NetVista Thin Client

IBM

Installing IBM Network Station Manager V2R1 on Windows NT
September 2000

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> **Note**
>
> Before using this information and the product it supports, be sure to read the information in "Notices" on page 57.

Contents

About Installing IBM Network Station Manager V2R1 on Windows NT® (SC41-0688)

Installing IBM Network Station Manager V2R1 on Windows NT (SC41-0688) provides planning, installation, configuration, and migration information for the IBM Network Station Manager Version 2 Release 1 licensed program (5648-C07), hereafter referred to in this publication as **IBM Network Station Manager**, on a Windows NT server.

IBM Network Station Manager V2R1 is also known as **IBM NetVista™ Thin Client Manager V2R1**. This software enables a systems administrator to manage and administer Network Stations and NetVista thin clients. For the purposes of consistency, this publication uses the term **thin clients** to refer to both Network Stations and NetVista thin clients.

Who should read this book

The person or group who installs and administers IBM Network Station Manager on a Windows NT server should read this publication.

Information on the Internet

- You can find additional information about your thin client at the following URL:

  http://www.ibm.com/pc/support

  1. Click **NetVista**.
  2. Click **NetVista thin client**.
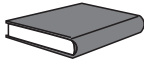
- You can obtain the latest version of this information at the following URL:

  http://www.ibm.com/nc/pubs
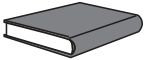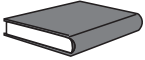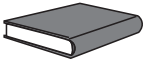
  This is the same URL that is printed on the cover of this document.

Related information

The following information is available for IBM Network Station Manager:

	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.

V

	Information name	Information description
	Installing IBM Network Station Manager on Windows NT, SC41-0688	Describes the installation and simple configuration of a Windows NT thin client 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 on Windows® 2000, SA23-2811	Describes the installation and simple configuration of a Windows 2000 thin client environment. 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

Your feedback is important in helping to provide the most accurate and high-quality information. If you have any comments about this book or any other documentation, fill out the readers' comment form at the back of this book.

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- If you prefer to send comments by FAX, use either of the following numbers:
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  - Other countries: 1-507-253-5192
- If you prefer to send comments electronically, use this network ID:
  - IBMMAIL, to IBMMAIL(USIB56RZ)
  - RCHCLERK@us.ibm.com

Be sure to include the following:
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- The publication number of the book.
- The page number or topic to which your comment applies.

Understanding the thin client

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 Network Station Manager. Network Station Manager allows you to set and change configurations for IBM thin clients (also referred to as Network Stations or NetVista thin clients) and thin client 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 thin client does not contain a hard drive, the Network Station accesses a server to download the client operating system, client programs, and data. After the thin client loads the client operating system, the thin client displays a graphical user interface (GUI). The GUI can provide the user access to the following 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 thin client communicates using Transmission Control Protocol/Internet Protocol (TCP/IP) over a token-ring connection or Ethernet connection to a server. Each thin client runs the client operating system and communicates to a server that runs Network Station Manager and other application programs.

Figure 1 on page 2 shows what happens when you power on a thin client.
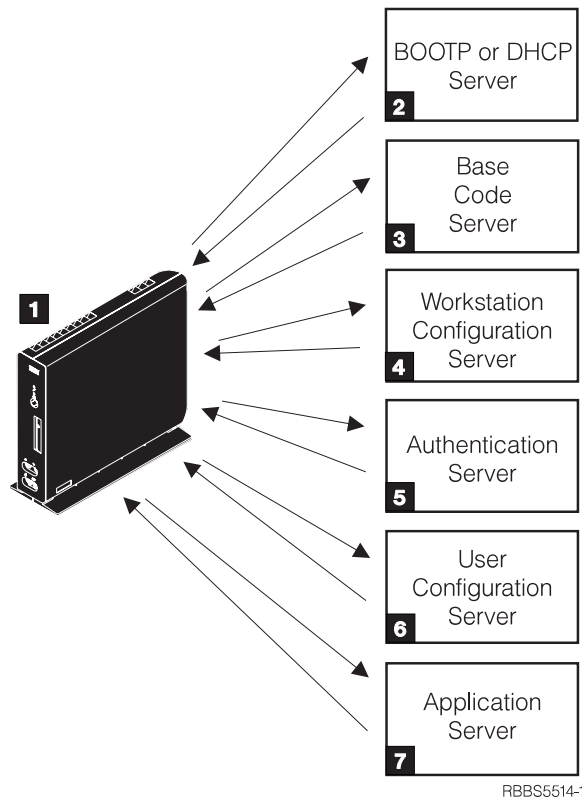
Figure 1. Thin client power-on sequence

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

2 The thin client contacts a DHCP boot server. The thin client 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 thin client may alternatively retrieve this information from values that are stored in its NVRAM.

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

4 The thin client downloads the workstation-based configuration information from the workstation configuration server.

5 The thin client 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 thin client 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 thin client 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 thin client. 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 thin client 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 thin client. For example, you can view the MAC address or you can set the monitor resolution of the thin client. See *Using IBM Network Station Manager* for more information about the Setup Utility and NS Boot Utility.

TCP/IP overview

In order for the thin client to communicate with your servers, you need a TCP/IP network. If you understand your TCP/IP network, installing and configuring your thin client and Network Station Manager 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 configure and install 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   192.168.1.2   192.168.1.3
Station

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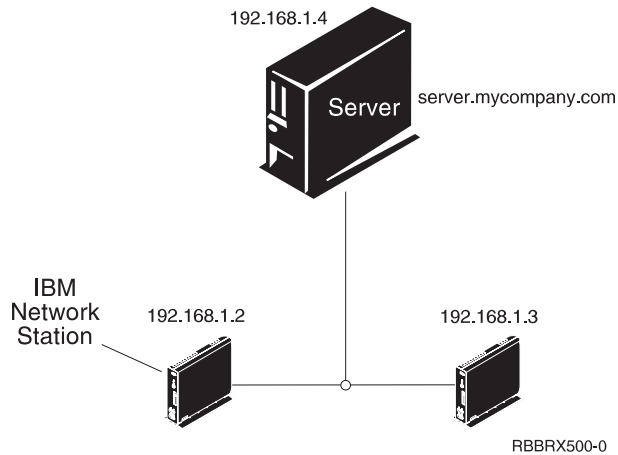
Figure 2. Two Network Stations connected to the server over a simple LAN

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   192.168.1.2   192.168.1.3
Station

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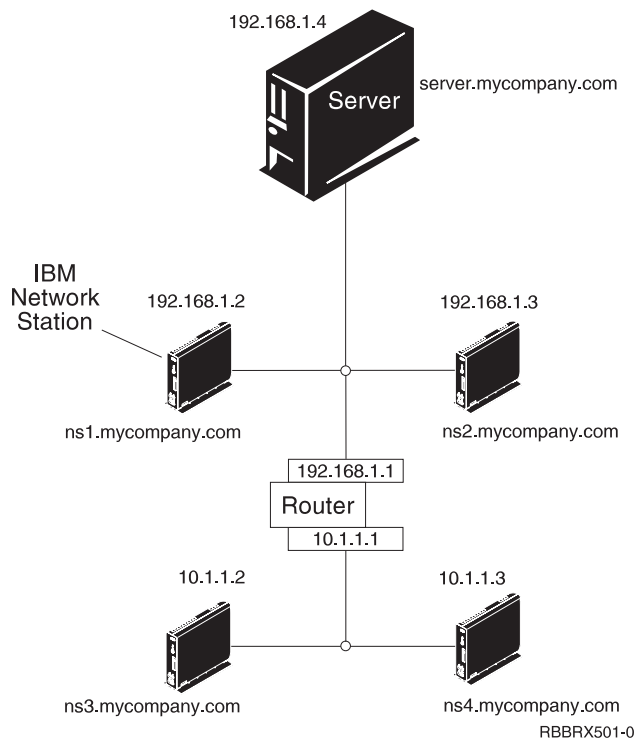
*Figure 3. Two Network Stations connected to the server over a local LAN and two Network
Stations connected to the server through a router over a remote LAN*

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 (DNS) 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
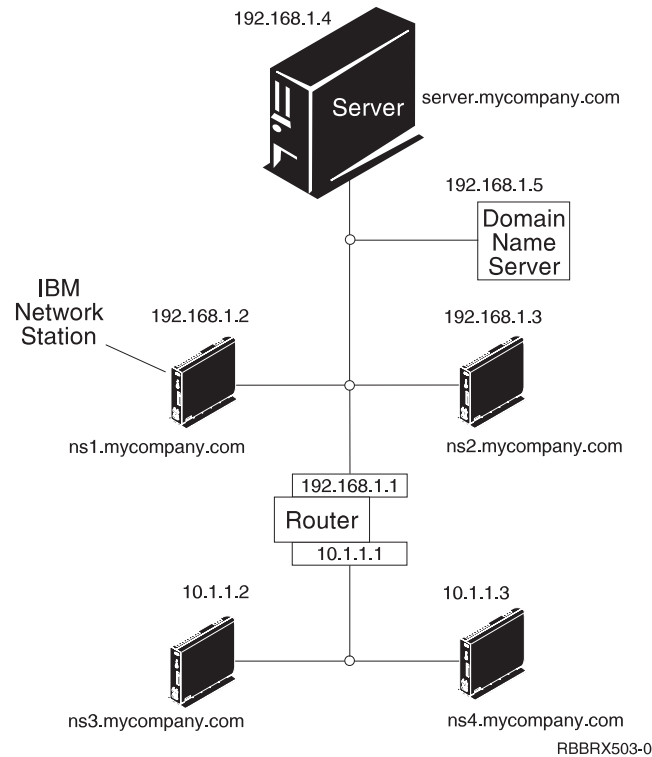
Figure 4. Four Network Stations connected to a network using a router and a domain name server

MAC addresses

Every thin client 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 thin client are assigned by manufacturing and hard-coded into the machine. The MAC address of a thin client 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 thin client on the same network might have the address 192.168.1.145.

Each thin client 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 thin client. 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
http://rs.internic.net
```

Boot methods

Since a thin client 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 thin client needs to find an IP address for itself. The IP address allows the thin client to communicate with other hosts. The thin client can use one of the following methods to request and receive this information:

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

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

- Use a system that has the necessary configuration support to receive limited 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 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 thin client 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 thin client in the DHCP server configuration along with an IP address, which is reserved for the thin client with this MAC address. A thin client, 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 thin client 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 thin client 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.

DHCP 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.

NVRAM

Non-Volatile Random-Access Memory (NVRAM) refers to local thin client memory. When you use the NVRAM boot method, you code the IP addresses of the thin client and its server into the memory of the individual thin client. The thin client 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 DHCP broadcast requests. 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 DHCP configurations.

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

- You must enter setup data into each thin client manually.
- DHCP 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 thin client uses either TFTP or NFS 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. The network file system (NFS) makes files and directories available to clients. NFS is generally more reliable than TFTP.

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 thin client allows the user to access applications without using permanent disk space either on the thin client 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 thin client

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 thin client 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 thin client by using the X11 protocol.
- Citrix MetaFrame is a multi-user Windows application product that is supported by Microsoft Windows NT Server 4.0, Terminal Server Edition, and Microsoft Windows 2000 Servers. Citrix MetaFrame communicates to the thin client 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
- Windows 2000 Servers - http://www.microsoft.com

Thin client memory requirements

Thin clients download each of their applications into memory. If you plan to run multiple applications on your thin clients, verify that each thin client has adequate memory to handle the projected applications. Subsequent releases of applications may have increased memory requirements.

Follow these steps to verify that your thin clients have enough memory to run their applications:

__ 1. Open your browser, and access the following URL:

```
http://www.pc.ibm.com/support
```

__ 2. Click **NetVista**, and then click **NetVista thin client**.

__ 3. In the **Search** box, type **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

IBM Network Station Manager Version 2 Release 1 (V2R1) 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 environments

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 boot locally 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 thin client 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 thin client hardware types, models, and series

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

Windows NT, AS/400, and RS/6000 server environments can support V2R1 coexistence with V1R3. You can install V2R1 on a system[1] that runs V1R3. The V2R1 installation does not affect the V1R3 environment. Both V2R1 and V1R3 can coexist and operate on the same server. The ability to have V2R1 and V1R3 coexist on the same server allows support for all thin client hardware models.

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1. Coexistence does not apply to Windows 2000 thin client environments. V1R3 is not supported on Windows 2000 servers.

Installing IBM Network Station Manager on Windows NT

About this section

This section provides information on planning and running a **typical installation** of IBM Network Station Manager V2R1 on a Windows NT server.

Planning the installation

Plan the installation of IBM Network Station Manager by identifying an applicable upgrade path from the following table. To minimize errors and reduce installation time, you can follow the upgrade paths that are recommended by IBM. An asterisk (*) marks a recommended upgrade path.

Current server environment	Upgrade goals	Upgrade paths
* **Fresh installation**		
A single, newly installed Windows NT server	Install IBM Network Station Manager for the first time on the same Windows NT server	1. Read important release information. See "Important information" on page 12. 2. Ensure that your Windows NT server meets the server requirements. See "Server requirements" on page 13. 3. Verify that your Windows NT server runs the prerequisite software. See "Prerequisite software" on page 14. 4. Install IBM Network Station Manager V2R1. See "Running the installation" on page 15.
Single-server: operating system upgrade		
A single Windows NT server with IBM Network Station Manager V2R1 installed	• Upgrade your Windows NT server operating system to Windows 2000 Server • Maintain IBM Network Station Manager V2R1 on the same server after the operating system upgrade	1. Refer to the *Installing IBM Network Station Manager V2R1 on Windows 2000* online publication. 2. Refer to Microsoft documentation for Windows 2000 upgrade information.
* **Dual-server: operating system upgrade**		

Current server environment	Upgrade goals	Upgrade paths
• A single Windows NT server with IBM Network Station Manager V2R1 • A single Windows 2000 server on which you plan to maintain IBM Network Station Manager V2R1	• Move IBM Network Station Manager V2R1 from the Windows NT server to the Windows 2000 server	1. Refer to the *Installing IBM Network Station Manager V2R1 on Windows 2000* online publication. 2. Refer to Microsoft documentation for Windows 2000 upgrade information.
Single-server: operating system upgrade and IBM Network Station Manager migration		
A single Windows NT server with IBM Network Station Manager V1R3 **Attention:** If you have thin clients that you need to support with V1R3, ensure that you maintain V1R3 on a Windows NT server.	• Upgrade your Windows NT server operating system to Windows 2000 Server • Upgrade IBM Network Station Manager from V1R3 to V2R1 on the same server after the operating system upgrade	1. Refer to the *Installing IBM Network Station Manager V2R1 on Windows 2000* online publication. 2. Refer to Microsoft documentation for Windows 2000 upgrade information.
* **Dual-server: operating system upgrade and IBM Network Station Manager migration**		
• A single Windows NT server with IBM Network Station Manager V1R3 • A single Windows 2000 server on which you plan to install IBM Network Station Manager V2R1 **Attention:** If you have thin clients that you need to support with V1R3, ensure that you maintain V1R3 on a Windows NT server.	• Install IBM Network Station Manager on the Windows 2000 server • Migrate V1R3 preference files on the Windows NT server to V2R1 on the Windows 2000 server	1. Refer to the *Installing IBM Network Station Manager V2R1 on Windows 2000* online publication. 2. Refer to Microsoft documentation for Windows 2000 upgrade information.

Important information

1. If you are migrating from IBM Network Station Manager V1R3, read the information in "Migrating to your new IBM Network Station Manager release" on page 47 before you start the IBM Network Station Manager V2R1 installation.
2. If you plan to separate various IBM Network Station Manager V2R1 functions across your servers, refer to the *IBM Network Station Advanced Information* online publication.
3. Read the readme.txt file on the IBM Network Station Manager installation CD for important product release information.

Server requirements

Verify that your Windows NT server meets these system requirements.

Table 2. Server Requirements

Server requirement	How to check for the requirement
Your Intel-based server must run any of the following operating system software: • Windows NT Server 4.0 with Service Pack 4 (or higher) for Windows NT Server 4.0 • Windows NT Server 4.0, Terminal Server Edition with Service Pack 4 (or higher) for Windows NT Server 4.0, Terminal Server Edition	To check for the operating system version: 1. From your Windows NT server desktop, click **Start**->**Settings**->**Control Panel**->**System**. 2. Click the **General** tab. 3. Verify that the correct Windows NT Server software is installed. To check for the Service Pack version: 1. From your Windows NT server desktop, click **Start**->**Programs**->**Administrative Tools**->**Windows NT Diagnostics**. 2. Click the **Version** tab. 3. Verify that the correct Service Pack is installed.
Your server must be configured as one of the following: • Stand-alone server • Domain member (member server of a domain) • Domain controller IBM recommends the installation and configuration of a thin client environment on a **stand-alone server** or a **domain member server**.	__ 1. From your Windows NT server desktop, click **Start**->**Settings**->**Control Panel**->**Network**. __ 2. Click the **Identification** tab. __ 3. Verify that your server is a member of either a domain or a workgroup.
Your server must have at least **500 MB** of free hard disk space to accommodate IBM Network Station Manager and other required software. If you are installing IBM Network Station Manager from the Internet, you need an extra **250 MB** of free disk space. This extra disk space is for downloading the software and expanding the executable files on your hard drive.	__ 1. From your Windows NT server desktop, double-click on the **My Computer** icon. __ 2. Right-click on the drive where you plan to install IBM Network Station Manager. __ 3. Select **Properties**, and click the **General** tab. __ 4. Verify that you have enough free hard disk space to accommodate the IBM Network Station Manager software.
The file system of your server must be **NTFS**.	__ 1. From your Windows NT server desktop, double-click on the **My Computer** icon. __ 2. Right-click on the drive where you plan to install IBM Network Station Manager. __ 3. Select **Properties**, and click the **General** tab. __ 4. Verify that your file system is NTFS.

Table 2. Server Requirements (continued)

Server requirement	How to check for the requirement
Your server must have correct regional settings.	__ 1. From your Windows NT server desktop, click **Start**->**Settings**->**Control Panel**->**Regional Settings**. __ 2. Click the **Regional Settings** tab. __ 3. Check to see if your locale is highlighted. __ 4. Check **Set as system default locale**. __ 5. Click **Apply**, and then click **OK**.

Prerequisite software

Verify that your Windows NT server runs the following prerequisite software:

- Any of the following web browsers:
  - Netscape Communicator 4.5 or higher
  - Microsoft Internet Explorer 5.0 or higher
- Any of the following web servers:
  - Lotus Domino Go 4.6.2.2 or higher
  - Microsoft Internet Information Server 5.0 (IIS) or higher
- Any of the following DHCP[2] services:
  - IBM DHCP
  - Microsoft DHCP

Notes:

1. If you plan to upgrade your operating system to Windows 2000, you must install and use IIS and Microsoft DHCP. The Windows 2000 thin client environment does not support Lotus Domino Go Webserver and IBM DHCP. Refer to the *Installing IBM Network Station Manager V2R1 on Windows 2000* online publication for more information on prerequisite software for installing IBM Network Station Manager on Windows 2000.

2. Microsoft does not support Microsoft Internet Information Server on Windows NT Server 4.0, Terminal Server Edition.

3. You can use the IBM Network Station Manager installation CD to install Netscape Communicator on your server.

4. You need the Windows NT Server installation CD to install these prerequisites. Refer to Microsoft documentation for more information on installation and configuration.
   - Microsoft Internet Explorer 5.0
   - Microsoft Internet Information Server 5.0
   - Microsoft DHCP

Installing Microsoft DHCP

Follow these steps to install Microsoft DHCP:

__ 1. Insert the Windows NT installation CD into your CD-ROM drive.

__ 2. From your Windows NT server desktop, select **Start**->**Settings**->**Control Panel**->**Network**->**Services**.

__ 3. Select the **Services** tab, and click **Add**.

---

2. Microsoft DHCP is not required if you plan to only use NVRAM to manage the network IP information for your thin clients.

    __ 4. Select **Microsoft DHCP Server**, and click **OK**.

    __ 5. Follow the installation prompts.

> **Note:** You may need to reinstall the correct Windows NT Service Pack after you install Microsoft DHCP. Refer to Microsoft documentation for more information.

Installing IBM DHCP

You can choose to install IBM DHCP automatically during the IBM Network Station Manager installation.

To manually install the NDIS intermediate driver, follow these steps:

__ 1. Install the NDIS intermediate driver.

    __ a. Insert the installation CD into your CD-ROM drive.

    __ b. Wait for the autorun dialog box to appear. Exit from this window.

    __ c. From your Windows NT server desktop, click **Start**->**Settings**->**Control Panel**->**Network**.

    __ d. Select the **Protocols** tab, and click **Add**.

    __ e. Click **Have Disk**.

    __ f. Enter the directory path, **[CD-ROM drive]:\ntnsm\en\products\enod\ndis**, and click **OK**.

    __ g. Highlight **IBM Intermediate Support Driver**, and click **OK**.

    __ h. Close the Network window.

    __ i. Click **Yes** to restart your computer.

__ 2. Install IBM DHCP[3].

    __ a. Insert the IBM Network Station Manager CD into your CD-ROM drive.

    __ b. Wait for the autorun dialog box to appear. Exit from this window.

    __ c. Run the command, **[CD-ROM drive]:\ntnsm\en\products\eNOD\tcpip\setup.exe**, from the Windows NT Run command box.

    __ d. Click **Next** on the Welcome screen.

    __ e. Select **TCP/IP Services** and click **Change**.

    __ f. Select **DHCP Server** and **DDNS Server** only. Click **Continue**.

    __ g. Review the current settings and make sure that the Setup program lists down **DHCP Server** and **DDNS Server** under **Selected Components**. Click **Next** to start copying files.

    __ h. Select **Finish** to restart your computer and complete the IBM DHCP installation.

Running the installation

These instructions pertain to a **typical installation** of IBM Network Station Manager V2R1 on a Windows NT server.

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3. You can use these instructions to install DHCP services on a separate server. For more information on separation of servers, refer to the *IBM Network Station Advanced Information* publication.

Attention: If you choose another type of installation, some screens[4] of the setup program may not appear. For more information on a **custom installation**, a **base code server installation**, or an **authentication server installation**, refer to the *IBM Network Station Advanced Information* online publication.

Follow these steps to install IBM Network Station Manager on your Windows NT server:

__ 1. Verify that there are no active users that are logged onto your server.

__ 2. Close all programs, restart your computer, and log in as administrator.

__ 3. Insert the IBM Network Station Manager CD into your CD-ROM drive.

__ 4. Select the language for the CD installation program.

__ 5. Select **Install IBM Network Station Manager V2**.

__ 6. Select **Run Installation**.

__ 7. Select the language for the installation, and click **OK**.

__ 8. Click **Next** on the Welcome window.

__ 9. Select **Yes** to accept the license agreement.

__ 10. The Setup program checks for any existing version of IBM Network Station Manager.

   a. If the setup program finds IBM Network Station Manager V1R3 on your server, the Important Coexistence Information window appears. This window briefly describes coexistence and other installation options. Read the information on this window carefully. Click **Next** to continue.

   b. Setup then asks if you would like to uninstall the existing version of IBM Network Station Manager. Select **Yes** if you would like to uninstall it. Otherwise, select **No**.

   Notes:

   a. The Important Coexistence Information window does not appear if you do not have any existing version of IBM Network Station Manager on your server.

   b. If Setup finds a software release older than IBM Network Station Manager V1R3 on your server, Setup ends and prompts you to exit the installation program. You can download the latest V1R3 software from http://www.ibm.com/nc. Refer to the V1R3 readme.txt file for installation instructions of V1R3.

   c. For more information on migration and coexistence, refer to "Migrating to your new IBM Network Station Manager release" on page 47.

__ 11. Click **Next** to install IBM Network Station Manager in the default directory.[5]

__ 12. Select **Typical Install**, and click **Next**.

   Notes:

   a. For general information on the types of installation, refer to "Types of Installation" on page 17.

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4. The Migration Location window does not appear if you select a **Custom Install** or a **Base Code Server** installation. If you select **Custom Install**, and if you plan to migrate your V1R3 preference files to V2R1, you should run a manual migration. Refer to the *IBM Network Station Advanced Information* online publication, and "Migrating to your new IBM Network Station Manager release" on page 47 for more information.

5. If you use TFTP to start your thin clients, you **must** install in the default directory.

      b. For technical information on a **custom installation**, a **base code server installation**, or an **authentication server installation**, refer to the *IBM Network Station Advanced Information* online publication.

__ 13. Click **Next** to add icons to the default program folder.

__ 14. Select one of the following options, and click **Next**.

- Select **Yes** to migrate your V1R3 preference files to V2R1, and enter the location of the V1R3 user preference files in the source directory box.

- Select **No** if you are not migrating any V1R3 preference files during the current installation.

__ 15. Click **Next** to install eNetwork On-Demand Server (eNOD) in the default directory.

__ 16. Select any additional options to install, and click **Next**.

__ 17. Click **Next** to accept the current settings.

The setup program stores your installation settings in a log file, **[drive:]\NetworkStationV2\instops.txt**.

__ 18. Click **Yes** to begin copying files.

The setup program installs the components and options you selected on your server.

__ 19. Click **Finish** to complete the setup program.

If you have additional software components to install, refer to "Installing the strong encryption (128-bit) products" on page 19.

If you encountered errors during the installation, refer to "Resolving installation problems" on page 20.

To configure your thin client environment, read "Configuring a thin client environment" on page 29.

Types of Installation

Type of Installation	Description
Typical Install	Provides a full installation of IBM Network Station Manager that supports authentication and base code functions. A typical install is the equivalent of an Authentication Server installation and a Base Code Server installation. This option installs the Network Station Files and Server Files of IBM Network Station Manager in the language of the default locale.
Custom Install (advanced users only)	Lets you select and specify individual components of IBM Network Station Manager for installation. **Notes:** 1. This option may require additional configuration on your server after installation. Refer to the *IBM Network Station Advanced Information* online publication for more information. 2. For a general description of each component, read "Components of IBM Network Station Manager" on page 18.

Type of Installation	Description
Authentication Server	Authenticates users and lets you configure IBM Network Station Manager settings for each user. This option installs the Server Files. **Notes:** 1. Refer to the *IBM Network Station Advanced Information* online publication for more information. 2. For a general description of the Server Files, read "Components of IBM Network Station Manager".
Base Code Server	Sets up TCP/IP services, and lets you run application programs on your thin clients. This option installs the Network Station Files. **Notes:** 1. Refer to the *IBM Network Station Advanced Information* online publication for more information. 2. For a general description of the Network Station Files, read "Components of IBM Network Station Manager".

Components of IBM Network Station Manager

1. **Network Station Files** include programs that allow you to run your thin client applications. Network Station Files have the following main components:

   - Components for Series 2800 and Series 2200

     These include subcomponents for both Series 2800 and Series 2200 thin clients.

   - Components for Series 1000 and Series 300

     These include subcomponents for both Series 1000 and Series 300 thin clients.

   Each of these two main components includes installable subcomponents. Table 3 briefly describes each of these subcomponents.

Table 3. Subcomponents of Network Station Files

Component Name	Description
Network Station Operating System	The kernel or operating system controls the operations of your thin clients.
ICA Client and Remote Application Manager	ICA enables thin clients to run Windows-based programs. ICA lets you see and work with the Windows-based user interface of a program while the application runs on the server.
Terminal Emulation Software	This program allows you to run 5250, 3270, and VT terminal sessions on your thin clients.
Netscape Communicator	On the thin client, the Netscape Communicator browser functions as a client by sending requests for information and displaying the information for the user. You also use Netscape Communicator to access and configure your thin clients.
Network Station Java Virtual Machine (JVM)	JVM provides your thin clients with a Java runtime environment that enables loading of Java-based applications.
Network Station Complete Font Support	This component installs the entire collection of system fonts for your thin clients.
National Language Support	This program allows you to run IBM Network Station Manager in your preferred language.

2. **Server Files** include programs that your server runs to manage your thin clients. Server Files have the following main components:

- Network Station Manager Program

   Network Station Manager allows you to configure and manage your thin clients from a server.

- Network Station Login Service

   This program allows you to authenticate users and start login access on your thin clients.

- Common Server Files

   These are components that support IBM Network Station Manager.

Supported languages

Table 4. Supported Languages and Language Designators

UNIX Language Designator	Language	Language Designator	Language
da_DK	Danish in Denmark	fr_CH	French in Switzerland
de_CH	German in Switzerland	fr_FR	French in France
de_DE	German in Germany	it_CH	Italian in Switzerland
en_GB	English in Great Britain	it_IT	Italian in Italy
en_US	English in the United States	nl_BE	Dutch in Belgium
es_ES	Spanish in Spain	nl_NL	Dutch in The Netherlands
es_LA	Spanish in Latin America	no_NO	Norwegian in Norway
fi_FI	Finnish in Finland	pt_BR	Portuguese in Brazil
fr_BE	French in Belgium	pt_PT	Portuguese in Portugal
fr_CA	French in Canada	sv_SE	Swedish in Sweden

Installing the strong encryption (128-bit) products

Customers from countries that allow strong encryption product imports have the option of installing the strong encryption (128-bit) products that are included in the IBM Network Station Manager (strong encryption) installation CD. The strong encryption (128-bit) products include the following:

- 128-bit Netscape Communicator browser
- Secure Sockets Layer (SSL shared library)
- 128-bit ICA Client and Remote Application Manager.

You can automatically install these products during the IBM Network Station Manager installation by clicking **Yes** when the the setup program prompts you.

Follow these steps to manually install the strong encryption (128-bit) products:

__ 1. Insert the IBM Network Station Manager CD into your CD-ROM drive.

__ 2. Run the following command from the Windows NT Run command box:

```
[CD-ROM drive]:\ntnsm\en\products\nsm128\setup.exe
```

   An installation wizard screen appears.

__ 3. Follow the prompts of the installation wizard to complete the installation.

Uninstalling IBM Network Station Manager

Follow these steps to uninstall IBM Network Station Manager:

__ 1. Verify that there are no active users that are logged onto your server.

__ 2. Close all programs, restart your computer, and log in as administrator.

__ 3. Select **Start**-**Settings**-**Control Panel**-**Add/Remove Programs**.

__ 4. Select **IBM Network Station Manager V2R1**, and click **Add/Remove**.

__ 5. Follow the prompts of the wizard that appears.

__ 6. Click **Finish** to complete the uninstallation.

Resolving installation problems

If problems occur during the installation of IBM Network Station Manager, consult Table 5 for an explanation of the installation error and the suggested steps to resolve it. If the installation problem persists, contact IBM technical support.

Table 5. Common Installation Errors

Error message	How do I resolve the error?
Cannot create an IBM Network Station Manager user group.	The setup program did not create the NSMUser group or NSMAdmin group. 1. Exit the setup program. 2. Restart your server. 3. Run the setup program again.

Table 5. Common Installation Errors (continued)

Error message	How do I resolve the error?
Cannot configure Microsoft Internet Information Server.	The setup program cannot configure Microsoft Internet Information Server 4.0. Follow these instructions to configure it manually: 1. From your Windows NT server desktop, click **Start**->**Programs**-> **Windows NT 4.0 Option Pack**->**Microsoft Internet Information Server**->**Internet Service Manager**. 2. Select the **Default** website. 3. From the Actions menu, select **New**->**Virtual Directory**. 4. For **Alias to be used to access virtual directory**, enter **networkstationv2**. Click **Next**. 5. For the path, enter **[drive:]\{float}\NetworkStationV2\servbase\html**. Click **Next**. 6. Select **Allow Read Access** only. Click **Finish**. 7. Right-click **networkstationv2** and select **Properties**. 8. Select the **Documents** tab. 9. Check enable **Default Document**. 10. Click **Add** and enter **admin.htm**. 11. Select the **Directory Security** tab and click **Edit**. 12. Check **Basic Authentication** (Password is sent in clear text.), and click **OK**. 13. Click **OK**. 14. Right-click **networkstationv2**. 15. Click **New**->**Virtual Directory**. 16. Repeat Steps 4 to 6 with the following values: Alias = admin and cgi (2 aliases with the same values) Path = [drive:]\{float}\NetworkStationV2\servbase\cgi-bin 17. Select **Allow execute access (includes script access) only**. 18. Repeat Steps 7 to 13 for admin. For step 9, enter **nsmcgain.exe**. 19. Repeat Steps 2-13 with the following values: Alias = flashconfigs Path = [drive:]\{float}\NetworkStationV2\userbase \flash\ImageConfigs 20. Select **Allow Read Access only**. Click **Finish**.
Cannot find file system.	The drive or partition where you plan to install IBM Network Station Manager may be damaged. Select a fixed drive for the IBM Network Station Manager installation.
Cannot install the IBM Network Station Login Service.	The setup program cannot install the IBM Network Station Login Service. 1. Make sure that you configured your Network Adapter card correctly. Your Network Adapter card should work properly before installing IBM Network Station Manager. 2. Make sure that your network cable is plugged in correctly. 3. Restart your server. 4. Run the setup program again.
Cannot obtain the Domain Controller name.	The setup program cannot locate the Domain Controller name for your Windows NT server. Verify that your Windows NT Domain Controller is responding to requests and is accessible from the network.

Table 5. Common Installation Errors (continued)

Error message	How do I resolve the error?
Corrupted AS/400 Integrated PC Server Registry.	The required PTF is not installed on the Integrated Netfinity® Server. This PTF fixes a registry compatibility problem with the installation of the NDIS intermediate support driver. 1. Exit from the setup program. 2. Restart your server. 3. Refer to the V2R1 readme.txt file for the PTF name. 4. Apply the required PTF. 5. Run the setup program again.
Error configuring DHCP.	Configure DHCP manually. Refer to "Configuring DHCP for your network" on page 32 for instructions.
Error configuring NFS.	The setup program cannot configure NFS properly. Follow these steps to configure NFS manually: 1. From your Windows NT server desktop, click **Start**->**Programs**->**eNetwork On Demand Server**->**NFS Server Configuration**. 2. Select the **Directories** tab and click **Add**. 3. Enter **[drive:]\{float}\NetworkStationV2\userbase** in the **Directory** field. 4. Enter **/NetworkStationV2/userbase/** in the **Alias** field. 5. Select **Allow hosts read and write access**, and click **Add**. 6. Click **Add**. 7. Enter **[drive:]\float\NetworkStationV2\prodbase** in the **Directory** field. 8. Enter **/NetworkStationV2/prodbase/** in the **Alias** field. 9. Select **Allow hosts read-only access**, and click **Add**. 10. Select the **Users** tab, and click **Add**. 11. Select **NSMNFS_User**, and click **Add**. 12. Select **NSM_NFSRoot**. 13. From the pulldown menu, click **File**->**Save**
Error configuring TFTP.	The setup program cannot configure TFTP properly. Configure TFTP properly. Follow these instructions: 1. From your Windows NT server desktop, click **Start**->**Programs**->**eNetwork On Demand Server**->**TFTP Server Configuration**. 2. Enter **[drive:]\{float}\NetworkStationV2\prodbase** in the **Directory** field, and click **Add**. 3. From the pulldown menu, click **File**->**Save**.

Table 5. Common Installation Errors (continued)

Error message	How do I resolve the error?

Error creating user directories.	The setup program did not create some or all of the following directories:
	
	``
	/NetworkStationV2/userbase
	  /NetworkStationV2/userbase/profiles
	    /NetworkStationV2/userbase/profiles/groups
	    /NetworkStationV2/userbase/profiles/ncs
	    /NetworkStationV2/userbase/profiles/users
	  /NetworkStationV2/userbase/nsmshared
	    /NetworkStationV2/userbase/nsmshared/kiosk
	  /NetworkStationV2/userbase/home/
	    /NetworkStationV2/userbase/home/kiosk
	  /NetworkStationV2/userbase/flash/
	``
	
	The setup program did not create some or all of the following base permissions:
	• **Full Control** for Administrators, NSMAdmin, and SYSTEM
	• **Read** for NSMUser
	
	Follow these steps:
	1. Exit from the setup program.
	2. Restart your server.
	3. Run the setup program again.

• Error launching eNetwork™ On-Demand Server installation. • Error creating input file for eNetwork On-Demand Server installation.	The setup program cannot install eNOD properly. Install the eNOD services manually. Follow these instructions: 1. Insert the IBM Network Station Manager CD into your CD-ROM drive. 2. Wait for the autorun dialog box to appear. Exit from this window. 3. Run the command, **[CD-ROM drive]:\ntnsm\en\products\eNOD\tcpip\setup.exe**, from the Windows NT Run command box. 4. Follow the installation instructions. 5. Select **Finish** to restart your computer and complete the eNOD services installation.
Error updating path environment variable.	The setup program cannot add the necessary entries to the system path. Add IBM Network Station Manager to the system path manually. To update the path environment variable manually, follow these instructions: 1. From your Windows NT server desktop, click **Start**->**Settings**->**Control Panel**->**System**. 2. Click the **Environment** tab. 3. Under **System Variables**, select **Path**. 4. Append **[drive:]\{float}\NetworkStationV2\servbase\bin** to the end of the current value of your path variable. 5. Click **Set**, and then click **OK**.
Error while trying to synchronize the /etc/hosts file.	This file was not correctly set up. Use the following sample to replace this file manually: Example for: ``` [drive:]\{float}\NetworkStationV2\prodbase\ppc\etc\hosts [drive:]\{float}\NetworkStationV2\prodbase\x86\etc\hosts 127.0.0.1 localhost 9.3.159.186 starscream starscream.austin.ibm.com ``` **Format: <Server IP Address> <computer name> <fully qualified computer name>**

Table 5. Common Installation Errors (continued)

Error message	How do I resolve the error?
File system is not NTFS.	The drive or partition where you plan to install IBM Network Station Manager must be formatted using NTFS. 1. Exit from the setup program. 2. Select a fixed drive that uses the NTFS file system, or switch the current drive to NTFS. 3. Run the setup program again.

Installation was unable to configure the /etc/resolv.conf file.	This file was not correctly set up. Use the following sample to replace these files manually:
	
	`Files to be replaced:`
	
	`[drive:]\{float}\NetworkStationV2\prodbase\ppc\etc\resolv.conf`
	`[drive:]\{float}\NetworkStationV2\prodbase\x86\etc\resolv.conf`
	
	`Format:`
	
	`domain <domain name>`
	`search <domain name 1> . . . <domain name n>`
	`nameserver <name server IP address>`
	`    . . . nameserver <name server IP address>`
	`lookup file bind`
	`Example:`
	
	`domain rchland.ibm.com`
	`search rchland.ibm.com ibm.com`
	`nameserver 12.34.56.78`
	`nameserver 12.34.56.89`
	`nameserver 12.34.56.90`
	`lookup file bind`

Migration internal error. Run the migration utility from the command line.	An invalid parameter was used to run migration. 1. Check the Windows NT Application Event Log for more information. 2. Refer to Table 11 on page 53 for valid migration parameters. 3. Run the migration utility from the command line.
Migration utility initialization failed. Run the migration utility from the command line.	An invalid parameter was used to run migration, or the migration program did not complete successfully. 1. Check the Windows NT Application Event Log for more information. 2. Refer to Table 11 on page 53 for valid migration parameters. 3. Run the migration utility from the command line.
Migration utility parameter not valid. Run the migration utility from the command line.	An invalid parameter was used to run migration. 1. Check the Windows NT Application Event Log for more information. 2. Refer to Table 11 on page 53 for valid migration parameters. 3. Run the migration utility from the command line.
NDIS Driver failed to install.	The setup program cannot find the path to install the IBM NDIS Intermediate Driver automatically. Install the NDIS intermediate driver manually. See "Installing IBM DHCP" on page 15 for instructions.
Network File System (NFS) failed with the following error:	An error occurred while setting NFS permissions. See the NSM_NFS_Error.txt for more information. Contact IBM Technical Support.

Table 5. Common Installation Errors (continued)

Error message	How do I resolve the error?
NFS user creation error.	The setup program cannot create an NFS User for the Network Station. Create this user manually. Refer to "Creating Users and Groups in Windows NT" on page 29 for instructions.
North American (128-bit) encrypted products installation error.	This error appears if you are using the North American version of the IBM Network Station Manager installation CD. The installation cannot install the 128-bit strong encryption products. Install the 128-bit strong encryption products manually. Refer to "Installing the strong encryption (128-bit) products" on page 19 for instructions.
Not enough Free Space on Disk.	You need at least 500 MB of free disk space to install IBM Network Station Manager on your server. 1. Exit from the IBM Network Station Manager setup program. 2. Free up some disk space or select another fixed drive with enough free disk space. 3. Run the IBM Network Station Manager setup program again.
Setup cannot install the IBM NDIS Intermediate Driver 3.0.	The IBM Network Station Manager setup program cannot install the IBM NDIS Intermediate Driver automatically. Install the NDIS intermediate driver manually. See "Installing IBM DHCP" on page 15 for instructions.
The drive chosen is not a fixed drive. Choose another install location.	The setup program cannot install IBM Network Station Manager on a remote or network drive. Select a fixed drive for the IBM Network Station Manager installation.
The following error occurred during Setup. Error: 100	The V1R3 Network Station Login Service was not removed successfully. Disable the V1R3 Network Station Login Service. Refer to "Starting and Stopping Servers and Services" on page 42 for instructions.
The following error occurred during Setup. Error: 101	The IBM Network Station Manager setup program cannot migrate the IBM Network Station Login Service to V2R1. Disable the V1R3 Network Station Login Service. Refer to "Starting and Stopping Servers and Services" on page 42 for instructions.
The following error occurred during Setup. Error: [102 to 115]	The program used to automatically syncronize the language initial locale preference for the Network Station login encountered an error. The language preference for the client login needs to be set properly. A utility program can be run to automatically set this preference. This program is in **[drive]:\\{float}\\NetworkStationV2\\servbase\\bin** ({float} is a subdirectory). You can run this program from a Windows NT command prompt. The command is: **nsmutlds -v ll_CC** where ll_CC is the 5 digit language designator for the client login language. Refer to "Supported languages" on page 19 for more information. If this utility does not run successfully, contact IBM technical support.

Table 5. Common Installation Errors (continued)

Error message	How do I resolve the error?

Unknown client synchronization error.	The setup program was unable to configure following files. Use the following samples to replace these files manually.
	
	`Files to be replaced:`
	
	`[drive:]\{float}\NetworkStationV2\prodbase\ppc\etc\hosts`
	`[drive:]\{float}\NetworkStationV2\prodbase\x86\etc\hosts`
	`Format:`
	
	`<server IP address><computer name><fully qualified computer name>`
	`Example:`
	
	`12.34.56.01 localhost`
	`12.34.56.78 starscream starscream.rchland.ibm.com`
	`Files to be replaced:`
	
	`[drive:]\{float}\NetworkStationV2\prodbase\ppc\etc\resolv.conf`
	`[drive:]\{float}\NetworkStationV2\prodbase\x86\etc\resolv.conf`
	`Format:`
	
	`domain <domain name>`
	`search <domain name 1> . . . <domain name n>`
	`nameserver <name server IP address>`
	`    . . . nameserver <name server IP address>`
	`lookup file bind`
	`Example:`
	
	`domain rchland.ibm.com`
	`search rchland.ibm.com ibm.com`
	`nameserver 12.34.56.78`
	`nameserver 12.34.56.89`
	`nameserver 12.34.56.90`
	`lookup file bind`

User not authorized to run setup and migration. User must belong to the NSMAdmin group. Run the migration utility from the command line.	A user that belongs to the NSMAdmin group should run migration. 1. Check the Windows NT Application Event Log for more information. 2. Restart your server. 3. Login as a user that belongs to the NSMAdmin group. 4. Run the migration utility from the command line.
V1R3 migration source directory does not exist or V1R3 not installed on this server. Run the migration utility from the command line.	The setup program cannot locate the V1R3 preference files on your server, or the source directory location specified was not accessible. 1. Check the Windows NT Application Event Log for more information. 2. Verify the directory location of IBM Network Station Manager V1R3. 3. Run the migration utility from the command line.
V1R3 uninstall error.	The setup program was unable to automatically uninstall IBM Network Station Manager V1R3. Uninstall this product manually by using **Add/Remove Programs** from the Windows NT Control Panel.

Table 5. Common Installation Errors (continued)

Error message	How do I resolve the error?
WARNING: Previous version found:	The setup program detected an earlier version of IBM Network Station Manager. 1. Exit from the IBM Network Station Manager setup program. 2. Download Version 1 Release 3.08 (V1R3 Service Update 8) from http://www.ibm.com/nc. 3. Upgrade IBM Network Station Manager Version 1 Release 2.0 to IBM Network Station Manager Version 1 Release 3.08 to preserve user preferences. 4. Restart your server. 5. Run the IBM Network Station Manager setup program again.

Configuring a thin client environment

About this section

This section provides information on configuring a thin client environment on Windows NT.

Planning the configuration

To configure a thin client environment on your Windows NT server, you must complete the following tasks:

- Add a user account to the NSMUser group for the thin client user.
- Configure your DHCP settings.

Managing users in a single Windows NT domain

IBM Network Station Manager assigns administrative control and sets directory permissions by using Windows NT local groups. The IBM Network Station Manager setup program creates the NSMUser and NSMAdmin local groups on your server.

You must define each thin client user in your network and add each thin client user to the NSMUser group. To limit administrative control, you should put the user in the NSMUser group only. To assign full administrative control, include the user in both the NSMUser and the NSMAdmin groups.

IBM Network Station Manager supports the Single Domain Model. If you installed IBM Network Station Manager on a Member Server of a domain, you should create your users on a Primary Domain Controller. You can add these users to the NSMUser group on the Member Server later. This setup eliminates duplication of users and makes future expansion of your network easier.

Creating Users and Groups in Windows NT

When you add a user account, or create a group and add users to it, observe the following restrictions for user names, group names, and passwords:

- User names and group names nust not be identical to Windows NT domain names or server names.
- Names cannot be more than 20 characters long.

- Names must be subsets of ″invariant ASCII″ or the English alphanumeric set. They may not contain any of the following elements:

Double-byte characters
Characters above ASCII 33 and below ASCII 27
Control characters
Spaces or tabs
Any of the following characters:
Forward slash (/)
Backward slash (\)
Colon (:)
Semicolon (;)
Asterisk (*)
Question mark (?)
Quotation mark (″)
″Greater than″ symbol
″Less than″ symbol
Brackets ([,])
Plus sign (+)

To create users or groups in your Windows NT server, follow these instructions:

__ 1. From your Windows NT server desktop, click **Start**->**Programs**->**Administrative Tools (Common)**->**User Manager for Domains**.

__ 2. From the pulldown menu, select **User**.

__ 3. If you are creating a new user, select **New User**. If you are creating a new group, select **New Local Group**.

To manually create the NSMUser group or NSMAdmin group, follow these instructions:

__ a. Select **New Local Group**.

__ b. Enter **NSMUser** or **NSMAdmin** in the **Group Name** field.

__ c. Click **OK**.

__ d. Make sure that the NSMUser or NSMAdmin group appears on the list of groups on the main window.

__ e. Continue to "Adding Users and Groups in Windows NT" to add users to the NSMUser group or NSMAdmin group.

__ 4. Set up a user account or group account by entering information in the input fields. Click **OK** when completed.

__ 5. Make sure that the newly created user or group appears on the list of users or groups on the main window.

Adding Users and Groups in Windows NT

To add domain users or groups to the local NSMUser group or NSMAdmin group, follow these instructions:

__ 1. From your Windows NT server desktop, click **Start**->**Programs**->**Administrative Tools (Common)**->**User Manager for Domains**.

__ 2. Double-click on the **NSMUser** group or **NSMAdmin** group.

__ 3. Click **Add**.

__ 4. Make sure that the correct domain is visible in the **List Names From** box.

__ 5. Highlight the domain user or group and click **Add**.

__ 6. Click **OK** to close the Add Users and Groups window.

__ 7. Click **OK** to close the Local Group Properties window.

If you would like a user with full administrative authority, you need to add the user name to the **Domain Admins** global group. You can add this group to your user name from the Primary Domain Controller.

Managing users in a Windows NT trusted domain

Multiple domains allow you to store accounts and access resources from other domains. IBM Network Station Manager also supports the Single Master Domain Model. If your network has a single master domain, you can share resources through a trust relationship. A trust relationship allows one domain to share its resources to other domains.

Figure 5 illustrates a one-way trust relationship between a resource domain and a user accounts domain. The trusting domain is the resource domain. The trusting domain allows the users and groups from the user accounts domain to use the trusting domain's resources. The trusted domain, which is also known as the Master domain, is the user accounts domain. This domain includes the users and groups who are allowed to use the trusting domain's resources.
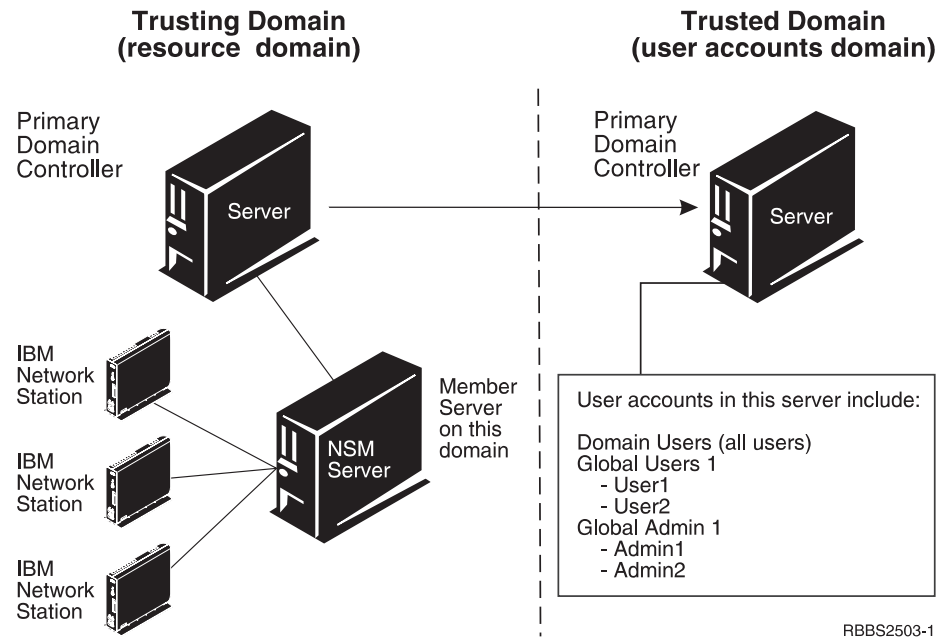
Figure 5. Trust Relationship between Two Domains

To eliminate duplication of users and efficiently manage your network, you should define all users and groups on a Primary Domain Controller in the Master domain. You can then install IBM Network Station Manager on a Member Server of the resource domain. You then establish a trust relationship between the two domains in the Primary Domain Controller of the trusted domain which is the user accounts domain. After you set up the trusting domain that can trust the user accounts domain, you then specify the trusted domain from the resource domain.

To set up a trust relationship from the trusted domain, follow these instructions:

__ 1. From your Windows NT server desktop, click **Start**->**Programs**->**Administrative Tools**->**User Manager for Domains**.

__ 2. Click **Policies** and select **Trust Relationships**.

__ 3. A window from the trusted domain appears. Enter the name of the trusting domain. Enter a password for the trust relationship. Click **OK**.

__ 4. A window appears showing you that the trusting domain is added to the Trust Relationships box. Click **Close**.

To set up the trusted domain from the trusting domain, follow these instructions:

__ 1. From your Windows NT server desktop, click **Start**->**Programs**->**Administrative Tools**->**User Manager for Domains**.

__ 2. Click **Policies** and select **Trust Relationships**.

__ 3. Enter the name of the trusted domain. Enter the password for the trust relationship. Click **OK**.

__ 4. A window appears showing you that the trusted domain is added to the Trust Relationships box. Click **Close**.

After you set up the trust, add users and groups to the NSMUser group or the NSMAdmin group on the Member Server of the trusting domain. To add domain users or global groups from the trusted domain to the Member Server of the trusting domain, follow these instructions:

__ 1. On the Member Server of the trusting domain, click **Start**->**Programs**->**Administrative Tools (Common)**->**User Manager for Domains**.

__ 2. Double-click on the **NSMUser** group.

__ 3. Click **Add**.

__ 4. Make sure that the Master Domain (trusted domain) is visible in the **List Names From** box.

__ 5. Highlight the domain user or global group and click **Add**.

__ 6. Click **OK** to close the **Add Users and Groups** window.

__ 7. Repeat these steps to add domain users or global groups to the **NSMAdmin** group.

If you would like a user with full administrative authority, you need to add the user name to the **Domain Admins** global group. You can add this group to the user name from the Primary Domain Controller on the Master Domain.

On the Member Server of the trusting domain, the IBM Network Station Manager Login Service searches for the domain user on the local machine. If the Login Service finds the domain user, the Login Service attempts to log the domain user in. The Login Service stops searching for the domain user even if the login attempt is unsuccessful.

If you have identical user names set up on both the trusting domain and the trusted domain, the Login Service logs in and authenticates the user name that is found on the trusting domain.

Configuring DHCP for your network

DHCP is a sophisticated tool for managing your network. A careful, well-thought out DHCP configuration can make a network run effectively. Whenever you make changes to your network configuration, you must ensure that the DHCP configuration reflects those changes. Read "DHCP" on page 6 for additional information about DHCP.

Collect the following information about your network before configuring DHCP. Record your information in Table 6 on page 33.

Table 6. Gathering DHCP Information

DHCP Option Number	Field	Description	Write Your Network Value Here
Defining DHCP Options			
Option 1	Subnet Mask	A value that enables network devices to direct packets of information accurately in a subnet.	
Option 3	Router IP Address (Default Gateway)	The IP address of the default router to which TCP/IP packets which are not addressed to your network will be sent.	
Option 6	Domain Name Server (IP Address)	Delivering the Domain Name Server IP address to clients allows them to use either fully qualified host names or IP addresses when they communicate with other devices.	
Option 15	Domain Name	The domain name allows the thin client to specify its domain to other devices. For example, in a network where the fully qualified host name is `server.mycompany.com`, the domain name is `mycompany.com`.	
Option 66	Trivial File Transfer Protocol (TFTP) Server Name (TFTP or NFS)	The IP address of the server from which the thin client downloads its operating system. This option serves the operating system kernel using both NFS and TFTP. NFS is the recommended download protocol. Enable the NFS download with Option 211.	
Option 67	Boot File name	The name of the file that contains the thin client operating system. Refer to Table 7 on page 34 for the appropriate boot file name.	/NetworkStationV2/ prodbase/[x86 or ppc]/[your kernel filename] **Note:** This is the NFS pathname. Refer to Table 7 on page 34 for the correct directory path and kernel file name.
Option 211	Base Code Server Protocol	This option sets the protocol used for the operating system kernel download. Specify this option to enable Option 66 to serve the kernel using NFS.	nfs
Defining the Subnet Options			
N/A	Subnet Address (Subnet IP Address)	The IP address associated with a particular subnet. For Class C networks whose subnet mask is 255.255.255.0, the subnet address is the same as the network address.	
N/A	Start DHCP Pool Address (IP Range From)	The first IP address in the range which you have specified for your pool of available addresses.	
N/A	Last DHCP Pool Address (IP Range To)	The last IP address in the range which you have specified for your pool of available addresses.	

Table 7 on page 34 specifies the directory path and boot file name for the different thin client hardware models.

Table 7. Boot File Name for the thin client hardware

Hardware Series (Type-Model)	Boot File Name
Series 2800 (8364 - all models)	/NetworkStationV2/prodbase/x86/kernel.2800
Series 2200 (8363 - all models)	/NetworkStationV2/prodbase/x86/kernel.2200
Series 1000 (8362 - all models)	/NetworkStationV2/prodbase/ppc/kernel.1000
Series 300 (8361-110 and 8361-210)	/NetworkStationV2/prodbase/ppc/kernel.300

Configuring IBM DHCP on your Windows NT server

Important

Before you begin the IBM DHCP configuration, read the following notes:

- If you plan to use IBM DHCP, you must ensure that the device driver associated with your LAN adapter card is compatible with the NDIS Intermediate Driver. Refer to the installation readme.txt file for known incompatibilities.

- If you chose to install IBM DHCP during the IBM Network Station Manager installation, the setup program automatically configures the IBM DHCP service with a sample subnet for your thin clients. If your server has an existing IBM DHCP configuration, Setup creates two example files that you may look at to configure DHCP manually.
  - [drive:]\OnDemand\SERVER\ETC\v2r1dhcpext.cfg
  - [drive:]\OnDemand\SERVER\ETC\v2r1dhcpsd.cfg

  The v2r1dhcpext.cfg file provides a list of DHCP options necessary to start and run a thin client in V2R1. The v2r1dhcpsd.cfg file is a sample DHCP subnet configuration for thin clients.

To configure a simple IBM DHCP network setup, follow these instructions:

__ 1. Complete Table 6 on page 33.

__ 2. Stop the IBM DHCP service. Refer to "Starting and Stopping Servers and Services" on page 42 for instructions.

__ 3. From your Windows NT server desktop, click **Start**->**Programs**->**eNetwork On-Demand Server**->**DHCP Server Configuration**.

   The following screen appears:
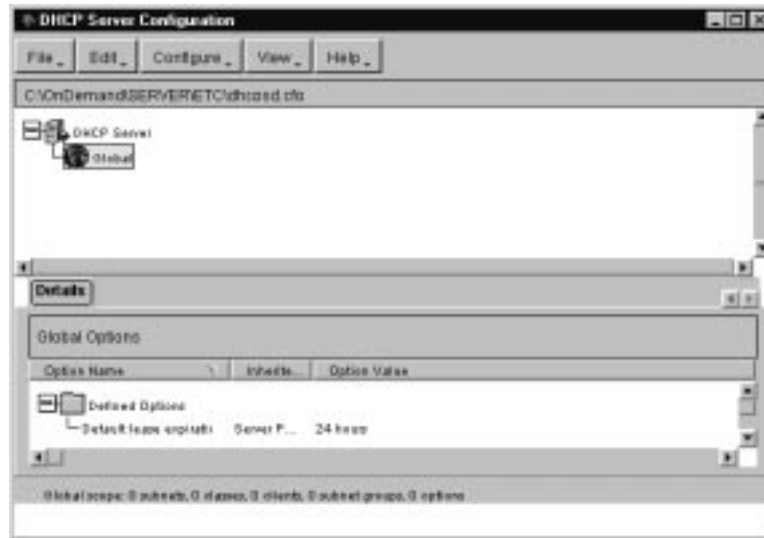
Figure 6. Main eNOD DHCP Configuration Window

__ 4. Define your global DHCP options.

    __ a. From the main menu, click **File**->**New**.

    __ b. Highlight **Global** and click **Configure**->**Modify selected item** from the main menu.

    __ c. The Global Parameters window opens. Click the **DHCP Options** tab. The following screen appears:

Figure 7. Defining Global DHCP Options

    __ d. In the **Available Options list**, select the DHCP options from Table 6 on page 33 and enter your corresponding network values in the **Option Value** window. Click **OK** to go back to the main screen.

__ 5. Define a subnet within your global configuration.

    __ a. Highlight **Global** and click **Configure**->**Add Subnet** from the main menu.

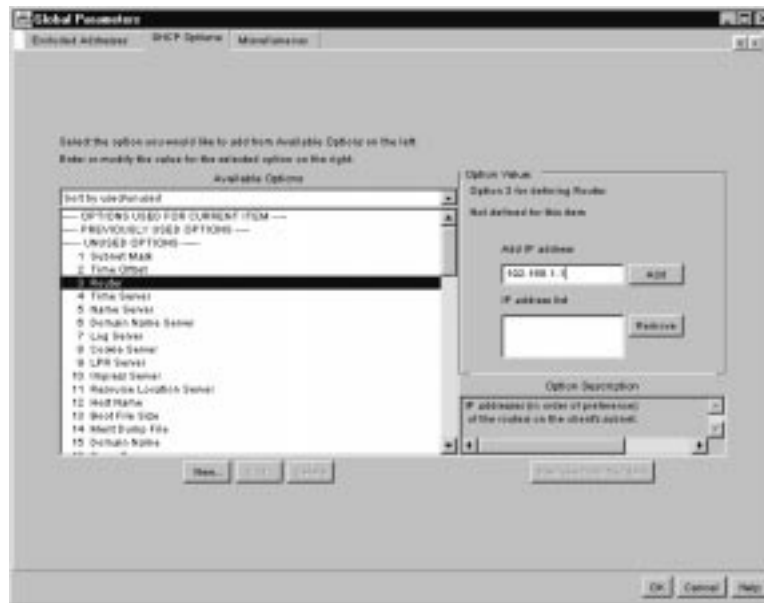The Subnet Parameters window appears with the **Subnet Definition** tab selected.

Figure 8. Defining a Subnet

> __ b. Enter your network values from Table 6 on page 33 in the appropriate input fields.
>
> - Specify a range of IP addresses that DHCP can assign to your thin clients.
> - Enter a lease time in which a client may use an IP address.
> - Specify a range of excluded IP addresses.
>
>   To exclude an IP address, enter the IP address in the IP address field. Click **Add**.
>
>   Exclude IP addresses of any devices on your network whose IP addresses are permanent or fixed to avoid address conflicts in your network. Exclude the IP addresses of the following devices:
>
>   - Boot servers, configuration servers, http servers, domain name servers
>   - Routers and network printers
>   - thin clients that start using NVRAM
>
> __ c. Click the **DHCP Options** tab.
>
> __ d. In the **Available Options list**, select the DHCP options from Table 6 on page 33 and enter your corresponding network values in the **Option Value** window. Any values you enter at this point override values that you specified previously. Click **OK** to go back to the main screen.

__ 6. Click **File**->**Save** to save your settings.

__ 7. Start the IBM DHCP service for your changes to take effect. Refer to "Starting and Stopping Servers and Services" on page 42 for instructions.

Creating a Class for your thin clients

Most organizations typically have a mixed network composed of thin clients, personal computers, and UNIX workstations. To simplify DHCP configuration for

thin clients that access two different servers to download the operating system and the kernel file, you create a class for your thin clients.

You can create a separate class for each hardware model of thin clients in your network. Thus, when a client that belongs to a thin client class reaches the DHCP server, it receives the necessary and appropriate information to access its kernel.

To create a class, follow these instructions:

__ 1. Stop the IBM DHCP service. Refer to "Starting and Stopping Servers and Services" on page 42 for instructions.

__ 2. Based on your organization's network setup, decide where you want to create the class, whether within your global configuration or subnet configuration.

__ 3. In the main eNOD DHCP configuration window, click **Global** if you plan to create the class outside of a subnet. If you are creating the class within a subnet, click the appropriate subnet.

__ 4. From the main menu, click **Configure**->**Add class**.

The following screen appears:

Figure 9. Adding a Class

__ 5. Enter the correct class value in the text field. Refer to Table 8.

Table 8. IBM thin client DHCP Classes

Hardware Series (Type-Model)	Class
Series 2800 (8364-EXX)	IBM 8364-EXX
Series 2800 (8364-TXX)	IBM 8364-TXX
Series 2200 (8363-EXX)	IBM 8363-EXX
Series 2200 (8363-TXX)	IBM 8363-TXX
Series 1000 (8362-A52)	IBMNSM A.5.0
Series 1000 (8362-A53)	IBMNSM A.5.0
Series 1000 (8362-A22)	IBMNSM A.2.0

Table 8. IBM thin client DHCP Classes (continued)

Hardware Series (Type-Model)	Class
Series 1000 (8362-A23)	IBMNSM A.2.0
Series 300 (8361-210)	IBMNSM 1.1.0
Series 300 (8361-110)	IBMNSM 2.1.0

__ 6. Enter the range of IP addresses that the server can assign to your thin clients in this class.

__ 7. Click the **DHCP Options** tab.

__ 8. In the **Available Options list**, select the DHCP options from Table 6 on page 33 and enter your corresponding network values in the **Option Value** window. Values you enter at this point override values that you specified previously. Click **OK** to go back to the main screen.

__ 9. Click **File**->**Save** to save your settings.

__ 10. Start the IBM DHCP service for your changes to take effect. Refer to "Starting and Stopping Servers and Services" on page 42 for instructions.

Assigning a Static IP Address to a thin client in a DHCP Environment

You can configure DHCP to assign a static IP address to a client (such as a thin client that is attached to a network printer). When the client requests an IP address from the server, the server assigns the same IP address to the defined client.

To create an individual client at the global level, follow these instructions:

__ 1. Stop the IBM DHCP service. Refer to "Starting and Stopping Servers and Services" on page 42 for instructions.

__ 2. Click **Global** on the main eNOD Configuration window.

__ 3. From the main menu, click **Configure**->**Add Client**.

The Client Parameters window appears with the **Client Definition** tab selected.

Figure 10. Defining a Client with a Fixed IP Address

__ 4. Enter the following information in the appropriate input fields.
- Enter the computer name of the thin client in the **Client name** field.
- For **Client hardware type**, choose **1 Ethernet (10 MB)** for Ethernet machines or **6 IEEE 802 Networks** for token-ring machines.
- The client ID is the MAC address of the thin client.
- Click **Assign this address** and enter an IP address for the thin client.

__ 5. Select the **DHCP Options** tab.

Figure 11. Specifying DHCP Options for a Client with a Fixed IP Address

__ 6. In the **Available Options list**, select the DHCP options from Table 6 on page 33 and enter your corresponding network values in the **Option Value** window. Values you enter at this point override values that you specified previously. Click **OK** to go back to the main screen.

__ 7. Click **File**->**Save** to save your settings.

__ 8. Start the IBM DHCP service for your changes to take effect. Refer to "Starting and Stopping Servers and Services" on page 42 for instructions.

When you make changes to your network, make sure to update your DHCP configuration. To change an existing configuration for global, subnet, class, or client levels, highlight the object in the main window and choose **Configure**->**Modify selected item**.

Creating DHCP Options on IBM DHCP

For advanced configurations, you may need to configure DHCP options which do not appear in the list of options on the DHCP interface. For more information on advanced DHCP configurations, refer to the *IBM Network Station Advanced Information* publication.

To create a DHCP option, follow these instructions:

__ 1. From your Windows NT server desktop, click **Start**->**Programs**->**eNetwork On**-**Demand Server**->**DHCP Server Configuration**.

__ 2. Click **Global**.

__ 3. Select **Configure**->**Modify selected item** from the main menu.

__ 4. Click **DHCP Options** tab.

__ 5. Click **New**.

__ 6. Fill in the **Create New Option** screen.

__ 7. Once you have created your DHCP option, click **OK** to return to the main DHCP configuration page.

__ 8. Highlight **Global** or the class, subnet, or client for which you want to configure your new DHCP option.

__ 9. Select the new DHCP option that you created and enter the appropriate information.

__ 10. When you are finished, click **OK** to save your changes and then exit the DHCP configuration utility.

Configuring Microsoft DHCP on your Windows NT server

To configure Microsoft DHCP, follow these instructions:

__ 1. Complete Table 6 on page 33.

__ 2. From your Windows NT server desktop, click **Start**->**Programs**->**Administrative Tools**->**DHCP Manager** from your server's desktop.

__ 3. In the DHCP Manager window, select **Server** from the main menu. Click **Add**.

__ 4. Enter the IP address of the server which will act as the DHCP server.

__ 5. In the left pane of the main DHCP Manager window, highlight your server.

__ 6. In the **DHCP Manager** window menu bar, select **Scope**->**Create**.

__ 7. In the **Create Scope** window, enter the pool of available IP addresses for your thin clients. If you have many thin clients, you can create two or more scopes to accommodate your clients.

__ 8. Enter the following information in the **Create Scope** window:
   • Start Address: This is the first address in the range of available IP addresses for the scope. It is part of the range.
   • End Address: This is the last address in the range of available IP addresses for the scope. It is also part of the range.
   • Subnet Mask: Enter the subnet mask for this scope.
   • Exclusion Range: If any addresses within the scope belong to a device with a fixed[6] IP address, exclude this IP address from the scope.

   Enter the following two values under the Exclusion Range:
   – Start Address: Type the first IP address to exclude from your scope. Click **Add** to enter it in the **Excluded Addresses** box.
   – End Address: Type the last IP address to exclude from your scope. Click **Add** to enter it in the **Excluded Addresses** box.
   • Lease Duration: You can specify the length of time your thin clients use their assigned IP addresses. Choose a workable lease time. thin clients automatically renew their own leases when they pass half of their lease time.

__ 9. Click **OK** after entering all of the required information on the **Create Scope** screen.

__ 10. Choose **Activate Now** to activate the scope.

---

6. Examples of devices whose IP addresses are fixed include the DHCP server, DNS servers, routers, and thin clients that do not use DHCP to start. If you leave those addresses in the range, the DHCP server might assign them to another thin client.

__ 11. In the main DHCP Manager window, highlight the scope that you just created.

__ 12. Select **DHCP Options** from the menu bar and choose from among **Scope**, **Global**, or **Defaults**.

Notes:

a. If you select **Global**, the options apply to every client on your network.

b. If you select **Scope**, the options apply to all of the clients in the scope that you have highlighted.

c. Do not select **Default**. If you do, a standard set of options takes effect which will not allow you to start your thin clients.

__ 13. Once you select a group of clients, you must specify which options you want to configure for the selected group of clients. To configure DHCP options, carry out the following steps:

__ a. In the **Unused Options** box, select the DHCP options from Table 6 on page 33. **Option Value** window. Click **OK** to go back to the main screen.

__ b. Once you have highlighted an option, click **Add**.

__ c. If you an option requires a value (like an IP address), click **Value**. Enter your corresponding network values. If the option requires an array of values (such as a range of IP addresses), click **Edit Array**. Enter the required information, click **Add**, and then click **OK**.

__ d. Once you have configured your DHCP options, click **OK**.

__ 14. Repeat this process for additional scopes that you would like to create.

__ 15. If you want to reserve an IP address for an individual client, you can do so by carrying out the following steps:

__ a. In the **DHCP Manager** window, highlight the scope in which you want the new client to exist.

__ b. From the DHCP Manager window menu bar, select **Scope**->**Add Reservations**.

__ c. Enter the following information in the **Add Reserved Clients** window:

   • IP Address: Enter the IP address that you want to reserve for this thin client. The address may be outside the range of the scope that you highlighted.

   • Unique Identifier: The unique identifier is the MAC address of the thin client.

   • Client Name: Enter the computer name of the thin client.

   • Client Comment: Use this optional field to enter an administrative comment.

__ d. Click **Add**.

__ e. Click **Close** to return to the main DHCP Manager window.

__ f. From the menu bar, select **Scope**->**Active Leases**.

__ g. The client that you just created should now appear in the **Active Leases** window.

__ h. Highlight the client that you just created.

__ i. Click **Properties**.

__ j. Select **Options**.

__ k. Enter options for this client as you did before for the scope.

__ l. Click **OK**.

__ 16. Your Microsoft DHCP server is ready to start thin clients. See the *Using IBM Network Station Manager* publication for instructions on how to configure your thin clients to start using DHCP.

Creating DHCP Options on Microsoft DHCP

For advanced configurations, you may need to configure DHCP options which do not appear in the list of options on the DHCP interface. For more information on advanced DHCP configurations, refer to the *IBM Network Station Advanced Information* publication.

To create a DHCP option, follow these instructions:

__ 1. Open the DHCP interface by selecting **Start**->**Programs**->**Administrative Tools**->**DHCP Manager**.

__ 2. Highlight the group of clients to which you want the new option to apply (global, scope, or client).

__ 3. Select **DHCP Options** from the main menu.

__ 4. Choose **Defaults**.

__ 5. In the **Option Class** list, select **Standard Option Types**.

__ 6. In the **Name** box, type a new option name. The name should be descriptive of the function that the option adds to your configuration.

__ 7. In the **Data Type** list, click the data type for the option. The data type is the way that the system reads the option value information.

__ 8. In the **Identifier** box, type a unique number to associate with the option.

__ 9. In the **Comment** box, enter a brief description about the new option. For example, a comment might read, *Protocol to use for terminal configuration information.*

__ 10. Enter the value for the DHCP option in the **Value** box.

__ 11. After configuring your new option, click **OK** to save your changes and exit the configuration utility.

Starting and Stopping Servers and Services

Ensure that you start your servers and services so that your network runs smoothly. There are several servers and services that must be running:

- Lotus Domino Go Webserver or Microsoft Internet Information Server
- IBM or Microsoft DHCP server
- IBM TCP/IP Services
- NFS server or TFTP server
- Ethernet adapter or token-ring adapter
- Network Station Login Service Version 2

To start or stop a service, follow these instructions:

__ 1. From your Windows NT server desktop, click **Start**->**Settings**->**Control Panel**->**Services**.

__ 2. Select the server or service which you want to start or stop.

__ 3. If you are starting a service, click **Start**. If you are stopping a service, click **Stop**.

To enable your Ethernet adapter or token-ring adapter, follow these instructions:

__ 1. From your Windows NT server desktop, click **Start**->**Settings**->**Control Panel**->**Network**->**Adapters**.

__ 2. Select the network adapter of your server.

__ 3. To enable the adapter, click **Start**. To disable the adapter, click **Stop**.

Configuring Printers for your thin clients

You can configure printers for your thin clients with IBM Network Station Manager. In order to configure printing successfully, you have to identify the datastreams that your printer understands. If an application produces a datastream other than what your printer can understand, you might not get a printed output. See the *Using IBM Network Station Manager* publication for more information on the datastreams that the common thin client applications produce.

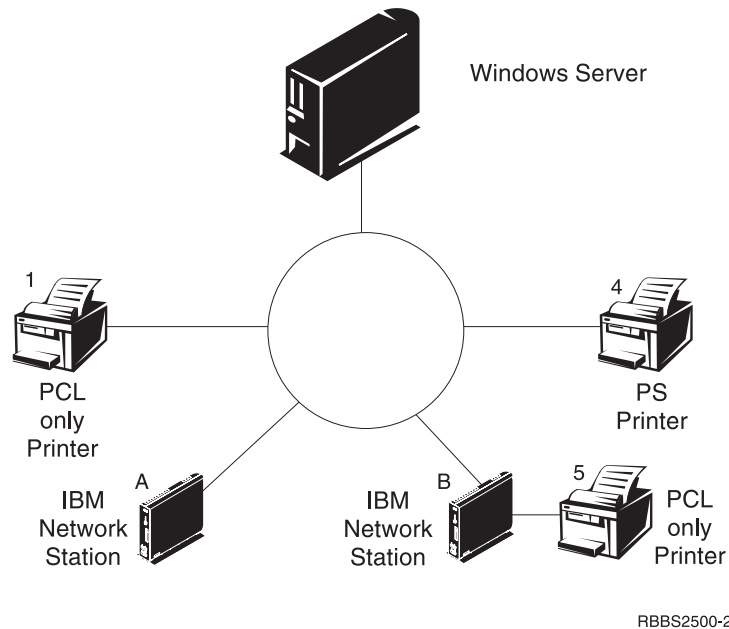Figure 12 illustrates a typical network printing setup.

Figure 12. Possible Printing Scenarios

Table 9 explains the basic steps to configure printers for your thin clients. Identify the scenario that best meets your needs and follow the instructions to configure your printers.

Table 9. Configuration Descriptions for Basic Printer Scenarios

Print Scenario	Print Job Flow in Figure 12	Configuration Instructions
thin client to a LAN printer	thin client A to Printer 1	1. In IBM Network Station Manager, access the following path from the right-side menu: **Hardware**->**Printers**. 2. Configure an entry in the **Remote Printer Server** field for the LAN printer.
thin client to a locally attached printer	thin client B to Printer 5	1. In IBM Network Station Manager, access the following path from the right-side menu: **Hardware**->**Printers**. 2. Configure an entry in the **Local Parallel Printer** or the **Local Serial Printer** field, depending on how the printer connects to the thin client.

Print Scenario	Print Job Flow in Figure 12 on page 43	Configuration Instructions
thin client to another thin client with an attached printer	thin client A to thin client B to Printer 5	1. In IBM Network Station Manager, access the following path from the right-side menu: **Hardware**->**Printers**. 2. Configure an entry in the **Remote Printer Server** field with the IP address of the thin client to which the printer is attached. In the **Queue name** field, type PARALLEL1 or SERIAL1, depending on how the printer connects to the thin client.
Windows NT Server 4.0 to a thin client with an attached printer	Windows NT Server 4.0 to thin client B to printer 5	1. Insert the correct Windows NT Server installation CD into your CD-ROM drive. 2. Click **Start**->**Control Panel**->**Network**. 3. Click the **Services** tab. 4. Highlight **Microsoft TCP/IP Printing** and click **Add**. 5. Select **Microsoft TCP/IP Printing**. 6. Click **OK** to close the current window. 7. Restart your server. You may need to reinstall the Windows NT Service Pack. 8. Start the thin client. 9. From your Windows NT server desktop, click **My Computer**->**Printers**->**Add Printer**. 10. Select **My Computer** and click **Next**. 11. Select **Add Port**. 12. Highlight **LPR Port** and click on **New Port**. 13. In the **Add LPR Compatible Printer** window, enter the name or IP address of the thin client to which the printer is attached. Enter the name of the printer or print queue (SERIAL1 or PARALLEL1) on that server. Click **OK**. 14. Specify PCL, ASCII, or PostScript in IBM Network Station Manager for this printer. The default is PostScript. 15. Click **Close**->**Next**. 16. In the Add Printer wizard window, select the manufacturer and model of the printer that is attached to the thin client. 17. Click **Next**. 18. Select whether you want to share your printer. 19. Print a test page to confirm proper setup.

Printer Administration Techniques

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

Controlling print jobs through your Windows NT server

One technique to consider is to have a server control the printers for your Network Stations. In Figure 12 on page 43, the Windows NT server could control a LAN printer like Printer 4. Network Station A and Network Station B send their print jobs to the Windows NT server. The Windows NT server controls the flow of print jobs to the printer.

Advantages	Disadvantages
This scenario reduces the work load on the Network Stations when the printer buffer is full because the Windows NT server negotiates print jobs with the printer.	Handling these print jobs may likely decrease the CPU performance of your Windows NT server, depending on the size and frequency of your print jobs. Your end users may notice that it takes longer for them to receive their printouts. Since you would send the print job from a Network Station, to a server, and then to a printer, this technique would increase network traffic, too.
To have a server control your Network Station printing is advantageous in an environment with mixed printer datastreams. Since Network Station applications produce certain datastreams, you may need to send print jobs to a server. The server processes the print job and transforms it into a datastream that your printer understands. Depending on which application creates the job, you may or may not need to transform your print jobs. To eliminate confusion, you should consider having all print jobs sent to the server regardless of whether the job needs transforming or not. In the end, you will have fewer printer entries in IBM Network Station Manager and fewer printer device descriptions on the server.	This may require more administration in IBM Network Station Manager and on the server. Your end users would also need to have a better understanding of printing and networking.

Sending print jobs directly to the printer

The other technique is to set up your printing strategy so that your Network Stations send their print jobs directly to the printer. You reduce printing time since the print job goes directly to the printer. Your server does not bear the load of controlling print jobs. Sending your print jobs directly to the printer also reduces the chance of lost or damaged print jobs. When a server misinterprets a print job, the job may become lost or damaged.

Before you continue . . .

- To ensure correct operation and to take advantage of new functionality, verify and update the boot code of your Network Stations to the latest level. Even if you have new Network Stations, you must verify and update the boot code of your Network Stations. For more information about updating the boot code, see the *Using IBM Network Station Manager* publication.
- For Series 300 and Series 1000 Network Stations, if you use the NVRAM boot method, you must enable DNS support through IBM Network Station Manager. To enable DNS support, see the *Using IBM Network Station Manager* publication.
- The information in the NS Boot Utility (Series 2800 and Series 2200) or Setup Utility (Series 1000 and Series 300) of your Network Stations must agree with your boot method. See the *Using IBM Network Station Manager* publication for more information.

- Verify that you started your DHCP server, HTTP server, and either NFS server or TFTP server. Refer to "Starting and Stopping Servers and Services" on page 42 for instructions.
- Verify that you excluded any statically addressed devices in your DHCP IP address range.
- If you have a router between your Network Stations and your boot server, verify that your router can handle DHCP requests.
- For more information about setting up Network Stations, see the *Using IBM Network Station Manager publication*.

Migrating to your new IBM Network Station Manager release

About this chapter

This chapter provides instructions for migrating your IBM Network Station Manager V1R3 preference files and your existing Network Stations to IBM Network Station Manager V2R1.

The Windows NT Application Event Log documents the status of the migration. If you encounter problems while running migration, refer to "Resolving installation problems" on page 20 for error resolution.

If you manually changed any configuration files in the past, refer to the *IBM Network Station Manager Advanced Information* publication for information on migrating these 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.

Important Considerations

If you plan to migrate from V1R3 to V2R1, read the following information:

- If you need to update your software with V1R3 Service Update 8, you can download V1R3 Service Update 8 from http://www.ibm.com/nc. Service Update 8 includes both IBM Network Station Manager Release 3.08 software and updated eNetwork On-Demand software.

- You can migrate your V1R3 preference files to V2R1 during the IBM Network Station Manager installation, or by running the V2R1 migration utility from a Windows NT command prompt after the IBM Network Station Manager installation. Migration during installation requires that you have V1R3 Service Update 8 installed on the server from which you are migrating.

- If you plan to install V2R1 on your server and maintain V1R3 support for your Network Stations, you need to install V1R3 Service Update 8.

- If you are migrating your V1R3 preference files to V2R1 on the same server where you installed V1R3 and where you store your preference files, run a single-server migration. If you are migrating your preference files from one server to another server, you can do a dual-server migration. Install V2R1 on your second server before attempting a dual-server migration.

- Typically, you group Network Stations that use different boot methods to start up and obtain their kernel files from your server into two client groups. NVRAM Network Station clients and DHCP Network Station clients use different client migration methods to migrate to V2R1. You use the migration utility to migrate NVRAM Network Station clients to V2R1. You change the DHCP configuration to migrate DHCP Network Station clients to V2R1.

- If you have different Network Station hardware on your network, you have to decide which software release should support a particular Network Station. To find out if V2R1 supports a specific Network Station machine type-model, consult Table 1 on page 10. If you find that you need both V2R1 and V1R3 to support your hardware, you may choose to operate both V2R1 and V1R3 through coexistence.

Coexistence

If you have Network Stations that operate only in the V1R3 environment, you need to maintain V1R3 on your server. The coexistence feature of IBM Network Station Manager V2R1 allows both V2R1 and V1R3 to coexist and operate on the same server.

Coexistence requires V1R3 Service Update 8. If you are using a release earlier than V1R3 Service Update 8, update your current software with Service Update 8.

These are the features of the Coexistence option:
- You use the V2R1 login service to login and authenticate your Network Stations.
- You have two IBM Network Station Manager program interfaces. Each interface has its own URL.
- You have two directory structures for IBM Network Station Manager on your server.
- You may need to reconfigure DHCP or NVRAM to point to the V2R1 environment. Refer to "Client Migration" on page 54.
- You have two sets of preference files. You may need to configure users in both the V1R3 and the V2R1 environments.
- You should refer to V1R3 documentation for information about V1R3 and V2R1 documentation for V2R1 information.

If you operate both software versions on the same server, you can run the V2R1 migration utility to specify which Network Stations should operate using V2R1. You also have to change your DHCP and NVRAM configurations such that your Network Stations start from V2R1 software. You can perform this migration on a per Network Station basis.

Migration to V2R1

To migrate your old IBM Network Station Manager environment to V2R1, you carry out two tasks. First, you move your preference files to V2R1 (preference file migration). There are two ways in which you can perform preference file migration. You can run automatic migration during your installation of IBM Network Station Manager V2R1, or you can perform manual migration by running the migration utility from the Windows NT command prompt. After you migrate your preference files, you then configure your Network Stations to start and operate from the new V2R1 software (client migration).

Preference File Migration

If you choose to migrate during installation (automatic migration), the migration utility performs complete migration to V2R1 for all of your V1R3 preference files. These include preference files for users, groups, Network Stations, and system defaults. For more information on migration during installation, refer to "Migration during Installation" on page 49.

If you choose not to migrate during installation, Setup installs V2R1 on your server. Your V1R3 environment remains unchanged.

If you choose to migrate after running the IBM Network Station Manager installation program, you can perform manual migration. You can manually migrate individual preferences or Network Stations by using command-line instructions. You run the migration utility from the Windows NT command prompt to accomplish migration in stages. The command-line interface allows you to specify an individual user, group, or Network Station for migration. For more information on manual migration, refer to "Manual Migration" on page 52.

The migration utility migrates other individual preferences when you run migration. These include 3270/5250 emulators, browser files, login files, V1R3 suppression of login (kiosk) files, and all other files in the user or group directory. When the migration utility migrates the old V1R3 browser files, it renames the old V1R3 NC Navigator browser files, bookmarks.html and address-book.html, to v1r3_bm.htm and v1r3_ab.htm, respectively. The migration utility saves these files under the Network Station user's /NetworkStationV2/userbase/home/[username]/.netscape directory. If you want to continue using your V1R3 browser preference information, you must import these files.

To import your bookmarks file, follow these instructions:
__ 1. Start your Network Station's Netscape Communicator browser.
__ 2. From the main menu, click **Communicator**->**Bookmarks**->**Edit Bookmarks**.
__ 3. From the main menu of the Bookmarks window, click **File**->**Import**.
__ 4. Select the **v1r3_bm.htm** file. Click **Open**.

To import your address book file, follow these instructions:
__ 1. Start your Network Station's Netscape Communicator browser.
__ 2. From the main menu, click **Communicator**->**Address Book**.
__ 3. From the main menu of the Address Book window, click **File**->**Import**.
__ 4. Select an import format and click **Next**.
__ 5. Select the **v1r3_ab.htm** file. Click **Open**.

Preference file migration, whether automatic or manual, is one-way (V1R3 to V2R1). You cannot migrate subsequent changes in V2R1 back to V1R3. Languages and keyboards that were available in V1R3 may not be available in V2R1.

Although you can run the migration utility several times, it is advisable that you run migration only once. If you make changes to the V1R3 environment after running migration, you can remigrate these changes to V2R1 by running migration again. This overwrites any V2R1 changes since the previous migration. Each time migration runs, this process overwrites any settings that were configured in V2R1 prior to running migration again.

Migration during Installation

The IBM Network Station Manager Setup program runs automatic migration when you choose to migrate during installation. Automatic migration requires V1R3 Service Update 8. If you are using a release earlier than V1R3 Service Update 8, update your current software with Service Update 8.

Single-Server Migration

If you have one IBM Network Station Manager server that you wish to completely migrate to V2R1, you should perform a single-server automatic migration.

Table 10 explains the two methods of migrating all of your preference files during a single-server automatic migration.

Table 10. Software Update Methods for Single-Server Automatic Migration

Software Update Method	Use in this Situation
Standard	Simple upgrade of IBM Network Station Manager from V1R3 to V2R1 and complete migration of all V1R3 preference files to V2R1.
Media-assisted	• When you change the server type (for example, from a PDC to a Stand-Alone Server). • When you reinstall the Windows NT operating system.

To do a single-server automatic migration, follow these instructions:

__ 1. If you are using the standard method, skip to Step 2. If you are using the media-assisted method, copy all the files from the following V1R3 directories onto a diskette or other storage media:

- [drive:]\{float}\nstation\userbase
- [drive:]\{float}\nstation\prodbase\configs ({float} is a subdirectory)

__ 2. Install the IBM Network Station Manager by following the instructions in Step "Running the installation" on page 15.

__ 3. On the Migration Location window of the IBM Network Station Manager Setup program, click **Yes** to confirm that you are migrating.

__ 4. On the same window, Setup prompts you to select the location of the V1R3 preference files. If you are using the standard method, skip to Step 5. If you are using the media-assisted method, skip to Step 6.

__ 5. The default location of the V1R3 preference files appears on the source directory box. Make sure that the directory location of your old user preference files appears correctly in the source directory box. Click **Next** to continue with the installation. Skip to Step 7.

__ 6. Enter the disk drive letter and the subdirectory where Setup can access the preference files. This path is [drive:]\nstation\. Make sure that the directory of your old user preference files appears correctly in the source directory box. Click **Next** to continue with the installation.

__ 7. Installation completes and migrates your V1R3 preference files to V2R1. You should move your existing Network Stations to your new IBM Network Station Manager V2R1 software. Refer to "Client Migration" on page 54.

Dual-Server Migration

If you have more than one Windows NT Server in your network, you can run dual-server migration to migrate your current V1R3 user preference files and update your V1R3 software. Your current Network Station users can operate off the old server until you configure and test the new server. You need to install a copy of V2R1 software on one server and test the V2R1 software installation.

To perform a dual-server preference file migration, follow these instructions:

__ 1. On your new server, make sure that you install Windows NT Server 4.0 or Windows NT Server 4.0, Terminal Server Edition with the necessary system requirements. You can check the requirements for your Windows NT server in "Server requirements" on page 13.

__ 2. On your new server, map a network connection to your old server.

    __ a. From your Windows NT server desktop, right-click on the **Network Neighborhood** icon.

    __ b. Select **Map Network Drive**.

    __ c. Enter an unused drive letter that you want to assign to the mapped drive.

    __ d. Enter the directory for the mapped drive (for example, \\V1R3server\C$).

    __ e. Select **Ok**.

       Notes:

       1) You may need to enter a user name and password to map a network connection to the old server.

       2) If you cannot map a network connection between your new server and your old server, see "Migration during Installation" on page 49 for instructions on performing a media-assisted software update method.

__ 3. Create (or replicate) users from your old V1R3 server to your new V2R1 server. Follow these instructions:

    __ a. You need to create the NSMUser and NSMAdmin groups on the new server. Refer to "Creating Users and Groups in Windows NT" on page 29 for instructions.

    __ b. To migrate from a Primary Domain Controller to a Member Server of a domain, copy the users from your old server to your new server. Copy the users from the old NSMUser and NSMAdmin groups on your old server to the new NSMUser and NSMAdmin groups on your new server.

       You may also add global groups from the Primary Domain Controller to the NSMUser and NSMAdmin groups on your new server.

    __ c. If you are migrating to a Stand-Alone server, you need to manually create all of your users on the new server. You must then add them to the NSMUser and NSMAdmin groups as appropriate. Refer to "Adding Users and Groups in Windows NT" on page 30 for instructions.

__ 4. Install the IBM Network Station Manager by following the instructions in Step "Running the installation" on page 15.

__ 5. On the Migration Location window of the IBM Network Station Manager Setup program, click **Yes** to confirm that you are migrating.

__ 6. On the same window, Setup prompts you to select the location of the V1R3 preference files. Enter the disk drive letter and the subdirectory where Setup can access the preference files. This path is `[drive:]\nstation\`. Make sure that the directory of your old user preference files appears correctly in the source directory box. Click **Next** to continue with the installation.

__ 7. Installation completes and migrates your V1R3 preference files to V2R1. You should move your existing Network Stations to your new IBM Network Station Manager V2R1 software. Refer to "Client Migration" on page 54.

Manual Migration

You run manual migration from the Windows NT command prompt. The migration utility enables you to copy V1R3 configurations and users to the V2R1 environment. The V1R3 operating environment remains unchanged. Because V2R1 can coexist with V1R3, you may or may not remove the previous product prior to the installation of V2R1. You can uninstall the V1R3 environment after the migration utility migrates the configuration information and user information. After you uninstall the V1R3 environment and delete the V1R3 preference files, you can no longer run the migration utility, nor perform preference file migration.

The Migration Utility

The migration utility has the following requirements and features:

- Your V2R1 server must have access to where your V1R3 preference files are.
- If you have Network Stations which you plan to support with V1R3, then you need to apply Service Update 8 to your V1R3 release. The migration utility does not support migration from a release earlier than V1R3.
- You can only run the migration utility from a server that has V2R1 installed.
- Only users with administrator authority (members of the NSMAdmin group) can run the V2R1 migration utility.
- The migration utility does not include an option to delete V1R3. You can manually uninstall the V1R3 environment after the migration utility migrates the configuration information and user preference files to V2R1.

  Note: If you are supporting any Series 100 (8361-100 and 8361-200) Network Stations or Series 300 (twin-axial 8361-341) Network Stations, you must install V1R3 Service Update 8. You need V1R3 Service Update 8 to operate and maintain these Network Stations. You can still operate other Network Stations in V2R1. Refer to "Coexistence" on page 48 for more information on how you can still operate other Network Stations in V2R1 while maintaining V1R3-supported Network Stations.

- After you manually uninstall the V1R3 environment and delete the V1R3 preference files, you no longer need to run the migration utility.
- Although you can run the migration utility several times, even over the same users, groups, or Network Stations, you should migrate preference files only once. Each time the migration utility runs, it writes over any existing V2R1 preference files.
- The migration utility can perform client migration for Series 300 (8361-110 and 8361-210) and Series 1000 (8362-all models) Network Stations. However, you have to manually configure DHCP and NVRAM for each Network Station. Refer to "Client Migration" on page 54 for instructions.

The migration utility is in **[drive:]\{float}\NetworkStationV2\servbase\bin**. You can run the migration utility from the Windows NT command prompt by using the following command structure:

nsmv2migr {parameter1 <attribute1>...<attribute#>}...{parameter# <attribute1>...<attribute#>}

Table 11 on page 53 explains the different parameters for running the migration utility.

Table 11. Migration Utility Command Parameters

Parameter	Description and Format
-A	Complete migration for all users, all groups, all terminals, and system preferences. This parameter does not migrate the Network Station clients. The command structure is `nsmv2migr -A`.
-S	Migrates system preference levels from V1R3 to V2R1. The command structure is `nsmv2migr -S`.
-U	Migrates user preference files. To migrate user preference files, the command structure is `nsmv2migr -U username1 <username2 . . . username#>`. To migrate all user preference files, the command structure is `nsmv2migr -U *ALL`.
-G	Migrates group preference files. To migrate group preference files, the command structure is `nsmv2migr -G groupname1 <groupname2 . . . groupname#>` To migrate all group preference files, the command structure is `nsmv2migr -G *ALL`.
-T	Migrates Network Station preference files. To migrate Network Station preference files, the command structure is `nsmv2migr -T NSname1 <NSname2 . . . NSname#>`. To migrate all Network Stations, the command structure is `nsmv2migr -T *ALL`.
-P	Specifies the directory path from which you can migrate. You specify the root directory path for the old V1R3 preference files. This flag can specify a directory path from the same server (single-server migration), or another server (dual-server migration) that is connected via a LAN to your server. When you do not specify a directory path, the migration utility looks for the preference files in your current server. To migrate preference files from another server, the command structure is `nsmv2migr -P <drive:\nstation>`. **Note:** If you plan to run a dual-server migration by using this parameter, make sure that you created your V1R3 user information on your new V2R1 server. Otherwise, the dual-server migration will not migrate your V1R3 preference files. Refer to "Dual-Server Migration" on page 50 and follow Steps 1 to 3.
-C	Client migration for all Series 1000 (8362 - all models) and Series 300 (8361-110 and 8362-210). Since this flag forces all of your Series 1000 (8362 - all models) and Series 300 (8361-110 and 8362-210) Network Stations to start from the V2R1 software, you should use this option with caution. To migrate your Network Stations to V2R1, the command structure is `nsmv2migr -C`. Refer to "Client Migration" on page 54 for testing instructions. **Notes:** 1. This parameter only applies to NVRAM Network Station clients. You can only use this option in a single-server migration, where V1R3 and V2R1 are both installed on the same server. 2. Running the migration utility with this parameter does not affect Series 100 Network Stations and Series 300 Twin-Axial Network Stations (8361-341 machine-type) on your network.

The following are examples of how to run the migration utility with the different parameters:

Example 1: dual-server migration of preference files for system defaults, two users, one group and a Network Station

```
nsmv2migr -P j:\nstation -S -U John Jane -G NSMAdmin -T NSAlpha
```

This migration utility command migrates system preferences, user preference files of *John* and *Jane*, group preference files of the *NSMAdmin* group, and Network Station preference files of the *NSAlpha* Network Station from another computer. The server that is running the migration utility has a mapped network connection to the [drive]:\nstation directory of the other computer via a LAN for the old preference files. This directory appears as network drive and directory, j:\nstation, on the current server.

Example 2: single-server migration of preference files for system defaults, all users, and two Network Stations

```
nsmv2migr -S -U *ALL -T NSDelta NSBeta
```

This migration utility command migrates system preferences, preference files for all users, and Network Station preference files for Network Stations *NSDelta* and *NSBeta*. V1R3 is installed on the same server where you are running migration.

Example 3: single-server migration of preference files for system defaults and two groups

```
nsmv2migr -S -G artdept newsdept
```

This migration utility command migrates system preferences and preference files of the *artdept* and *newsdept* groups. V1R3 is installed on the same server where you are running migration.

Example 4: single-server migration of all Network Station NVRAM clients

```
nsmv2migr -C
```

This migration utility command migrates all NVRAM Network Station clients, except Series 100 (all models) and Series 300 Twin Axial (8361-341). V1R3 is installed on the same server where you are running migration.

Client Migration

You run client migration when you have Network Stations that were previously supported in V1R3 but you now plan to operate using V2R1. These are Series 1000 (8362 - all models) Network Stations and Series 300 (8361-110 and 8362-210) Network Stations.

You run client migration after you complete preference file migration. It is advisable that you run client migration only once.

Client Migration for DHCP clients

To move your existing DHCP Network Station clients[7] to your new IBM Network Station Manager V2R1 software, follow these instructions:

__ 1. Install and configure DHCP as instructed in "Configuring DHCP for your network" on page 32.

__ 2. In your current DHCP configuration, set the following DHCP options so that the following values apply to all of your Network Stations:

   • Option 66: IP address of the boot server
   • Option 67: /NetworkStationV2/prodbase/ppc/[your kernel filename]

   Refer to Table 7 on page 34 for the correct kernel filename.

__ 3. Configure DHCP option 211 as a global parameter with the value ″nfs″ or ″tftp″.

---

7. If you support Series 100 Network Stations or Series 300 Twin-Axial Network Stations, you must continue to support these Network Stations in V1R3. If you start these Network Stations through DHCP, you must configure a separate class for these DHCP Network Station clients. Refer to "Creating a Class for your thin clients" on page 36 for instructions. Specify V1R3 values when you configure DHCP options for this class so they can continue to operate using V1R3.

Notes:

    a. If you select ″tftp″ as your boot protocol, the kernel downloads via the TFTP protocol. The Network Station then switches to the NFS protocol for all other data transfers.

    b. Option 211 does not exist on the Microsoft DHCP interface. To create a new DHCP option while using Microsoft DHCP, refer to "Installing Microsoft DHCP" on page 14.

__ 4. Restart one Series 1000 (8362 - all models) or Series 300 (8361-110 and 8362-210) Network Station as a test client. The server automatically updates the boot PROM of the Network Station and the test client restarts automatically.

    Note: Do not touch the Network Station while the Network Station boot PROM updates. If you interrupt the boot PROM update, you have to replace the Network Station.

__ 5. If the test client has a token-ring adapter, it updates again and restarts automatically.

__ 6. Restart the test client to check the DHCP configuration.

__ 7. If everything appears correctly on your test client, restart[8] all of the remaining Network Stations that you plan to move over to the new V2R1 server.

__ 8. Test your Network Stations to see if the user profile information is correct.

Client Migration for NVRAM clients

To move your existing NVRAM Network Station clients to your new IBM Network Station Manager V2R1 software, follow these instructions:

__ 1. Test one Series 300 (8361-110 or 8361-210) Network Station or Series 1000 (8362-A22, 8362-A23, 8362-A52, or 8362-A53) Network Station.

    __ a. Power on the Network Station.

    __ b. Wait for the message ″*NS0500 Searching for Host System*″ to appear on the screen. Press the Esc key to bring up the IBM Network Station Setup Utility main screen.

        If password control is active, you must enter the case-sensitive Administrator password.

    __ c. From the Setup Utility main screen, press F3, Set Network Parameters.

        __ 1) Enter the IP address of your new boot server in the First Boot Host IP Address field.

            If you did not change your boot server, or if you did not perform a dual server preference file migration, the IP address value here remains the same.

        __ 2) Press Enter to save your changes.

    __ d. From the Setup Utility main screen, press F4, Set Boot Parameters.

        __ 1) Enter /NetworkStationV2/prodbase/ppc/ in the Boot Directory field.

        __ 2) Enter the correct kernel filename in the Boot File field. Refer to Table 7 on page 34 for the correct filename for your test Network Station.

---

8. If you have several Network Stations that you need to restart, you can restart these clients remotely by using a special command. Refer to the *IBM Network Station Manager Advanced Information* publication for more information.

              __ 3) Press Enter to save your changes.

       __ e. From the Setup Utility main screen, press F5, Set Configuration Parameters.

              __ 1) Enter /NetworkStationV2/userbase/profiles in the First Configuration Directory field.

              __ 2) Press Enter to save your changes.

       __ f. From the Setup Utility main screen, press Enter to restart your test Network Station.

       __ g. Your new V2R1 server automatically updates the boot PROM of your Network Station when your test Network Station client restarts.

          Note: Do not touch the Network Station during the boot PROM update. If you interrupt the boot PROM update, you have to replace the Network Station.

       __ h. Restart the test Network Station client.

       __ i. Test your Network Station to see if the preference information is correct.

       __ j. If everything appears correctly on your test Network Station, go to Step 2.

__ 2. From a Windows NT command prompt, run the migration utility by using the client migration parameter[9] (`nsmv2migr -C`). Refer to Table 11 on page 53 for the command structure.

__ 3. Restart the test client without making any changes to the Network Station. The Network Station starts from the new IBM Network Station Manager V2R1 software. The server may also automatically update the Network Station boot PROM so that the Network Station restarts automatically.

    Note: Do not touch the Network Station during the boot PROM update. If you interrupt the boot PROM update, you have to replace the Network Station.

__ 4. If your Network Station has a token-ring adapter, it updates again and restarts automatically.

__ 5. Each time you restart the test Network Station it starts from the new IBM Network Station Manager software. Test the user preference files on the test client. If everything appears correctly, repeat the instructions from step 3 for all of the clients that you want to migrate.

__ 6. Once you migrate all of the clients so that they start from the new server, test your Network Stations to see if the preferences are correct.

---

9. You can only use this option in a single-server migration, where V1R3 is still installed on your server. Running the migration utility with this parameter does not affect Series 100 Network Stations and Series 300 Twin-Axial Network Stations (8361-341 machine-type) on your network.

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