev/dsk/c0t6d0 /cdrom pfs-rrip xlat=unix 0 0
```

5. Enter the following commands. You must reenter these commands any time that you restart your system.

```
# nohup /usr/sbin/pfs_mountd &
# nohup /usr/sbin/pfsd &
```

6. To physically mount the CD-ROM, place the CD-ROM in the machine and enter the following command:

```
# /usr/sbin/pfs_mount /cdrom
```

Unmounting a CD-ROM

After you finish using the CD-ROM, enter the following command to unmount it:

```
# /usr/sbin/pfs_umount /cdrom
```

You can now eject the CD-ROM.

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.