Installing the Advanced Edition using iPlanet Web Server Enterprise Edition and Sybase 12 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)
- iPlanet Web Server Enterprise Edition 4.1
- Sybase 12
- 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

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. If you have not already done so, install the Web server and 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. Instructions for installation follow:

1. Installing iPlanet Web Server Enterprise Edition 4.1
2. Installing Sybase 12
3. Configuring Sybase 12 for use with WebSphere Application Server
4. Installing WebSphere Application Server--**Custom Installation** option
5. Testing the installation
6. Testing with an enterprise bean

Installing iPlanet Web Server Enterprise Edition 4.1

This article describes how to perform the following procedures on a Solaris SPARC machine from files downloaded from the iPlanet Web site at www.iplanet.com/downloads/download/:

- Install iPlanet Web Server Enterprise Edition
- Test the installation
- Start and stop the Web server and Servlet Engine

It is recommended that you install iPlanet Web Server before installing WebSphere Application Server. The WebSphere Application Server installation process changes a Web server's configuration so that the Web server directs certain requests (such as servlet requests) to WebSphere Application Server. If the Web server is not installed before WebSphere Application

Server, WebSphere Application Server might function incorrectly.

These instructions assume the following:

- You do not have a previous version of iPlanet Web Server already installed on your machine. If you do have a previous version of iPlanet Web Server installed, you might need to perform migration tasks based on the version installed. In this case, do not follow these instructions. Instead, refer to iPlanet product documentation on the iPlanet Web Server Documentation Web site at docs.iplanet.com/docs/manuals/.
- Your machine has enough memory and disk space for your installation. See the iPlanet product documentation on the iPlanet Documentation Web site at docs.iplanet.com/docs/manuals/ for the necessary requirements.
- You have checked the WebSphere Application Server Supported Hardware, Software, and APIs Web site at www.ibm.com/software/webservers/appserv/doc/latest/prereq.html to learn what level of iPlanet Web Server you need to download.
- You have downloaded the appropriate version of iPlanet Web Server and any required patches from the iPlanet Web site at www.iplanet.com/downloads/download/ by following the steps given on that Web site.

Installing iPlanet Web Server Enterprise Edition

To install iPlanet Web Server, perform the following steps:

1. Ensure that you are logged into the host machine with superuser (root) privileges.
2. Move to the directory containing the downloaded file.
3. Unzip and extract the files.
4. Start the installation program by typing the following command:

   ```
   # ./setup
   ```

   A welcome window opens.

5. Press Enter to close the welcome window and continue installation.
6. Type `Yes` to accept the software licensing agreement and press Enter.
7. A warning window might appear that alerts you to any potential installation problems and asks if you want to continue with the installation. If you want to resolve any problems, type `No` and press Enter to exit from the installation program. If you want to proceed with the installation, type `Yes` and press Enter to close the warning window.
8. Choose the type of installation you require by typing the appropriate number and pressing Enter. For this example, type `2` for **Typical installation**.
9. Type the directory path for the location where the server files and directory structure are to be installed or accept the default location `/usr/netscape/server4`, and press Enter.
10. Choose the **iPlanet Web Server, Enterprise Edition** option and indicate that you want to select from all of its components by typing `All` and pressing Enter.
11. Choose the components you want to install by typing the number of each, separating each entry from the next with a comma. Press Enter. (To accept the default installation of all components except **WAI Support**, press Enter.)

    Note: See the iPlanet Web Server documentation for descriptions of each component. If you do not install a component and later decide that you need it, you can run the installer again and install just the missing component; however, you cannot uninstall individual components after they are installed.
12. If the default *host_name* (the name of your host machine) shown in brackets ([]) is correct, press Enter. If your *host_name* differs from the one shown in brackets, type the correct *host_name* and press Enter.
13. Type the UNIX user name to use when running the default instance of iPlanet Web Server. For this example, accept the default user name of `nobody` and press Enter.
14. Type the UNIX group name to use when running the default instance of iPlanet Web Server. For this example, accept the default group name of `nobody` and press Enter.
15. Type the UNIX user name to use when running the Administration Server. In most cases, this is `root`. Press Enter.
16. Type the Administration Server user name to use for authentication. For this example, type the default name `admin` and press Enter. (This user is not a UNIX user, but a user name set up in the iPlanet environment.)
17. Type the Administration Server password to use for authentication. For this example, type the default name `admin` and press Enter. (This password is not a UNIX password, but a password set up in the iPlanet environment.)
18. Retype the Administration Server password and press Enter.

19. Type a number between 1024 and 65535 for the port on which to run the Administration Server, or accept the default of `8888` and press Enter. Note this number for later reference.

   Note: If you want to use a port number lower than 1024, you must be logged in as `root` to start the server.

20. Type a number for the port on which to run the iPlanet Web Server and press Enter. For this example, accept the default of `80`. Note this number for later reference.

   Note: If you want to use a port number lower than 1024, you must be logged in as `root` to start the server. If you choose a port number other than 80, the Uniform Resource Locator (URL) used to gain access to your home page changes. For instance, if your host is called `www.`*`host_name`*`.com` and you choose port `9753`, your server's URL becomes `http://www.`*`host_name`*`.com:9753/`.

21. Specify whether you are using a Lightweight Directory Access Protocol (LDAP)-based directory server. For this example, accept the default `No` and press Enter.

22. Type the path for the root directory where your server's content files are to reside or accept the default of *`server_root`*`/docs`, where *`server_root`* refers to the directory path for the location of the server files that you specified in Step 9. Press Enter.

23. Type `Yes` to indicate that you want to use your own Java 2 Software Development Kit (SDK) and press Enter.

24. Type the absolute path to the directory on your system where the SDK is installed and press Enter.

25. A window might appear that prompts you to specify a path name to your SDK libraries if they are not found in the /jre/lib subdirectory of the SDK directory. For this example, press Enter.

26. A window might appear that prompts you to specify a path name to your SDK library classes if they are not found in the /lib subdirectory of the SDK directory. For this example, press Enter.

27. After the installation program extracts and installs the iPlanet Web Server components, a message is displayed, indicating that installation is complete. Press Enter.

Testing installation of iPlanet Web Server Enterprise Edition and starting the server

To demonstrate that iPlanet Web Server is operating correctly, perform the following steps:

1. Go to the directory that stores the server files (the directory that you specified in Step 9 in the previous section. In this example, the directory is `/usr/netscape/server4`.

2. Start iPlanet Web Server Enterprise Edition by entering the following command:

```
# ./startconsole
```

   The **startconsole** command starts the iPlanet Web Server processes and starts a Netscape Navigator session to the Enterprise Administration Server administration page. **Note:** The **startconsole** command requires that Netscape Navigator is installed on the host machine and that the **netscape** executable file is accessible via the PATH environment variable. For Netscape Navigator to run, the TERM and DISPLAY environment variables must be set to the correct values for your terminal type and display name, respectively.

3. In the Netscape:Password window, type the Administration Server user name and password that you specified in Step 16 and Step 17 in the previous section (in this example, `admin`). Click **OK**.

4. In the iPlanet Web Server Administration Server window, select the server by clicking the server name button beside the field **Select a Server**.

5. Click **Manage** beside the server name button.

6. In the iPlanet Web Server Server Manager window, click **Server On**.

7. The Netscape:Security Warning window informs you that the information you are about to submit is insecure and could be observed by a third party while in transit. For this example, click **Continue Submission**.

8. The Netscape:Question window confirms that the server has started successfully. Click **OK**.

9. Open a browser window and type the Web address `http://`*`host_name`*`/`, where *`host_name`* is the host name that you specified in Step 12 in the previous section. A default page provided by the iPlanet installation is displayed.

10. Type the Web address `http://`*`host_name`*`:`*`administration_port_number`*`/`, where *`administration_port_number`* is the port number that you defined in Step 19 in the previous section. You might be prompted for the Administration Server user name and password.

When these steps are complete, iPlanet Web Server is installed and operating correctly. If you are going to install Websphere Application Server, you must stop iPlanet Web Server and the iPlanet Servlet Engine.

Stopping iPlanet Web Server Enterprise Edition and the iPlanet Servlet Engine

Before installing WebSphere Application Server, stop the Web Server and Servlet Engine by performing the following steps. (At several points in this process, the Netscape:Security window might open to inform you that the information you are about to submit is insecure and might be observed by a third party while in transit. For this example, click **Continue Submission** in each case.)

1. In the iPlanet Web Server Server Manager window, click **Server Off**.
2. The Netscape:Question window confirms that the server has stopped successfully. Click **OK**.
3. In the iPlanet Web Server Server Manager window, click the **Servlets** tab. The Enable Servlets window opens.
4. Under the **Activate the Servlet Engine?** field, click the radio button beside the **No** option and then click **OK**.
5. The Save and Apply Changes window appears. Click **Save and Apply**.
6. The Netscape:Question window confirms that your changes are saved and applied. Click **OK**.

Installing Sybase 12

This article describes the following:

- Installing and configuring Sybase on a local Solaris SPARC machine
- Upgrading Sybase with an Electronic Software Distribution (ESD) fix

These instructions assume the following:

- You do not have a previous version of Sybase already installed on your machine. If you have a previous version of Sybase installed, you might need to migrate databases, depending on the version installed. In this case, do not follow these instructions. Instead, refer to Sybase product documentation on the Sybase Web site at sybooks.sybase.com/asp1200e.html.
- Your Sybase 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.
- You have checked the Sybase product documentation on the Sybase Web site at sybooks.sybase.com/asp1200e.html to verify that you have enough memory and disk space for your installation.

Note: Install Sybase before installing WebSphere Application Server. Also, the Sybase installer requires Java to be installed on the local host.

Installing Sybase

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

1. Ensure that you are logged onto the machine with superuser (root) privileges.
2. Ensure that you have set the following UNIX shared memory parameters properly:
   - SHMMAX
   - SHMSEG

   Further, ensure that the Asynchronous I/O parameter is set to the value enable.

   After setting these values, enter the command # `touch /reconfigure` and restart your system so that the new settings can take effect. For more information on setting values for these parameters, refer to the Sybase installation documentation.

3. Ensure that the DISPLAY and TERM environment variables are set correctly for your environment.
4. Create a file system, logical volume, or directory to hold the Sybase software. If you plan to use Sybase in a production environment, it is recommended that you create a file system on a separate partition to store the database files. Refer to the Sybase installation documentation and your Solaris system documentation for more information on creating and mounting a file system.
5. Set the JAVA_HOME environment variable to the directory where Java is installed on the local machine.
6. Use operating system utilities to create the group sybase:

```
# groupadd sybase
```

7. Use operating system utilities to create the user sybase. Use the location you created in Step 4 as the user's home directory.

```
# useradd -d home_directory -g sybase sybase
```

8. Edit the /etc/group file to do the following:
     o Add the user sybase to the group sybase.
     o Add the user root to the group sybase.
9. Change the ownership of the home directory to the group sybase with the user sybase:

```
# chown sybase:sybase home_directory
```

10. Log in as the user sybase, by using the following command. Note that when you log in as the user sybase, the command prompt changes in appearance to indicate your login identity.

```
# su - sybase
```

11. Ensure that the DISPLAY, TERM, and JAVA_HOME environment variables are still set properly.
12. Insert the Sybase 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 your machine, see your Solaris documentation for instructions on how to mount the CD-ROM drive.

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

13. Enter the following commands to begin the Sybase installation process:

```
$ cd /cdrom/sybase
$ ./install
```

    The Installation Type window opens.

14. Ensure that the radio button for **Standard Install** is selected and click **Next**. The Choose Directory window opens.
15. Specify the installation location for the Sybase files (make the installation directory the home directory of the user sybase) and click **Next**. The Summary window opens, summarizing all of the installation choices you have made so far.
16. Verify the information in the Summary window. When you have determined that it is correct, click **Next**. The Installing window opens; it tracks the status of the Sybase installation.
17. After the components are installed, the Sybase License Management window opens. Click **No** to close this window for now.
18. The Sybase License Management window opens again. Click **No** to close this window for now.
19. The Sybase Installer window opens. Click **No** to close this window for now.
20. An Information window opens, informing you that installation is complete. Click **OK**.
21. Create a .profile file in the home directory for the user sybase, as follows:
     a. Ensure that you are in the Bourne shell in the home directory of user sybase.
     b. Copy the file SYBASE.sh to the file .profile by entering the following command:

```
$ cp SYBASE.sh .profile
```

     c. Enter the following commands to change directory and file ownerships:

```
$ chown -R sybase:sybase *
```

```
$ chown sybase:sybase .profile
```

d. Add the following information to the .profile file. The environment variable DSQUERY defaults to your machine's host name, but you can change the value to any valid Adaptive Server Enterprise (ASE) server name. The *server_name* is the name of the server that you will create in the article "Configuring Sybase 12 for use with WebSphere Application Server", and *home_directory* is the installation directory of the Sybase software and, in this example installation, the home directory of the user sybase.

```
DSQUERY=server_name
export DSQUERY
PATH=home_directory/ASE-12_0/install:$PATH
export PATH
XACONFIGFILE=home_directory/xa_config
export XACONFIGFILE
```

22. Log out and log back in as user sybase to enable the changes to the environment.
23. To add licenses to your installation, enter the following command. The *home_directory* is the installation directory of the Sybase software and, in this example installation, the home directory of user sybase:

```
$ home_directory/SYSAM-1_0/bin/lmgr
```

24. The Sybase License Management window opens, asking whether you have a Sybase Software Asset Management Certificate to register. Click **Yes**.

   Your license agreement can differ from the type of agreement demonstrated here. Check with your system administrator or refer to the Sybase installation documentation for more information on registering licenses.

25. In the window that opens, enter information from the Sybase License Certificate for the feature you have purchased. Click **More** if you have more than one licensed feature. This action prompts the installer to record the information from the current feature in the license file and prompts you to enter information for the next additional feature. For WebSphere Application Server, you must install and define jConnect 5.2 to use JDBC 2.0/JTA. For distributed transactions with the WebSphere Application Server, a DTM license (ASE 12.0 DTM Option) is required. Click **Done** after you enter all of your license information.

Determine whether you need to update the basic Sybase installation with an ESD fix by reviewing the information on the WebSphere Application Server Supported Hardware, Software, and APIs Web site at www.ibm.com/software/webservers/appserv/doc/latest/prereq.html. If you must install a fix, note the fix level and proceed to the section "Upgrading Sybase with an ESD fix."

Upgrading Sybase with an ESD fix

To upgrade Sybase with an ESD fix, do the following:

1. If you have not already done so, 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 whether you need to install a Sybase ESD fix for your level of WebSphere Application Server. Note the ESD fix level needed.
2. Ensure that you are logged into the machine as user sybase. Note that when you log in as user sybase, the command prompt changes in appearance to indicate your login identity.
3. Create a directory into which to download the file.
4. Open a Web browser window and go to www.sybase.com/downloads. Move to the product downloading site, which can be restricted to registered users, and download the appropriate file. Check with your system administrator if you cannot access this site.
5. On the host machine, navigate to the directory containing the downloaded file.
6. Uncompress and untar the downloaded file to extract the Sybase files.
7. Navigate to the *home_directory*/ASE-12_0 directory by entering the following command. The *home_directory* is the installation directory of the Sybase software and, in this example installation, the home directory of user sybase.

```
$ cd home_directory/ASE-12_0
```

8. Recursively copy the download directory contents to *home_directory*/ASE-12_0 directory by entering the following

command. The *fix_directory* is the directory containing the fix files. It usually bears the name of the fix level (such as ebf8774, for example).

```
$ cp -R /download_directory/fix_directory/* .
```

To check the installation, proceed to "Configuring Sybase 12 for use with WebSphere Application Server."

Configuring Sybase 12 for use with WebSphere Application Server

This article describes how to do the following:

- Create, configure, and verify the operation of a Sybase server.
- Create and configure a database named WAS40 and the Sybase users required by WebSphere Application Server.

The procedures in this article assume that you have installed Sybase and any required ESD fix.

Creating, configuring, and verifying the operation of a Sybase server

Create, configure, and verify the operation of a Sybase server by performing the following steps:

1. Ensure that you are logged in as the user sybase.
2. Ensure that the DISPLAY, TERM, and JAVA_HOME environment variables are set properly.
3. Start the Sybase Adaptive Server setup and configuration utility by entering the following command:

```
$ asecfg
```

4. In the ASE Setup and Configuration window, click **Configure a new server**.
5. In the srvbuild-Select Servers to Build window, click the radio button **Adaptive Server** and type the server name. The name must match the value that you defined for the DSQUERY environment variable.
6. Click **OK**. The srvbuild-Server Attribute Editor window opens.
7. In the **Master device path** field, enter the value `home_directory`/master, where the *home_directory* is the installation directory of the Sybase software and, in this example installation, the home directory of the user sybase.
8. Accept the default values for the **Master device size (MB)** and **Master database size (MB)** fields.
9. In the **Sybsystemprocs device path** field, enter the value `home_directory`/sybsystemprocs. As before, *home_directory* is the installation directory of the Sybase software and the home directory of the user sybase.
10. Accept the default values for the other fields and click **Edit Advanced Adaptive Server Attributes**. The srvbuild-Server Attribute Editor window opens.
11. In the **Sybsystemdb (two-phase commit) device path** field, enter the value `home_directory`/sybsystemdb.
12. Accept the default values for the other fields and click **Build Server!**. The srvbuild-Status Output window opens, showing the status of the various configuration tasks as they run.
13. Near the end of the configuration process, the srvbuild-question window opens, asking whether you want to localize your Adaptive Server to use a language other than U.S. English or to use a different default character set or sort order. For this example configuration, click **No**. (If you need to change these parameters, click **Yes** and refer to the Sybase installation documentation for more information.)
14. If the configuration is successful, the following message is displayed in the srvbuild-Status Output window:

```
Server 'server_name' was successfully created.
Done
```

15. Click **OK** to close the srvbuild-Status Output window.
16. In the srvbuild-Select Servers to Build window, click **Exit**.
17. A srvbuild-question window opens, asking whether you want to exit from the utility. Click **Yes**.
18. If the ASE Setup and Configuration window continues to be displayed, click **Exit**.
19. Use the following procedure to check the operation of the server you created:
    a. As the user sybase, use the following command to log into the Adaptive Server as the user sa and start the Sybase **isql** interactive utility. The variable *home_directory* is the installation directory of the Sybase software and, in this example configuration, the home directory of the user sybase. The variable *server_name* is the

name of the server you just created.

```
$ home_directory/OCS-12_0/bin/isql -Usa -P -Sserver_name
```

You see the **isql** prompt:

```
1>
```

Note: The Adaptive Server installation and setup processes require certain user roles. Different user roles own different responsibilities and privileges. The user sybase is the UNIX login account that owns all of the Sybase installation directories and files, sets permissions on those directories and files, and performs the installation and upgrading of Adaptive Server. The user sa, created when you install the Sybase software, is not a UNIX login account; it is specific to Adaptive Server and is used to log in to Adaptive Server with the **isql** command. It is the Sybase system administrator in charge of creating user accounts, assigning permissions on databases, and creating new databases.

b. Shut down the server by entering these commands:

```
1> shutdown
2> go
```

Text similar to the following is displayed:

```
Server SHUTDOWN by request.
The SQL Server is terminating this process. . .
```

c. Navigate to the *home_directory*/ASE-12_0/install directory by entering the following command:

```
$ cd home_directory/ASE-12_0/install
```

d. Start the server by entering the following command:

```
$ startserver -f RUN_server_name
```

where *server_name* is the value that you set for the DSQUERY environment variable.

Check the messages that appear to ensure that no errors are reported.

e. Press Return when a line similar to the following is displayed:

```
00:00000:00001:2000/05/09 13:19:14.32 server    'iso_1' (ID = 1).
```

20. As the user sybase, use the following procedure to ensure that any installed fix was applied correctly to the Sybase base installation.
   a. Type the following command to launch the Sybase **isql** interactive utility:

```
$ home_directory/OCS-12_0/bin/isql -Usa -P -Sserver_name
```

You see the **isql** prompt:

```
1>
```

b. Type the following commands:

```
1> select @@version
2> go
```

Text similar to the following appears. Note that the installed patch appears in this listing.

```
Adaptive Server Enterprise/12.0/P/SWR 8774 ESD 1/Sun_svr4/OS  \
5.6/1580/32bit/FBO/Tue Dec  7 03:10:20 1999
```

c. If necessary, enter the following command to exit the **isql** utility:

```
1> quit
```

21. To use the jConnect 5.2 Java Database Connectivity (JDBC) driver, set the JDBC_HOME and CLASSPATH environment variables by doing the following (for this example installation, assume the use of jConnect 5.x):
    a. Set JDBC_HOME to the directory where you have installed jConnect (in this example installation, *home_directory*/jConnect-5_2).
    b. Set CLASSPATH to the location of your jConnect JAR file (in this example installation, *home_directory*/jConnect-5_2/classes/jconn2.jar).
    c. To enable the jConnect verification steps performed in Step 22, append CLASSPATH with *home_directory*/jConnect-5_2/classes.
    d. Log out and log back in as the user sybase to enable the changes to the environment.
22. To verify that the jConnect driver is operating correctly, test the installation by running the supplied **Version** program. The **Version** program connects to a demonstration database that Sybase makes available on the Internet. Therefore, you must have Internet access to run the program successfully. To run the **Version** program, do the following:
    a. Navigate to the directory represented by the JDBS_HOME environment variable (in this example installation, *home_directory*/jConnect-5_2) by entering the following command:

```
$ cd home_directory/jConnect-5_2
```

    b. Enter the following command to run the Java program:

```
$ java sample2.SybSample Version
```

The SybSample window appears, which displays source code in the top pane, text in the middle pane, and status information in the bottom pane. If you see the following text in the middle Sample Output pane, jConnect has been installed correctly:

```
Using JDBC driver version 5.2
jConnect  (TM) for JDBC(TM)/5.2. . .
```

23. As the user sybase, run the **instmsgs.ebf** script to update your SQL server messages to the latest installed fix level. Save the output of this step to an operating system output file.

```
$ home_directory/OCS-12_0/bin/isql -Usa -P -Sserver_name -n \
-ihome_directory/ASE-12_0/scripts/instmsgs.ebf -ooutput_file
```

24. As the user sybase, use the following commands to create a password for the user sa. (Immediately after a new installation, there is no password on the sa account, and one must be created.) Passwords beginning with numerals must be enclosed in quotation marks (").

```
$ home_directory/OCS-12_0/bin/isql -Usa -P  \
-Sserver_name> sp_password null, new_sa_password
```

Creating and configuring the WAS40 database and Sybase users required for WebSphere Application Server

Before you can effectively run WebSphere Application Server, you must create a Sybase database named WAS40 and the Sybase users EJSADMIN and EJB, which are required by WebSphere Application Server. To perform these tasks, complete the following steps:

1. Type the following command to launch the Sybase **isql** interactive utility:

```
$ home_directory/OCS-12_0/bin/isql -Usa -Pnew_sa_password -Sserver_name
```

You see the **isql** prompt:

```
1>
```

2. Initialize a database device named WASDEV by entering the following commands:

```
1> disk init name = 'WASDEV',
          physname = '/home_directory/was.dat',
          vdevno = 3,
          size = 5000
2> go
```

In these commands, the value for the name option is the device name, the value for the physname option is the name of the raw disk partition or operating system file, the value for the vdevno option is the identifying number for the database device, and the value for the size option is the size of the database device in 2-KB blocks.

Note: The value of the vdevno option must be set to the next available (unused) device. To list the devices in use, enter the following commands:

```
1> sp_helpdevice
2> go
```

The value of 5000 for the size option is equivalent to 10 MB. You might need to specify a higher value for production use. The Sybase default is 2 MB, which is too small for use with WebSphere Application Server.

3. Enter the following commands to create the database WAS40 on the WASDEV database device and allocate 10 MB of space to the database. The database name must be in uppercase letters.

```
1> create database WAS40 on WASDEV = 10
2> go
```

Text similar to the following is displayed:

```
CREATE DATABASE: allocating 4864 pages on disk 'WASDEV'
```

4. Change to the new database by entering the following commands:

```
1> use WAS40
2> go
```

5. Create the Sybase login ID and password for WebSphere Application Server by entering the following commands. You will use this database login ID and password when you install WebSphere Application Server. The login ID must be in uppercase letters. The password must be a minimum of six characters.

```
1> sp_addlogin EJSADMIN, 6-or-more-character_password, WAS40
2> go
```

6. Add the user EJSADMIN to the database WAS40 by entering the following commands:

```
1> sp_adduser EJSADMIN
2> go
```

7. Create a Sybase login ID for enterprise beans by entering the following commands. You will use this login ID and

password to access your data source for enterprise beans in WebSphere Application Server. The login ID must be in uppercase letters. The password must be a minimum of six characters.

```
1> sp_addlogin EJB, 6-or-more-character_password, WAS40
2> go
```

8. Add the user EJB to the database WAS40 by entering the following commands:

```
1> sp_adduser EJB
2> go
```

9. Grant the users EJSADMIN and EJB all object access permissions to the database WAS40 by entering the following commands:

```
1> grant all to EJSADMIN, EJB
2> go
```

10. Grant the user EJB the privileges of dtm_tm_role by entering the following commands. (You will enable Data Transaction Management (DTM) in Step 13.

```
1> grant role dtm_tm_role to EJB
2> go
1> COMMIT
2> go
```

11. Use the following commands to turn on the database option **trunc log on chkpt**. Turning on this option ensures that committed transactions are removed from the transaction log when the CHECKPOINT checking process occurs. (Transactions are removed from the log file in this case only if 50 or more rows exist in the log.)

```
1> use master
2> go
1> sp_dboption WAS40, "trunc log on chkpt", true
2> go
```

The following text is displayed:

```
Database option 'trunc log on chkpt' turned ON for database 'WAS40'.
Run the CHECKPOINT command in the database that was changed.
(return status = 0)
```

12. Enter the following commands to complete the configuration:

```
1> COMMIT
2> go
1> use WAS40
2> go
1> COMMIT
2> go
1> CHECKPOINT
2> go
```

13. To enable Data Transaction Management (DTM), perform the following steps:
    a. Turn on the **enable DTM** configuration parameter by entering the following commands:

    ```
    1> sp_configure "enable DTM", 1
    2> go
    ```

    b. To enable the option to take effect, shut down the database server by entering the following commands:

```
1> shutdown
2> go
```

   c.   Restart the server by entering the following command:

```
$ home_directory/ASE-12_0/install/startserver -f RUN_server_name
```

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.

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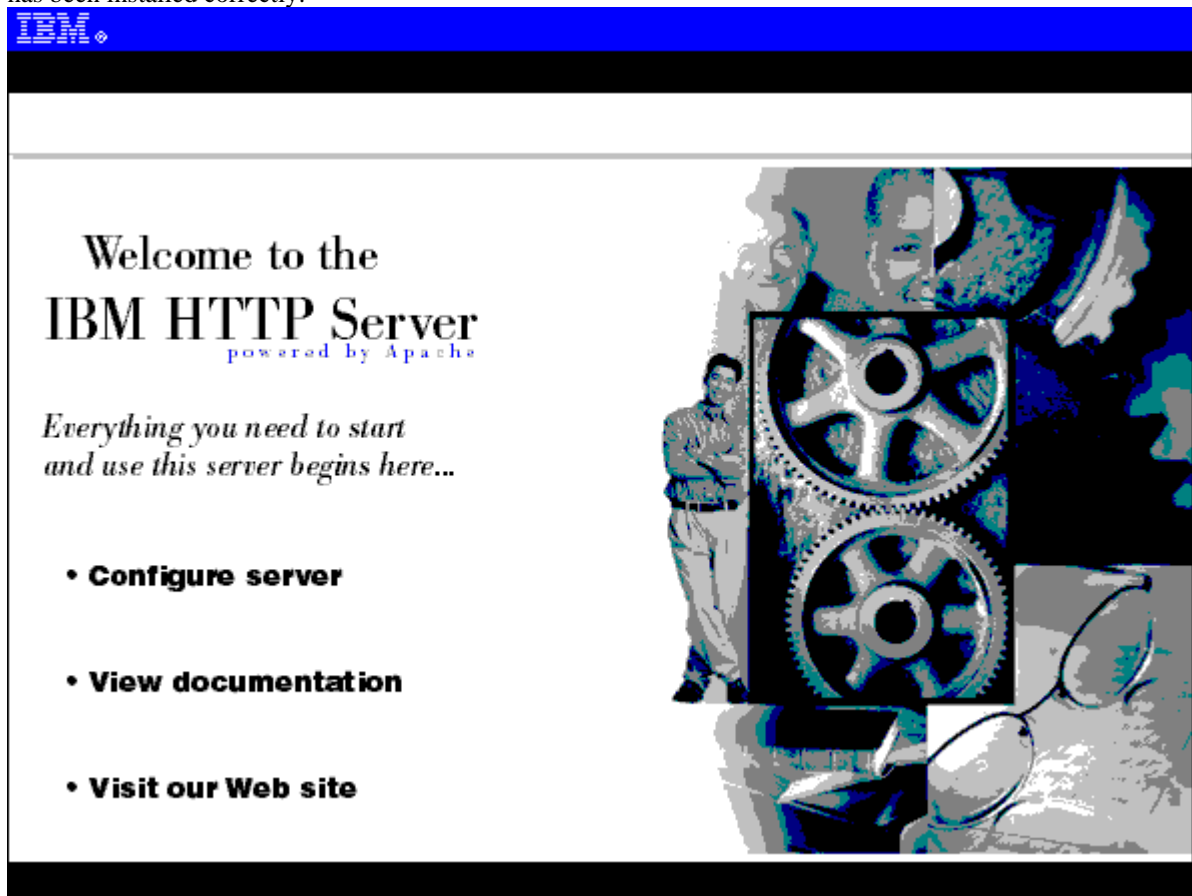
Note that you might need to make configuration adjustments to the server in order to run it successfully on your system. See the IBM HTTP Web Server documentation at www.ibm.com/software/webservers/httpservers/library.html for more information.

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.