IBM Network Station

IBM

Installing IBM Network Station Manager for AS/400
V2R1, November 1999

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Contents

About Installing IBM Network Station Manager for AS/400 (SC41-0684)

Who should read this book

This information is intended for the person who is installing and administering the IBM Network Station Manager.
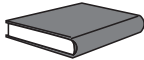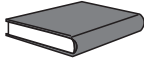
Information available on the World Wide Web

You can obtain the latest version of this book on the World Wide Web from the following URL: `http://www.ibm.com/nc/pubs` This is the same URL that is printed on the cover of this book.

Related information

The following information is available for the IBM Network Station Manager product:

	Information name	Information description
	Installing IBM Network Station Manager for AS/400, SC41-0684	Describes the installation and simple configuration of an AS/400 Network Station environment. It is shipped with the IBM Network Station Manager licensed program. Updates to this information are at http://www.ibm.com/nc/pubs.
	Installing IBM Network Station Manager for RS/6000, SC41-0685	Describes the installation and simple configuration of an RS/6000 Network Station environment. It is shipped with the IBM Network Station Manager licensed program. Updates to this information are at http://www.ibm.com/nc/pubs.
	Installing IBM Network Station Manager for Windows NT, SC41-0688	Describes the installation and simple configuration of a Windows NT Network Station environment. It is shipped with the IBM Network Station Manager licensed program. Updates to this information are at http://www.ibm.com/nc/pubs.
	Using IBM Network Station Manager, SC41-0690	Describes the basic tasks for managing user desktops through the IBM Network Station Manager program. It is shipped with the IBM Network Station Manager licensed program. Updates to this information are at http://www.ibm.com/nc/pubs.
	IBM Network Station Advanced Information	Describes tasks and information beyond a basic installation and configuration of your Network Station environment. This information is only available at http://www.ibm.com/nc/pubs.
	IBM Network Station Manager help text	Describes the basic how-to tasks for configuring your Network Station desktop appearance. This information is availble by clicking the help icon in the IBM Network Station Manager program.
	Desktop help	Describes how to use and operate the Network Station desktop. This information is available by clicking the help icon in the lower right of the Network Station desktop.

How to send your comments

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Chapter 1. Understanding the IBM Network Station

IBM Network Station overview

The IBM Network Station Manager licensed program code is made up of several programs that are installed on a server. One of these programs is the IBM Network Station Manager program. The IBM Network Station Manager program allows you to set and change configurations for IBM Network Station thin clients (hereafter referred to as Network Stations) and Network Station users through a Web browser. See the *Using IBM Network Station Manager* book for more information about the IBM Network Station Manager program.

Since the Network Station does not contain a hard drive, the Network Station accesses the server to download the client operating system, client programs, and data. After the Network Station loads the client operating system, the Network Station displays a graphical user interface (GUI). The GUI can provide the user access to the following kinds of resources:

- 5250 emulator application
- 3270 emulator application
- Telnet application
- Web browser application (Netscape Communicator)
- Java applets or applications
- Windows-based applications
- Local and remote printers

The Network Station communicates using Transmission Control Protocol/Internet Protocol (TCP/IP) over a token-ring or Ethernet connection to the server. Each Network Station runs the client operating system and communicates to a server that runs the IBM Network Station Manager program and other application programs.

Figure 1 on page 2 shows what happens when you power on an IBM Network Station.
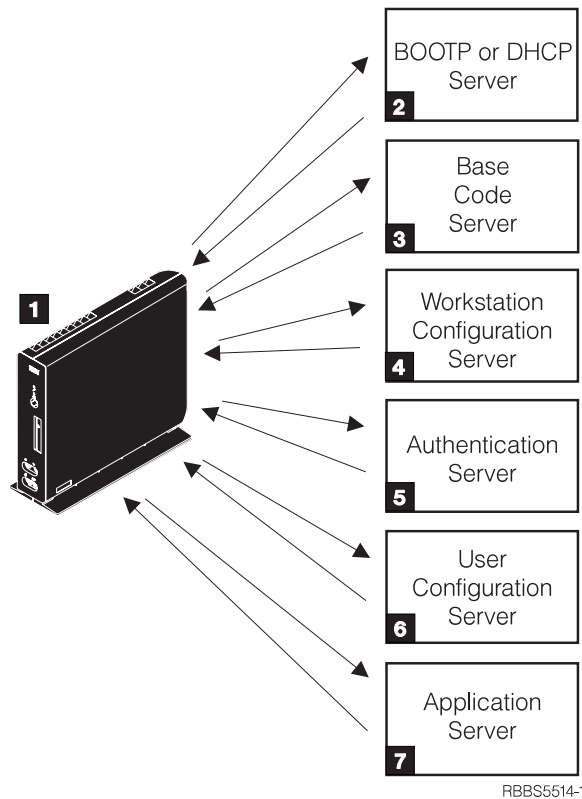
Figure 1. Network Station power-on sequence

1 A non-volatile random access memory (NVRAM) resident program starts. The Network Station automatically runs a series of power-on self tests (POST).

2 The Network Station contacts a BOOTP or DHCP boot server. The Network Station exchanges its media access control (MAC) address for the IP address that is provided by the server. The boot server also provides the address or path of the base code server. The Network Station may alternatively retrieve this information from values that are stored in its NVRAM.

3 The Network Station downloads the base code from the base code server using trivial file transfer protocol (TFTP) or network file system (NFS).

4 The Network Station downloads the workstation-based configuration information from the workstation configuration server.

5 The Network Station presents a logon screen. When the user enters a user id and password, the authentication server verifies the user's identification.

6 The user's configuration server downloads and initiates the personalized environment preferences of the user.

7 The Network Station displays the personalized desktop of the user. The user is able to access application programs that reside on the application server (or host computer).

Each Network Station contains a simple network management protocol (SNMP) agent as part of its operating system. An SNMP manager at a central location can communicate and exchange information with the agent on a Network Station. You

can use this information to manage your network environment. SNMP is an industry-standard protocol for network management. See *IBM Network Station Advanced Information* for more information about SNMP. You can find this document at http://www.ibm.com/nc/pubs.

Each Network Station can display the IBM Network Station Setup Utility or IBM Network Station NS Boot utility. The Setup Utility or NS Boot utility allows you to **View** or **Set** (change) configuration settings on a particular Network Station. For example, you can view the MAC address or you can set the monitor resolution of the Network Station. See *Using IBM Network Station Manager* for more information about the Setup Utility and NS Boot Utility.

TCP/IP overview

In order for the Network Station to communicate with your servers, you need a TCP/IP network. If you understand your TCP/IP network, installing and configuring your Network Station and IBM Network Station Manager program is much easier. To help understand your network, draw a diagram of your network.

Refer to the network examples in this section to help you understand how to configure your network. Choose the network example that most closely resembles your network diagram. Refer to these examples as you go about configuring and installing Network Stations on your network.

Note: You do not need to be an expert in order to set up a TCP/IP network. However, you should have an understanding of basic TCP/IP. A detailed introduction to TCP/IP is beyond the scope of this book. If you need to improve your understanding of TCP/IP, you can contact your IBM sales representative, who has information about classes in your area. You may also want to refer to the redbook, *TCP/IP Tutorial and Technical Overview*, GG24-3376.

LAN network examples

LAN network example 1
Figure 2 on page 4 shows an example of a network diagram in which two Network Stations are connected over a simple local area network (LAN).

192.168.1.4

Server server.mycompany.com

IBM
Network
Station

192.168.1.2

192.168.1.3

RBBRX500-0
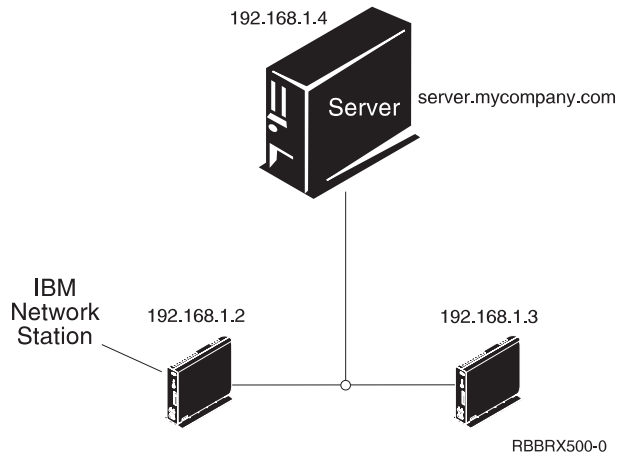
Figure 2. Two Network Stations connected to the server over a simple LAN

LAN network example 2

Figure 3 shows an example of a network diagram in which two Network Stations are connected to the server over a local LAN. Two more Network Stations connect to the server through a router over a remote LAN.

192.168.1.4

Server server.mycompany.com

IBM
Network
Station

192.168.1.2

192.168.1.3

ns1.mycompany.com

ns2.mycompany.com

192.168.1.1

Router

10.1.1.1

10.1.1.2

10.1.1.3

ns3.mycompany.com

ns4.mycompany.com

RBBRX501-0
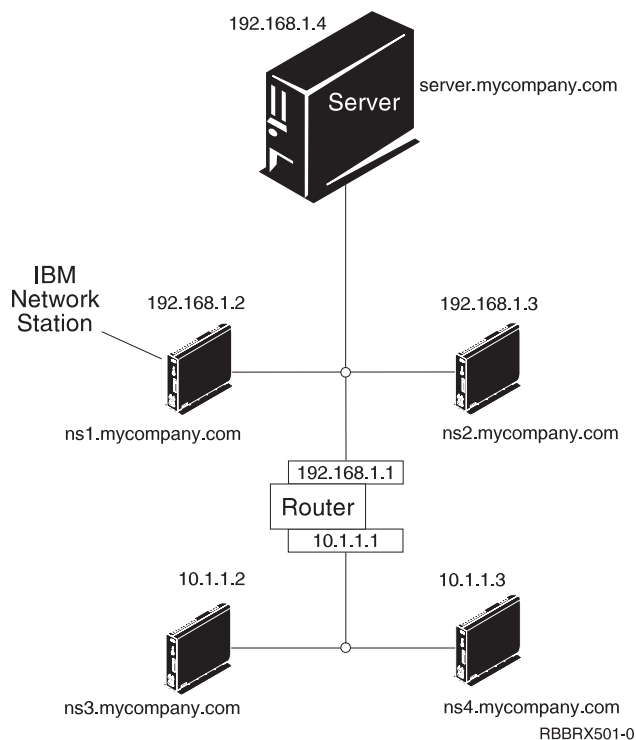
Figure 3. Two Network Stations connected to the server over a local LAN and two Network Stations connected to the server through a router over a remote LAN

LAN network example 3

In Figure 4 on page 5, additional Network Stations connect to the server by using Ethernet connections and token-ring connections. Two token-ring LANs connect via a router. A Domain Name Server also connects to the network.

192.168.1.4

Server   server.mycompany.com

192.168.1.5

Domain
Name
Server

IBM
Network
Station   192.168.1.2   192.168.1.3

ns1.mycompany.com   ns2.mycompany.com

192.168.1.1

Router

10.1.1.1

10.1.1.2   10.1.1.3

ns3.mycompany.com   ns4.mycompany.com

RBBRX503-0
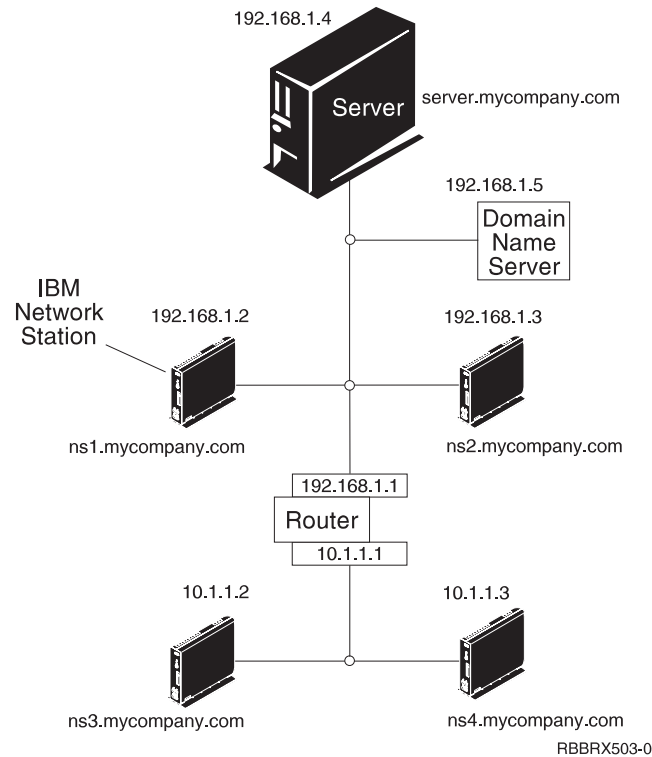
Figure 4. Four Network Stations connected to a network using a router and a domain name server

MAC addresses

Every Network Station comes with a unique identifying number that can be used to keep track of which IP address has been assigned to it. Media access control (MAC) addresses of each Network Station are assigned by manufacturing and hard-coded into the machine. The MAC address of a Network Station is on the side panel of the small box in which the logic unit is packaged. If you no longer have the box, see the *Using IBM Network Station Manager* book for instructions on how to find the MAC address.

You can override the hard-coded MAC address with a customer-assigned MAC address. See *Using IBM Network Station Manager* for instructions on how to override the hard-coded MAC address.

IP addresses

Internet Protocol (IP) addresses are numbers that are assigned to devices on a network (or on the Internet). IP addresses allow computers to communicate through TCP/IP. IP addresses consist of four numbers (from 0 to 255) that are separated by periods, for example 192.168.1.1. The numbers that are separated by periods indicate the network to which a computer belongs and the specific location of the host computer within that network.

IP addresses are not just for computers such as Network Stations, but also for routers, servers, and even subnets and networks themselves. For example, the IP address of a network might be 192.168.1.0. A router on that network might use the IP address 192.168.1.1. A Network Station on the same network might have the address 192.168.1.145.

Chapter 1. Understanding the IBM Network Station   **5**

Each Network Station must have a unique IP address. If you are using the DHCP boot method, you must specify a range of IP addresses so that the server can assign an address to each Network Station. For intranets (networks within your own organization), you can assign your own addresses. However, if you want to connect to the Internet, a central authority must officially assign the network addresses and domain names. At the time of this writing, the authority is as follows:

```
Network Solutions, Inc.
InterNIC Registration Services
505 Huntmar Park Drive
Herndon, VA 22070
1-703-742-4811
E-mail: hostmaster@internic.net
WWW: http://rs.internic.net
```

Boot methods

Since a Network Station has no disk from which to start, it must request information either from its own non-volatile random access memory (NVRAM) or from a server. The Network Station needs to find an IP address for itself. The IP address allows the Network Station to communicate with other hosts. The Network Station can use one of the following methods to request and receive this information:

- Dynamic Host Control Protocol (DHCP)
- Bootstrap Protocol (BOOTP)
- Non-Volatile Random Access Memory (NVRAM)

BOOTP servers can only respond to BOOTP clients, but DHCP servers can respond to both BOOTP and DHCP clients.

Note: If you use the BOOTP or DHCP boot methods, you must configure all routers and gateways in your network to send and receive BOOTP or DHCP packets. If you cannot configure your routers to be BOOTP or DHCP relay agents, you could do either of the following:

- Use a system that has the necessary configuration support to receive limited BOOTP or DHCP broadcasts. Then forward those broadcasts to the appropriate server.
- Use the NVRAM boot method for those Network Stations that are behind a router that cannot forward BOOTP or DHCP broadcasts.

DHCP

Dynamic Host Configuration Protocol (DHCP) is a TCP/IP protocol. DHCP provides a way for a server to automatically allocate IP addresses and configuration information without forcing the administrator to record and track the MAC addresses of the networked computers. DHCP is capable of assigning either a permanent IP address or a temporary IP address for every host or Network Station within a predetermined range of IP addresses. You can also use DHCP to assign IP addresses either statically or dynamically.

In static IP address assignment, you define the MAC address of every Network Station in the DHCP server configuration along with an IP address, which is reserved for the Network Station with this MAC address. A Network Station, identifying itself by its MAC address, sends a request to the DHCP server. The server then returns the IP address that it has reserved for that client.

In dynamic IP address assignment, the server still identifies a Network Station by its MAC address. However, instead of using a fixed IP address, the server allocates any address out of the available pool. The server leases the address to the Network Station for a specified period of time. The address returns to the pool either when the client releases it or when the lease runs out.

DHCP can allow for unlisted clients. Any client, even one with an undefined MAC address in the DHCP configuration, may request an IP address from the pool of available addresses. The use of unlisted clients might be appropriate in an environment in which it is not necessary or preferable to keep track of MAC addresses.

While BOOTP servers can handle requests only from BOOTP clients, DHCP can handle requests from both DHCP and BOOTP clients.

DHCP servers (unlike BOOTP servers) can reuse IP addresses that are not currently being used.

Finally, DHCP provides a large set of configuration options that may include user-defined options. These options are useful in configuring advanced network environments. See *IBM Network Station Advanced Information* for a more in-depth discussion of advanced network environments. You can find this document at http://www.ibm.com/nc/pubs.

BOOTP

Bootstrap protocol (BOOTP) is a TCP/IP protocol that allows the Network Station to request an IP address and the location of the base code file from a server.

To use the BOOTP boot method, the network administrator must record the MAC addresses of all the Network Stations on the network. Then the network administrator assigns each of them an IP address. The administrator then enters those assignments on a BOOTP table. When you need to change IP addresses, you can do so centrally on the table in the boot server rather than individually on each Network Station.

When a Network Station powers on, it broadcasts its MAC address to the BOOTP server. The server looks up the IP address of the Network Station according to its MAC address. BOOTP then returns a reply that assigns the IP address for the Network Station and the name and location of the base code file.

Because BOOTP assigns IP addresses statically (fixing an IP address according to a computer's MAC address and then recording this assignment), it is less versatile than DHCP.

NVRAM

Non-Volatile Random-Access Memory (NVRAM) refers to local Network Station memory. When you use the NVRAM boot method, you code the IP addresses of the Network Station and its server into the memory of the individual Network Station. The Network Station powers on and requests the download of the base code file from the server.

The NVRAM boot method is most practical in small, stable networks. You may also choose to use the NVRAM boot method for one of the following reasons:
- As a method to avoid routers that block BOOTP and DHCP broadcast requests. BOOTP and DHCP broadcast requests for IP addresses can create unnecessary

traffic on the network. Many network routers are configured not to pass these broadcast requests. Since NVRAM does not need to request its IP address (because it has been entered in the NVRAM of the Network Station), it does not make broadcasts.

- As an aid in finding and correcting problems with network connections.
- As an aid in finding and correcting problems with BOOTP or DHCP configurations.

This method may not work well for larger networks for the following reasons:

- You must enter setup data into each Network Station manually.
- DHCP and BOOTP can configure many more parameters that may not be easily configured with this method.

For information about how to configure NVRAM in the Setup Utility or NS Boot utility, see the *Using IBM Network Station Manager* book.

Boot file service

The Network Station uses TFTP to receive the base code file from the base code server. Trivial file transfer protocol (TFTP) is a simple protocol that is used to transfer files.

Java on the Network Station

Java is a programming language that is designed to bridge the gap between different platforms. Java's imperative, "Write once, run anywhere," refers to its portability and to the ability of a single Java program to run on different platforms. To view Java applications, you need a bundle of Java-enabling programs called Java Virtual Machine (JVM). Using JVM on diskless clients such as the Network Station allows the user to access applications without using permanent disk space either on the Network Station or on the server.

There are two kinds of Java programs:

- Applets — require a browser or applet viewer
- Applications — display directly

The first variety, applets, rely on a browser or applet viewer to provide windows and graphical layout. In general, the browser does not "trust" applets because they are downloaded across the Internet. In other words, the browser can restrict applets from reading or writing to local files and from connecting to machines other than those from which they are downloaded. These restrictions protect users from virus-contaminated programs and provide a safe environment for examining programs on the Internet.

See *IBM Network Station Advanced Information* for more information about Java. You can find this document at at http://www.ibm.com/nc/pubs.

Windows applications on the Network Station

Network Stations can run Windows-based applications through the use of a multi-user Windows server. There are several products that can provide a multi-user Windows server:

- Citrix WinFrame is a multi-user Windows application server that is based on Windows NT 3.51. Citrix WinFrame communicates to the Network Station by using the independent computer architecture (ICA) protocol.

- NCD WinCenter is a multi-user Windows application product that requires Citrix WinFrame or Microsoft Windows NT Server 4.0, Terminal Server Edition. NCD WinCenter communicates to the Network Station by using the X11 protocol.
- Citrix MetaFrame is a multi-user Windows application product that requires Microsoft Windows NT Server 4.0, Terminal Server Edition. Citrix MetaFrame communicates to the Network Station by using the ICA protocol.

Network Stations that start from a V1R3 or V2R1 IBM Network Station Manager licensed program server can communicate to a multi-user Windows server using the X11 protocol or the ICA protocol.

For more information, see the following Web sites:
- WinFrame and MetaFrame - http://www.citrix.com
- WinCenter - http://www.ncd.com
- Windows NT Server 4.0, Terminal Server Edition - http://www.microsoft.com

Network Station memory requirements

Network Stations download each of their applications into memory. You should verify that your Network Stations have enough memory to run their applications. For more information on memory, do the following:
1. Go to this Web site: http://www.ibm.com/nc
2. Select your country and select **Go**.
3. In the left frame, click on **Support**.
4. In the **Search** field, enter `memory requirements`.

Taking advantage of multiple server environments

You can install the IBM Network Station Manager licensed program on multiple computer systems. For a more in-depth discussion of this topic, see the *IBM Network Station Advanced Information*. You can find this document at http://www.ibm.com/nc/pubs.

New features in Version 2 Release 1

Version 2 Release 1 (V2R1) of the IBM Network Station Manager licensed program introduces many new features. These features include:

Client desktop
>   The client desktop has a new look and includes the following:
>   - 16-bit color support
>   - Scalable fonts
>   - Desktop help
>   - Kiosk mode
>
>   For more information, see the *Using IBM Network Station Manager* book.

Netscape Communicator 4.5
>   Netscape Comunicator 4.5 includes the Navigator browser, and Messenger (e-mail and news). The browser is fully compatible with other Unix versions of Netscape Navigator. Key features that are new in this version include:
>   - Netscape JVM

- Runtime Plug-in for the Network Station, Java Edition
- PDF helper application
- Real Player helper application
- Audio player helper application
- Video player helper application

For more information, see the *Using IBM Network Station Manager* book.

Windows application support

Enhanced ICA support. For more information, see the *Using IBM Network Station Manager* book.

VT emulator

Enhanced VT emulator. For more information, see the *Using IBM Network Station Manager* book.

Productivity applications
- File manager
- Text editor
- Calendar
- Calculator
- Paint

For more information, see the *Using IBM Network Station Manager* book.

Java The IBM Network Station Manager licensed program provides two JVMs:
- Netscape 4.5 JVM
- IBM JVM (JDK 1.1.8)

Flash memory support

Flash memory support provides the ability to local boot from a flash memory card and a flash memory management utility. For more information, see *IBM Network Station Advanced Information*. You can find this document at http://www.ibm.com/nc/pubs.

Hardware support

Table 1 shows the IBM Network Station hardware by machine type, model number, and series. It also shows which version and release of the IBM Network Station Manager licensed program is required to support a particular hardware machine type and model.

For example:
- Machine type 8364 model Exx requires V2R1
- Machine type 8362 model A22 is supported by either V2R1 or V1R3

Table 1. IBM Network Station hardware types, models, and series

Compatible release	Machine type - model				
	Series 100	Series 300	Series 1000	Series 2200	Series 2800
V2R1 only				8363-Exx	8364-Exx
				8363-Txx	8364-Txx

Table 1. IBM Network Station hardware types, models, and series (continued)

Compatible release	Machine type - model				
	Series 100	Series 300	Series 1000	Series 2200	Series 2800
both V2R1 and V1R3		8361-110 8361-210	8362-A22 8362-A23 8362-A52 8362-A53		
V1R3 only	8361-100 8361-200	8361-341*			
* Twinaxial model supported only on AS/400 servers.					

Coexistence with V1R3

When you install V2R1 on a system that already has V1R3 installed on it, the V1R3 environment is preserved. Both V2R1 and V1R3 can coexist and operate on the same server. The ability to have two software versions that coexist on the same server allows support for all Network Station hardware models. A migration utility can migrate the V1R3 preference files to V2R1. You can uninstall the V1R3 environment after you migrate the V1R3 preference files. For more information, see "Chapter 4. Migrating from V1R3 to V2R1" on page 43.

Chapter 2. Installing and configuring an IBM Network Station environment on an AS/400 server

About this chapter

This chapter contains instructions for preparation, installing and configuring an IBM Network Station environment on an AS/400 server. While completing the installation procedure and the configuration procedure, do not deviate from the order of the steps.

Installing IBM Network Station Manager licensed program

This section describes the preparation and installation of the IBM Network Station Manager (5648-C07) licensed program.

Attention:

- If you have manually changed any configuration files instead of using the IBM Network Station Manager in the past, go to http://www.ibm.com/nc/pubs for Advanced User Information.

- The Series 2800 (Type 8364) Network Station supports multiple software releases. For information on the best way to set up Series 2800 (Type 8364) Network Stations for V2R1 IBM Network Station software, you must see ″Running V2R1 on Series 2800″ in the latest V2R1 information on the web.

  1. Go to http://www.ibm.com/nc/.
  2. Select your country and click **Go**.
  3. In the left frame, click **Support**.
  4. In the Search field, specify ′Running V2R1 on Series 2800′ and click **Go**.

To install the IBM Network Station Manager (5648–C07) licensed program, do the following:

__ 1. If you have a previous release of IBM Network Station Manager installed on your server, you must read the information in "Chapter 4. Migrating from V1R3 to V2R1" on page 43 before you continue.

__ 2. For the latest V2R1 information, a list of required product temporary fixes (PTF) and other important information do the following:

    a. Go to http://www.ibm.com/nc/.

    b. Select your country and click **Go**.

    c. In the left frame, click **Support**.

    d. In the Search field, specify ′PTF′ and click **Go**.

Review this list to see the latest information and required PTFs. The application of these PTFs prevents unpredictable results including possible data loss.

__ 3. To determine which PTFs you should order based on the PTFs already installed, you can run Display Program Temporary Fix (DSPPTF). At an AS/400 command line, type `DSPPTF`.

__ 4. Verify prerequisite hardware and software

Your AS/400 server must meet the following minimum software requirements:

- OS/400 Version 4 Release 2 (5769–SS1 with the installation of option 12)
- OS/400 TCP/IP Connectivity Utilities (5769-TC1)
- For V4R3 and later, IBM HTTP Server for AS/400 (5769–DG1)
- A PC with V4R4 Client Access Express for Windows (5769–XE1) service pack 1 (SPF1)

   Note: Please check Informational APAR II11759 for the latest list of OS/400 PTFs. You must install the latest PTFs on the AS/400 prior to attempting any Client Access functions. If the required OS/400 PTFs are not installed on the AS/400, some of the fixes in this service pack will not work. You can view Informational APARs for Client Access on the internet at http://www.as400.ibm.com/clientaccess/ under the "Information APARs" link.

   For Client Access Express ordering information, visit the same web location.

- The Network component of AS/400 Operations Navigator
- You must configure the AS/400 NetServer. To configure the AS/400 NetServer, see the Client Access Express For Windows – Setup hard copy book (SC41–5507). For additional information on the NetServer see the Info Center at http://www.as400.ibm.com/infocenter. Choose Information Center and the version and release. Then look under **Networking**.

__ 5. Verify the memory requirements for your Network Stations

Network Stations download each of their applications into memory, including their base systems. You should verify that your Network Stations have enough memory to run their applications.

   a. Go to http://www.ibm.com/nc/.
   b. Select your country and click **Go**.
   c. In the left frame, click **Support**.
   d. In the Search field, specify 'Memory Requirements' and click **Go**.

__ 6. Verify your security authority

Your user profile must have the following authorities:

- *SECADM
- *ALLOBJ
- *IOSYSCFG
- *SECOFR (to run the migration utility)

To check your security authorities, you can use the Display User Profile (DSPUSRPRF) command. At the AS/400 command line, type the following command to view your user profile:

`DSPUSRPRF youruserid`

__ 7. With the information you obtained in step 2 on page 13, apply the group
PTF to your AS/400

    __ a. At an AS/400 command line, type GO PTF.

    __ b. Select option 8. The display for the Install Options for Program
Temporary Fixes appears.

```
                Install Options for Program Temporary Fixes
                                                    System:   AS400TEST
 Type choices, press Enter.

   Device  . . . . . . . . .               Name, *SERVICE

   Automatic IPL . . . . . .   N           Y=Yes
                                           N=No

   Restart type  . . . . . .   *SYS        *SYS, *FULL

   PTF type  . . . . . . . .   1           1=All PTFs
                                           2=HIPER PTFs and HIPER LIC fixes
                                             only
                                           3=HIPER LIC fixes only
                                           4=Refresh Licensed Internal Code

   Other options . . . . . .   N           Y=Yes
                                           N=No




 F3=Exit   F12=Cancel
```

    __ c. Enter the device name where the PTF CD is located (OPT01).

> **Note:** You may receive a message that no PTFs were installed. This message
> means that your operating system did not need any PTFs. Also, you
> may have received messages that some PTFs did not install. You can
> ignore these messages, because they pertain to the PTFs that are not
> pertinent to your system.

__ 8. If PTFs were installed, perform an IPL

Because of the PTFs you just installed, you must perform an IPL for the
AS/400 system before you install the Network Station Manager licensed
program. You must perform this step for the Network Station Manager
program to function correctly.

    __ a. Ensure that the system IPL mode is in the normal mode.

    __ b. Use the Power Down System (PWRDWNSYS) command to perform
the IPL. At an AS/400 command line, type

        `PWRDWNSYS *IMMED RESTART(*YES) IPLSRC(B)`

__ 9. If TCP/IP is active, you must end the HTTP server. At an AS/400 command
prompt, type `ENDTCPSVR *HTTP`. You cannot complete this procedure while
the HTTP server is active.

__ 10. Install the IBM Network Station Manager licensed program (5648-C07)

The IBM Network Station Manager licensed program is available for
AS/400 systems with the a minimum operating system of V4R2.

    __ a. Insert the compact disc (CD) that contains the Network Station
Manager licensed program into your AS/400 CD drive.

    __ b. Install the licensed program.

        To install a new licensed program, use the Restore Licensed Program
(RSTLICPGM) command. At the AS/400 command line, type:

        `RSTLICPGM LICPGM(5648C07) DEV(OPT01) OPTION(*BASE)`

__ c. Verify that the restore was successful.

Use the Display Job Log (DSPJOBLOG) command to view the AS/400 job log.

1) At the AS/400 command line, type `DSPJOBLOG`

2) Look for any installation errors and take the appropriate action.

__ 11. The following information is to support Series 300 and 1000 machines.

To install the Power PC (ppc) component of the product, type the following command on the AS/400 command line:

`RSTLICPGM LICPGM(5648C07) DEV(OPT01) OPTION(1)`

Note: If your server's primary language is not the language you wish to install, then specify:

`LNG (language number)`

on the `RSTLICPGM` command.

As part of the Network Station Manager licensed program, the install program automatically installs the:

- 40-bit NC Navigator browser
- Independent Computing Architecture
- Secure Sockets Layer.

__ 12. Apply the PTFs for the IBM Network Station Manager licensed program. This is necessary only if you found required PTFs for the IBM Network Station Manager licensed program in step 2 on page 13.

To avoid an unnecessary IPL, you must follow these steps in the exact order they are presented.

__ a. With the information you obtained in 2 on page 13, apply the required PTFs to your AS/400.

__ b. At an AS/400 command line, type `GO PTF`.

__ c. Select option 8. The display for the Install Options for Program Temporary Fixes appears.

```
                 Install Options for Program Temporary Fixes
                                                    System:    AS400TEST
 Type choices, press Enter.

   Device  . . . . . . . . .             Name, *SERVICE

   Automatic IPL . . . . . .   N          Y=Yes
                                          N=No

   Restart type  . . . . . .   *SYS       *SYS, *FULL

   PTF type  . . . . . . . .   1          1=All PTFs
                                          2=HIPER PTFs and HIPER LIC fixes
                                            only
                                          3=HIPER LIC fixes only
                                          4=Refresh Licensed Internal Code

   Other options . . . . . .   Y          Y=Yes
                                          N=No



 F3=Exit    F12=Cancel
```

__ d. In the *Device* field, specify OPT01.

__ e. In the *Automatic IPL* field, select N, because you do not need to IPL your system after applying these PTFs.

__ f. In the *Other options* field, select Y. The *Other Install Options* display appears.

```
                           Other Install Options
                                                    System:    AS400TEST
  Type choices, press Enter.

    Omit PTFs  . .   N             Y=Yes, N=No

    Apply Type . .   3             1=Set all PTFs delayed
                                   2=Apply immediate, set delayed PTFs
                                   3=Apply only immediate PTFs








  F3=Exit    F12=Cancel
```

__ g. In the *Apply Type* field, enter option 3.

__ h. Press the Enter key.

__ 13. Install optional software

The following describes the installation of the 128-bit licensed program (5648-C08) as **optional** software for your Network Stations.

__ a. Insert the CD that contains the Strong Encryption Support for IBM Network Station Manager V2 licensed program (5648–C08) into your AS/400 CD drive.

__ b. Install the licensed program.

To install a new licensed program, type the following command on an AS/400 command line:

```
RSTLICPGM LICPGM(5648C08) DEV(OPT01) OPTION(*BASE)
```

__ c. Verify that the restore was successful.

Use the DSPJOBLOG command to view the AS/400 job log. Look for any installation errors and take the appropriate action.

__ 14. The following information is to support Series 300 and 1000 machines.

To install the Power PC (ppc) component of the product, type the following command on the AS/400 command line:

```
RSTLICPGM LICPGM(5648C08) DEV(OPT01) OPTION(1)
```

.

Note: If your server's primary language is not the language you wish to install, then specify

```
LNG (language number)
```

on the RSTLICPGM command.

After installation of the ppc component, all users will have strong encryption support.

> **Note:** Your system will revert back to the 5648C07 licensed program if you:
> - Installed the 5648C07 licensed program, then
> - Installed the 5648C08 (strong encryption support) licensed program, then
> - Choose to delete the strong encryption support.

As part of the optional licensed program, the install program automatically installs the:
- 128-bit NC Navigator browser
- Independent Computing Architecture
- Secure Sockets Layer.

__ 15. Installation completed

You have installed all the required software for the IBM Network Station Manager licensed program. Continue to "Configuring your AS/400 environment for Network Stations" to configure your TCP/IP environment and boot server.

Configuring your AS/400 environment for Network Stations

This section describes how to configure the AS/400 environment for your Network Stations. You must have completed "Installing IBM Network Station Manager licensed program" on page 13 before using this section. To complete the installation and configuration for your IBM Network Stations, you must install and run the IBM Network Station Setup Wizard.

Installing the Network Station Setup Wizard on your PC

Make sure that the AS/400 NetServer is 'started' as follows:

__ 1. Close any other *Operations Navigator* windows.

__ 2. Open the *AS/400 Operations Navigator* main window.

__ 3. Expand the view for your AS/400 system.

__ 4. Expand the **Network**, then **Server** objects.

__ 5. Double-click **TCP/IP**.

__ 6. In the right frame, look for **AS/400 NetServer** and check that the status is **Started**.

__ 7. If the status is 'Stopped':

   a. Right-click the **AS/400 NetServer**

   b. Choose **Start**.

__ 8. Close *Operations Navigator*.

Use Client Access Selective Setup to add the component for the Network Station Setup Wizard to *Operations Navigator*:

__ 1. From the desktop launch bar, click `Start=>Programs=>IBM AS400 Client Access Express=>Selective Setup`.

__ 2. At the Selective Setup Options dialog box, click Source directory.

__ 3. Enter this path:

   `\\<server name>\QIBM\ProdData\NetworkStationV2\IBM.NSWizard`

and click **Next**. See Figure 5.

> **Note:** If you received the error message, "The install path specified is not valid. Please specify a different path", you may need to map a network drive to your target server.

__ 4. At the Component Selection dialog box, expand the *AS/400 Operations Navigator* component. See Figure 6.

__ 5. Click to place a check mark next to **Network Station Setup Wizard** and click **Next**. Selective Setup will add the component for you.

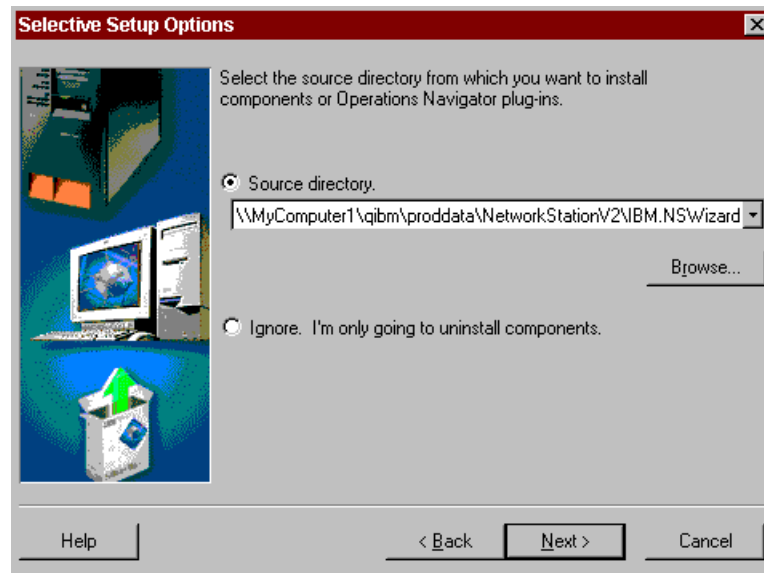__ 6. Follow the prompts until you are finished adding the component.

Figure 5. Client Access Express Selective Setup Options. Enter The Source Directory.
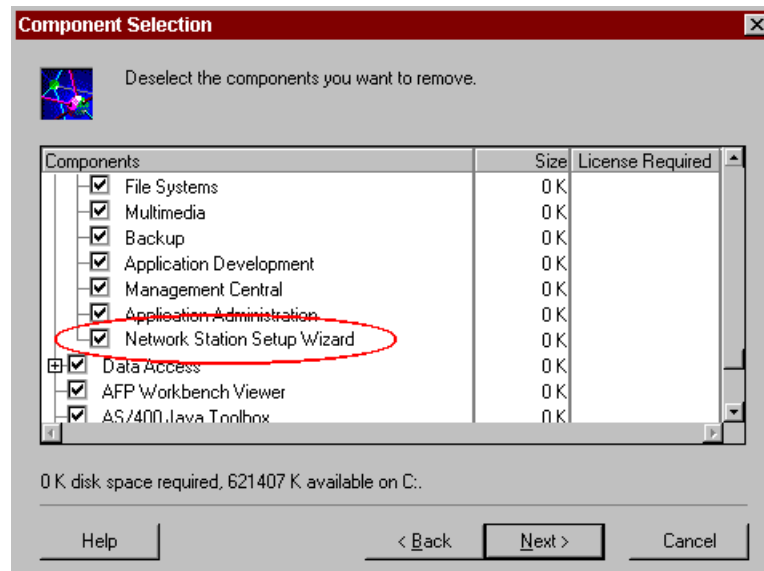
Figure 6. Client Access Express Selective Setup Component Selection. Select Network Station Setup Wizard.

Running the Network Station Setup Wizard

This section describes how to run the IBM Network Station Setup Wizard.

> **Attention**
>
> The IBM Network Station Setup Wizard will cycle off and on again the following servers:
> - TCP/IP
> - TFTP
> - HTTP
> - DHCP
> - Telnet.

Launch the Network Station Setup Wizard.

__ 1. Open the *AS/400 Operations Navigator* main window.

__ 2. Expand the view for your AS/400 system.

__ 3. If you receive an *AS/400 Operations Navigator* message to scan your target server, click **Scan Now**.

__ 4. Expand the **Network** object.

__ 5. Right mouse click on **IBM Network Stations** and select **Add Network Stations to AS/400**. See Figure 7 on page 21. This will launch the wizard.

__ 6. Follow the screens to complete the AS/400 Network Station Setup Wizard. Use the online Planning Form and online help information for additional support. Move your cursor into a field and press F1 for specific help.

__ 7. When you see the message 'Configuration and Verification Completed ... ' in the last line of the final wizard panel, click **Close**.
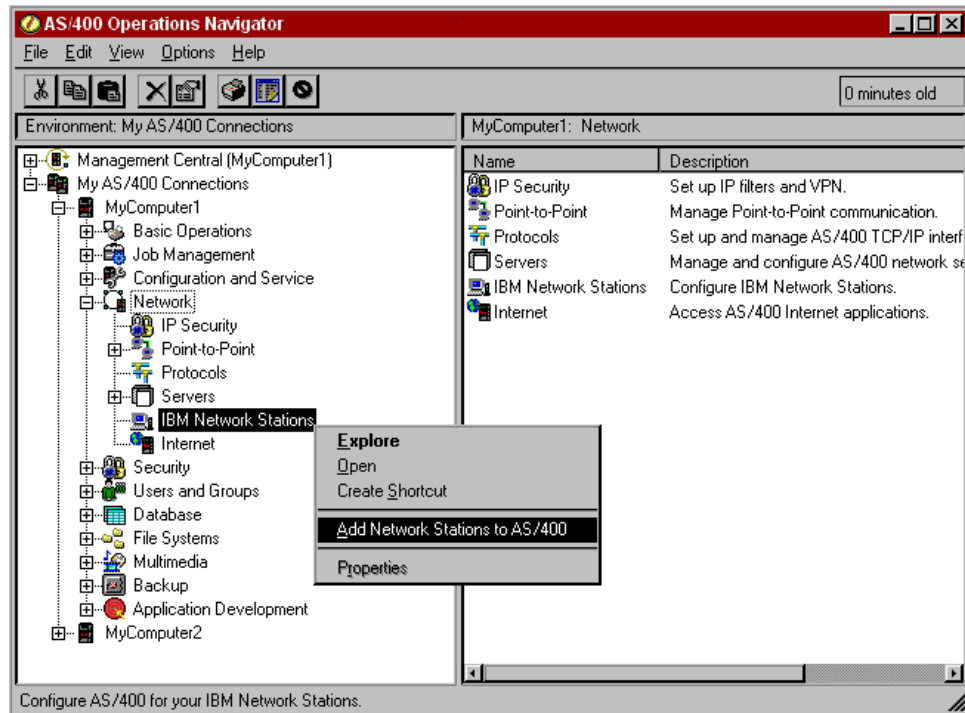
Figure 7. AS/400 Operations Navigator. Right-click on Add Network Station to AS/400.

To find out what the Network Station Setup Wizard does, see "What the Network Station Setup Wizard does".

What the Network Station Setup Wizard does

You should use the setup wizard to configure your AS/400 for use with Network Stations.

Attention

The IBM Network Station Setup Wizard will cycle off and on again the following servers:

- TCP/IP
- TFTP
- HTTP
- DHCP
- Telnet.

The wizard configures the AS/400 for IBM Network Stations. This includes TCP/IP and either DHCP or BOOTP configuration. After successfully completing the wizard, your Network Station will be able to start from this AS/400.

You may view a list of the functions the wizard will perform:

1. At the end of the wizard, you will see the **AS/400 Network Station Setup Summary** panel. See Figure 8 on page 22.
2. On this panel, click the **Details** button. A Notepad viewer displays with a list of what you have input to the wizard and the functions the wizard will perform.
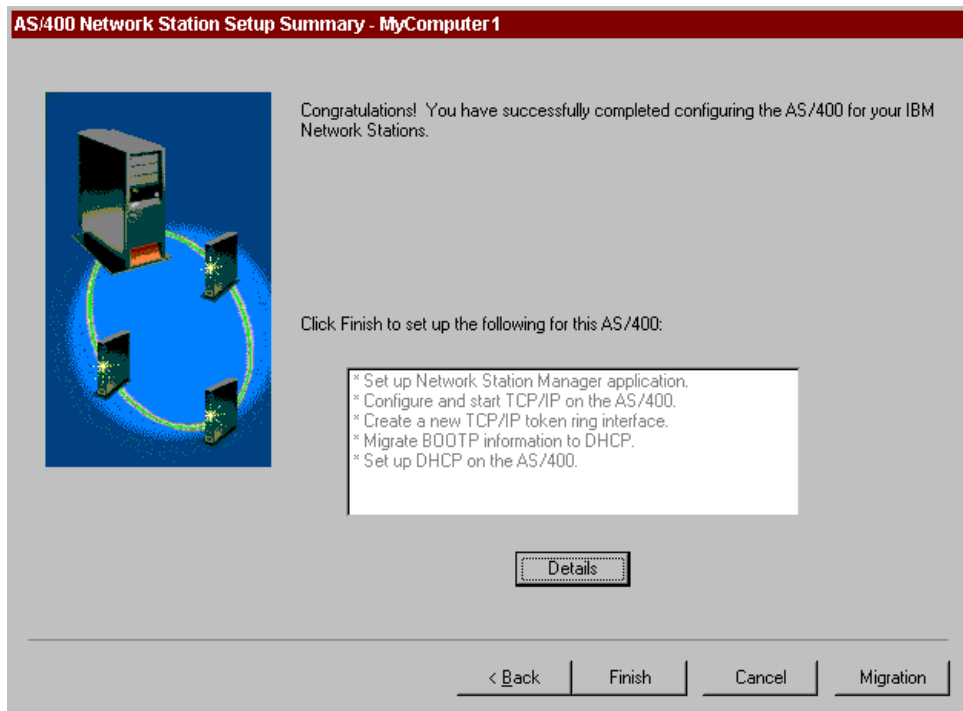
Figure 8. AS/400 Network Station Setup Summary

Note: The process speed will vary greatly depending on what you have asked the wizard to do and your computer configuration.

The AS/400 Network Station Setup Wizard can (depending on your input):
- Set the host name for the AS/400
- Set the domain name for the AS/400
- Set the Domain Name Servers for the AS/400
- Set the TFTP server to autostart
- Set the DHCP server to autostart
- Set the HTTP server to autostart
- Set the Telnet server to autostart
- Start TCP/IP
- Set the HTTP server directives
- Create a new line
- Create a new TCP/IP interface
- Add gateways
- Adding routes
- Create a new network server description
- Add subnet to DHCP
- Exclude IP addresses from the subnet
- Set boot information
- Add static client IP addresses to the subnet
- Set the DHCP required global classes
- Start the Network Station login daemon

- Make the new line available
- Set your system to keep server security data
- Set the BOOTP server to not autostart
- Stop the BOOTP server
- Add host table entry for the interface
- Migrate the BOOTP server configuration to DHCP
- Make the network server available

After completing the wizard, you can use the AS/400 *Operations Navigator* to review the configuration. See Figure 9 on page 24.

- Start an *Operations Navigator* session.
- In the left frame, expand your AS/400 server directory.
- Go to `Network=>Servers=>TCP/IP`.
- In the right frame, double-click on **DHCP**.
- In the left frame, highlight a subnet range. The **Contents** frame opens in the upper right hand corner.
- In the **Contents** frame, highlight a class. The **Options** frame in the lower right hand corner shows the options for that class.
- Notice the icons:
  – Option tags 1, 3, 6, and 15 are in the subnet level.
  – Tag 51 is in the global level.
  – Tag 67 is in the class level.

  Note: A PC or a printer (for example) will not have a class. They can have all the options shown except option number 67.

Subnet Range   Class within Subnet

Global level   Class level   Subnet level

RBBRX514-1
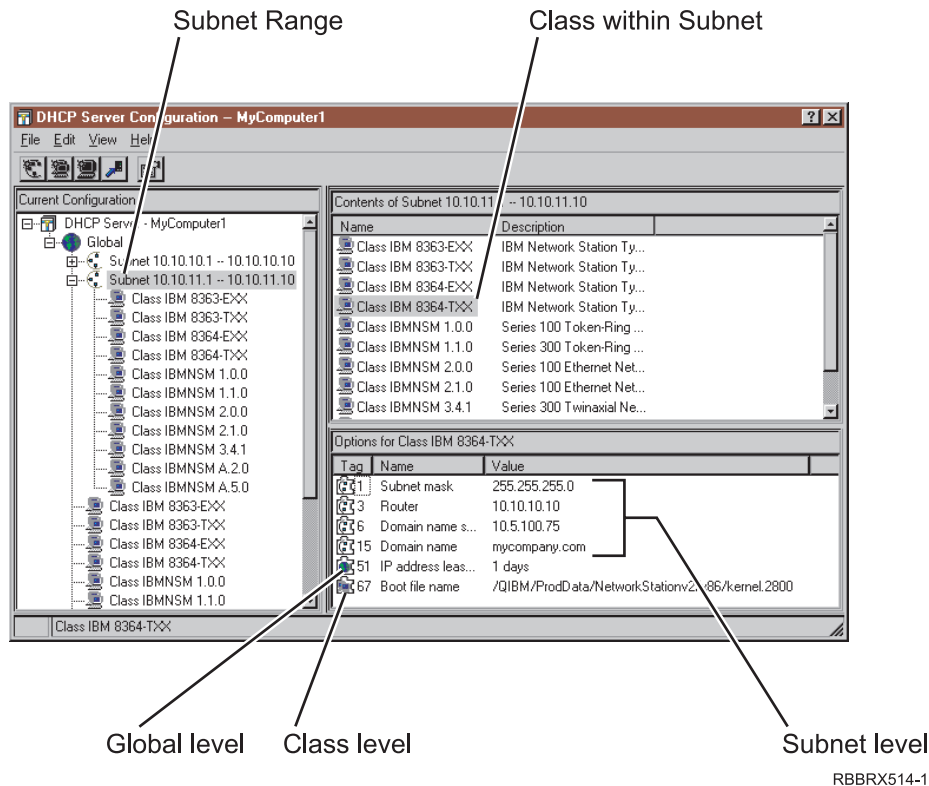
Figure 9. DHCP Configuration. Review the DHCP configuration with Operations Navigator.

After completing the wizard, you can change the configuration with the AS/400 *Operations Navigator*.

To change the TCP/IP configuration, go to `Network=>Protocols=>TCP/IP` in the *Operations Navigator* window.

To change the DHCP configuration, go to `Network=>Servers=>TCP/IP=>DHCP` in the *Operations Navigator* window.

Depending on your system's language, the Setup Wizard also adds some HTTP directives. For more information about HTTP directives, see "HTTP directives" on page 38.

Additional information for NVRAM

After you run the Network Station Setup Wizard:
- Go to each separate Network Station
- Use the Network Station Setup Utility or the NS Boot Utility to correctly determine the values for your network.

For information on using these utilities, see the *Using IBM Network Station Manager* book.

Additional information for BOOTP

In addition to running the Network Station Setup Wizard, for BOOTP see "Adding BOOTP Network Stations with Operations Navigator" on page 27.

If you chose BOOTP during the Network Station Setup Wizard and you now want to use the V2R1 boot path, you must change each Network Station individually. See "Client migration" on page 47.

Diagnose and repair DHCP configuration errors

In the Network Station configuration for DHCP, if there is partial data or bad data, you can find the suspected line through *Operations Navigator*:

1. Start a separate AS/400 *Operations Navigator* session.
2. In the left frame, expand your AS/400 server directory.
3. Open **Network**, **Servers** then **TCP/IP**.
4. In the right frame, right-click on **DHCP** and choose **Configuration**. The **DHCP Server Configuration** dialog box appears.
5. If an error exists in the DHCP configuration file, you will see an Operations Navigator error dialog box.
6. Take note of the line number where the error occurred and the specified file.
7. Select **Ignore** to see the same pop up for any other configuration error.
8. To edit the file in the message, use Operations Navigator's Integrated File System as follows:

   a. In the left frame, expand **File Systems**. Right-click on **Integrated File System**.
   b. Choose **Properties**. Click on **All files in the Allow edit menu option for:** field. Click **OK**.
   c. From the error message, find the specified file under:

      `File Systems\Integrated File System\Root\<file path name>`
   d. Right-click the specified file and choose **Edit**.
   e. Find the line that was defined as an error and fix.

Before you continue ...

Before you begin using your Network Stations, read and complete (when applicable) each of the following items:

Updating boot code and boot monitor

To take advantage of new functionality, you must update the boot monitor on your Network Stations. You may have Network Station machines with different levels of boot monitor. Even if you have purchased new Network Stations, you should verify and update the boot monitors of your Network Stations. For information about updating boot monitors, see the *Using IBM Network Station Manager* book.

IBM Network Station login server

To allow V2R1 to run your Network Station network, you will need to stop the V1R3 Network Station login server.

To stop the V1R3 Network Station login server, use the End TCP/IP Server (ENDTCPSVR) command. At the AS/400 command line, type

`CALL QYTC/QYTCUSVR ('ENDTCPSVR ')`

Notice the space before the last quotation mark.

The IBM Network Station Setup Wizard starts the Network Station login server. If you stop your TCP/IP or IPL your system, you must restart the Network Station

login server. To start the V2R1 Network Station login server, use the Start TCP/IP Server (STRTCPSVR) command. At the AS/400 command line, type `CALL QYTCV2/QYTCUSVR ('STRTCPSVR ')`. To stop the V2R1 Network Station login server, type `CALL QYTCV2/QYTCUSVR ('ENDTCPSVR ')`. Notice the space before the last quotation mark.

DNS support

For series 300 and series 1000, if you use the BOOTP or NVRAM boot method, you must enable DNS support through the Network Station Manager licensed program. To enable DNS support, see the *Using IBM Network Station Manager* book.

Verify network parameters

Verify that the network parameters in the Setup Utility or the NS Boot Utility of your Network Stations agree with your boot method. See the *Using IBM Network Station Manager* book for more information about the Setup Utility or the NS Boot Utility.

Verify that you started your:
- BOOTP or DHCP server
- NFS or TFTP server
- HTTP server.

Verify that you excluded any statically addressed devices in your DHCP address range.

If you have a router between your Network Station and your boot server, verify that your router can handle BOOTP and DHCP requests.

For more information about setting up Network Stations, see the *Using IBM Network Station Manager* book.

Chapter 3. After installation and configuration

About this chapter

This chapter describes the functions that supplement the setup and configuration of your Network Station environment.

After you have completed the Network Station Setup Wizard

How to configure your DHCP with both V1R3 and V2R1 environments running on your network.

- For V2R1M0, the boot path for models S300 and S1000 is pointed at V2R1.
- For BOOTP table configurations, see "Adding BOOTP Network Stations with Operations Navigator"
- For NVRAM memory settings, see the *Using IBM Network Station Manager* book for more information about the Setup Utility or the NS Boot Utility.

Adding BOOTP Network Stations with Operations Navigator

This procedure adds Network Stations to an existing BOOTP environment.

Note: You need *Operations Navigator* (OS/400 V4R2 or later) to complete this procedure.

__ 1. For each new Network Station, fill out a new row of information on Table 2 on page 28.

__ 2. Start an AS/400 *Operations Navigator* session.

__ 3. In the left frame, expand your AS/400 server directory.

__ 4. Open `Network=>Servers=>TCP/IP`.

__ 5. Double-click the **BOOTP** server.

__ 6. Click the **Add** button. See Figure 10 on page 28.

__ 7. Fill in the Network device information:

- **Host Name**
- **MAC address**
- **IP address**
- **Hardware type**

__ 8. Fill in the Network routing information:

- **Gateway IP address**. If you do not use gateway IP addresses for remote local area networks (LANs), leave this field blank.
- **Subnet mask**. If you do not use a subnet mask for remote LANs, leave this field blank.

___ 9. Check the Boot information. Verify that the following default values are correct:

- Type: IBM Network Station Manager
- Filename and directory: (8363-TXX and EXX) /QIBM/ProdData/NetworkStationV2/X86/kernel.2200 (for series 2200 type-models 8363-TXX and 8363-EXX)
- Filename and directory: (8364-TXX and EXX) /QIBM/ProdData/NetworkStationV2/X86/kernel.2800 (for series 2800 type-models 8364-TXX and 8364-EXX)
- Filename and directory: (NSM 1.1.0 and 2.1.0) /QIBM/ProdData/NetworkStationV2/ppc/kernel.300 (for series 300 type-models 8361-110 and 8361-210)
- Filename and directory: (NSM A.2.0 and A.5.0) /QIBM/ProdData/NetworkStationV2/ppc/kernel.1000 (for series 1000 type 8362)
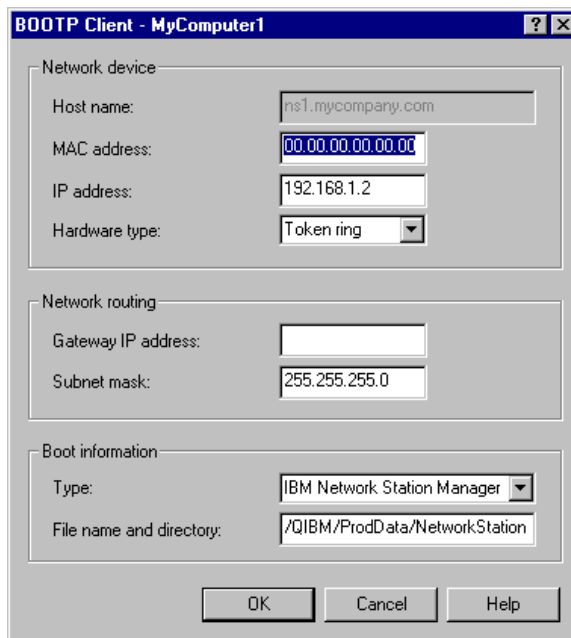
Figure 10. Sample Configuration for a Network Station. Add a BOOTP client.

___ 10. Click the **OK** button.

___ 11. Repeat steps 6 on page 27 through 10 for each additional Network Station.

___ 12. Click **OK** again to return to the *Operations Navigator* main window.

Table 2. BOOTP Network Station Information

Field	Description	Write Value Here
Host name	The host name uniquely identifies your AS/400 server in a TCP/IP network. In Figure 4 on page 5, the host name for one of the Network Stations is ns1.mycompany.com.	

Table 2. BOOTP Network Station Information (continued)

Field	Description	Write Value Here
MAC address	A message authentication code (MAC) address is a 12 digit number that uniquely identifies each Network Station, much like a serial number. The MAC address can consist of both letters and numbers (but not all numbers). During manufacturing, the original MAC address is hard coded in the Network Stations. For Ethernet lines, specify a hexadecimal value between: 020000000000 and 7EFFFFFFFFFF. For Token Ring lines, specify a hexadecimal value between: 400000000000 and 7FFFFFFFFFFF. The values must be 12 digits long. To find the MAC address, see the chapter *Working with MAC addresses* in *Using IBM Network Station Manager*.	
IP address	Each Network Station requires a unique IP address. In Figure 4 on page 5, ns1.mycompany.com has an IP address of 192.168.1.2. You should ensure the IP address is valid for your organization and that no other device in the network uses it.	
Hardware type	Your Network Stations can attach to either a Token-ring or an Ethernet LAN.	
Gateway IP address for remote LANs	If you do not use a gateway IP address for remote LANs, disregard this field and leave it blank in Operations Navigator. • If the LAN that you are attaching Network Stations to is not directly attached to your AS/400, it is referred to as a remote LAN. You need to specify the IP address of the IP router/gateway that your Network Station will use to reach the server. • In Figure 4 on page 5, the gateway IP address for Network Station ns3.mycompany.com is 10.1.1.1.	
Subnet mask for remote LANs	If you do not use a gateway IP address for remote LANs, disregard this field and leave it blank in Operations Navigator.	
Boot Type	The boot type is a constant. IBMNSM identifies this network device as a Network Station.	IBMNSM

Table 2. BOOTP Network Station Information (continued)

Field	Description	Write Value Here
Boot File name and directory	The boot file name is the name of the file that the Network Station downloads and uses to boot the remote device. The value (the kernel) is a constant. The path name is used to access the boot file on the host. This value is always the same depending on your hardware.	See notes below

Notes:

1. For IBM 8363-TXX and IBM 8363-EXX, the boot path is:
   /QIBM/ProdData/NetworkStationV2/x86/kernel.2200 (for series 2200 type-models 8363-TXX and 8363-EXX)

2. For IBM 8364-TXX and IBM 8364-EXX, the boot path is:
   /QIBM/ProdData/NetworkStationV2/x86/kernel.2800 (for series 2800 type-models 8364-TXX and 8364-EXX)

3. For IBMNSM 1.1.0 and IBMNSM 2.1.0, the boot path is:
   /QIBM/ProdData/NetworkStationV2/ppc/kernel.300 (for series 300 type-models 8361-110 and 8361-210)

4. For IBMNSM A.2.0 and IBMNSM A.5.0, the boot path is:
   /QIBM/ProdData/NetworkStationV2/ppc/kernel.1000 (for series 1000 type 8362)

Defining statically addressed Network Stations in a DHCP environment

A DHCP environment can support statically defined clients (Network Stations, printers, PCs, and so forth). This is helpful when you want the DHCP server to always assign a specific IP address to the client. With a statically defined client, when the defined client requests an IP address from the server, the server always returns the same IP address. Typically you will want to have DHCP dynamically assign addresses to client workstations. However there may be times that you want DHCP to assign a specific address to a workstation or device (for example, network printer).

You can statically define a Network Station with the IBM Network Station Setup Wizard. See "Running the Network Station Setup Wizard" on page 20.

You can also statically define a Network Station with *Operations Navigator*:

1. Start a separate AS/400 *Operations Navigator* session.

2. In the left frame, expand your AS/400 server directory.

3. Open `Network=>Servers=>TCP/IP`.

4. In the right frame, double-click on **DHCP**. The **DHCP Server Configuration** dialog box appears.

5. In the left frame, right-click on the Subnet from which you would like to define a static client. Choose **New Client**. The **New Client Properties** box appears.

6. On the **General** tab, fill in the **Name** and **Unique Identifier** fields.

7. Choose the **IP Address** tab. Click on the **Assign IP Address** button and fill in the IP address you want to statically define. See Figure 11 on page 31.

8. Choose the **Options** tab. Select the options you require. At a minimum add the following options:
   - Option 1 Subnet mask
   - Option 66 Server name

- Option 67 Boot file name
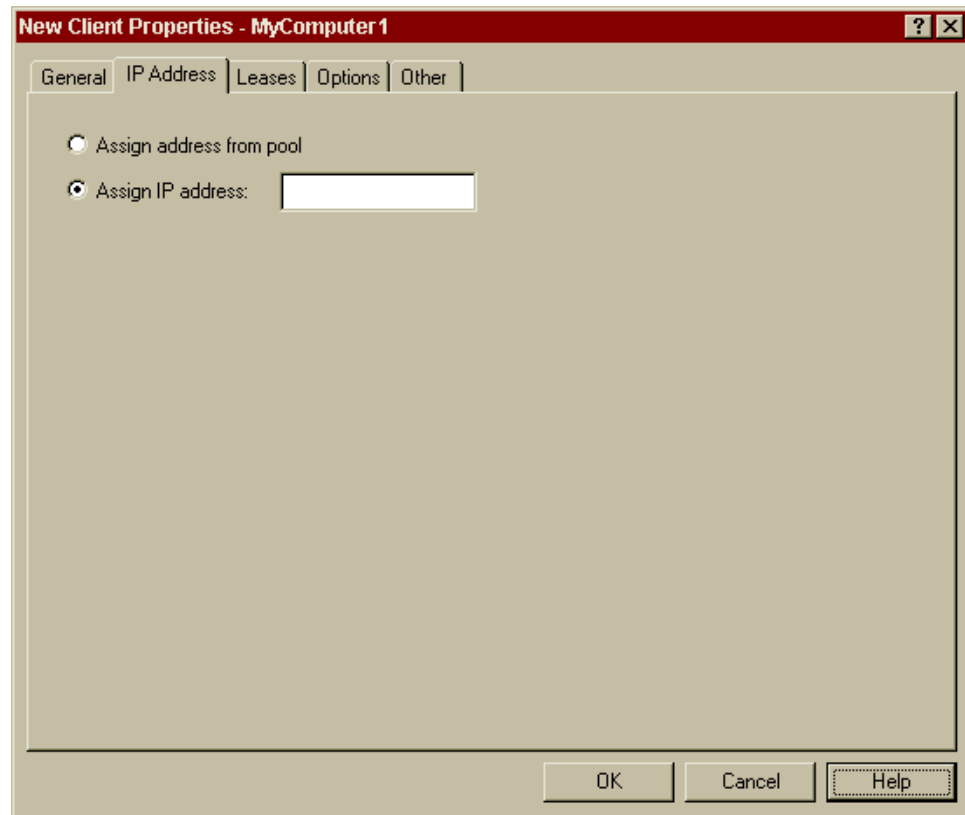- Option 211 Boot protocol
9. Click **OK**.

Figure 11. Define New Client Properties. Assign a static address to a Network Station.

Migrating BOOTP Clients to a DHCP environment

You can migrate the BOOTP configuration to DHCP with the IBM Network Station Setup Wizard. See "Running the Network Station Setup Wizard" on page 20.

DHCP can support BOOTP clients. If you want your existing BOOTP entries to remain statically addressed (versus dynamically addressed), you can migrate them into your DHCP environment. The migration program defines the BOOTP clients as DHCP Clients. This change of service will not affect the BOOTP clients.

> **Attention**
>
> This migration will not migrate clients from V1R3 to V2R1. To migrate clients from V1R3 to V2R1, see "Client migration" on page 47.

Configuring Printers on an AS/400

Note: Transforming print jobs requires OS/400 Version 4 Release 2 or later.
You can configure printers for your Network Stations with the IBM Network Station Manager licensed program. A Network Station Manager application generates a datastream. This datastream must match a datastream that your printer

understands. *Using IBM Network Station Manager* describes which datastreams the Network Station Manager application produces. If your Network Station Manager application does not produce a datastream that your printer understands, you must send the print job to an AS/400 server. The AS/400 server transforms the print job into the datastream of your choice. For example; Network Station A in Figure 12 generates a print job from Netscape Communicator for Printer 1 (a Printer Control Language (PCL) printer). The Network Station cannot send its print job directly to the printer. Because Netscape Communicator can only generate PostScript (PS) datastreams, the Network Station must send its print job to the AS/400 server. The AS/400 server will transform the print job into a PCL datastream. A queue on the AS/400 server then sends the transformed print job to Printer 1.

For server-based applications, such as a 5250 session, you must configure a printer on the server where the application is running. In this case, think of the Network Station as only a window to the server. The server still performs the "work". For example, in Figure 12 Network Station A is running a 5250 session on the AS/400 server. If you want to print to Printer 4, you must create a printer device description on the AS/400 server. The AS/400 server will send the print job to Printer 4. To create a printing device description on your AS/400 system, see "The CRTDEVPRT command" on page 35.

Configuring Basic Printer Scenarios

Using Figure 12 as an example, Table 3 on page 33 explains the basic steps to configure printers for your Network Stations.
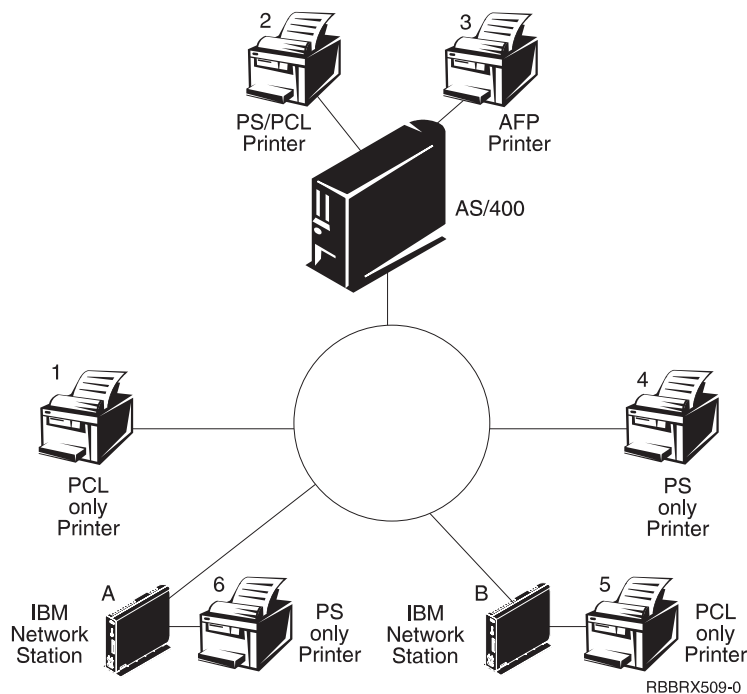

Figure 12. Possible Network Station Printing Scenarios

Identify the scenario that best meets your needs and follow the steps to configure your printers.

Table 3. Configuration Descriptions for Basic Printer Scenarios

Desired Print Scenario	Print Job Flow in Figure 12 on page 32	Configuration Instructions
Print from a Network Station to a LAN printer	Network Station A to Printer 4	1. In the Network Station Manager licensed program, configure an entry in the *Remote Printer Server* field for the LAN printer.
Print from a Network Station to a LAN printer with a different datastream	Network Station A to AS/400 server to Printer 1	1. On the server that will transform the print job, create a printer device description and queue. The printer device description must contain the IP address or host name of the LAN printer. For more information on configuring a printer device description, see "The CRTDEVPRT command" on page 35. 2. In the Network Station Manager licensed program, configure an entry in the *Remote Printer Server* field with the IP address or host name of the transform server and its queue name.
Print from a Network Station to a locally attached parallel printer	Network Station A to Printer 6	1. In the Network Station Manager licensed program, configure an entry in the *Local Parallel Printer* field.
Print from a Network Station to a locally attached printer with different datastream	Network Station B to AS/400 Server to Printer 5	1. On the server that will transform the print job, create a printer device description and queue. The printer device description must contain the IP address or host name of the Network Station to which the printer is attached. For more information on configuring a printer device description, see "The CRTDEVPRT command" on page 35. 2. In the Network Station Manager licensed program, configure an entry in the *Remote Printer Server* field with the IP address or host name of the transform server and its queue name.
Print from a Network Station to another Network Station with an attached parallel printer	Network Station B to Network Station A to Printer 6	1. In the Network Station Manager licensed program, configure an entry in the *Remote Printer Server* field with the IP address of the Network Station to which the printer is attached. In the *Queue name* field, type `PARALLEL1`.
Print from a Network Station to another Network Station with an attached printer and a different datastream	Network Station A to AS/400 server to Network Station B to Printer 5	1. On the server that will transform the print job, create a printer device description and queue. The printer device description must contain the IP address or host name of the Network Station to which the printer is attached. For more information on configuring a printer device description, see "The CRTDEVPRT command" on page 35. 2. In the Network Station Manager licensed program, configure an entry in the *Remote Printer Server* field with the IP address or host name of the transform server and its queue name.

Desired Print Scenario	Print Job Flow in Figure 12 on page 32	Configuration Instructions
Print from a Network Station to a server controlled printer	Network Station A to AS/400 server to Printer 2 or 3	1. In the Network Station Manager licensed program, configure an entry in the *Remote Printer Server* field with the host name or IP address of the server that controls the printer. In the *Queue name* field, enter the name of the queue that controls the printer. In this scenario, it does not matter if the datastreams do not match. If you used the CRTDEVPRT command (as specified in "The CRTDEVPRT command" on page 35), the server will automatically transform the job if necessary.

Printer Administration Techniques

Administrating a printer environment is a difficult task. You should create a printer network diagram. Based on your diagram and printing needs, you should develop a printing strategy. Under the right conditions, Network Stations can print to most types of printers.

- One technique to consider is to have a server control the printers for your Network Stations. In Figure 12 on page 32, the AS/400 server could control a LAN printer like Printer 4. If Network Stations A and B always sent their print jobs to the AS/400 server, the AS/400 server could control the flow of print jobs to the printer. This scenario would reduce the work load on the Network Stations when the printer's buffer is full because the AS/400 would negotiate print jobs with the printer. However, handling these print jobs may decrease the performance of the central processing unit (CPU) in the AS/400 server depending on the size and frequency of your print jobs. Your end users will notice that it takes longer for them to receive their printouts. Also, since you would send the print job from a Network Station to a server, then to a printer, this technique would adversely increase network traffic.

  To have a server control your Network Station printing is advantageous in an environment with mixed printer datastreams. Since Network Station Manager applications only generate certain datastreams, you may need to send print jobs to a server. At the server the print job can be transformed into a datastream that your printer understands. Depending on which application generates the job, you may or may not need to transform your print jobs. This may require more administration in the Network Station Manager licensed program and on the server. Also, your end users would need to have a better understanding of printing and networking. To eliminate confusion, you may consider sending all print jobs to the server regardless of the need for job transformation. In the end, you will have fewer printer entries in the Network Station Manager program and fewer printer device descriptions on the server.

- The other technique is to set up your printing strategy so that your Network Stations send their jobs directly to the printer. This strategy works whenever datastream transformation is unnecessary. You can reduce printing time since the print job goes directly to the printer. Your server will not bear the load of controlling print jobs, and you perform less administration. Also, when you send print jobs directly to the printer the chances are decreased that your server will misinterpret your print job . When a server misinterprets a print job, the job may become lost or damaged.

The CRTDEVPRT command

The CRTDEVPRT command creates a printer device description on your AS/400 server.

__ 1. From an AS/400 command line, type CRTDEVPRT, and specify the following parameters:

- Device description
- Device Class = *LAN
- Device Type = 3812
- Device Model= 1
- LAN attachment = *IP
- Activation Timer = 1-2550 seconds
- Inactivity Timer = 1-30 seconds, or *NOMAX
- Host Print Transform = *YES
- Image Configuration = Obtain a value from Table 4.
- Manufacturing/Type/Model = Press the F4 key and match value
- Remote Location = Name or IP address of the LAN attached printer(or server) or IP address of a Network Station with an attached printer
- Port Number = TCP/IP port number that is used by printer
  - 2501-IBM network printers
  - 6464-printer attached to a Network Station
  - 9100-most remaining network printers
- System Driver Program
  - *NETSTNDRV for printers attached to Network Station
  - *IBMPJLDRV for IBM network printers
  - *HPPJLDRV for HP PJL-compatible printers attached directly to the TCP/IP network

The AS/400 system automatically creates an output queue with the name of the device description. For more information about AS/400 printing, see the publication *Printer Device Programming*, SC41-5713.

__ 2. Activate the device.

- Type: WRKCFGSTS CFGTYPE(*DEV) CFGD(device description), and vary the device on.

__ 3. Start a printer writer.

- Type: STRPRTWTR DEV(device description)

Table 4. Common Printers and Their Image Configuration Values. For more values, see the publication *Printer Device Programming*, SC41-5713.

Image Configuration Value	Printer
Compaq Pagemarc 20	*IMGD01
Epson EPCL-4 Printer	*IMGA01
Epson EPCL-5 Printer	*IMGA02
Epson Stylus Photo with PostScript	*IMGB10
Epson Stylus Color 600, 800 with PostScript	*IMGB11
HP Color Laserjet 5	*IMGA04
HP Color Laserjet 5M	*IMGD04
HP Deskjet 560C, 820C, 1200C	*IMGA04

Table 4. Common Printers and Their Image Configuration Values (continued). For more values, see the publication *Printer Device Programming*, SC41-5713.

Image Configuration Value	Printer
HP Deskjet 500, 600, 1200	*IMGA01
HP Deskjet 1600C, 1600CN	*IMGA04
HP Deskjet 1600CM	*IMGD04
HP Laserjet II, IID, IIP	*IMGA09
HP Laserjet II, IID, IIP with PostScript	*IMGB01
HP Laserjet III, IIID, IIISi, 4L	*IMGA01
HP Laserjet III, IIID, IIISi, 4L with PostScript	*IMGD01
HP Laserjet 4, 4P, 4V, 4Si, 4 Plus	*IMGA02
HP Laserjet 4M, 4MP, 4MV, 4Si MX, 4M Plus	*IMGD02
HP Laserjet 5, 5P, 5Si	*IMGA02
HP Laserjet 5M, 5MP, 5Si MX	*IMGD02
HP Laserjet 6, 6P, 6L	*IMGA02
HP Laserjet 6M, 6MP	*IMGD02
IBM 3112, 3116 Page Printer with Intelligent Printer Data Stream (IPDS) feature	*IMGD02
IBM 3112, 3116 Page Printer (ASCII/LAN)	*IMGA02
IBM 3112, 3116 Page Printer with PostScript	*IMGD02
IBM 3130, 3160-1 AF Printer (240-pel mode)	*IMGC01
IBM 3130 AF Printer (300-pel mode)	*IMGC02
IBM 3825, 3827, 3828 AF Printer	*IMGC09
IBM 3825, 3827, 3828 AF Printer (with AFIG)	*IMGC01
IBM 3829 AF Printer	*IMGC01
IBM 3835-001 AF Printer	*IMGC10
IBM 3835-001 AF Printer (with AFIG)	*IMGC05
IBM 3835-002, 3900 AF Printer	*IMGC05
IBM 3912, 3916 Page Printer (ASCII/LAN)	*IMGA01
IBM 3912, 3916 Page Printer with IPDS feature (twinax)	*IMGC06
IBM 3930-03 Page Printer	*IMGA01
IBM 3930-03 Page Printer with PostScript	*IMGD01
IBM 3935 AF Printer	*IMGC02
IBM 4019 LaserPrinters (HP mode)	*IMGA09
IBM 4019 LaserPrinters with PostScript	*IMGB01
IBM 4028 LaserPrinters	*IMGC06
IBM 4029 LaserPrinters	*IMGA01
IBM 4029 LaserPrinters with PostScript	*IMGB02
IBM 4039 LaserPrinters	*IMGA01
IBM 4039 LaserPrinters with PostScript	*IMGD07
IBM 4049 LaserPrinters	*IMGA02
IBM 4049 LaserPrinters with PostScript	*IMGD02

Table 4. Common Printers and Their Image Configuration Values (continued). For more values, see the publication *Printer Device Programming*, SC41-5713.

Image Configuration Value	Printer
IBM 4079 Color Jetprinter PS	*IMGB09
IBM 4303 Network Color Printer	*IMGB05
IBM 4312, 4317, 4324 NP with IPDS feature (twinax)	*IMGC06
IBM 4312, 4317, 4324 NP with IPDS feature (LAN)	*IMGC06
IBM 4312, 4317, 4324 NP (ASCII/LAN)	*IMGA02
IBM 4312, 4317, 4324 NP with PostScript (ASCII/LAN)	*IMGD02
IBM InfoPrint 60	*IMGC03
IBM InfoPrint 62 Model 2	*IMGC05
IBM InfoPrint 62 Model 3	*IMGC06
IBM InfoColor 70	*IMGB05
IBM InfoPrint 4000	*IMGC05
IBM InfoPrint 4000 High Resolution	*IMGC06
Lexmark 4039Plus	*IMGB02
Lexmark Optra C Color Printer	*IMGD11
Lexmark Optra E, E+	*IMGA02
Lexmark Optra N	*IMGD02
Lexmark Optra R+, Rx+, Lx+, Lxn+	*IMGD02
Lexmark Optra S Printers	*IMGD02
Lexmark Optra SC Color Printer	*IMGD05
Okidata OL400 LED Page Printer	*IMGA01
Okidata OL800, OL810 LED Page Printers	*IMGA02
QMS 2025, 3225	*IMGB12
QMS Magicolor CX	*IMGD04
Tektronix Phaser 140	*IMGB09
Tektronix Phaser 400	*IMGB05
Tektronix Phaser 300	*IMGB04
Tektronix Phaser 540, 550	*IMGB05
Tektronix Phaser 560	*IMGB06
Xerox 4219/MRP	*IMGA01
Xerox 4220/MRP	*IMGA02
Xerox 4230 DocuPrinter	*IMGA02
Xerox 4512, 4517 Network Printer	*IMGA02
Xerox 4520mp Printer	*IMGB13
Xerox 4700 II Color Document Printer	*IMGD04
Xerox 4915 Color Laser Printer	*IMGB08
Xerox 4920, 4925 Color Laser Printer	*IMGB05

Optimizing your AS/400 server for Network Stations

By configuring some components of your TCP/IP, you can increase the network performance of your Network Stations. The numbers listed below are recommendations only. You may need to experiment with these values to optimize your system.

__ 1. Increase your line description's maximum frame size.

 • For a token-ring line, type: CHGLINTRN LIND(YY) MAXFRAME(ZZ)

 The value YY is the line description name, and ZZ is the maximum frame size (recommended minimum size of 4096 for token-ring lines and 1496 for Ethernet lines).

 • For an Ethernet line, type: CHGLINETH LIND(YY) and press the F4 key.

 Scroll down and change the maximum frame size values to best fit your system with a maximum value less than 1496.

__ 2. Enlarge the Send/Receive buffer sizes with the Change TCP/IP Attributes (CHGTCPA) command.

 Type: CHGTCPA TCPRCVBUF (64000) TCPSNDBUF (64000).

__ 3. Change TFTP Attributes

 __ a. Type: CHGTFTPA and press F4. The *Change TFTP Attributes* screen appears.

```
                    Change TFTP Attributes (CHGTFTPA)

  Type choices, press Enter.

  Autostart server . . . . . . . .    *NO          *YES, *NO, *SAME
  Enable subnet broadcast  . . . .    *YES         *YES, *NO, *SAME
  Number of server jobs:
    Minimum  . . . . . . . . . . >  X              1-20, *SAME, *DFT
    Maximum  . . . . . . . . . . >  Y              1-250, *SAME, *DFT
  Server inactivity timer  . . . .    30           1-1440, *SAME, *DFT
  ASCII single byte CCSID:
    Coded character set identifier  00819          1-65532, *SAME, *DFT
  Maximum block size . . . . . . .    YY           512-65464, *SAME, *DFT
  Connection response timeout  . .    60           1-600, *SAME, *DFT
  Allow file writes  . . . . . . .    *NONE        *DFT, *NONE, *CREATE...
  Alternate source directory . . .    '*NONE'



                                                                    More...
  F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
  F24=More keys
```

 __ b. Increase the number of TFTP jobs that are started on the host.

 The value X is the minimum number, and Y is the maximum number of server jobs. Determine the appropriate values for your AS/400 server and network environment.

 __ c. Set TFTP Maximum block size the same as the line description's maximum frame size.

 The value YY is the same as value ZZ entered on step 1.

HTTP directives

When you used the IBM Network Station Setup Wizard to configure your Network Station environment, it used a table similar to Table 5 on page 39 to configure your HTTP directives.

You may see garbled characters if you are using a web browser to access your HTTP server. If so, use this section to verify that your HTTP directives are correct.

Table 5. Primary Languages and Their DefaultFsCcsid and DefaultNetCcsid Values

Language	Primary Language Value	DefaultFsCcsid Value	DefaultNetCcsid Value
Brazilian Portuguese	2980	37	819
Canadian French	2981	500	819
Danish	2926	277	819
Dutch Netherlands	2923	37	819
English Uppercase	2950	37	819
English Uppercase and Lowercase	2924	37	819
English Uppercase double-byte character set (DBCS)	2938	37	819
English Uppercase and Lowercase DBCS	2984	37	819
Finnish	2925	278	819
French	2928	297	819
French MNCS	2940	500	819
German	2929	273	819
German MNCS	2939	500	819
Italian	2932	280	819
Italian MNCS	2942	500	819
Norwegian	2933	277	819
Portuguese	2922	37	819
Portuguese MNCS	2996	500	819
Spanish	2931	284	819
Swedish	2937	278	819

- To view and change your HTTP directives on a V4R1 or later system, see "HTTP directives for V4R1 and later systems".

HTTP directives for V4R1 and later systems

__ 1. At an AS/400 command line, type WRKHTTPCFG.

__ 2. After the **Work with HTTP Configuration** screen appears, scroll down to the entries that were added by the IBM Network Station Setup Wizard. The following screen is an example of HTTP directives for a Swedish V4R1 or later system.

```
02120    Map   /networkstationv2/admin /QYTCV2/QYTCMAIN.PGM
02150    Exec  /QYTCV2/* /QSYS.LIB/QYTCV2.LIB/*
02160    DefaultNetCcsid 00819
02170    DefaultFsCcsid 00278
```

__ 3. Verify that the DefaultNetCcsid and DefaultFsCcsid values match the values in Table 5 for your language. If the values do not match or do not exist, add the statements with the correct values.

__ 4. Verify that the following statements are also in your HTTP directives.

```
Map   /networkstationv2/admin /QYTCV2/QYTCMAIN.PGM
Pass  /networkstationv2/* /QIBM/ProdData/HTTP/Protect/NetworkStationV2/*
Pass  /flashconfigs/* /QIBM/UserData/NetworkStationV2/flash/ImageConfigs/*
```

If the statements are not in your directives, you must add them.

__ 5. At an AS/400 command line, type WRKHTTPCFG *ADMIN. Verify that the following statements are in the directives for your HTTP ADMIN server.

```
Map   /networkstationv2/admin /QYTCV2/QYTCMAIN.PGM
Pass  /networkstationv2/* /QIBM/ProdData/HTTP/Protect/NetworkStationV2/*
```

If the statements are not in your directives, you must add them.

__ 6. At an AS/400 command line, type ENDTCPSVR *HTTP to end the HTTP server. Then restart the HTTP server with STRTCPSVR *HTTP.

Trivial File Transfer Protocol (TFTP) subnet broadcast

When multiple Network Stations start up at the same time, they can create heavy network usage, sometimes called boot storms. TFTP subnet broadcast (or broadcast boot) is a solution to balancing your network traffic during these boot storms.

These boot storms occur because the AS/400 server is trying to deliver an individual boot file to each Network Station. The server holds the boot file download and distributes it only once to all Network Stations when:

- The TFTP subnet broadcast option is enabled, and
- Multiple Network Stations request their boot files.

You must enable the TFTP subnet broadcast option on both the AS/400 server and the Network Stations. By default, the TFTP subnet broadcast option is enabled. To verify this value type, CHGTFTPA at an AS/400 command line. The Enable Subnet Broadcast value must be *YES.

Attention

Before you use TFTP subnet broadcast, you must verify or apply product temporary fixes (PTFs).

Visit our IBM Network Station site at the following URL for the latest V2R1 information: http://www.ibm.com/nc.

1. In the left frame, click on **Support**.
2. In the **Search** field, enter 'PTF' to show a list of required PTFs.

   You should review this list to see the latest information and required PTFs for **every** AS/400 server in your network. The application of these PTFs prevents unpredictable results including possible data loss.

To enable the TFTP subnet broadcast (broadcast boot) option on the clients, use the IBM Network Station Manager program. See the online help information for assistance.

For more information about TFTP subnet broadcast, see the *TCP/IP Configuration and Reference* manual, SC41-5420.

Load balancing is another way to avoid boot storms. For more information on load balancing, see *IBM Network Station Advanced Information* at http://www.ibm.com/nc/pubs.

Chapter 4. Migrating from V1R3 to V2R1

About this chapter

This chapter provides instructions for migrating your preference files and your existing Network Stations to V2R1.

These instructions are for migrating to V2R1:
- Your software release (migration utility), and
- Your existing hardware (client migration) if desired.

If you did not use the V1R3 migration utility and you manually changed configuration files in the past, refer to the *IBM Network Station Manager Advanced Information* publication. This book has more information for migration of these user-edited configuration files.

You should read this entire chapter before you take any steps to migrate your files. Preference file migration and client migration are complex processes. Do not try to migrate your preference files without reading the sections below.

Migrating to the V2R1 environment

Migration will be initiated from an AS/400 command line. This migration utility will enable the administrator to have their IBM Network Station Manager V1R3 configurations and users copied into the V2R1 environment. The V1R3 operating environment remains unchanged. In addition to migrating configurations, the utility directs the administrator to change his DHCP, BOOTP, or NVRAM configurations so that the Network Station starts with the V2R1 software. The administrator can perform this migration on a box-by-box basis or by vendor class depending on the original Network Station configuration.

Both V2R1 and V1R3 can coexist and operate on the same server. When you install V2R1 on a system that already has V1R3 installed on it, the V1R3 environment is preserved. The ability for two software versions to coexist on the server allows support for all Network Station hardware models. You can migrate configuration information and user data from V1R3 to V2R1 with this migration utility. After you migrate the configuration information and user data, you can uninstall (delete) the V1R3 environment. Note that coexistence is not a requirement; either version can stand alone on a server.

Because the V2R1 product can co-exist with the previous V1R3 product, removal of the V1R3 product prior to installation of V2R1 is NOT required. If you use Series 100 or Series 300 Twinax models in your network, you need to continue to support them with the V1R3 product. If these models are not present, you may choose to remove the V1R3 product from the server. Or you can choose to isolate each version to a separate server in the network. In any case, V1R3 is NOT a prerequisite for V2R1.

Migration considerations

You may need to consider the following items as you plan your migration:

- Before you can migrate from V1R3 to V2R1, you must install the latest PTFs on V1R3. Please check Informational APAR II11759 for the latest list of OS/400 PTFs at http://www.as400.ibm.com/clientaccess/ under the "Information APARs" link.
- If you have both the V1R3 and V2R1 environments on your server, then:
  - You have two IBM Network Station Manager program interfaces. Each interface has its own URL.
  - You have two directory structures. You may need to reconfigure DHCP, BOOTP, or NVRAM to point to the new environment. See "Client migration" on page 47.
  - You have two sets of configuration files. You may need to configure users in both the V1R3 and V2R1 environments.
  - The V2R1 Network Station login daemon supports both V2R1 and V1R3 environments.
  - You should refer to V1R3 documentation for information about V1R3 and V2R1 documentation for information about V2R1.
  - Migration is one way (V1R3 to V2R1). Subsequent changes to the V2R1 environment cannot be migrated back to V1R3.
  - After you run the migration utility, you can migrate V1R3 changes to V2R1 if you re-run the utility. However, be aware that this may overlay any changes that are made to V2R1 since the first migration.

    Note: If you configure a V2R1 preference in V1R3, an overlay will occur. However, if the V2R1 preference does not exist in the V1R3 configuration, it will most likely remain in the V2R1 files after migration.
- You can only run the migration utility on the server.
- Languages and keyboards that were available in V1R3 may not be available in V2R1.
- The text on buttons that were configured in V1R3 in a language that is not supported in V2R1 may contain gibberish. If you detect this, you need to make the changes manually.

Migration utility

The migration utility has the following requirements and features:

- Only persons with security officer authority can run this utility.
- While it is not necessary to have V1R3 installed, the utility will check to see if the default userbase path is a valid V1R3 userbase structure.
- Migration from V1R3 to V2R1 is one way. Changes to configuration information or user data in the V2R1 environment are not reflected in the V1R3 environment. When you run the migration utility, changes to configuration information or user data in the V1R3 environment can be reflected in the V2R1 environment .
- You can run the migration utility multiple times. Each time the migration utility runs, it writes over any existing V2R1 configuration information and user data.
- You may run migration repeated times even against the same users, groups, or Network Stations.

- The migration utility does not include an option to delete the V1R3 environment. You must manually remove V1R3 and remove any left over configuration files, if so desired.

  Note: After you delete the V1R3 environment, you cannot run the migration utility.
- Everything in your home directory in V1R3 is migrated over to V2R1.

Running the migration utility

For the latest V2R1 information go to http://www.pc.ibm.com/support/.
- In the left frame, click on **Support**.
- In the **Search** field, enter 'PTF' to show the required product temporary fixes (PTFs). You should review this list to see the latest information and required PTFs for 5648-C07. The application of these PTFs prevents unpredictable results including possible data loss.

To run the migration utility from a command line, type:

```
call pgm(qytcv2/qytcmumu) parm('<flag A>' <objectA1> <...> <object An>
  '<flag B>' <objectB1> <...> <object bn>)
```

Note: All flags must have apostrophes around them.

Where <flag A> can be the -U, -G, -T flag. And <flag B> would be the next flag.

Breakdown of flags:

Note: The flags are not case sensitive.

Flag	Description and Format
-A	This flag is an *ALL option for the administrator to migrate everything (all users, all groups, all terminals, and system preferences). Also, no other flag should be entered.
-S	This flag is specified to migrate the system configurations of V1R3 to V2R1. No objects are after this flag.
-U	This flag is used to migrate either particular users or all users. To migrate a specific user, the username would be entered after the -U flag. You must specify *ALL to get migration of all users.
-G	This flag is used to migrate either particular groups or all groups. To migrate a specific group, the groupname would be entered after the -G flag. You must specify *ALL to get migration of all users.
-T	This flag is used to migrate either particular Network Stations or all Network Stations. The Network Station name would be entered after the -T flag. To migrate a specific Network Station, the Network Station name would be entered after the -T flag. The parameters to this flag should only contain the name of the Network Station preference file (for example: ex.term1). For instance, if the preference file is named after a MAC address, then you should place this MAC address on the command line. The name of a Network Station preference file can be a host name, an IP address or a message authentication code (MAC) address. You must specify *ALL to get migration of all Network Stations.
-C	This flag is used to migrate systems with the Power PC version. This only allows client migration to proceed. No objects are after this flag.

-P	This flag is not recommended unless running S/390 migration. Please refer to S/390 documentation for more information. It is used to is allow a path other than the default path (/QIBM/UserData/NetworkStation). This path needs to point to the NetworkStation directory. This flag was created to allow migration from an S/390 to an AS/400. So, if you are migrating from an S/390, you must provide the mount point to the S/390 on the path flag. Single quotes are required around the path. Please refer to the Series 390 migration documentation for more information.

Example 1: `call pgm(qytcv2/qytcmumu)`
`parm('-U' eddie john '-G' AdminGroup '-T' termname '-S' '-C')` — where the utility will migrate

- users — eddie and john
- groups — AdminGroup
- terminals — termname
- system preferences,
- enable client migration (-C) and

Example 2: `call pgm(qytcv2/qytcmumu) parm('-U'`
`*all '-G' AdminGroup)` — where the utility will migrate ALL Network Station Manager users, user

Note: The -G flag, along will all other flags, should have apostrophes around it.

Example 3: `call pgm(qytcv2/qytcmumu) parm('-A'`
`'-C')` This migrates all V1R3 preferences.

Migrating specific files manually

You must manually migrate certain user files, if desired.

The V1R3 *bookmarks.html* and *address-book.html* files in your NAV directory will be renamed to *v1r3_bm.htm* and *v1r3_ab.htm*. They will reside in the new V2R1 browser directory (`QIBM/UserData/NetworkStationV2/home/<user>/.netscape`). This is due to the two default files already in place in the browser directory. If you want to use your V1R3 *bookmarks.html* file information, import the information from the browser as follows:

1. From the Netscape Communicator browser on a Network Station, click on **Bookmarks**.
2. From the drop-down menu, choose **Edit Bookmarks**.
3. Choose **File**=>**Import**.
4. Select **v1r3_bm.htm** file at `QIBM/UserData/NetworkStationV2/home/<user>/.netscape` and click **OK**.

If you want to use your V1R3 address-book.html file information, import the information from the browser as follows:

1. From the NC Navigator browser on a Network Station, click on **Communicator**.
2. From the drop-down menu, choose **Address Book**.
3. Choose **File**=>**Import**.
4. Select **v1r3_ab.htm** file at `QIBM/UserData/NetworkStationV2/home/<user>/.netscape` and click **OK**.

Migrating Netscape mail.

1. Open a Netscape Communicator browser.

2. Select **Communicator** => **Messenger**.

3. Click on **Migrated Folders** (these folders will contain ″??″ under column ′unread′).

4. Following is a list of conditions for this to work:

   - You must install V2R1 on the same system that contained V1R3

   - Only the series 300 and 1000 NVRAM Network Stations will get migrated to V2R1

   - This migration is all or nothing. If you would like to move certain Network Stations back to V1R3, this you must do this manually. See page 47.

   - You can do this migration only one time. You will not be able to run client migration again.

Client migration

Client migration (which is for the hardware) is handled separately from software migration (user preferences, configuration files). You will utilize client migration where Network Station models that had been supported by the V1R3 product are now also supported by the V2R1 product. Boot parameters such as path names and protocols can and will be different in V2R1. Changes to the client configuration are dependent on whether a specific Network Station is going to run in the V1R3 or V2R1 environment. To see which release of IBM Network Station Manager is required for your hardware, refer to Table 1 on page 10.

When you upgrade to V2R1, you need to migrate the following values:
- The file path
- The name of the boot code
- The boot file service

> **Note:** Trivial file transfer protocol (tftp) is not available in V2R1. Therefore you should replace tftp with rfs. For V2R1, tftp is only available as the boot protocol for the kernel.

In the IBM Network Station Setup Wizard you had the option to migrate the BOOTP configuration to DHCP. To migrate all the clients in the BOOTP table, you must migrate all or nothing. Once the migration utility has run, you must manually update the non-V2R1 entries in the BOOTP table as follows:

Note: If you have a number of entries to make, it may be handy to have a pad and pencil for reference.

1. Start a separate AS/400 *Operations Navigator* session.

2. In the left frame, expand your AS/400 server directory.

3. Open **Network**, **Servers** then **TCP/IP**.

4. In the right frame, right-click on **DHCP** and choose **Configuration**. The **DHCP Server Configuration** dialog box appears.

5. In the left frame, locate each Network Station class to migrate to the correct boot path.

6. Highlight each class individually. In the lower right frame, double-click the option 67 tag. The **Class Properties** dialog box appears.

7. Click on the **Options** tab and in the right frame, click on option 67. You will see the File name (boot path) in the lower box.

8. Enter the correct path name from the table below for each Network Station:

Class	Boot Path
IBM 8363-EXX	/QIBM/ProdData/NetworkStationV2/x86/kernel.2200 (for IBM Network Station Ethernet)
IBM 8363-TXX	/QIBM/ProdData/NetworkStationV2/x86/kernel.2200 (for IBM Network Station Token-Ring)
IBM 8364-EXX	/QIBM/ProdData/NetworkStationV2/x86/kernel.2800 (for IBM Network Station Ethernet)
IBM 8364-TXX	/QIBM/ProdData/NetworkStationV2/x86/kernel.2800 (for IBM Network Station Token-Ring)
IBMNSM 1.1.0	/QIBM/ProdData/NetworkStationV2/ppc/kernel.300 (for Series 300 Token-Ring)
IBMNSM 2.1.0	/QIBM/ProdData/NetworkStationV2/ppc/kernel.300 (for Series 300 Ethernet)
IBMNSM A.2.0	/QIBM/ProdData/NetworkStationV2/ppc/kernel.1000 (for Series 1000 Ethernet
IBMNSM A.5.0	/QIBM/ProdData/NetworkStationV2/ppc/kernel.1000 (for Series 1000 Token-Ring)

9. Click **OK**.

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