Installing the Standard Edition using IBM HTTP Server and IBM DB2 UDB on Windows

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

- Windows NT or Windows 2000 (tolerated)
- IBM Developer Kit, Java™ 2 Technology Edition, Version 1.2.2
- IBM HTTP Server 1.3.12
- DB2 Universal Database (UDB) 6.1 or 7.1
- A single node

See "Software Prerequisites" to learn what products and fixpacks are supported for your level of WebSphere Application Server.

Steps for installation

Deciding which steps to follow
Installing DB2 UDB 6.1 or 7.1
Installing WebSphere Application Server
Testing the installation
Testing with an Enterprise Bean (optional)
Setting up TCP/IP for standalone operations (optional)

Deciding which steps to follow

Install DB2 UDB and then obtain the product CD for WebSphere Application Server or download the product from the Web. Instructions for installing the products follow:

1. Install DB2 UDB 6.1 or DB2 UDB 7.1. Both installation instructions describe how to install DB2 UDB and an appropriate fixpack.
2. Install WebSphere Application Server 3.5 using the **Custom Install** option

If your system is not connected to the network, also complete the steps in "Setting up TCP/IP for standalone operations".

Installing DB2 Universal Database (UDB) 6.1

The steps below cover how to install DB2 UDB 6.1 and any needed fixpack. For the most recent information on installing DB2 UDB or a fixpack, consult the DB2 documentation.

Installing DB2 UDB

1. If you have the WebSphere Application Server CDs, find the DB2 UDB installation files on one of the WebSphere Application Server CDs. Run `setup.exe` in the \Db2 subdirectory.

   If you have the CD for DB2 UDB, run the `setup.exe` file.

   If you downloaded DB2 UDB, unzip the DB2 zip file to a temporary directory using an option that recreates the directory structure. Then, run the `setup.exe` file from the directory.

2. Select **Next**, choose the Enterprise Edition or the Workgroup Edition, and then select **Next**.
3. Put a check mark beside the **Typical** installation, specify the installation directory (for example, `C:\SQLLIB`), and click **Next**.
4. If necessary, overwrite the default Username and Password with your own user ID and password. Consider using the same user ID and password specified during the Web server and WebSphere Application Server installation. This will

make it the DB2 administration ID as well. Note that DB2 requires a password of 8 or fewer characters.

5. Select **Next**, and continue with the installation.
6. After the product installs, opt to restart your system.

Installing any needed DB2 UDB fixpack

If you installed DB2 UDB from a WebSphere Application Server CD, you do not need to go further. Any needed DB2 UDB fixpack was installed when you installed the base UDB product.

If you did not install DB2 UDB from the WebSphere Application Server CD, see "Software Prerequisites" to learn whether you need to install a DB2 UDB fixpack for your level of WebSphere Application Server. If you need a DB2 UDB fixpack, download the fixpack from the product Web site or obtain a CD that holds the appropriate fixpack.

Next, read the README file that accompanies the fixpack and follow the installation instructions.

Verifying the installation

After your system restarts, the DB2 First Steps and Control Center dialogs may display. At this point, you may create the database SAMPLE used by the WebSphere Application Server samples. To create the database SAMPLE, click **Create the SAMPLE database** in the DB2 First Steps dialog and then click **Yes** in the confirmation dialog.

If you receive an error message stating that the database was not created, go to the Services dialog accessible from a Control Panel and ensure that the status for the DB2-DB2 service is **Started**. The startup type for the DB2-DB2 service should be **Automatic** and the hardware profile should be **Enabled**. Once you start the DB2-DB2 service, try creating the database SAMPLE again.

After you finish, close the DB2 dialogs.

To ensure that the database SAMPLE was created, go to the DB2 Control Center (**Start**, **Programs**, **IBM DB2**, and then **Control Center**) and look in the tree for your user account for the DB2 instance SAMPLE.

Installing DB2 Universal Database (UDB) 7.1 on a Windows system

The instructions in this section cover the following tasks:

- Ensuring that your user ID has the appropriate user rights
- Installing DB2 UDB 7.1
- Installing any needed fixpack
- Verifying that the product is correctly installed

For the most recent information on installing DB2 UDB or a fixpack, consult DB2 documentation.

Checking the user rights for your ID

To install DB2, you must be logged in using a user ID that has the following set of basic and advanced user rights:

- Is defined locally
- Belongs to the Local Administrator's group
- Act as part of the operating system
- Create a token object
- Increase quotas
- Replace a process level token

Use the Windows **User Manager** utility to ensure that the user ID has the appropriate rights. To activate this utility on Windows NT, click **Start -> Programs -> Admininstrative Tools (Common) -> User Manager**. On Windows 2000, click **Control Panel -> Users and Password**. See Windows documentation for information on how to use this tool. Note that you

might need to restart your system in order for any changes made to the user account to take effect.

Installing DB2 UDB 7.1

To install DB2 UDB 7.1, follow these steps:

1. Log in using a user ID that has the appropriate user rights as shown in the preceding section.
2. If you have the product CD for DB2 UDB 7.1, run **setup.exe**. If you downloaded DB2 UDB, unzip the DB2 zip file to a temporary directory, using an option that re-creates the directory structure. Then, run **setup.exe**. The Welcome to DB2 window is displayed.

3. On the Welcome to DB2 window, read the information as needed under the **Installation Prerequisites**, **Release Notes**, and **Quick Tour** options. Click **Install** to begin the installation process.
4. The Select Products window is displayed. Choose the **Enterprise Edition** or the **Workgroup Edition**, and click **Next**.
5. The Setup Type window is displayed. Select **Typical**, and click **Next**.
6. The Choose Destination Location window is displayed. Specify an installation directory for DB2, and click **Next**.
7. The Select Username and Password windows is displayed, and default values show in the **Username** and **Password** fields.

   To simplify administration, consider configuring DB2 administration to use the same user ID and password as those that are used by the Web Server installation. In the **Username** and **Password** fields, overwrite the default values in the **Username** and **Password** fields with your own choices for user ID and password. Note that DB2 requires a password of eight or fewer characters. Click **Next**, and continue with the installation.

8. The **setup.exe** program performs the default configuration for users, groups, and an instance to be used by DB2. On Windows NT, you are prompted to restart your system after the installation is complete.

Installing any needed DB2 UDB fixpack

See "Software Prerequisites" to learn whether you need to install a DB2 UDB fixpack for your level of WebSphere Application Server. If you need a DB2 UDB fixpack, download the fixpack or obtain a CD that holds the fixpack. Follow the instructions in the README file that accompanies the fixpack.

Verifying the installation

To verify that your installation has completed successfully, create the database SAMPLE used by the WebSphere Application Server samples. To create the database SAMPLE, follow these steps:

1. Click **Start > Programs > IBM DB2 > First Steps**. The First Steps window is displayed.
2. Click **Create Sample Databases**. The First Steps - Create Sample Databases window is displayed.
3. Click **DB2 UDB Sample** and click **OK**. The SAMPLE database is added to the default instance that was created by the **setup.exe** program.

   If you receive an error message stating that the database was not created, go to the Services dialog box accessible from the Control Panel and ensure that the DB2 parameters are set as follows:

   - The DB2-DB2 service is **Started**.
   - The startup type for the DB2-DB2 service is **Automatic**.
   - The hardware profile is **Enabled**.

   After you set the parameters, try creating the database SAMPLE again.

4. To ensure that the database SAMPLE was created, go to the DB2 Control Center (**Start > Programs > IBM DB2 > Control Center**) and ensure that the name of the DB2 database SAMPLE is shown in the tree.
5. After you finish, close the DB2 dialog box.

Installing WebSphere Application Server -- Custom Installation option

To install WebSphere Application Server along with the IBM Developer Kit and IBM HTTP Server, do the following:

1. If IBM HTTP Server or another Web server on your system is running, stop the Web server.
2. Run the downloaded executable if you obtained Version 3.5 from the product Web site. Or, run `\nt\setup.exe` if you have the product CD.

   You will need 100 MB free in your temp directory (usually on the C drive), even if you are installing on another drive, because the installation shield package unpacks to the temp directory. This will kick off an installation shield package.
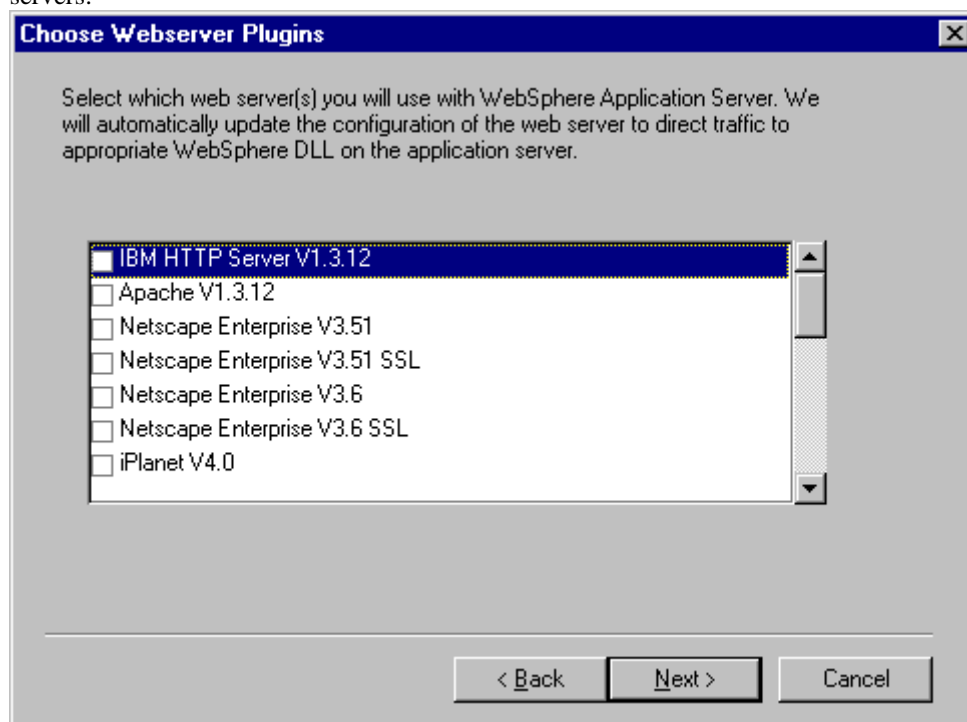
3. Select a language and click **OK**.
4. Click **Next** to pass the introductory page.
5. If WebSphere Application Server is already installed on your system, a dialog giving you the option to backup and uninstall WebSphere Application Server displays. You now have two options:
   o To backup your files and uninstall WebSphere Application Server, click **Backup and Uninstall** and then **Next** to continue with the installation.
   o To install to a different directory, simply click **Next** and continue with the installation.

   If WebSphere Application Server is not already installed on your system, proceed to step 6.

6. In the Install Options dialog, select **Custom Installation**; then click **Next**.
7. In the Choose Application Server Components dialog, select those components you want and deselect those components you do not want. You will likely want to include the default options.

   Clicking **Other JDK** displays the Select Java Development Kit dialog. If you have a Java development kit installed specify that you want the Java Development Kit 1.2 (IBM Developer Kit 1.2.2.) and its destination directory; then click **Next**. Otherwise, click **Back** to exit the dialog.

8. Click **Next**. If necessary, shut down all Web servers you plan to run with WebSphere Application Server and proceed.
9. On the Choose Webserver Plugins page, select **IBM HTTP Server V1.3.12**. Only IBM HTTP Server 1.3.12 is provided with WebSphere Application Server. You must separately purchase and install the other supported Web servers.

10. On the Security Options dialog, fill in the user ID, security password, and confirming password to use for the application server. You must have administrative privileges, your user ID must have the advanced user right "Act as part of the operating system," and you must be installing from a local user ID. Note that if your user ID has insufficient user rights to install WebSphere, it will not successfully register the WebSphere Administrative Server to the NT services database.

   If you do not need special key ring files, click **Next** to take the default key ring files and to move to the Product Directory dialog. Note that if you are using WebSphere Application Server in a production environment, you should generate your own unique key ring file after installation. The default key ring file is available to all customers and thus is insecure.

   If you do need special key ring files, click **Advanced Key Ring Settings**, select **Specify your own key ring files**, designate client and server files and passwords, and then click **Next**. After the Security Options page displays again, click **Next** to move to the Product Directory dialog.

11. Specify the destination directories and click **Next**.
12. On the Database Options dialog, do the following:
    1. For **Type**, select **DB2**.
    2. For **Database Name**, give the name of the database to use. The default is **was**.
    3. For **Path**, specify the path for the database program. This is the SQLLIB directory.
    4. For **URL**, specify the URL for accessing the database. You will likely want to take the default, which has the form `jdbc:db2:was`.
    5. For **User**, specify your user name. Note that if you use an invalid user ID to install WebSphere, it will not successfully register the WebSphere Administrative Server to the NT services database. If you have already installed DB2 UDB, ensure that you specify the Username that installed DB2 UDB.
    6. For **Password** and **Confirm**, enter your password. If you have already installed DB2 UDB, ensure that you specify the Password specified when installing DB2 UDB. Note that DB2 requires a password of 8 or fewer characters.
    7. Click **Next**.
13. Click **Next** again to begin the installation.
14. Click **OK**, and it will finish updating the files and installing.
15. The next page points you to the README and, if you are installing the samples, states where the samples have been installed. For the most recent version of the README or release notes, go to the **Library** section of the product Web site at http://www.ibm.com/software/webservers/appserv/.

   Click **Finish**, and choose to restart.

Finishing prerequisite configuration

When installing WebSphere Application Server, the installation program should have created a DB2 UDB database to store the administrative configuration used when your system starts up after rebooting. Further, the installation program should have created the WAS database with its DB2 application heap size set to 256.

To ensure that the WAS database exists, do the following:

1. Go to the Control Center dialog. If it did not open automatically after rebooting, open it as follows: from the **Start** menu, select **Programs -> DB2 for Windows NT -> Administrative Tools -> Control Center**.
2. In the DB2 Control Center, expand the tree under **Systems**. Your DB2 databases are listed under **Databases**. Examine the list to see if WAS is in it.

If you see WAS in the list, proceed to "Testing the installation".

If you do not see WAS listed, run the file createdb2.bat in the \AppServer\bin directory. Or, do the following:

1. Go to the Services dialog accessible from a Control Panel and set the startup for the DB2-DB2 service to **Automatic**. Also, ensure that the hardware profile for the DB2-DB2 service is enabled. Then, complete Step 2. Optionally, for information about why the installation program did not create the WAS database, look at the wasdb2.log file.
2. If the DB2 database WAS has not yet been created, do the following:

1. From the **Start** menu, select **Programs -> DB2 for Windows NT -> Command Line Processor**.
2. Enter `CREATE DATABASE WAS`
3. Wait a minute to allow time for DB2 to create the database.
4. Enter `UPDATE DB CFG FOR WAS USING APPLHEAPSZ 256`
5. Type `quit` to leave the CLP, and then `exit` to finish the command prompt.
6. Restart the machine.

If an application heap size of 256 doesn't work for your system, return to the DB2 Command Line Processor and change the application heap size to, for example, 512 using the command:

```
UPDATE DB CFG FOR WAS USING APPLHEAPSZ 512
```

Testing the installation

1. Check that WebSphere administrative server has been registered in the Services dialog. Open the Control Panel and select **Services**. If you scroll down you should see **IBM WS AdminServer**.
2. Start the service by selecting **IBM WS AdminServer** and then selecting **Start**.

Wait patiently. To see whether the system is still trying to start the server, examine the **Performance** page of the Task Manager. If the server is slow to start or does not start successfully, look at the last line in the \WebSphere\AppServer\logs\tracefile log. If the trace file says *server is open for e-business*, the server has started.
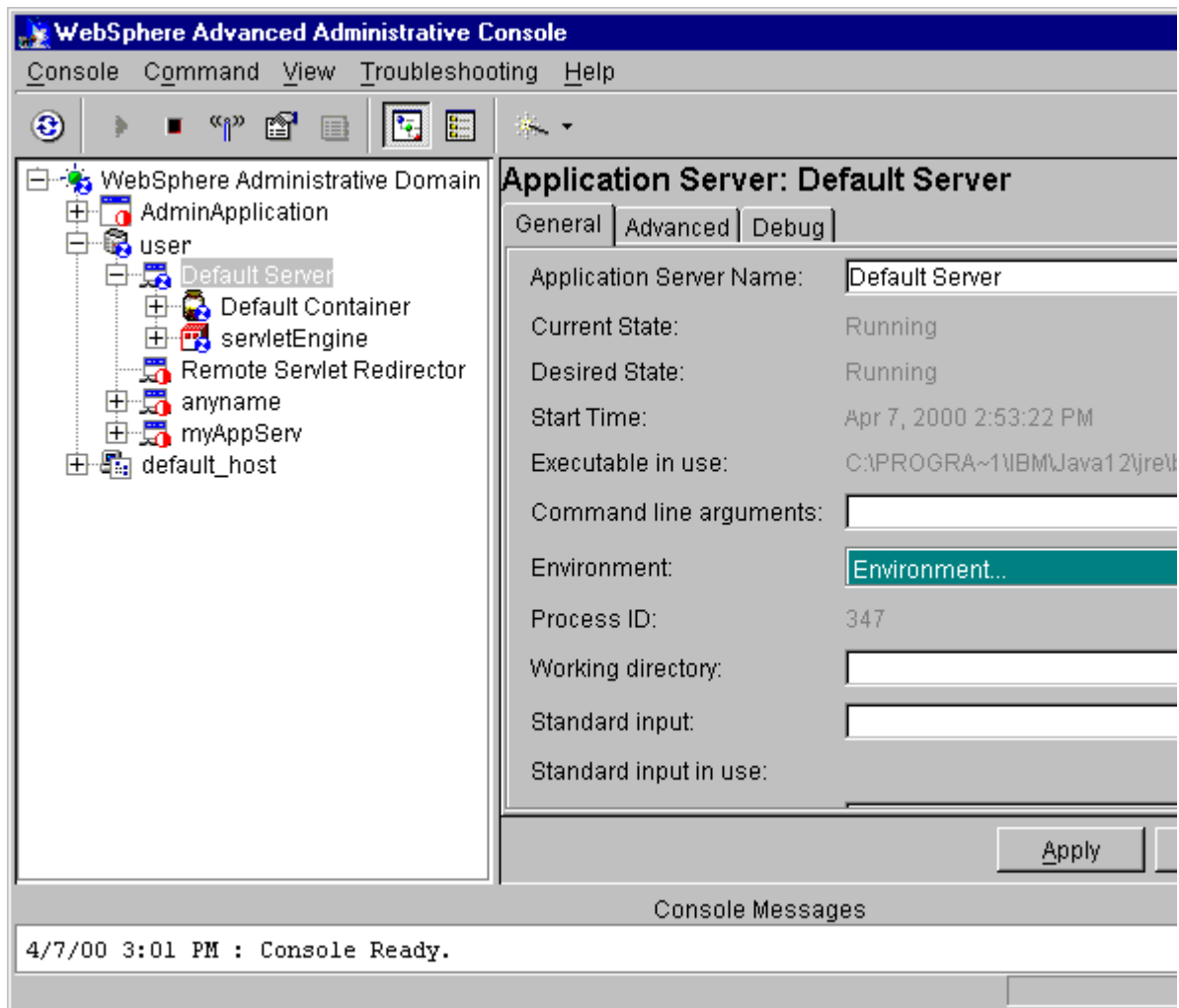
Hint: You can control the server from a command line or batch file using the following commands:

```
net start "IBM WS AdminServer"
net stop "IBM WS AdminServer"
```

Explaining the AdminServer: The AdminServer doesn't run any servlets, Java Server Pages, or Enterprise Beans. Each node can have multiple JVMs known as servers which run the application code. The Admin Server manages these servers, and if they stop, it restarts them. Each server can have EJB Containers to run EJBs, and a servlet engine to run servlets. Servers can either be independent, running different code, or clones which are identical, and the infrastructure manages spreading the incoming requests across the servers. A cluster consists of multiple nodes, each with clones.

Although the installation has created a default server, it hasn't started it, so you can't run anything yet.
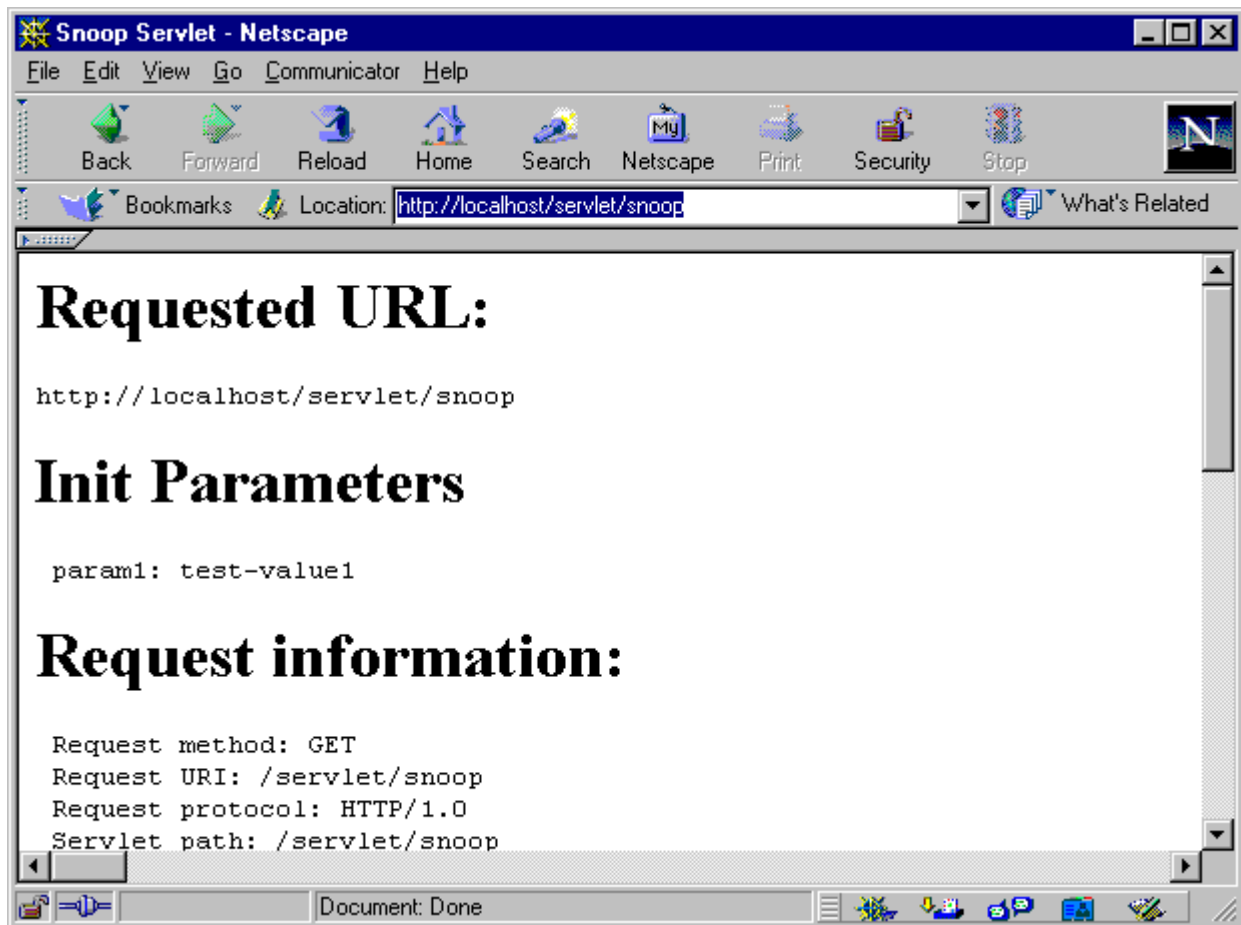
3. To start the server, run the administrative console, which is how you manage WebSphere Application Server 3.5. From the **Start** menu, select **Programs-> IBM WebSphere -> Application Server 3.5 -> Administrator's Console**. This starts the WebSphere Advanced Administrative Console.
4. Wait until you see the console message *Console Ready*. Then administer the server:
   1. When the Administrative Console opens, the **Topology** tree view is shown. Click on the + sign next to **WebSphere Administrative Domain** to expand the view.
   2. Your host name should be listed. Expand the view of that node, and you should see an entry called **Default Server**. Expand that and you will see the default container and servletEngine.

3. Select **Default Server**. If the **Current State** of DefaultServer is *Stopped*, click the **Start** icon on the tool bar. After an information dialog displays, stating that the server us running, click **OK**. Note that the current state changes from *Stopped* to *Running*.

   Once the server starts, it is marked in the configuration database that it should be running. If it stops, or if you reboot the machine, the administrative server will automatically restart it. Even if the administrative server fails, it will continue to run.

5. Test the server. Ensure that the IBM HTTP Server is running. (The status for **IBM HTTP Server** in a Services dialog, which is accessible from a Control Panel, shows *Started*.) If the IBM HTTP Server is not running, use the **Start** option in a Services dialog to start the server, or select **Start -> Programs -> IBM HTTP Server -> Start HTTP Server**. Then, open a browser and go to http://localhost/servlet/snoop, which is a standard sample servlet installed by default. You should see information on /servlet/snoop.
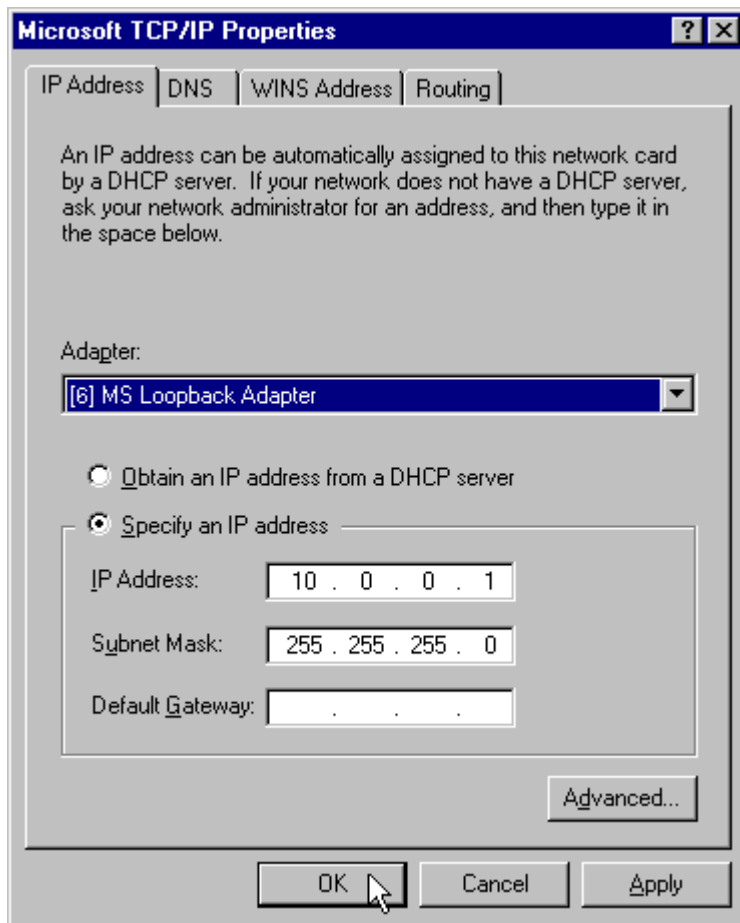
Setting up TCP/IP for standalone operations

If your system is not connected to a network, you must set up WebSphere Application Server for standalone operations.
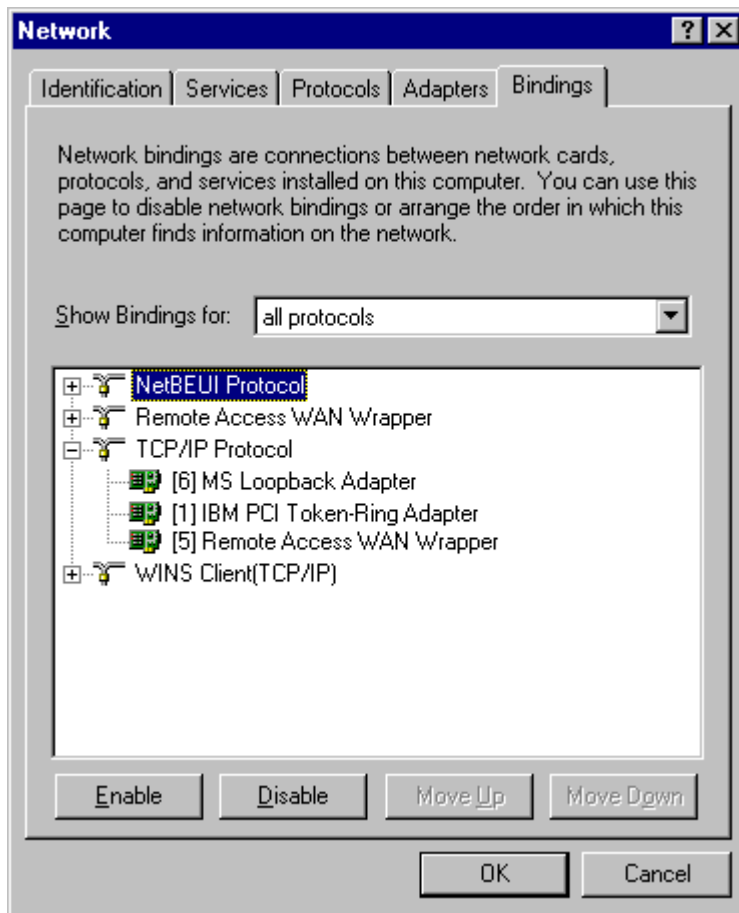
To set up your system for standalone operations, you must have TCP/IP networking installed. If you will run WebSphere Application Server as a standalone (not connected to a network), your host name must remain fixed. WebSphere Application Server is a "networked" system that can be clustered into a single domain, with the administration and other aspects rely upon the IP networking. When the product starts for the first time, it records the host name. When it restarts, it needs to be able to contact that IP address again. If you wish to use WebSphere Application Server "disconnected", you must still always be able to "ping" your host name successfully.

If you need to set up a fixed IP address, go to the **Network** section of the Control Panel, in the **Adapters** tab, and install the **MS Loopback Adapter**.

Then, go to the **Protocols** tab, open TCP/IP properties, and specify a fixed TCP/IP address of 10.0.0.1 (which is an address reserved for private use and thus appropriate for standalone operations), and a subnet mask of 255.255.255.0.

No default gateway for this adapter is specified. Go to the **Bindings** tab, select **all protocols**, expand **TCP/IP Protocol**, and then move the MS Loopback Adapter to the top of the **TCP/IP Protocol** list.

Save the changes and reboot. After rebooting, you should be able to ping your host name whether or not you are connected to a network. To test your new TCP/IP setup, ping your host name while running standalone and, optionally, while connected to a network.