

## Installing the Advanced Edition using IBM HTTP Server and Sybase on AIX

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

- AIX 4.3.3 or AIX 5.1
- IBM Java 2™ Software Developer's Kit (SDK) 1.3.0
- IBM HTTP Server 1.3.19
- 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](http://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](#)

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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](http://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, install Sybase 12 and obtain the product CD for WebSphere Application Server download the product from the WebSphere Application Server Download Web site at [www.ibm.com/software/webservers/appserv/download.html](http://www.ibm.com/software/webservers/appserv/download.html). WebSphere Application Server comes with the IBM Java 2™ Software Developer's Kit (SDK) and IBM HTTP Server. Instructions for installation follow:

1. [Installing Sybase 12](#) describes how to install Sybase and an appropriate Electronic Software Distribution (ESD) fix.
2. [Configuring Sybase 12](#) describes how to configure Sybase for use with WebSphere Application Server.
3. [Installing WebSphere Application Server 4.0](#) describes how to install WebSphere Application Server by using the **Custom Installation** option.
4. [Testing the installation](#) describes how to test the installation and configuration of your WebSphere system.
5. [Testing with an enterprise bean](#) describes how to test your WebSphere configuration by using an enterprise bean and the Increment sample.

### Installing Sybase 12

This article describes how to do the following:

- Install Sybase 12 on a local AIX machine.
- Upgrade Sybase 12 with an Electronic Software Distribution (ESD) fix.

These instructions assume the following:

- Your machine has enough memory and disk space for your installation. See the Sybase Product Manuals Web site at [sybooks.sybase.com/asp1200e.html](http://sybooks.sybase.com/asp1200e.html) for the requirements.
- You do not have a previous version of Sybase already installed on your machine. If a previous version of Sybase is

installed, you can need to migrate databases, depending on the version installed. In this case, do not follow these instructions. Instead, refer to the Sybase Product Manuals Web site at [sybooks.sybase.com/asp1200e.html](http://sybooks.sybase.com/asp1200e.html).

- Your Sybase database server will reside on the same machine as WebSphere Application Server. This configuration and the use of the default settings documented in these instructions are appropriate only for development and small production environments.

**Note:** Install Sybase before installing WebSphere Application Server. The Sybase installer requires Java to be installed on the local machine.

## Installing Sybase 12

Perform the following steps to install Sybase 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 shared memory and shared memory segments parameters properly. Refer to the Sybase installation documentation for more information about setting these parameters.
3. Invoke the System Management Interface Tool (SMIT) to enable Asynchronous I/O by entering the following command:

```
# smit devices
```

The Devices window opens

4. On the Devices window, select **Asynchronous I/O**.
5. On the Asynchronous I/O window, select **Change/Show Characteristics of Asynchronous I/O**.
6. On the Change/Show Characteristics of Asynchronous I/O window, perform the following steps:
  - a. Set the value for the **STATE to be configured at system restart** field to **available**.
  - b. Set the value of the **State of fast path** field to **enable**.
  - c. Accept the default values for the other fields and click **OK**. When this process is complete, exit from SMIT.
7. Restart your system for the updated settings to take effect.
8. Ensure that the **DISPLAY** and **TERM** environment variables are set correctly for your environment.
9. Create a file system, logical volume, or directory to hold the Sybase software. Ensure that the location you choose has sufficient disk space.
10. If you plan to use Sybase 12 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 12 installation documentation and your AIX system documentation for more information on creating and mounting a file system.
11. Set the **JAVA\_HOME** environment variable includes the full pathname of the directory where Java is installed on the local machine.
12. Invoke SMIT to create an administrative group for Sybase, named **sybase** in this example, by entering the following command:

```
# smit mkgroup
```

13. In the Add a Group window, perform the following steps:
  - a. In the **Group NAME** field, type **sybase**.
  - b. Click **OK**. When this process is complete, exit from SMIT.
14. Create a user to administer Sybase, named **sybase** in this example, by entering the following command:

```
# smit mkuser
```

The **sybase** user must have permissions to access the directory structure from the root operating system directory or disk partition down to the specific physical device or operating system file containing the Sybase software. It is recommended that the user named **sybase** perform all unloading, installing, upgrading, and setup tasks.

15. In the Add a User window, perform the following steps:
  - a. In the **User NAME** field, type **sybase**.
  - b. In the **Primary GROUP** field, type **sybase**.
  - c. In the **HOME directory** field, type **/home/sybase**. Note that the value you enter in the **HOME directory**

field can be different than the example shown here.

d. Click **OK**. When this process is complete, exit from SMIT.

16. Ensure that the user root is a member of the sybase group by entering the following command:

```
# smit chuser
```

17. In the Change / Show Characteristics of a User window, type `root` in the **User NAME** field, and click **OK**.

18. In the Change / Show Characteristics of a User window, perform the following steps:

- a. In the **Group SET** field, ensure that the group sybase is included by clicking in the field and scrolling to the end of the entries. If it is not included, append it to the end of the entries.
- b. Click **OK**. When this process is complete, exit from SMIT.

19. Change the ownership of the installation directory to the group sybase and the user sybase, respectively, by using the **chown** command, as follows:

```
# chown sybase:sybase install_directory
```

In this command, *install\_directory* indicates the directory or the full path name of the file system or logical volume you have created to contain the Sybase software.

20. Ensure that a CD-ROM drive is installed and configured on the machine. If a CD-ROM drive is not installed or configured on the machine, install and configure one according to the instructions provided with the drive.

21. Insert the Sybase software CD-ROM into the machine's CD-ROM drive.

22. Use the **mkdir** command to create a mount point for the CD-ROM drive. The following command creates a mount point for the CD-ROM at `/cdrom`; you can mount the CD-ROM at any location in the machine's local file system.

```
# mkdir /cdrom
```

**Note:** The commands in this document assume the CD-ROM is mounted at `/cdrom`. If you mount the CD-ROM drive at a different location, use that location when issuing the commands in this document.

23. Invoke SMIT for configuring CD-ROM file systems by entering the following command:

```
# smit cdrfs
```

24. From the **CDROM File Systems** menu, click **Add a CDROM File System**.

25. In the Add a CDROM File System window, perform the following steps:

- a. With the cursor in the **DEVICE name** field, click the **List** button and choose the name of the CD-ROM drive that contains the Sybase 12 software CD-ROM.
- b. In the **MOUNT POINT** field, type the full pathname of the mount point for the CD-ROM drive. Use the name of the directory that you created with the **mkdir** command in Step 25.
- c. In the **Mount AUTOMATICALLY at system restart** field, set the value to `yes` to specify that the CD-ROM drive is mounted automatically each time the machine is restarted, or `no` to specify that the CD-ROM drive is not mounted automatically each time the machine is restarted.
- d. Click **OK**. The CD-ROM file system is added. When this process is complete, exit from SMIT.

26. Invoke SMIT for mounting a file system by entering the following command:

```
# smit mountfs
```

27. In the Mount a File System window, perform the following steps:

- a. With the cursor in the **FILE SYSTEM name** field, click the **List** button and choose the CD-ROM file system that you want to mount.
- b. In the **DIRECTORY over which to mount** field, type the name of the mount point for the CD-ROM drive. Use the name of the directory that you created with the **mkdir** command in Step 25.
- c. With the cursor in the **TYPE of file system** field, click the **List** button and choose **cdrfs**.
- d. Set the **Mount as READ-ONLY system** field value to `Yes`.
- e. Verify or change the entries in the remaining fields, depending on how you want to mount the CD-ROM drive, and then click **OK**. The drive is mounted as a file system. When this process is complete, exit from SMIT.

28. Authenticate as the user sybase by using the **su** command, as follows:

```
# su - sybase
```

Note that when you log in as the user *sybase*, the command prompt changes from # to \$ to indicate a change in your login identity.

29. Ensure that the DISPLAY, TERM, and JAVA\_HOME environment variables are still set properly. In addition, ensure that the PATH environment variable includes the full pathname of the directory in which Java is installed.
30. Navigate to the /cdrom directory.
31. Start the Sybase installation program by entering the **install** command, as follows:

```
$ ./install
```

32. The Installation Type window opens. Ensure that the **Standard Install** radio button is selected and click **Next**. A Standard installation requires 460 MB of disk space. Customized installations can require additional disk space. See the Sybase installation documentation for more information.
33. The Choose Directory window opens. Specify the installation directory for Sybase, and click **Next** to continue.
34. The Summary window opens. It summarizes all of the installation choices you have made so far. Verify that the information and when you have determined that it is correct, click **Next** to continue.
35. The Installing window displayed. It tracks the status of the Sybase installation.
36. After the components are installed, the Sybase License Management window opens. Click **No** to exit from this window.
37. The Sybase License Management window opens again. Click **No** to exit from this window.
38. The Sybase Installer window opens. Click **No** to exit from this window.
39. The Information window opens, informing you that installation is complete. Click **OK** to exit from the Sybase installation program.
40. Create a .profile file in the home directory of the user sybase, as follows:
  - a. Ensure that you are in the home directory of the user sybase.
  - b. Ensure that you are using the Bourne shell. If you are not, enter the following command:

```
$ sh
```

- c. Copy the file SYBASE.sh to the file .profile, as follows:

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

- d. If necessary, modify the ownership of the .profile file by entering the following commands. The need to enter these commands depends on how the user sybase is configured on your system.

```
$ cd /home_directory
$ chown -R sybase:sybase *
$ chown sybase:sybase .profile
```

- e. Add the following information to the .profile file. In this example, *server\_name* is the name of the server that you will create, and *install\_directory* is the installation directory of the Sybase software:

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

DSQUERY defaults to your machine's host name, but you can change the value to any valid ASE server name.

41. Configure the user root to execute the user sybase's .profile file on startup. This is required to install and run WebSphere Application Server.
42. Log out and log back in as the user sybase for your changes to take effect.
43. To add licenses to your installation, enter the following command:

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

In this command, *install\_directory* is the installation directory of the Sybase software.

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

**Note:** Your license agreement can differ from the type of agreement used in this example. Refer to the Sybase installation documentation for more information about registering licenses.

45. Enter information from the Sybase License Certificate for the feature you have purchased. Click **More** if you have more licensed features. This action prompts the installer to record the information you entered for the first feature in the license file and prompts you to enter information for the next 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 Advanced Edition, a DTM license (ASE 12.0 DTM Option) is required. Click **Done** after you have entered all of your license information.
46. See the WebSphere Application Server Supported Software and APIs Web site at [www.ibm.com/software/webservers/appserv/doc/latest/prereq.html](http://www.ibm.com/software/webservers/appserv/doc/latest/prereq.html) to determine if it is necessary to install a Sybase ESD for your version of WebSphere Application Server.

### Upgrading Sybase 12 with an ESD

Perform the following steps to upgrade Sybase 12:

1. If you have not already done so, see the WebSphere Application Server Supported Software and APIs Web site at [www.ibm.com/software/webservers/appserv/doc/latest/prereq.html](http://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 required.
2. Ensure that you are logged into the machine as the user sybase. Note that when you log in as the user sybase, the command prompt appears as \$, rather than #, to indicate your login identity.
3. Create a directory into which to download the patch file.
4. Start a Web browser and go to the Sybase Downloads Web site at [www.sybase.com](http://www.sybase.com).
5. Download the appropriate file to the local machine.
6. Navigate to the directory containing the downloaded file.
7. Uncompress and untar the downloaded file to extract the Sybase 12 files.
8. Navigate to the *install\_directory*/ASE-12\_0 directory. The *install\_directory* represents the full pathname or the directory containing the base Sybase software.
9. Recursively copy the download directory contents to the *install\_directory*/ASE-12\_0 directory by entering the following command:

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

In this command, *download\_directory* represents the directory you created to contain the downloaded file and *fix\_directory* represents a directory that is created when you uncompress and untar the downloaded file. The *fix\_directory* usually bears the name of the fix level (ebf8774, for example).

10. Proceed to the article [Configuring and verifying installation of Sybase 12](#) to configure and test your installation of Sybase.

### Configuring and verifying installation of Sybase 12

This article describes how to do the following:

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

These instructions assume that Sybase is installed and that the required Electronic Software Distribution (ESD) fix is installed, if necessary.

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

Perform the following steps to create a database for WebSphere:

1. Log in as the user sybase. Note that when you log in as user sybase, the command prompt appears as \$, rather than #, to indicate your login identity.
2. Ensure that the DISPLAY, TERM, and JAVA\_HOME environment variables are still set properly. In addition, ensure that the PATH environment variable includes the full pathname of the directory in which Java is installed.
3. Start the Sybase Adaptive Server setup and configuration utility by entering the following command:

```
$ asecfg
```

4. The ASE Setup and Configuration window opens. Click **Configure a new server**.
5. The srvbuild-Select Servers to Build window opens. Select the **Adaptive Server** radio button and type the server name. This name must match the value that you defined for the \$DSQUERY environment variable. Click **OK**.
6. The srvbuild-Server Attribute Editor window opens. In the **Master device path** field, type the following:

```
install_directory/master
```

In this command, *install\_directory* is the full pathname of installation directory of the Sybase software.

7. Accept the default values for the **Master device size (MB)** and **Master database size (MB)** fields.
8. In the **Sybsystemprocs device path** field, type the following:

```
install_directory/sybsystemprocs
```

9. Accept the default values for the other fields, and click **Edit Advanced Adaptive Server Attributes**.
10. The srvbuild-Server Attribute Editor window opens. In the **Sybsystemdb (two-phase commit) device path** field, type the following:

```
install_directory/sybsystemdb
```

11. Accept the default values for the other fields, and click **Build Server!**.
12. The srvbuild-Status Output window opens. It shows the status of the various installation tasks as they run.
13. Near the end of the installation process, the srvbuild-question window displays, 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 installation, click **No**. (If you need to change these parameters, click **Yes**. Refer to the Sybase installation documentation for more information.)
14. If the installation is successful, the following message appears in the srvbuild-Status Output window:

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

15. Click **OK** to close the srvbuild-Status Output window.
16. The srvbuild-Select Servers to Build window opens. Click **Exit** to close this window.
17. A srvbuild-question window opens, asking whether you want to exit from the utility. Click **Yes** to continue.
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, enter the following command to log into the Adaptive Server as the user sa and launch the Sybase **isql** utility:

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

In this command, *install\_directory* represents the installation directory of the Sybase software.

If server *server\_name* is running, the **isql** prompt opens:

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 the following commands:

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

A message similar to the following opens:

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

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

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

- d. Start the server by entering the following command:

```
$ startserver -f RUN_$$DSQUERY
```

where `$$DSQUERY` is the value that you set for this environment variable.

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

- e. Press Return when a line similar to the following opens:

```
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:

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

You will see the **isql** prompt:

1>

- b. Type the following commands:

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

The output should include the product name, version number, and patch level.

- 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, update the .profile file by including the JDBC\_HOME and CLASSPATH environment variables. Set these variables by doing the following (for this example installation, assume the use of jConnect 5.x with JDK 1.2):
  - a. Set JDBC\_HOME to the directory where you have installed jConnect (in this example installation, *install\_directory/jConnect-5\_2*).
  - b. Set CLASSPATH to the location of your jConnect JAR file (in this example installation, *install\_directory/jConnect-5\_2/classes/jconn2.jar*).
  - c. To enable the jConnect verification steps append CLASSPATH with *install\_directory/jConnect-5\_2/classes*.
  - d. Log out and log back in as the user sybase for your changes to take effect.
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. Ensure that your JAVA\_HOME, JDBC\_HOME, and CLASSPATH environment variables are set properly.
  - b. Navigate to the directory represented by the JDBC\_HOME environment variable (in this example installation, *install\_directory/jConnect-5\_2*) by entering the following command:

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

- c. Enter the following command to run the Java program:

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

The SybSample window displays, showing the source code for the **Version** program 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. . .
```

- d. On the **File** menu, click **Close** to exit from the SybSample window.
23. Run the **instmsgs.ebf** script to update the SQL server messages to the latest installed fix level. Save the output of this step to a file, as follows:

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

24. After the initial Sybase installation, the password for user sa is NULL. As the user sybase, set the password by entering the following commands:

```
isql -Usa -P -Sserver_name
1> sp_password null, new_password
2> go
```

25. Type quit.

### Creating Sybase resources required by WebSphere Application Server

Perform the following steps to create a database named WAS40 and the Sybase users required by WebSphere:

1. Create the database WAS40 by performing the following steps:
  - a. Enter the following command to start the Sybase **isql** interactive utility:

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

The **isql** prompt opens:

```
1>
```

- b. Initialize a database device named WASEV by entering the following commands:

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

In this example, 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 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 commands:

```
isql -Usa -P
1> sp_helpdevice
2> go
```

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

2. 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 will be the WebSphere Application Server administrative repository that you configure during installation of WebSphere Application Server. The database name must be in uppercase letters:

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

A message similar to the following opens:

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

3. Access the new database by entering the following commands:

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

4. Create the Sybase user ID and password for WebSphere Application Server by entering the following commands:

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

You will use this database user ID and password when you install WebSphere Application Server. The user ID must be in uppercase letters and the password must be a minimum of 6 characters.

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

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

6. Create a Sybase user ID for enterprise beans by entering the following commands:

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

You will use this user ID and password to access your data source for enterprise beans in WebSphere Application Server. The user ID must be in uppercase letters and the password must be a minimum of 6 characters.

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

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

8. 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
```

9. Grant the user EJB the privileges of dtm\_tm\_role by entering the following commands. You will enable Data Transaction Management (DTM) in Step [12](#).

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

10. Use the following commands to activate the database option **trunc log on chkpt**. Activating 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 opens:

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

11. 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
```

12. Perform the following steps to enable Data Transaction Management (DTM):

- a. Activate the **enable DTM** configuration parameter by entering the following commands:

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

- b. For your changes 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:

```
$ install_directory/ASE-12_0/install/startserver -f RUN_$DSQUERY
```

## Installing WebSphere Application Server 4.0

This article describes how to install WebSphere Application Server on an AIX machine by using the Custom Installation option.

These instructions assume the following:

- The 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](http://www.ibm.com/software/webservers/appserv/doc/latest/prereq.html) for the requirements.
- If you plan to use IBM HTTP Server, you will select it for installation during the WebSphere Application Server installation process. If you plan to use a different supported Web server with WebSphere, you have already installed it on the same machine that will contain WebSphere Application Server.
- You have installed and configured a supported database for use with WebSphere Application Server.
- You do not have a previous version of WebSphere Application Server already installed on this machine. If you do have a previous version of WebSphere Application Server already installed, do not follow these instructions. Instead, see the article [Migration overview](#).

**Note:** IBM HTTP Server is provided with WebSphere Application Server. If you want to install and use a different supported Web server, you must purchase and install it separately.

Perform the following steps to install WebSphere Application Server:

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.
3. If you have a version of IBM HTTP Server older than version 1.3.19 installed on your machine, you must uninstall it before using the WebSphere Application Server installation program to install IBM HTTP Server 1.3.19.
4. Insert the WebSphere Application Server CD-ROM into the CD-ROM drive.
5. If necessary, use the **mkdir** command to create a mount point for the CD-ROM. The following command creates a mount point at the directory /cdrom; you can mount the CD-ROM at any location on the machine's local file system.

```
# mkdir /cdrom
```

The commands in these steps assume the CD-ROM is mounted at /cdrom. If you mount the CD-ROM at a different location, use that location when issuing commands.

6. Mount the CD-ROM drive by entering the following command:

```
# mount -o ro -v cdrfs /dev/cdnumber /cdrom
```

In this command, *number* is the CD-ROM number for your system, usually 0 (zero). Note that this command assumes that the CD-ROM is mounted at /cdrom.

7. Ensure that your DISPLAY and TERM environment variables are set properly.
8. If the supported Web server or database you plan to use with WebSphere 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](http://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 prerequisite checking functionality, perform the following steps:

- a. Copy the `prereq.properties` file from the `/cdrom` 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.
9. Navigate to the `/cdrom/aix` directory.
  10. If you have not downloaded an updated `prereq.properties` file or disabled the prerequisite checking functionality, start the WebSphere Application Server installation program by using the **`install.sh`** command, as follows:

```
# ./install.sh
```

If you have downloaded an updated `prereq.properties` file or disabled the prerequisite checking functionality as detailed in [Step 8](#), start the WebSphere Application Server installation program by using the **`install.sh`** command, as follows:

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

11. The Welcome to the IBM WebSphere Application Server Setup program dialog box opens. Click **Next** to continue.
12. The Install Options dialog box opens. Select **Custom Installation**, and click **Next**.
13. The Choose Application Server Components dialog box opens. Select the components you want to install and deselect the components you do not want to install. Note the following information:
  - o The Java 2 Software Developer's Kit (SDK) is installed by default.
  - o 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.
  - o 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.
  - o 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://local_host:9080/servlet/snoop`. 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.

14. If you selected the **Web Server Plugins** option, the Choose Application Server Components dialog box opens. Select the appropriate plug-in for your Web server, and click **Next**.
15. The Database Options dialog opens. Depending on the database you have installed, complete one of the following set of instructions:
  - o If you are using DB2, perform the following steps in the Database Options dialog:
    - a. In the **Database Type** field, select **DB2** from the pull-down menu.
    - b. Ensure that **Remote DB** is not selected. For this example, the database and WebSphere Application Server are installed on the same node.
    - c. In the **Database Name (Database SID)** field, type the name of the database, `was40`.
    - d. In the **DB Home** field, type the full pathname of the home directory of the DB2 instance owner, `/home/db2inst1`, or specify the full pathname of the home directory by using the **Browse**

- button.
  - e. The **DB URL** field cannot be edited.
  - f. The **Server Name** field cannot be edited.
  - g. The **Port Number** field cannot be edited.
  - h. In the **Database User ID** field, type the name of the database instance owner, `db2inst1`.
  - i. In the **Database Password** field, type the current password for the database instance owner.
  - j. Click **Next** to continue.
- o If you are using Oracle, perform the following steps in the Database Options dialog:
    - a. In the **Database Type** field, select **Oracle** from the pull-down menu.
    - b. Ensure that **Remote DB** is not selected. For this example, the database and WebSphere Application Server are installed on the same node.
    - c. In the **Database Name (Database SID)** field, type the name of the Oracle database you created. For example, `ORA817.machine_name`.
    - d. In the **DB Home** field, type the full pathname of the directory you created to contain the Oracle software and to be the home directory of the user named oracle, or specify the full path name of the directory by using the **Browse** button. This path should also be the value of the `ORACLE_HOME` environment variable.
    - e. In the **DB URL** field, accept the default value `jdbc:oracle:thin:@fully_qualified_domain_name:port_number:database_name`, or specify a different URL for accessing the database.
    - f. In the **Server Name** field, type the name of the machine on which the database is installed.
    - g. In the **Port Number** field, type the port number used to access the database.
    - h. In the **Database User ID** field, type the name of the database owner, `EJSADMIN`.
    - i. In the **Database Password** field, type the current password for the database owner.
    - j. Click **Next** to continue.
  - o If you are using Sybase, perform the following steps in the Database Options dialog:
    - a. In the **Database Type** field, select **Sybase** from the pull-down menu.
    - b. Ensure that **Remote DB** is not selected. For this example, the database and WebSphere Application Server are installed on the same node.
    - c. In the **Database Name (Database SID)** field, type the name of the database, `was40`.
    - d. In the **DB Home** field, type the path of the Sybase installation directory, or specify the full pathname of the directory by using the **Browse** button.
    - e. The **DB URL** field cannot be edited.
    - f. In the **Server Name** field, type the name of the machine on which the database is installed.
    - g. In the **Port Number** field, type the port number used to access the database.
    - h. In the **Database User ID** field, type the name of the database user for example, `EJSADMIN`.
    - i. In the **Database Password** field, type the current password for the database user.
    - j. Click **Next** to continue.
16. The Select Destination Directory dialog opens. Specify the directory in 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 the destination directory. Click **Next** to continue.
  17. The Install Options Selected dialog box opens. Verify that the information is correct and click **Install** to complete the installation.
  18. Depending on the machine's configuration, the Location of Configuration files dialog box can open. It prompts you to enter the full pathname of the directory in which you want to store the specified Web server configuration file. Specify the full pathname of the file by typing it in the field or by clicking **Browse**.
  19. The Setup Complete dialog box 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.
  20. The WebSphere Application Server - First Steps dialog box opens. You can use this 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 the Web server before using WebSphere, close this dialog for now. You can launch the First Steps GUI at a later time by running the `firststeps.sh` script located in the `/usr/WebSphere/AppServer/bin` directory.
  21. Unmount the CD-ROM before removing it from the CD-ROM drive by using the `umount` command, as follows:

```
# umount /cdrom
```

22. If you are using a Web server other than IBM HTTP Server, start the server. If you are using IBM HTTP Server and have installed it during the WebSphere Application Server installation, you may need to configure the Web Server to run it successfully.

Perform the following steps to verify that IBM HTTP Server is installed and configured correctly:

- a. Ensure that the Web server is running. If not, start it by entering the following command:

```
# /usr/HTTPServer/bin/apachectl start
```

- b. Start a browser and enter the name of the local machine as the URL. If you see the IBM HTTP Server Web page, the server is installed and configured correctly.

See the IBM HTTP Server documentation Web site at [www.ibm.com/software/webservers/httpservers/library.html](http://www.ibm.com/software/webservers/httpservers/library.html) for more information about configuring IBM HTTP Server.

To enable the Secure Sockets Layer (SSL) for IBM HTTP Server, see the IBM HTTP Server documentation Web site at [www.ibm.com/software/webservers/httpservers/doc/v1319/index.html](http://www.ibm.com/software/webservers/httpservers/doc/v1319/index.html) for more information.

23. Proceed to the article [Testing the installation](#).

## Testing the installation

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

Perform the following steps to test your WebSphere installation:

1. Ensure that you are logged into the machine with superuser (root) privileges.
2. Start the WebSphere administrative server by executing the **startupServer** script, as follows:

```
# cd /usr/WebSphere/AppServer/bin
# ./startupServer.sh
```

Ensure that the administrative server has started successfully by checking the file named tracefile located in the /usr/WebSphere/AppServer/logs directory. The message `Server open for e-business` appears in this file when the server has started successfully.

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

```
# cd /usr/WebSphere/AppServer/bin
# ./adminclient.sh
```

4. When the console displays the message `Console Ready`, administer the application server by performing the following steps:
  - a. When the administrative console opens, a tree view is displayed. Click the plus sign (+) next to **WebSphere Administrative Domain** entry to expand the view.
  - b. Expand the view of the **Nodes** entry.
  - c. Identify the name of your host machine and expand the view of that entry.
  - d. Expand the view of the **Application Servers** entry.
  - e. Select the **Default Server** entry and click the **Start** icon located on the toolbar. An information window opens and indicates that the server has started. Click **OK** to close the information window.

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

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

6. Start a browser and enter the URL for the snoop servlet, which is a sample servlet that is installed by default, as follows:

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

Information about /servlet/snoop is displayed.

7. Proceed to the article [Testing with an enterprise bean](#).

## Testing with an enterprise bean

This article describes how to test your WebSphere configuration by using an enterprise bean and the Increment sample. These instructions assume that you have installed your WebSphere Application Server system and have tested the installation by using the instructions in the article [Testing the installation](#).

Perform the following steps to test your WebSphere configuration using an enterprise bean:

1. Ensure that you are logged into the machine with superuser (root) privileges.
2. Ensure that the administrative console is running.
3. Ensure that the default server (located under **WebSphere Administrative Domain > Nodes > node\_name > Application Servers**) is running.
4. 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 is running. When the Web page opens, several selection options are displayed.

5. Under the heading **Generate hit count using**, click the radio button for the **Enterprise Java Bean** option.
6. Under the heading **Transaction Type**, click the radio button for the **None** option.
7. Click **Increment**.

If the number of hits is displayed, WebSphere is functioning 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](http://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.