

Installation Guide

Netscape Application Server:
Process Automation Edition

Version 4.0

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This *Installation Guide* provides information administrators need to successfully install Netscape Application Server: Process Automation Edition (PAE) 4.0.

About This Guide

This guide provides information you need to install PAE:

- Getting ready to install PAE
- Installing PAE components
- Troubleshooting

Conventions Used in This Guide

File and directory paths are given in Windows format (with backslashes separating directory names). For Unix versions, the directory paths are the same, except slashes are used instead of backslashes to separate directories.

This guide uses URLs of the form:

`http://server.domain/path/file.html`

In these URLs, *server* is the name of server on which you run your application; *domain* is your Internet domain name; *path* is the directory structure on the server; and *file* is an individual filename. Italic items in URLs are placeholders.

This guide uses the following font conventions:

- The monospace font is used for sample code and code listings, API and language elements (such as function names and class names), file names, path names, directory names, and HTML tags.

- *Italic* type is used for book titles, emphasis, variables and placeholders, and words used in the literal sense.
- **Boldface** type is used for glossary terms

Viewing Documentation Online

For your convenience, PAE manuals are replicated online in both PDF and HTML formats. You can access the online documentation from the Help menu of each PAE component. You can access context-sensitive documentation by clicking a Help button or link in each PAE component.

Installation

Depending on your operating system, you install Netscape Application Server: Process Automation Edition (PAE) 4.0 with a Windows NT-based onscreen installer or with a single Unix command.

This chapter describes these topics:

- Getting Ready to Install
- Installing on Windows NT
- Installing Process Builder Only
- Installing on Unix
- What Happens During Installation
- Installation Troubleshooting
- Creating a Cluster and Getting Started
- Uninstalling PAE (NT)

Getting Ready to Install

Before you install, you need to be sure you have the right hardware resources on your local machine, you need to have access to a database, and you need to know the location of a corporate user directory. Once you have all these resources in place, you are ready to install PAE.

Upgrading From Previous Versions

You cannot install PAE 4.0 in the same location as previous versions of the product. If you have the earlier version, you must install PAE in a different location or you must uninstall previous versions and delete all your PAE database tables before starting to install PAE 4.0. For details of how to do this, see the PAE 4.0 release notes.

Hardware and Software Requirements

Process Engine, which includes Process Administrator, Process Business Manager, and Process Express is available on these platforms:

- Windows NT 4.0 with Service Pack 3.

If you use true color on a Windows NT system, you may be unable to start the Netscape Java VM. The solution is to install a Microsoft patch, available from the Netscape Technical Support web site at <http://help.netscape.com/kb/client/971009-22.html>.

- Solaris 2.6 or 2.7

Process Builder is available on these platforms:

- Windows NT 4.0 with Service Pack 3 and its true color patch (mentioned above)
- Solaris 2.6 or 2.7

Process Administrator, Process Business Manager and Process Builder require Netscape Communicator 4.5, so if you are currently using an older version, you must upgrade. Process Express is available with any of these browsers:

Microsoft Internet Explorer 3.x or 4.x, Netscape Navigator 3.x, Netscape Communicator 4.x. You can download Netscape Communicator 4.5 from the Netscape home page at <http://home.netscape.com/communicator/v4.5/index.html>.

You need ~128 MB RAM to run the Directory Server, Netscape Application Server, and PAE. If the database is installed on the same machine, you may need 256 MB of RAM. Less RAM may result in resource contention.

Depending on your operating system and which components you are installing, you need to be sure you have enough disk space:

- On a Windows NT system, you need ~250 MB of disk space available for a complete installation.
- On a Unix system, you need ~400 MB of disk space available for a complete installation.
- On either operating system, you need 20 MB for the Process Engine/Process Builder-only installation.

Access Requirements

You need access to a relational database that can be used for storing application data. When you want to test against real users and when you put an application into production, you need to be able to access the corporate user directory that identifies all users who can be assigned to activities in PAE applications.

The PAE Database

PAE uses a relational database to store process instance data, so you must have a database available to you on your local system or available over a network on another system. If you are using a remote database, you must have the appropriate database client installed on your local system.

You need to have enough privileges to create tables and views. Your database administrator can set them up for you if necessary.

PAE supports the following databases:

- Oracle 8.0.5
- Sybase 11.1.1 (client), Sybase 11.9.2 (server)

The Corporate User Directory

PAE identifies activity assignees through a central user and group directory, typically the one in which your corporation lists all of its users and groups. This directory must be an LDAP-compliant directory (such as Netscape Directory Server v4.0).

The default installation uses the same Directory Server for both configuration and user data, but when you want to test with real users or go into production, you need to obtain the LDAP URL for your company's official corporate user directory. See the *Administrator's Guide* for details on how to switch your user directory after installation.

Note It is strongly recommended that you use separate directories for your corporate user directory and configuration directory when you go to a production environment.

The PAE Components

There are several components in PAE:

- Netscape Directory Server 4.0
- Netscape Console
- Process Engine, which includes Process Administrator, Process Business Manager, and Process Express
- Process Builder
- Netscape Application Server 4.0

Note You should have Netscape Enterprise Server 3.62 and Netscape Communicator 4.x installed on your machine before you begin the PAE installation process.

When you run the installation wizard, you can install any or all of these components. The following is a brief description of four of these components:

- **Netscape Application Server** includes Netscape Application Server, Netscape Application Server Administrator, the Web Connector plug-in used to communicate between NAS and the web server, and the Deployment Manager.
- **Netscape Console** provides the common user interfaces for all Netscape server products. From it you can perform common server administration functions such as stopping and starting servers, installing new server instances, and managing user and group information. Netscape Console can be installed stand-alone on any machine on your network and used to manage remote servers.
- **Netscape Administration Server** is a common front end to all Netscape servers. It receives communications from Netscape Console and passes those communications on the appropriate Netscape server. Your site will have at least one Administration Server for each server root in which you have installed a Netscape server.
- **Netscape Directory Server** is Netscape's LDAP implementation. The Directory Server runs as the `slapd` service on your machine. This is the server that manages the directory databases and responds to client requests.

The installation program asks whether you want to install Netscape Servers or Netscape Console. It is recommended that you select the Netscape Servers option, which includes Netscape Application Server, Netscape Console, and Netscape Directory Server. Netscape Console includes only the Netscape Console.

The default installation directory for Netscape Servers on Windows NT is `c:\Netscape\Server4`. If you use this path, the Netscape Application Server installation directory is set to `c:\Netscape\Server4\nas`. Decide if you'd rather install to a different directory. It is strongly recommended that you use the default installation directory.

The default installation directory for Netscape Servers on Unix is `/usr/Netscape/Server4`. If you use this path, the Netscape Application Server installation directory is set to `/usr/Netscape/Server4/nas`. It is strongly recommended that you use the default installation directory.

Directory Server Issues

- Before you run the installation program, read the Netscape Directory Server documentation, particularly the *Netscape Directory Server 4.0 Installation Guide*, for information about setting up Directory Server and details about the issues discussed in this section. All Directory Server documentation is located in the following places:
 - `install directory/manual/en/slaped`
 - <http://home.netscape.com/eng/server/directory/4.0/>
- If you install Directory Server with this installation of Netscape Application Server, you must designate this installation of Directory Server as the configuration directory, even if another installation of Directory Server already exists at your site.

The configuration directory contains the `o=NetscapeRoot` tree used by your Netscape servers. The `o=NetscapeRoot` tree is where all the configuration settings of your Netscape servers are stored.

- If you *do not* install Directory Server with this installation of NAS, you must designate an existing Directory Server as the configuration directory. Make sure that the Directory Server you designate as the configuration directory contains the `o=NetscapeRoot` tree.

The NAS installation program will prompt you for the following information about the existing Directory Server:

- The host name and port number for the machine where the existing Directory Server is installed.
- Login ID and password to connect to the existing Directory Server installation.
- Administrator login ID and password
- Multiple NAS installations can store their configuration settings on the configuration Directory Server. To avoid your settings being overwritten by another NAS installation's configuration settings, assign a unique global configuration name to your NAS installation's settings. This name appears in the `o=NetscapeRoot` tree along with the global configuration names of other NAS installations.

During installation, you are asked to provide the global configuration name for the configuration settings of the NAS you are currently installing. Note that if you want to share configuration settings with other NAS installations, simply enter the same global configuration name for each installation.

- If you install Directory Server with this installation of Netscape Application Server, you must designate this installation of Directory Server as the storage directory (as well as the configuration directory), even if another installation of Directory Server already exists at your site.
- If you *do not* install Directory Server with this installation of NAS, gather the following information about the existing storage Directory Server:
 - The host name and port number for the machine where the existing Directory Server is installed
 - Login ID and password for the existing Directory Server
 - The top level domain name (suffix) of your Directory Server structure. This is the directory entry that represents the first entry in the directory tree. You will need at least one directory suffix for the tree that will contain your enterprise's data. It is recommended that you select a directory suffix that corresponds to the DNS host name used by your enterprise. For example, if your organization uses the DNS name of `airius.com`, then select a suffix of `o=airius.com`.
- The configuration directory contains an administration domain, which allows you to group Netscape servers together so that you can more easily distribute server administrative tasks across organizations while retaining centralized control. Decide if you want to use administration domains, and if so, select the name(s) you want to use. It is recommended that you use names that correspond to the organizations that will control the servers in each domain.
- The installation program asks you to specify a Directory Manager distinguished name (DN) and password. Directory Manager DN is the special directory entry to which access control does not apply. Think of directory manager as your directory's superuser.

The default Directory Manager DN is `cn=Directory Manager`. Because the Directory Manger DN is a special entry that is not stored in the directory tree (instead it is stored in `slapd.conf`), it does not have to conform to any suffix configured for your Directory Server. Also, you should not create an actual Directory Server entry to use with the Directory Manager DN.

The Directory Manager password must be at least 8 characters long.

- The Netscape Administration Server is a common front end to all Netscape servers. It receives communications from Netscape Console and passes those communications on to the appropriate Netscape server. Your site will have at least one Administration Server for each server root in which you have installed a Netscape server. During installation you are prompted for an Administration Server port number. This is the port number that your system administrator must specify to access the Administration Server.

Make sure the port number you select for the Administration Server is unique and has not been assigned earlier during the installation process to the non-SSL port number for the configuration server.

Basic Netscape Application Server Configuration Issues

- Decide how many Netscape Application Server instances you want to run. An instance of Netscape Application Server is defined as one installation of Netscape Application Server with one Executive Server (KXS). Only one instance of Netscape Application Server should run per machine. You should not install multiple Netscape Application Servers on the same machine.
- When you install Netscape Application Server products, you must specify a product key. The product key is available on the Welcome letter you received with the server products that you purchased.
- Know the number of Java Servers (KJS) you want to run for each instance of a Netscape Application Server.
- Know the number of C++ Servers (KCS) you want to run for each instance of a Netscape Application Server.

Know the available port numbers on your machine so that you can assign ports to the Administrative, Executive, Java, and C++ Servers. All ports you specify are listener ports. Valid port numbers must be within the acceptable range (1025 to 32768) and must be unique (not used by any other applications on your system).

The default port numbers are as follows:

- 10817 for the Administrative Server (KAS)
- 10818 for the Executive Server (KXS)
- 10819 for the Java Server (KJS). You can configure multiple Java Servers.
- 10820 for the C++ Server (KCS). You can configure multiple C++ Servers.

In most cases, the default port numbers suggested by the installation program are adequate, unless you are configuring multiple Java and C++ Servers, in which case you assign a unique number to each additional Java and C++ engine.

- Decide if you want to install Netscape Application Server so that it starts up automatically when you boot your system. If you decide yes, then log on to the system as the root user before installing Netscape Application Server.

Web Server Configuration Issues

[Please note that “webless” installation is not supported in this release.]

- Know whether your web server runs on the machine where you are about to install Netscape Application Server or whether it resides on another machine. If it is on another machine, you perform what is referred to as a “webless” installation of Netscape Application Server.
- Know the full path location of the web server.
- If you are performing a webless installation of Netscape Application Server, know the type of web server you have and remember to install the Web Connector plug-in on the web server after you finish installing Netscape Application Server. See “Hardware and Software Requirements” on page 8 for information about supported web server versions and types.
- Consider security issues related to your firewall setup. In a webless install of Netscape Application Server, if a firewall will exist between the Netscape Application Server machine and the web server machine, before installing Netscape Application Server, consult with your security administrator to ensure that the necessary ports on the firewall are open so that the Executive Server (KXS) and the Web Connector plug-in can communicate.

- Install Netscape Application Server as the same user or as a member of the same group that installed the web server with which your Netscape Application Server will interface.
- For automatic configuration of the connector plug-in for Netscape Enterprise Server (version 3.6), know the instance directory (the directory where web server configuration and start/stop scripts are stored) of the installed web server.

Note: If you are installing Netscape Application Server over an NFS-mounted file system, make sure you have the same read-write permission on the following directories as the user who installed the web server:

- gxlib
- APPS
- registry
- kdb

These are subdirectories in the NAS installation directory.

- If you use one of the supported web servers on the same machine as the Netscape Application Server, the connector plug-in configuration is automatic. For installations of Netscape Application Server, know the location of the web server document directory. This is the directory where the web server gets the files it serves to a web browser, such as HTML, GIF, and JPEG. The installation program will detect the HTML directory for all supported web servers.

Note: PAE does not support Microsoft IIS web server.

Database Configuration Issues

Determine the database connectivity configuration for this installation of Netscape Application Server. During installation of Netscape Application Server, you are asked to rank the client databases in priority order. Sample applications installed with Netscape Application Server will be configured to connect to the database that is assigned the top priority.

In addition, when you create your own applications, you can elect not to specify the particular database you want the application to use. In this case, the application attempts connecting to the configured databases in the priority order you specify during installation.

Note that Netscape Application Server supports two database client versions, with each one interfacing with a variety of database servers. The following table lists Netscape Application Server database compatibility information:

DB Client	DB Server
Oracle 8.05	Oracle 8.05
Sybase 11.1.1	Sybase 11.9.2

Install and configure all database servers *before* installing Netscape Application Server.

Know the directory paths of the different database client libraries installed on your system. You are asked during the installation if you want to configure Netscape Application Server with connectivity to supported databases. For each Yes response, you are prompted to provide the home directory for the database client and the database library name.

Transaction Manager Issues

The transaction manager is a feature that coordinates global transactions within a Java Server (KJS process). You do not need to configure the transaction manager to use PAE. For more information about this feature, see the *Netscape Application Server Installation Guide* located in `serverRoot/nas/nasdocs/insttoc.htm`.

Resource Manager Issues

The resource manager lets you connect to a database back end for global transactions. You do not need to configure the resource manager to use PAE. For more information about this feature, see the *Netscape Application Server Installation Guide* located in `serverRoot/nas/nasdocs/insttoc.htm`.

Clustering and Data Synchronization Issues

An Netscape Application Server cluster is a group of Netscape Application Servers, installed on separate machines, that can participate as a group in synchronization of state and session data. Each server within a cluster can

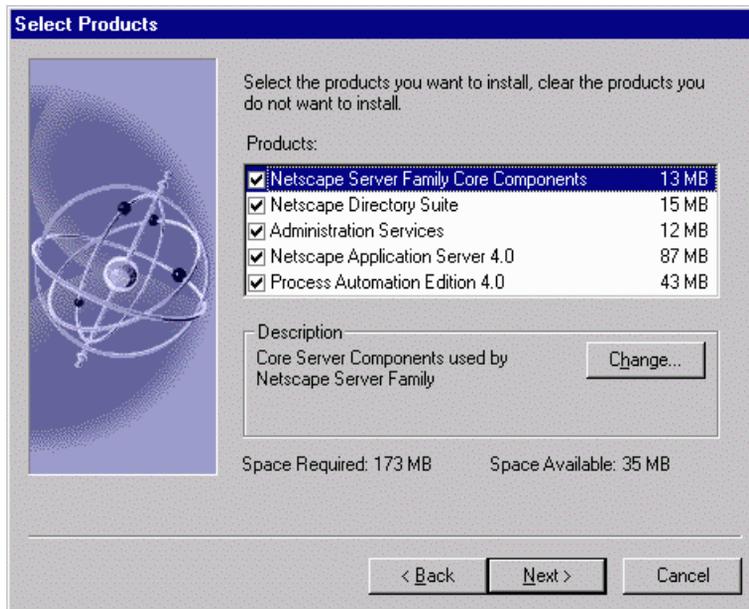
assume one of several roles. Most important for this installation discussion is the category of Sync Server, which includes the Sync Primary, Sync Backup, and Sync Alternate servers.

You do not need to configure your instance of Netscape Application Server for distributed data synchronization to use PAE. PAE uses its own type of clusters, described later in this chapter. For more information about distributed data synchronization in Netscape Application Server, see the *Netscape Application Server Installation Guide* located in `serverRoot/nas/nasdocs/insttoc.htm`.

Installing on Windows NT

On Windows NT, you use an onscreen PAE installer that allows you to click through a set of install options.

When installing PAE on a Windows NT system, you can select which components to install by checking the corresponding boxes as shown in the following figure:



Note It is strongly recommended that you install PAE on a clean system, that is, one that does not already have any Netscape servers installed.

Installing All Components (NT)

To install the PAE components using the installation wizard, follow these steps:

1. Insert the PAE disc into your CD ROM drive or download the compressed product file from the ftp site.
2. Execute the `Setup.exe` file to launch the installer.

Before you install PAE, see “Getting Ready to Install” on page 8. The section explains important concepts and information required to properly install and configure Netscape Application Server.

Note: You must be logged on to Windows NT as a user with administrator privileges to install Netscape Application Server.

To install PAE and its components, perform the following steps:

1. Click Next in the Welcome dialog box.
2. Click Yes to accept the Software License Agreement.
3. When prompted for the installation, click Netscape Servers. This gives you the choice to install Netscape Application Server, Netscape Directory Server, Netscape Console, Netscape Application Server Administrator, the Web connector plug-in, and PAE.

(Selecting Netscape Console installs Netscape Console as a standalone application.)

4. When prompted for the installation type, click Typical.

5. Select the installation directory and click Next.

The default directory is `c:\Netscape\Server4`. Note that if you use the default, Netscape Application Server is installed in `c:\Netscape\Server4\NAS`.

You cannot use a directory name that includes spaces.

6. Do one of the following:

To install Netscape Application Server *along with* Directory Server, select all of the following components (these are the default selections):

- Netscape Server Family Core Components
- Netscape Directory Suite
- Administration Services
- Netscape Application Server 4.0
- PAE 4.0

The first three components (Netscape Server Family Core Components, Netscape Directory Suite, Administration Services) install Directory Server software.

To install Netscape Application Server *without* Directory Server, select only Netscape Application Server 4.0.

To install only PAE, select only PAE 4.0.

To install only part of PAE, select PAE 4.0 and click Change. Deselect the component you do not want to install and click Continue. If you are installing only Process Builder, click Next to complete the installation process. If you are installing only PAE server, click next to go to Step 30.

7. Click Yes when asked to overwrite the `naldap32x30.dll` file.
8. Click Change to select subcomponents and then choose the Netscape Application Server component(s) you wish to install:
 - Web Connector Component (Web Connector)
 - Core Server Component (NAS, without the Web Connector plug-in)
 - Administrator Component (Netscape Application Server Administrator)
 - Deployment Manager Component

If you want to install NAS without the Web Connector plug-in, select Core Server Component, and proceed to Step 9.

9. If you specified in Step 6 that you want to install a new instance of Directory Server, click “This instance will be the configuration directory server.”

If you do not want to install Directory Server, enter the following information for the configuration Directory Server that you want this NAS installation to be configured with:

Host name and port number of the machine where the existing installation of Directory Server resides

Login ID to the machine where Directory Server is installed in “Bind As” (the default value is `cn=Directory Manager`)

Password to the machine where Directory Server is installed.

If you are installing a new Directory Server click “Store data in this directory server.”

If you are not installing a new Directory Server, enter the following information for the storage Directory Server that you want this NAS installation to be configured with:

Host name and port number of the machine where Directory Server is installed

Login ID to the machine where Directory Server is installed in “Bind As”

Password to the machine where Directory Server is installed

Top level domain name in Suffix

Go to Step 16 to proceed to the NAS portion of the installation process.

10. If you are not installing a new Directory Server, skip this step. Otherwise, enter the settings to be used by the Directory Server you are installing or accept the default settings:
 - Host name of the machine in Server Identifier
 - Server Port number
 - Top level domain name in Suffix
11. If you are not installing a new Directory Server, skip this step. Otherwise, enter the Administrator ID and password to the configuration directory.

Important: This is the Administrator ID and password required to uninstall NAS and Directory Server. Make a note of this information, as you will need it if you uninstall either of these products.

12. Enter the name of the Administration Domain where Netscape software information is stored on Directory Server or accept the default name.
13. Enter the Directory Manager distinguished name (DN) and password. The default value for the distinguished name is `cn=Directory Manager`.
14. Enter the port number for the Directory Server Administration Server. This is required for using the Console to administer the Directory Server.

This is the last step of the Directory Server portion of the installation process. The steps that follow install NAS.

Note: Take note of this port number. Either use a number meaningful to you or store the port number in a safe place.

15. Confirm the configuration Directory Server information by entering the server's host name (defaults to the host you have used so far in the installation), port number (defaults to 389), Directory Manager user, and the Directory Manager password.
16. Enter the unique global configuration name of the configuration settings for this installation of NAS. The name you assign is stored on the configuration Directory Server, under the `o=NetscapeRoot` tree along with the global configuration names of other NAS installations. The default is `nasconfig`.
17. Enter the product key of Netscape Application Server. See the Welcome letter you received with the product for the correct key.
18. When prompted for the type of web server to be used with this installation of Netscape Application Server, click one of the supported web server types and, if you clicked Netscape Enterprise Server, enter the web server instance name which defaults to `https-hostname`.
19. Enter the number of Java Servers (KJS) and C++ Servers (KCS) used to process applications. The default value is 1; increase this to handle high processing loads.

- 20.** Enter the port numbers for the Administrative Server (KAS), the Executive Server (KXS), the Java Servers (KJS), and C++ Servers (KCS). All port numbers you specify are for listener ports, must be within the acceptable range (1 to 65535), and must be unique (not used by any other applications on your system). See “Basic Netscape Application Server Configuration Issues” on page 14.

Note that the default port number is always suggested by the installation program, whether or not the port number is already being used by another service. If it is already in use, make sure you change the value to a unique port number. Otherwise, the service you are assigning a port number to will not start up when you run NAS.

- 21.** When prompted for the Administration Server user ID and password, enter the user ID and password that will be required to log on to the Administration Server through the Administrator tool (Netscape Application Server Administrator).
- 22.** Rank the installed databases in priority order.

The installation program lists all supported database client types. The clients are required for your applications to connect to your database back ends. You must rank the clients in order of connectivity priority, whether you’ve installed the clients or not. You can always install the client software after running the NAS installation program. Note that sample applications are configured for the highest priority database.

The following three steps configure the transaction manager for NAS. You do not need the transaction manager to use PAE. You can simply accept the default values for these steps if you do not plan to use transaction manager.

- 23.** Indicate whether or not your server will use global transactions. Typically, you will click No for this option.
- 24.** Enter the mirror directory path where the transaction manager `restart.bak` file for each KJS engine process gets stored or take the default.

The default disk drive is the drive on which you are installing NAS. It is strongly recommended that you specify a path on a separate disk drive. If you do, make sure you create the directory on that drive, *prior* to running the installation program.

25. Enter the log volume disk name where the transaction manager log file gets stored for each Java Server.

It is strongly recommended that you create a raw partition on disk *prior* to running the installation program and that you specify the name of the raw device here.

26. Indicate if the specified disk name is a raw partition. If you indicate that it is, make sure that the name you specify in Step 25 is that of a raw device.
27. If the log volume is a raw partition, indicate the number of pages (Size) in the raw partition and the starting page number (the Offset value). Make sure that the size allocated for the log file is greater than 4MB; in other words, the file should be greater than or equal to 1000 pages, at a size of roughly 4KB per page.
28. Indicate whether or not you want to configure Netscape Application Server with resource manager.

You do not need to configure the resource manager to use PAE. For more information about configuring the resource manager, see the Netscape Application Server Installation Guide located in `serverRoot/nas/nasdocs/insttoc.htm`.

29. When prompted whether the server will synchronize data across servers, click Yes if you intend to synchronize session and state information across multiple servers for failover and fault tolerance. Otherwise, click No.

You do not need to enable distributed data synchronization to use PAE. If you want to configure your Netscape Application Server for data synchronization, see the Netscape Application Server Installation Guide located in `serverRoot/nas/nasdocs/insttoc.htm`.

Note: Before proceeding with PAE installation, make sure the values you have entered so far are correct. You cannot click Back to return to the NAS installation screens once you have proceeded to the next step in the process.

30. Enter the Directory Server 4.0 home directory. This is your Netscape server root directory.

31. Enter the Enterprise Server home directory. This is the directory where your web server is installed. You can navigate to this directory using the “Browse” button. If you enter a directory where no Enterprise Server is installed, an error message appears.
32. Enter your corporate directory URL. This is the directory server NAS uses to authenticate users and groups. The corporate directory server can be on your own machine if you’ve installed a directory server or it can any other directory server in your enterprise.
33. Enter the administrative user(s) for PAE. This user should exist in the corporate directory. You can enter more than one user ID by separating the IDs with commas. All users you list in this field will have administrative use of PAE.
34. Enter the bind dn and password for the configuration directory, the host name of the machine where that directory resides, and the port number for that machine.

If you are installing Directory Server, these are the same values you entered in Step 13.

35. Review the summary provided by the installation program of the configuration you have selected. If necessary, go back and make changes.
36. When the installation is complete, reboot the computer so that the new settings take effect.
37. During the installation process, when prompted if you want to overwrite an existing .dll file, press OK.

Creating New Server Instances on NT

If you have completed a PAE-only installation and you had a Netscape Directory Server or a Netscape Enterprise Server already installed in on your system, you now must create a new instance of the server or servers to be used exclusively for PAE.

If you do need to create new server instances, follow these steps:

1. Go to the main Server Administration page:

`http://yourServer:AdminPort#`

2. If a dialog box prompts you to enter a user ID and password, enter the ones that you defined for your Administration Server. For example, `admin/netscape`. When you are authenticated, the Server Administration page is displayed.
3. If you need to create a new instance of the Directory Server, click the “Create New Netscape Directory Server 4.0” link.

On the Netscape Directory Server Installation page, several fields are already filled in for you and you need to fill in the remaining fields. See “Directory Server Issues” for details. Be sure to use a unique Server Identifier. When you are done, click OK.

4. If you need to create a new instance of the Enterprise Server, click the “Create New Netscape Enterprise Server 3.6” link.

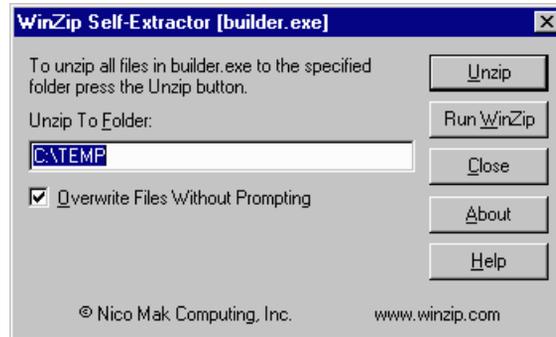
On the Netscape Enterprise Server Installation page, several fields are already filled in for you and you need to fill in the remaining fields. You must use a unique server identifier and you must enter a valid MTA Host name. When you are done, click OK.

Installing Process Builder Only

You can install the Process Builder as a stand-alone tool on your system. Note that if you install PAE 4.0, Process Builder is installed by default; you do not need to install Process Builder separately. However, if you want to install *only* Process Builder, perform the following steps:

1. Locate the `builder.exe` file on the CD or download it from the PAE ftp site.
2. Double-click the `builder.exe` file.

The self-extraction tool appears as shown in the following figure:



3. Enter the directory where the self-extractor will extract the files.
4. Click Unzip.

The Process Builder files are extracted into the directory you specified in Step 3.

5. Click OK in the dialog box that appears indicating that the files were extracted successfully.
6. Click Close in the self-extractor window.
7. Navigate to the directory you specified in Step 3 and open the builder folder.
8. Double-click the `PMBuild.exe` file.

Process Builder appears.

Alternatively, you can double-click the `PMBuild.bat` file to launch a separate DOS window in addition to Process Builder that displays diagnostic messages. Note that if you close this DOS window, Process Builder closes as well.

Uninstalling Process Builder Only

If you have installed Process Builder as a stand-alone application on your Windows NT machine, you can uninstall the application by performing the following steps:

1. Delete the Process Builder menu item from your Start Menu.
2. In your the CLASSPATH of your system environment, delete the variable `%BPM CLASSPATH%`.
3. In your system environment, delete the `BPM_CLASSPATH` entry.
4. In your file system, delete the `/builder` folder.

Installing on Unix

The Unix installer uses an install command that acts upon a file containing a set of predefined install options. You can install all PAE components using the defaults in the file or you can selectively install only some of the components by manually editing the `setup.inf` file.

Installing all Components (Unix)

Before you install PAE, see “Getting Ready to Install” on page 8.

Note: Log on to the system as the same user or as a member of the same group that installed the web server with which your Netscape Application Server will interface. If you install as a regular user, and elect to configure the Netscape Application Server for automatic startup, you will have to log on again as the root user after you install to enable automatic startup.

To install PAE and its components, perform the following steps:

1. Insert the Install CD-ROM into the CD-ROM drive.
2. Mount the CD-ROM on, for example, `/cdrom/cdrom0`.
3. At the shell prompt, run the following command:

```
/cdrom/cdrom0/solaris/setup
```

During installation, press:

CTL+B to back up to the previous screen within an installation section. An installation section is defined by the title at the top of the screen. For example, “Netscape Server Products,” “Netscape Directory,” and “Application” are names of sections within the installation program. You cannot use CTL+B to go back to a screen in a different section than the one you are currently in.

CTL+C if you need to exit the installation. This results in an incomplete installation. If you want to install again, you must run the installation program from the beginning, starting at Step 1 of this procedure.

4. When prompted, press Enter to accept the default [yes] to continue with the installation.
5. When prompted, type *yes* to accept the Software License Agreement.
6. When prompted, press Enter or specify 1 to select “Netscape Servers” as the item to install.
7. Specify 2 to select an installation type of Typical.
8. Specify a target installation directory as the base directory within which all components are installed. Do not include spaces in the path name.
9. When prompted for the components you want to install, do one of the following:

To install Netscape Application Server *along with* Directory Server, press Enter. This selects *all* of the following components.

- Netscape Server Family Core Components
- Netscape Directory Suite
- Administration Services

This installs the Administration Services and Console, allowing you to administer your Netscape servers from the same machine as the Console.

- **Netscape Application Server 4.0 Suite**
This installs Netscape Application Server, Netscape Application Server Administrator, the Web Connector plug-in used to communicate between NAS and the web server, and Deployment Manager.
- **PAE 4.0**

The first three components (Netscape Server Family Core Components, Netscape Directory Suite, Administration Services) install Directory Server software. The fourth component installs Netscape Application Server and its associated components. The last component installs PAE 4.0 and its associated components.

To install Netscape Application Server *without* Directory Server, type 4,5 (a NAS and PAE-only installation), and go to Step 13.

To install only PAE, type 5 and go to Step 14.

- 10.** When prompted to install the Netscape Server Family Core Components, press Enter to select all of the components listed.
- 11.** When prompted to install the Directory Suite components, press Enter to select all of the components listed.
- 12.** When prompted to install the Administration Services components, press Enter to select all of the components listed.
- 13.** When prompted to install Netscape Application Server Suite components, press Enter if you want to install all the listed components.
 - 1.** NAS Web Connector Component
 - 2.** Core Server Component (NAS without the Web Connector plug-in)
 - 3.** Administrator Component (Netscape Application Server Administrator)
 - 4.** Deployment Manager

If you want to install NAS without the Web Connector plug-in, specify 2 (Core Server Component) and 3 (Administrator Component) and proceed to Step 15.

14. When prompted to install PAE, press Enter if you want to install all the listed components.

- 1.** PAE (this is the engine software)
- 2.** Process Builder

If you only want to install the Process Builder, specify 2 and press Enter to continue.

15. When prompted to specify the fully qualified domain name, press Enter to accept the default or type in another domain name.

16. When prompted to specify the Unix user and group under which your NAS and Directory Server installations will run, press Enter to accept the default user [nobody] and press Enter again to accept the default group [nobody]. You can also type in another user and group.

You should have already set up this user and group prior to running the installation program. Specify a user that has no privileges elsewhere on the system, so as to avoid access to restricted servers, such as the configuration Directory Server, from NAS.

17. When prompted if you want to use an existing Directory Server for your configuration directory, press Enter to accept the default [no]. This means that you want to use the Directory Server you are installing as part of this installation as your configuration directory.

You can type **yes** to use another directory if you are not installing a Directory Server during this installation process, but this is not recommended for this beta release.

18. When prompted if you want to use an existing Directory Server for your users and groups directory, press Enter to accept the default [no]. You can type **yes** to use another directory if you are not installing a Directory Server during this installation process.

19. If you are installing Directory Server with this installation of NAS, specify this Directory Server as the configuration Directory Server. Only specify an existing Directory Server as the configuration Directory Server if you are not installing Directory Server with this installation of NAS.

20. If you are installing Directory Server with this installation of NAS, specify this Directory Server as the storage server. Only specify an existing Directory Server as the storage server if you are not installing Directory Server with this installation of NAS.

If you specify an existing installation as the storage Directory Server, enter the following information:

- Host name and port number of the machine where Directory Server is installed
 - Login ID to the machine where Directory Server is installed in “Bind As”
 - Password to the machine where Directory Server is installed
 - Top level domain name in Suffix
21. Enter the port number to be used by the Directory Server you are installing. The default value is 389.
 22. When prompted for the Directory Server identifier, enter the host name of the Directory Server machine.
 23. Enter the administrator ID and password for the configuration Directory Server.

Important: This is the Administrator ID and password required to uninstall NAS and Directory Server. Make a note of this information, as you will need it if you uninstall either of these products.

24. When prompted for the suffix, enter the top level domain name.
25. Enter the Directory Manager distinguished name (DN) and password. The default value for the distinguished name is `cn=Directory Manager`

Note: It is good practice to use your own port number, such as 10000 or 20000, so you won't forget it. If you want to use the randomly generated port number, be sure to write it down somewhere handy.

26. Enter the administrative domain.
27. Enter the port number for the Directory Server Administration Server. This is required for using the Console to administer the Directory Server.

28. When prompted to specify the user the Administration Server will run as, press Enter to accept the default [root].

This is the last step of the Directory Server portion of the installation process. All steps that follow install NAS.

29. When prompted to specify the host name of the machine on which you are installing NAS, press Enter to accept the default [*yourLocalMachine*].
30. If you installed Directory Server earlier during this installation process, type yes to configure NAS with this Directory Server.

If you did not install Directory Server earlier during this installation process, provide the following information about the already existing Directory Server that you want NAS to be configured with:

- Server identifier
 - Host name
 - Port number
 - Username (same value you entered in Step 25)
 - User password (same value you entered in Step 25)
31. Enter the unique global configuration name of the configuration settings for this installation of NAS or press Enter to accept the default [nasconfig]. The name you assign is stored on the configuration Directory Server, under the o=NetscapeRoot tree along with the global configuration names of other NAS installations.
 32. Enter the product key of Netscape Application Server. The product key is available in the Welcome letter you received with the product.
 33. Enter a full path of a web server instance to be used or enter cgi if you are using CGI.
 34. Press enter to continue.
 35. When prompted to enable the web server user to access the registry and plug-in libraries, press Enter to accept the default [y]. You are only prompted for this information if you belong to a different group than the one used to install the web server.

36. When prompted if you want to continue with the NAS installation despite needing to change some file permissions, press Enter to accept the default [y]. You are only prompted for this if you belong to a different group than the one used to install the web server.
37. When prompted, enter port numbers for the Administrative Server (KAS), the Executive Server (KXS), and the web server (CGI to KXS) or press Enter to accept the defaults [10817], [10818], and [10819].

All port numbers you specify are for listener ports, must be within the acceptable range (1025 to 32768), and must be unique (not used by any other services on your system). In most cases, the default port numbers supplied by the installation program are adequate.

See “Basic Netscape Application Server Configuration Issues” on page 14.

38. Enter the number of Java Servers (KJS) that you intend to use to process applications with this installation of Netscape Application Server, and the port number(s) for the Java Server(s) or press Enter to accept the default number of ports [1] and port number [10820].

All Java Server port numbers you specify are for listener ports and must be within the acceptable range of 1025 to 32768. Port numbers must be unique (not used by any other services on your system). In most cases, the default port numbers supplied by the installation program are adequate.

39. Enter the number of C++ Servers (KCS) that you intend to use to process applications with this installation of Netscape Application Server, and the port number(s) for the C++ Server(s) or press Enter to accept the default number of ports [1] and port number [10821].

All C++ port numbers you specify are for listener ports and must be within the acceptable range of 1025 to 32768. Port numbers must be unique (not used by any other services on your system). In most cases, the default port numbers supplied by the installation program are adequate.

40. When prompted for the Server Administrator username and password, enter the username and password to log on to the NAS Administrator tool or press Enter to accept the default [admin].
41. Provide all the necessary database connectivity information or press Enter to accept the default [n].

The installation program lists the database clients supported by Netscape Application Server. The clients are required for your NAS applications to process data. You must indicate if you want to configure this instance of Netscape Application Server to connect with each of the supported database clients. For each client that you specify Yes, you must provide the installation program with the client's home directory and library name.

For more information about prioritizing and configuring databases, see "Database Configuration Issues" on page 16.

42. If you specified at least one database in Step 41, rank the installed databases in priority order. Specify the top priority database first. (If you only specified one database in Step 41, then list that one here as the top priority database).

You can use just the first character of the database's name to indicate it.

The following three steps configure the transaction manager for NAS. You do not need the transaction manager to use PAE. You can simply accept the default values for these steps if you do not plan to use transaction manager.

43. Indicate whether or not your server will use global transactions.
44. Enter the mirror directory path where the transaction manager restart .bak file of each KJS process gets stored.

The default directory is `nas install directory/CCS0/TXNMGR_MIRROR/`. This is the same path that is used to store the restart file. It is recommended that you store restart .bak in a different location than restart. Consider using a pointer to the different physical disk drive.

45. For each Java Server specified in Step 38, specify the following information:
 - Log volume disk name where the transaction manager log file gets stored. The default name is `nas install directory/CCS0/TXNMGR/ENGnumber`, where *number* represents the KJS engine process number.
 - Whether or not the log volume disk is a raw partition. If you specify Yes, make sure that the name you enter here is that of a raw device.

- If the log volume disk is a raw partition, indicate the number of pages (Size) in the raw partition and the starting page number (the Offset value). Make sure that the size allocated for the log file is greater than 4MB; in other words, the file should be greater than or equal to 1000 pages, at a size of 4KB per page.
- 46.** When prompted, indicate if you want to enable the resource manger or press Enter to accept the default [n], which does not enable the resource manager.

You do not need to configure the resource manager to use PAE. For more information about configuring the resource manager, see the Netscape Application Server Installation Guide located in `serverRoot/nas/nasdocs/insttoc.htm`.

- 47.** If you answer Yes in Step 46, specify the number of resource managers you want to enable.
- 48.** If you answer Yes in Step 46, specify the following information for each resource manager:
- User-defined resource manager name
 - Database type
 - Open string (See “Resource Manager Issues” on page 17)
 - Whether or not the resource manager is enabled
- 49.** Indicate whether or not you want to run Netscape Application Server automatically when you reboot the machine. You can only complete this step if you are logged on as root.
- 50.** When prompted whether the server will synchronize data across servers (Dsync), specify Yes if you intend to synchronize session and state information across multiple servers for failover and fault tolerance or press Enter to accept the default [n] which does not use DSync.

You do not need to enable distributed data synchronization to use PAE. If you want to configure your Netscape Application Server for data synchronization, see the Netscape Application Server Installation Guide located in `<serverRoot>/nas/nasdocs/insttoc.htm`.

The following steps install PAE.

51. When prompted if you want to run NAS automatically at system startup, press Enter to accept the default [n].
52. Press Enter to continue with the installation.
53. When prompted if you want to change ownership of NAS files to the user:group you used in Step 16, press Enter to accept the default [n].
54. Enter the NAS home directory. This is your Netscape server root directory, set as Server4 by default.
55. Enter the Enterprise Server home directory. This is the directory where your web server is installed. If you enter a directory where no Enterprise Server is installed, an error message appears.
56. Enter your corporate directory URL. This is the directory server NAS uses to authenticate users and groups. The corporate directory server can be on your own machine if you've installed a directory server or it can any other directory server in your enterprise.
57. Enter the administrative user(s) for PAE or press Enter to accept the default [admin]. This user should exist in the corporate directory. You can enter more than one user ID by separating the IDs with commas. All users you list in this field will have administrative use of PAE.
58. When prompted for the configuration directory information, press Enter to accept the defaults.
59. Press Enter to complete the installation.

What Happens During Installation

When you install PAE, the installer makes several modifications to files on your machine.

Windows NT

On a Windows NT machine, the installer performs the following actions in order:

1. NT registry modified: The system `CLASSPATH` variable is modified to contain the `BPMCLASSPATH` variable.

2. `DefaultPMCluster.properties` file modified: This file contains the properties needed to register the `PMCluster` bean. The following line is added to this file:

```
Environment.0.Value = $BPM_HOME
```

where `$BPM_HOME` is `serverRoot/bpm`.

`DefaultPMCluster.properties` is located in the `serverRoot/bpm/registry` directory.

3. Beans and `AppLogics` registered: The installer registers four `AppLogics` and one bean with the configuration directory.

`AppLogics`:

- `DeploymentManager.npm`
- `Administrator.apm`
- `Business.apm`
- `Express.npm`

Bean:

- `PMCluster`

4. Enterprise Server files updated:
 - `dbswitch.conf`: The installer adds the corporate directory LDAP URL for PAE.
 - `generated.https-enterpriseServerID.acl`: The installer modifies this file to contain the default ACLs for PAE. The three types of ACLs are as follows:

- **Admin IT Auth:** controls access to the Information Technology portion of Process Administrator. By default, this ACL allows access to only the default PAE administrative user.
 - **Admin Data Auth:** controls access to the Data Management portion of Process Administrator. By default, this ACL allows access to only the default PAE administrative user.
 - **Basic Auth:** controls access to Process Express. By default, this ACL allows all users in the corporate directory to access it.
-
- **webpub.conf:** The installer modifies this file to enable web publishing for the Enterprise Server instance.
 - **obj.conf:** The installer modifies this file to do the following:
 - allow name translation of PAE URLs
 - apply ACLs to the appropriate PAE URLs
 - add the ACL names
 - add the required configuration information for web publishing
-
5. **bpm.ldif** file modified: Generic parameters are replaced by installation-specific data.

This file, stored in the *serverRoot/bpm/admin* directory, contains the LDIF entries that are added to the configuration directory for Netscape Console integration.

Installation log files for Windows NT are stored in the following directory:

serverRoot/bpm/bpm_install.log

Unix

On a Unix machine, the installation process is similar to that of Windows NT in the previous section. The following lists actions unique to the Unix installation:

- Several files modified to include the PAE classpath. The installer modifies the following files:

- `kjs`: The PAE classpath is added to the `CLASSPATH` variable of this shell script, which runs the Java Server for Netscape Application Server. This addition allows the Java Server to execute PAE-related logic.
- `beanreg`: The PAE classpath is added to the `CLASSPATH` variable of this shell script as well. PAE-related beans can then be registered with the configuration directory.

Both the `kjs` and `beanreg` files are located in the `serverRoot/nas/bin` directory.

The PAE classpath is `serverRoot/bpm/classes`.

On a Unix system, the pre-installation log files are located in the following directory:

```
/tmp/bpm_preinstall_userID.log
```

where `userID` is the user ID that is running the installation script.

The post-installation log files are located in the following directory:

```
/tmp/bpm_postinstall_userID.log
```

Installation Troubleshooting

The following troubleshooting hints are applicable to installations on both Windows NT and Unix machines.

- Incorrect corporate directory URL: Be sure to type the correct URL for your corporate directory. The corporate directory URL should be a complete LDAP URL of the following format:

```
ldap://hostname:portnumber/binddn
```

where `hostname` is the name of the machine where your corporate directory is installed, `portnumber` is the port number of that machine, and `binddn` is the node inside the corporate directory that contains all the user and group information.

The following is a sample LDAP corporate directory:

```
ldap://nsdirectory.mcom.com:389/ou=People, o=Netscape Communications Corp., c=US
```

The corporate directory URL is stored in the file `EnterpriseServerRoot/userdb/dbswitch.conf`. You can edit this file manually to contain the correct corporate directory URL. You must stop your Enterprise Server before you edit this file.

- Invalid Process Administrator user: Be sure the user name you enter for the Process Administrator user exists in the corporate directory. This user entry is stored in the following file:

`EnterpriseServerRoot/httpacl/generated.https-EnterpriseServerID.acl`

This file contains the entries for the ACLs Admin IT Auth and Admin Data Auth. You can modify these ACLs to contains users who will be the default Process Administrator. You must copy this ACL file onto the `genwork.https-EnterpriseServerID.acl` file and restart your Enterprise Server.

- Bean and AppLogics not registered: Make sure your four AppLogics and one bean are registered correctly by following these steps:

1. Open Netscape Console.
2. Open the Directory Server administrator.
 - The AppLogics (`DeploymentManager.npm`, `Administrator.apm`, `Business.apm`, `Express.npm`) and bean (`PMCluster`) should be listed under the following key in Directory Server:

`serverRoot/NASCluster/nasconfig/Global/SOFTWARE/Netscape/Application Server/Name Trans`

If these AppLogics and bean are not listed, you can register them:

Windows NT:

1. Go to the `serverRoot/bpm/registry` directory.
2. Double-click the `registerBPM.bat` file.

Unix:

1. Go to the `serverRoot/bpm/registry` directory.
2. Execute the `registerBPM.bat` shell script.

Your files should now be registered.

Creating a Cluster and Getting Started

After you've installed PAE, and performed all the post-installation tasks, you need to create a cluster. Until a cluster is available, designers cannot deploy applications. Once you have a valid cluster, designers can launch Process Builder to start building applications.

This section gives a brief overview of the steps required. See the *Administrator's Guide* for detailed steps on how to create a cluster. See the *Developer's Guide* for details on launching and using Process Builder.

To create a cluster, you must begin by launching Process Administrator and accessing the Cluster Management forms.

1. To launch Process Administrator, enter this URL in your web browser:

```
http://yourServer/Administrator.apm
```

2. Click the Cluster Management tab.

This displays the Create or Join a Cluster page.

3. Click the Create a Cluster link.
4. In the form that appears, fill in the fields as needed and click Create Cluster.

A series of diagnostic messages are displayed onscreen as the cluster is created. The last few lines contain instructions for how to configure the Process Builder's `preferences.ini` file. For more information, see the *Administrator's Guide*.

5. Copy the lines and paste them into the Process Builder's `preferences.ini` file, located in the Process Builder root folder. On a Windows NT system, this is typically in the `serverRoot/builder` folder.

When you have done this, designers can start using Process Builder to build and deploy applications.

To launch Process Builder on Windows NT system, execute this file:

```
//builder/PMBuilder.exe
```

To launch Process Builder on a Sun Solaris Unix system, issue this command:

```
yourProcessBuilderRoot/builder/PMBuilder.sh
```

For further information on using Process Builder, see the *Developer's Guide*.

Uninstalling PAE (NT)

On Windows NT, if you currently have PAE 1.x and you want to upgrade to PAE 4.0, you must first uninstall PAE 1.x. This section discusses how to do this. In addition, there may be situations in which you wish to uninstall PAE 4.0, and this discussion applies to this as well.

Deleting PAE 1.x Database Tables

If you want to uninstall PAE 1.x in order to install PAE 4.0, you must also delete your existing PAE database tables because the database table schemas have changed. See the *Administrator's Guide* for more details about the PAE 4.0 tables.

Uninstalling the Software

Note the following before uninstalling Netscape Application Server or its related components:

- When uninstalling NAS, use the procedure described in this section. *Do not* uninstall NAS by deleting directories or modifying parameters in the registry.
- This procedure is for uninstalling NAS and its subcomponents only. If you installed Directory Server along with NAS, other servers may also have since been configured with that Directory Server. Uninstalling the Directory Server could cause problems for these other servers. Therefore, you should

not uninstall Directory Server with NAS, unless you are absolutely certain that the only system configured with this installation of Directory Server is the NAS you are uninstalling.

- The following directories remain after you uninstall the software:
 - Netscape Application Server root directory
 - [NT only] Any custom directories you created under the NAS directory
 - [Unix only] The *nas install directory*/APPS directory, which is moved by the uninstallation program to *NAS server root/nas_APPS/*.
 - [NT only] *nas install directory*\APPS directory

After uninstalling the software, decide if you want to remove these directories, particularly the custom and APPS directories which may contain applications you've developed and files you wish to keep.

- Before running the uninstallation program, make sure that Directory Server is running. Do not uninstall Directory Server *before* you uninstall NAS.
- During the uninstallation process, you are prompted to provide a username and password with administrator access to the configuration Directory Server. If you do not want to use the user name and password you entered at the beginning of the installation process, enter another user name and password, *as long as it has administrator privileges on the configuration Directory Server*.
- [Unix only] The uninstall program overwrites the web server configuration file (*obj.conf*) with a version of the same file that existed *before* you installed Netscape Application Server and the Web Connector plug-in. Therefore, all changes you made to the web server's *obj.conf* file after installing Netscape Application Server and the Web Connector plug-in are lost.
- [Unix only] Some Netscape Application Server files may remain after running the uninstall program due to locks that the operating system or NFS might have. Remove such files manually.

- [NT only] Some Netscape Application Server files remain in the installation directory after uninstalling. These files are marked by your machine's operating system for deletion and are removed when you reboot your machine. *You must reboot immediately after you uninstall* Netscape Application Server.
- [NT only] If you do not reboot the machine after uninstalling Netscape Application Server and if you re-install Netscape Application Server immediately, you might receive missing file messages such as 'Cannot find gxutil.dll', and so on. Such errors occur if a file was unable to be removed during the uninstall process and hence it was marked for removal after system reboot. To prevent this behavior, reboot after uninstall and before re-installing the product.

To uninstall Netscape Application Server

1. From the Netscape installation directory (the default is `/usr/netscape/server4`), type `uninstall` and press Enter.
2. Follow the uninstall instructions.
3. Specify the components you want to uninstall.
4. Enter a user ID and password that has administrator privileges on the configuration Directory Server. If you do not want to use the user name and password you entered at the beginning of the installation process (Step 23, page 32) enter another user name and password, as long as it has administrator privileges on the configuration Directory Server.