

NetVista™ Thin Client



Installing IBM Network Station Manager V2R1 on Windows 2000 August 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 47.

First Edition (August 2000)

This edition applies to Version 2, Release 1, Modification 0 of IBM Network Station Manager (product number 5648-C07) and to all subsequent releases and modifications until otherwise indicated in new editions.

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About this book

Installing IBM Network Station Manager V2R1 on Windows 2000 (SA23-2811) 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 2000 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 2000 server should read this publication.

Information on the Internet

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

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

1. Click **NetVista**.
2. Click **NetVista thin client**.



- You can obtain the latest version of this information at the following URL:

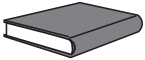
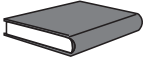
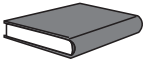
<http://www.ibm.com/nc/pubs>

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 .

	Information name	Information description
	Installing IBM Network Station Manager on Windows NT, SC41-0688	Describes the installation and simple configuration of a Windows NT Network Station environment. It is shipped with the IBM Network Station Manager licensed program. Updates to this information are at http://www.ibm.com/nc/pubs .
	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 available 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.

- If you prefer to send comments by mail, use the readers' comment form with the address that is printed on the back. If you are mailing a readers' comment form from a country other than the United States, you can give the form to the local IBM branch office or IBM representative for postage-paid mailing.
- If you prefer to send comments by FAX, use either of the following numbers:
 - United States and Canada: 1-800-937-3430
 - 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:

- The name of the book.
- The publication number of the book.
- The page number or topic to which your comment applies.

Understanding the IBM Network Station

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IBM Network Station overview

The IBM Network Station Manager licensed program code is made up of several programs that are installed on a server. One of these programs is 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 Network Station does not contain a hard drive, the Network Station accesses a server to download the client operating system, client programs, and data. After the Network Station loads the client operating system, the Network Station displays a graphical user interface (GUI). The GUI can provide the user access to the following resources:

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

The Network Station communicates using Transmission Control Protocol/Internet Protocol (TCP/IP) over a token-ring connection or Ethernet connection to a server. Each Network Station 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 Network Station.

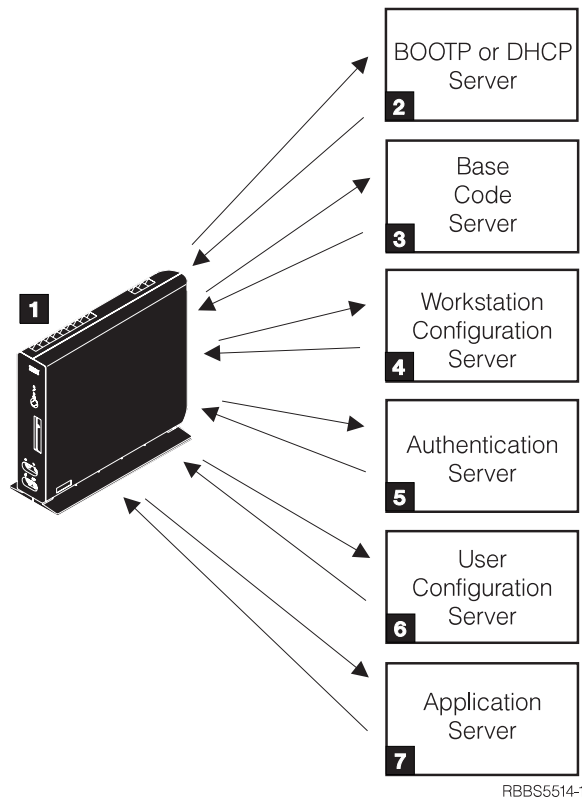


Figure 1. Thin client power-on sequence

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

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

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

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

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

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

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

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

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

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

TCP/IP overview

In order for the Network Station to communicate with your servers, you need a TCP/IP network. If you understand your TCP/IP network, installing and configuring your Network Station and 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).

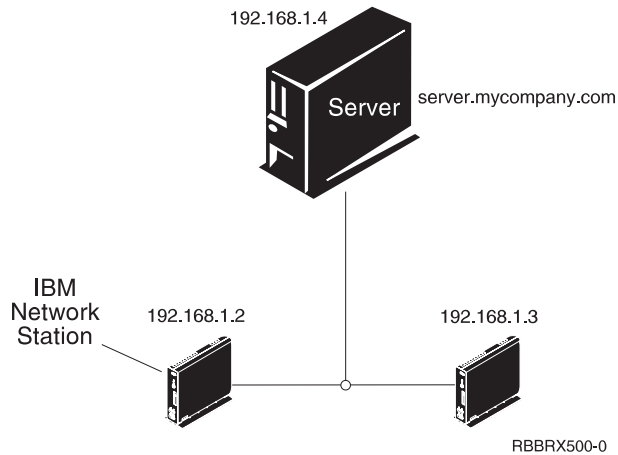


Figure 2. Two Network Stations connected to the server over a simple LAN

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.

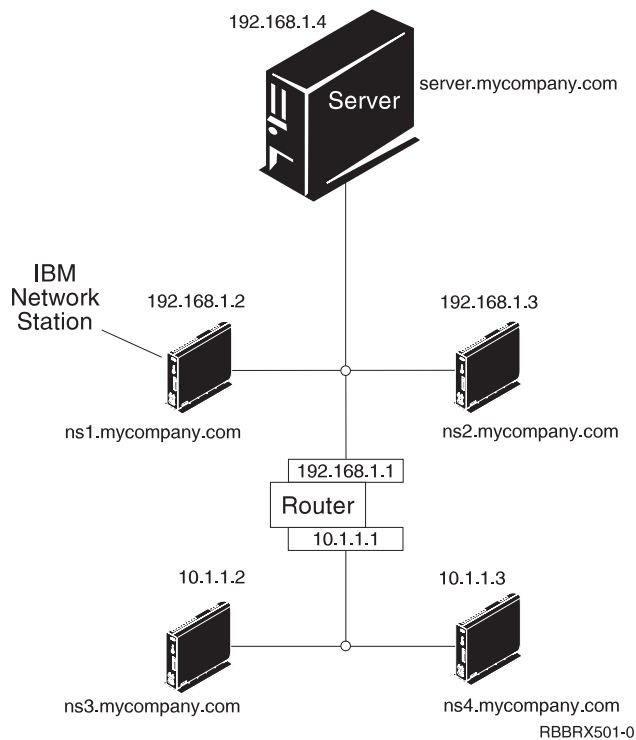


Figure 3. Two Network Stations connected to the server over a local LAN and two Network Stations connected to the server through a router over a remote LAN

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.

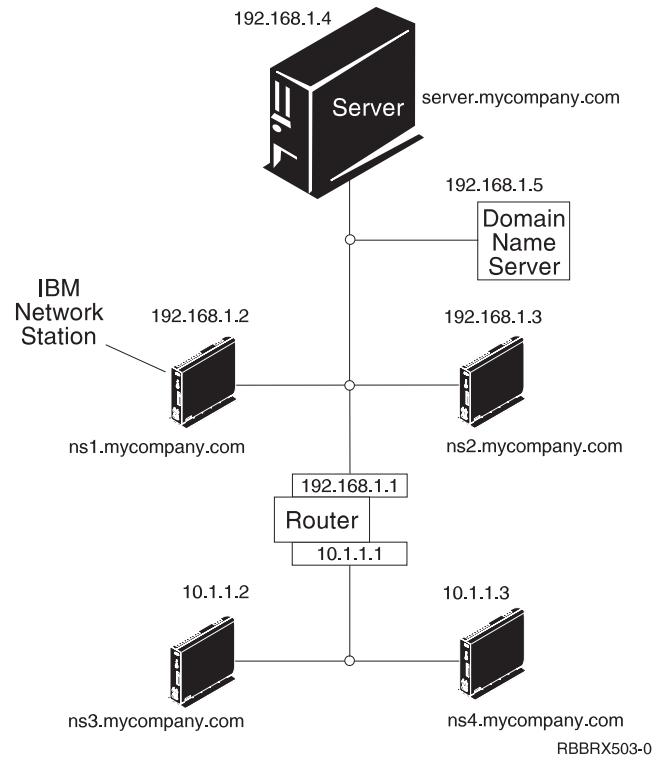


Figure 4. Four Network Stations connected to a network using a router and a domain name server

MAC addresses

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

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

IP addresses

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

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

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

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

Boot methods

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

- Dynamic Host Control Protocol (DHCP)
- 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 Network Station within a predetermined range of IP addresses. You can also use DHCP to assign IP addresses either statically or dynamically.

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

In dynamic IP address assignment, the server still identifies a Network Station by its MAC address. However, instead of using a fixed IP address, the server allocates any address out of the available pool. The server leases the address to the Network

Station for a specified period of time. The address returns to the pool either when the client releases it or when the lease runs out.

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

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 Network Station memory. When you use the NVRAM boot method, you code the IP addresses of the Network Station and its server into the memory of the individual Network Station. The Network Station powers on and requests the download of the base code file from the server.

The NVRAM boot method is most practical in small, stable networks. You may also choose to use the NVRAM boot method for one of the following reasons:

- As a method to avoid routers that block 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 Network Station 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 Network Station 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 Network Station allows the user to access applications without using permanent disk space either on the Network Station or on the server.

There are two kinds of Java programs:

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

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

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

Windows applications on the Network Station

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

- Citrix WinFrame is a multi-user Windows application server that is based on Windows NT 3.51. Citrix WinFrame communicates to the Network Station by using the independent computer architecture (ICA) protocol.
- NCD WinCenter is a multi-user Windows application product that requires Citrix WinFrame or Microsoft Windows NT Server 4.0, Terminal Server Edition. NCD WinCenter communicates to the Network Station by using the X11 protocol.
- Citrix MetaFrame is a multi-user Windows application product that is supported by Microsoft Windows NT Server 4.0, Terminal Server Edition, and Microsoft Windows 2000 Servers. Citrix MetaFrame communicates to the Network Station by using the ICA protocol.

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

For more information, see the following Web sites:

- WinFrame and MetaFrame - <http://www.citrix.com>
- WinCenter - <http://www.ncd.com>
- Windows NT Server 4.0, Terminal Server Edition - <http://www.microsoft.com>
- 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 Communicator 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 Network Station hardware by machine type, model number, and series. It also shows which version and release of the IBM Network Station Manager licensed program is required to support a particular hardware machine type and model.

For example:

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

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

Compatible release	Machine type - model				
	Series 100	Series 300	Series 1000	Series 2200	Series 2800
V2R1 only				8363-Exx 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 system¹ 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.

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

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About this section

This section provides information on planning and running a **typical installation** of IBM Network Station Manager V2R1 on a Windows 2000 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 2000 server	Install IBM Network Station Manager for the first time on the same Windows 2000 server	<ol style="list-style-type: none"> 1. Read important release information. See “Important information” on page 16. 2. Ensure that your Windows 2000 server meets the server requirements. See “Server requirements” on page 16. 3. Verify that your Windows 2000 server runs the prerequisite software. See “Prerequisite software” on page 17. 4. Install IBM Network Station Manager V2R1. See “Running the installation” on page 18.
Single-server: operating system upgrade		
A single Windows NT® server with IBM Network Station Manager V2R1 installed	<ul style="list-style-type: none"> • 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 	<ol style="list-style-type: none"> 1. Upgrade your server operating system to Windows 2000 Server. Refer to Microsoft® documentation for more information. <ol style="list-style-type: none"> a. Read important release information. See “Important information” on page 16. b. Ensure that your Windows 2000 server meets the server requirements. See “Server requirements” on page 16. c. Verify that your Windows 2000 server runs the prerequisite software. See “Prerequisite software” on page 17. 2. Apply the latest Service Update for IBM Network Station Manager V2R1.
* Dual-server: operating system upgrade		

Current server environment	Upgrade goals	Upgrade paths
<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Move IBM Network Station Manager V2R1 from the Windows NT server to the Windows 2000 server 	<ol style="list-style-type: none"> 1. Read important release information. See “Important information” on page 16. 2. Ensure that your Windows 2000 server meets the server requirements. See “Server requirements” on page 16. 3. Verify that your Windows 2000 server runs the prerequisite software. See “Prerequisite software” on page 17. 4. From the Windows 2000 server, map a connection to the Windows NT server, and copy the entire [drive:]\NetworkStationV2\userbase directory from the Windows NT server to the Windows 2000 server. Note: When you install IBM Network Station Manager, the setup program resets the permissions on the \userbase directory to work correctly on the Windows 2000 server. 5. Install IBM Network Station Manager V2R1 on the Windows 2000 server. See “Running the installation” on page 18 6. Uninstall IBM Network Station Manager V2R1 on the Windows NT server through the Add/Remove Programs utility in the Control Panel. See “Uninstalling IBM Network Station Manager” on page 22.
Single-server: operating system upgrade and IBM Network Station Manager migration		

Current server environment	Upgrade goals	Upgrade paths
<p>A single Windows NT server with IBM Network Station Manager V1R3</p> <p>Attention: If you have thin clients that you need to support with V1R3, ensure that you maintain V1R3 on a Windows NT server.</p>	<ul style="list-style-type: none"> • 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 	<ol style="list-style-type: none"> 1. Apply the latest V1R3 Service Update to your V1R3 software on the Windows NT server. You can download the latest V1R3 Service Update from http://techsupport.services.ibm.com/nc. Note: The latest V1R3 Service Update ensures that you can successfully migrate from V1R3 to V2R1. 2. If you use IBM DHCP, disable or stop the IBM DHCP server. 3. Uninstall the following software through the Add/Remove Programs applet in the Windows NT Control Panel: <ul style="list-style-type: none"> • IBM Network Station Manager V1R3 (see “Uninstalling IBM Network Station Manager” on page 22). • Lotus® Domino™ Go Webserver 4. Upgrade your server operating system to Windows 2000 Server. Refer to Microsoft documentation for more information. <ol style="list-style-type: none"> a. Read important release information. See “Important information” on page 16. b. Ensure that your Windows 2000 server meets the server requirements. See “Server requirements” on page 16. c. Verify that your Windows 2000 server runs the prerequisite software. See “Prerequisite software” on page 17. 5. Install IBM Network Station Manager V2R1. See “Running the installation” on page 18. Note: Migrate your V1R3 preference files to V2R1. See “Migrating to your new IBM Network Station Manager release” on page 39.
<p>* Dual-server: operating system upgrade and IBM Network Station Manager migration</p>		
<ul style="list-style-type: none"> • 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 <p>Attention: If you have thin clients that you need to support with V1R3, ensure that you maintain V1R3 on a Windows NT server.</p>	<ul style="list-style-type: none"> • 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 	<ol style="list-style-type: none"> 1. Apply the latest V1R3 Service Update to your V1R3 software on the Windows NT server. You can download the latest V1R3 Service Update from http://techsupport.services.ibm.com/nc. 2. Read important release information. See “Important information” on page 16. 3. Ensure that your Windows 2000 server meets the server requirements. See “Server requirements” on page 16. 4. Verify that your Windows 2000 server runs the prerequisite software. See “Prerequisite software” on page 17. 5. Install IBM Network Station Manager V2R1 on the Windows 2000 server. See “Running the installation” on page 18. Note: Migrate your V1R3 preference files to V2R1. See “Migrating to your new IBM Network Station Manager release” on page 39.

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 39 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 2000 server meets these system requirements.

Table 2. Server Requirements

Server requirement	How to check for the requirement
<p>Your Intel-based server must run any of the following operating system software:</p> <ul style="list-style-type: none"> • Windows 2000 Server • Windows 2000 Advanced Server 	<p>__ 1. From your Windows 2000 server desktop, click Start->Settings->Control Panel->System.</p> <p>__ 2. Click the General tab.</p> <p>__ 3. Verify that the correct Windows 2000 Server software is installed.</p>
<p>Your server must be configured as one of the following:</p> <ul style="list-style-type: none"> • Stand-alone server • Domain member (member server of a domain) • Domain controller <p>IBM recommends the installation and configuration of a thin client environment on a stand-alone server or a domain member server.</p>	<p>__ 1. From your Windows 2000 server desktop, click Start->Settings->Control Panel->System.</p> <p>__ 2. Click the Network Identification tab.</p> <p>__ 3. Verify that your server is a member of either a domain or a workgroup.</p>
<p>Your server must have at least 500 MB of free hard disk space to accommodate IBM Network Station Manager and other required software.</p> <p>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.</p>	<p>__ 1. From your Windows 2000 server desktop, double-click on the My Computer icon.</p> <p>__ 2. Right-click on the drive where you plan to install IBM Network Station Manager.</p> <p>__ 3. Select Properties, and click the General tab.</p> <p>__ 4. Verify that you have enough free hard disk space to accommodate the IBM Network Station Manager software.</p>

Table 2. Server Requirements (continued)

Server requirement	How to check for the requirement
The file system of your server must be NTFS.	<ul style="list-style-type: none"> ___ 1. From your Windows 2000 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.
Your server must have correct regional settings.	<ul style="list-style-type: none"> ___ 1. From your Windows 2000 server desktop, click Start->Settings->Control Panel->Regional Options. ___ 2. Click the General tab. ___ 3. Check to see if your locale is highlighted. ___ 4. Click Set Default. ___ 5. Select your locale from the pulldown list, and click OK. ___ 6. Click Apply, and then click OK.

Prerequisite software

Verify that your Windows 2000 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
- Microsoft Internet Information Server 5.0 (IIS) or higher
- Microsoft Dynamic Host Control Protocol (DHCP²)

Notes:

1. The Windows 2000 thin client environment does not support Lotus Domino Go Webserver and IBM DHCP. If you currently have any of these software, you must convert or upgrade to the prerequisite software.
2. You can use the IBM Network Station Manager installation CD to install Netscape Communicator on your server.
3. You need the Windows 2000 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 2000 installation CD into your CD-ROM drive.

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

- __ 2. From your server desktop, select **Start->Programs->Administrative Tools->Configure your Server**.
The Windows 2000 Configure your Server window appears.
- __ 3. Click **Networking**, and then click **DHCP**.
- __ 4. Click **Start the Windows Components Wizard**.
The Windows Components Wizard appears.
- __ 5. Highlight **Networking Services** from the list of components, and click **Details**.
The Networking Services window appears.
- __ 6. Select **Dynamic Host Configuration Protocol (DHCP)**, and click **OK**.
The Networking Services window closes, and the Windows Components Wizard appears.
- __ 7. Click **Next** to install DHCP on your server.
- __ 8. Click **Finish** to close the Windows Components Wizard.

Installing Microsoft IIS

Follow these steps to install Microsoft IIS:

- __ 1. Insert the Windows 2000 installation CD into your CD-ROM drive.
- __ 2. From your server desktop, select **Start->Programs->Administrative Tools->Configure your Server**.
The Windows 2000 Configure your Server window appears.
- __ 3. Click **Web/Media Server**, and then click **Web Server**.
- __ 4. Click **Start the Windows Components Wizard**.
The Windows Components Wizard appears.
- __ 5. Highlight **Internet Information Services (IIS)** from the list of components, and click **Details**.
The Internet Information Services (IIS) window appears.
- __ 6. Select the following minimum components, and click **OK**.
 - Common Files
 - Internet Information Services Snap-In
 - Internet Services Manager (HTML)
 - World Wide Web ServerThe Internet Information Services (IIS) window closes, and the Windows Components Wizard appears.
- __ 7. Click **Next** to install IIS on your server.
- __ 8. Click **Finish** to close the Windows Components Wizard.

Running the installation

These instructions pertain to a **typical installation** of IBM Network Station Manager V2R1 on a Windows 2000 server.

Attention: If you choose another type of installation, some screens³ 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 2000 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. Click **Next** to install IBM Network Station Manager in the default directory.⁴
- ___ 11. Select **Typical Install**, and click **Next**.

Notes:

- a. For general information on the types of installation, refer to “Types of Installation” on page 20.
 - 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.
- ___ 12. Click **Next** to add icons to the default program folder.
 - ___ 13. 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.
 - ___ 14. Click **Next** to install eNetwork™ On-Demand Server (eNOD) in the default directory.
 - ___ 15. Select any additional options to install, and click **Next**.
 - ___ 16. Click **Next** to accept the current settings.

The setup program stores your installation settings in a log file, **[drive:]\NetworkStationV2\instops.txt**.
 - ___ 17. Click **Yes** to begin copying files.

The setup program installs the components and options you selected on your server.
 - ___ 18. Click **Finish** to restart your computer, and complete the setup program.

If you have additional software components to install, refer to “Installing the strong encryption (128-bit) products” on page 22.

If you encountered errors during the installation, refer to “Resolving installation problems” on page 22.

3. 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 39 for more information.

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

To configure your thin client environment, read “Configuring a thin client environment” on page 31.

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 <i>IBM Network Station Advanced Information</i> online publication for more information. 2. For a general description of each component, read “Components of IBM Network Station Manager”.
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 <i>IBM Network Station Advanced Information</i> 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 <i>IBM Network Station Advanced Information</i> 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 on page 21 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 2000 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 any software that IBM Network Station Manager from your Windows 2000 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. 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 with your installation error, and follow the steps to resolve the problem. 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. <ol style="list-style-type: none">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	<p>The setup program cannot configure Microsoft Internet Information Server.</p> <p>Follow these steps to configure IIS manually:</p> <ul style="list-style-type: none"> • From your Windows 2000 server desktop, click Start->Programs->Administrative Tools-> Computer Management. • From the Tree area, click Services and Applications->Internet Information Services. • Select the Default web site. • From the Actions menu, select New->Virtual Directory. <ol style="list-style-type: none"> 1. For Alias to be used to access virtual directory, enter networkstationv2, and click Next. 2. For the path, enter [drive:]\{float}\NetworkStationV2\servbase\html, and click Next. 3. Select Allow Read Access only, and click Next. 4. Click Finish. 5. Right-click networkstationv2 and select Properties. <ol style="list-style-type: none"> a. Select the Documents tab. b. Check enable Default Document, and click Add. c. Enter admin.htm. d. Select the Directory Security tab, and click Edit. e. Check Basic Authentication (Password is sent in clear text.), and click OK. f. Click OK to close the networkstationv2 properties dialog box. 6. Right-click networkstationv2. 7. From the Actions menu, select New->Virtual Directory. <ol style="list-style-type: none"> a. For Alias to be used to access virtual directory, enter admin, and click Next. b. For the path, enter [drive:]\{float}\NetworkStationV2\servbase\cgi-bin, and click Next. c. Select Allow execute access (includes script access) only, and click Next. d. Click Finish. 8. Right-click admin and select Properties. <ol style="list-style-type: none"> a. Select the Documents tab. b. Check enable Default Document, and click Add. c. Enter nsmcgain.exe. d. Select the Directory Security tab, and click Edit on the Anonymous Access and Authentication Control box. e. Check Basic Authentication (Password is sent in clear text.), and click OK. f. Click OK to close the networkstationv2 properties dialog box. 9. From the Actions menu, select New->Virtual Directory. <ol style="list-style-type: none"> a. For Alias to be used to access virtual directory, enter cgi, and click Next. b. For the path, enter [drive:]\{float}\NetworkStationV2\servbase\cgi-bin, and click Next. c. Select Allow execute access (includes script access) only, and click Next. d. Click Finish. 10. Select the Default web site.

Table 5. Common Installation Errors (continued)

Error message	How do I resolve the error?
	<ul style="list-style-type: none"> • From the Actions menu, select New->Virtual Directory. <ol style="list-style-type: none"> 1. For Alias to be used to access virtual directory, enter flashconfigs, and click Next. 2. For the path, enter [drive:]\{float}\NetworkStationV2\userbase\flash\ImageConfigs, and click Next. 3. Select Allow Read Access only, and click Next. 4. Click Finish. 5. Right-click flashconfigs and select Properties. <ol style="list-style-type: none"> a. Select the Documents tab. b. Check enable Default Document, and click Add. c. Enter admin.htm. d. Select the Directory Security tab, and click Edit on the Anonymous Access and Authentication Control box. e. Check Basic Authentication (Password is sent in clear text.), and click OK. f. Click OK to close the networkstationv2 properties dialog box.
Cannot find file system.	<p>The drive or partition where you plan to install IBM Network Station Manager may be damaged.</p> <p>Select a fixed drive for the IBM Network Station Manager installation.</p>
Cannot install the IBM Network Station Login Service.	<p>The setup program cannot install the IBM Network Station Login Service.</p> <ol style="list-style-type: none"> 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.	<p>The setup program cannot locate the Domain Controller name for your Windows 2000 server.</p> <p>Verify that your Windows 2000 Domain Controller is responding to requests and is accessible from the network.</p>
Corrupted AS/400® Integrated PC Server Registry.	<p>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.</p> <ol style="list-style-type: none"> 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.

Table 5. Common Installation Errors (continued)

Error message	How do I resolve the error?
Error configuring NFS.	<p>The setup program cannot configure NFS properly.</p> <p>Follow these steps to configure NFS manually:</p> <ol style="list-style-type: none"> 1. From your Windows 2000 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. 11. Select NSMNFS_User, and click Add. 12. Select NSM_NFSRoot, and click Add. 13. From the pulldown menu, click File->Save.
Error configuring TFTP.	<p>The setup program cannot configure TFTP properly. Configure TFTP properly. Follow these instructions:</p> <ol style="list-style-type: none"> 1. From your Windows 2000 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.
Error creating user directories.	<p>The setup program did not create some or all of the following directories:</p> <pre> /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/ </pre> <p>The setup program did not create some or all of the following base permissions:</p> <ul style="list-style-type: none"> • Full Control for Administrators, NSMAdmin, and SYSTEM • Read for NSMUser <p>Follow these steps:</p> <ol style="list-style-type: none"> 1. Exit from 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?
<ul style="list-style-type: none"> • Error launching eNetwork On-Demand Server installation. • Error creating input file for eNetwork On-Demand Server installation. 	<p>The setup program cannot install eNOD properly.</p> <p>Install the eNOD services manually. Follow these instructions:</p> <ol style="list-style-type: none"> 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 2000 Run command box. 4. Follow the installation instructions. 5. Select Finish to restart your computer and complete the eNOD services installation.
<p>Error updating path environment variable.</p>	<p>The setup program cannot add the necessary entries to the system path.</p> <p>Add IBM Network Station Manager to the system path manually.</p> <p>Follow these steps to update the path environment variable manually:</p> <ol style="list-style-type: none"> 1. From your Windows 2000 server desktop, click Start->Settings->Control Panel->System. 2. Click the Advanced tab. 3. Under Environment 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.
<p>Error while trying to synchronize the /etc/hosts file.</p>	<p>This file was not correctly set up. Use the following sample to replace this file manually:</p> <p>Example for:</p> <pre>[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</pre> <p>Format: <Server IP Address> <computer name> <fully qualified computer name></p>
<p>File system is not NTFS.</p>	<p>The drive or partition where you plan to install IBM Network Station Manager must be formatted using NTFS.</p> <ol style="list-style-type: none"> 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.

Table 5. Common Installation Errors (continued)

Error message	How do I resolve the error?
<p>Installation was unable to configure the /etc/resolv.conf file.</p>	<p>This file was not correctly set up. Use the following sample to replace these files manually:</p> <p>Files to be replaced:</p> <pre>[drive:]\{float}\NetworkStationV2\prodbase\ppc\etc\resolv.conf [drive:]\{float}\NetworkStationV2\prodbase\x86\etc\resolv.conf</pre> <p>Format:</p> <pre>domain <domain name> search <domain name 1> . . . <domain name n> nameserver <name server IP address> . . . nameserver <name server IP address> lookup file bind</pre> <p>Example:</p> <pre>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</pre>
<p>Migration internal error. Run the migration utility from the command line.</p>	<p>An invalid parameter was used to run migration.</p> <ol style="list-style-type: none"> 1. Check the Windows 2000 Application Event Log for more information. 2. Refer to Table 9 on page 43 for valid migration parameters. 3. Run the migration utility from the command line.
<p>Migration utility initialization failed. Run the migration utility from the command line.</p>	<p>An invalid parameter was used to run migration, or the migration program did not complete successfully.</p> <ol style="list-style-type: none"> 1. Check the Windows 2000 Application Event Log for more information. 2. Refer to Table 9 on page 43 for valid migration parameters. 3. Run the migration utility from the command line.
<p>Migration utility parameter not valid. Run the migration utility from the command line.</p>	<p>An invalid parameter was used to run migration.</p> <ol style="list-style-type: none"> 1. Check the Windows 2000 Application Event Log for more information. 2. Refer to Table 9 on page 43 for valid migration parameters. 3. Run the migration utility from the command line.
<p>Network File System (NFS) failed with the following error:</p>	<p>An error occurred while setting NFS permissions. See the NSM_NFS_Error.txt for more information. Contact IBM Technical Support.</p>
<p>NFS user creation error.</p>	<p>The setup program cannot create NFS User.</p> <ol style="list-style-type: none"> 1. Exit from the setup program. 2. Restart your server. 3. Run the setup program again.
<p>North American (128-bit) encrypted products installation error.</p>	<p>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.</p> <p>Install the 128-bit strong encryption products manually. Refer to “Installing the strong encryption (128-bit) products” on page 22 for instructions.</p>

Table 5. Common Installation Errors (continued)

Error message	How do I resolve the error?
Not enough Free Space on Disk.	<p>You need at least 500 MB of free disk space to install IBM Network Station Manager on your server.</p> <ol style="list-style-type: none"> 1. Exit from the setup program. 2. Free up some disk space or select another fixed drive with enough free disk space. 3. Run the setup program again.
The drive chosen is not a fixed drive. Choose another install location.	<p>The setup program cannot install IBM Network Station Manager on a remote or network drive.</p> <p>Select a fixed drive for the installation.</p>
The following error occurred during Setup. Error: 100	<p>The V1R3 Network Station Login Service was not removed successfully.</p> <p>Disable the V1R3 Network Station Login Service. Refer to “Starting and stopping services” on page 34 for instructions.</p>
The following error occurred during Setup. Error: 101	<p>The setup program cannot migrate the IBM Network Station Login Service to V2R1.</p> <p>Disable the V1R3 Network Station Login Service. Refer to “Starting and stopping services” on page 34 for instructions.</p>
The following error occurred during Setup. Error: [102 to 115]	<p>The program used to automatically synchronize 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.</p> <p>A utility program can be run to automatically set this preference. This program is in [drive]:\{float}\NetworkStationV2\servbase\bin ({float} is a subdirectory).</p> <p>You can run this program from a Windows 2000 command prompt. The command is:</p> <p>nsmutlds -v ll_CC</p> <p>where ll_CC is the 5 digit language designator for the client login language. Refer to “Supported languages” on page 21 for more information.</p> <p>If this utility does not run successfully, contact IBM technical support.</p>

Table 5. Common Installation Errors (continued)

Error message	How do I resolve the error?
<p>Unknown client synchronization error.</p>	<p>The setup program was unable to configure following files. Use the following samples to replace these files manually.</p> <p>Files to be replaced:</p> <pre>[drive:]\{float}\NetworkStationV2\prodbase\ppc\etc\hosts [drive:]\{float}\NetworkStationV2\prodbase\x86\etc\hosts</pre> <p>Format:</p> <p><server IP address><computer name><fully qualified computer name></p> <p>Example:</p> <pre>12.34.56.01 localhost 12.34.56.78 starscream starscream.rchland.ibm.com</pre> <p>Files to be replaced:</p> <pre>[drive:]\{float}\NetworkStationV2\prodbase\ppc\etc\resolv.conf [drive:]\{float}\NetworkStationV2\prodbase\x86\etc\resolv.conf</pre> <p>Format:</p> <pre>domain <domain name> search <domain name 1> . . . <domain name n> nameserver <name server IP address> . . . nameserver <name server IP address> lookup file bind</pre> <p>Example:</p> <pre>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</pre>
<p>User not authorized to run setup and migration. User must belong to the NSMAdmin group. Run the migration utility from the command line.</p>	<p>A user that belongs to the NSMAdmin group should run migration.</p> <ol style="list-style-type: none"> 1. Check the Windows 2000 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.
<p>V1R3 migration source directory does not exist or V1R3 not installed on this server. Run the migration utility from the command line.</p>	<p>The setup program cannot locate the V1R3 preference files on your server, or the source directory location specified was not accessible.</p> <ol style="list-style-type: none"> 1. Check the Windows 2000 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.
<p>V1R3 uninstall error.</p>	<p>The setup program was unable to automatically uninstall IBM Network Station Manager V1R3.</p> <p>Uninstall this product manually by using Add/Remove Programs from the Windows 2000 Control Panel.</p>
<p>WARNING: Previous version found:</p>	<p>The setup program detected an earlier version of IBM Network Station Manager.</p> <p>Remove V1R3. Refer to “Uninstalling IBM Network Station Manager” on page 22 for instructions.</p>

Configuring a thin client environment

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About this section

This section provides information on configuring a thin client environment on Windows 2000.

Planning the configuration

To configure a thin client environment on your Windows 2000 server, you must complete the following tasks:

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

Creating Users and Groups

When you create user accounts or group accounts for your thin clients, observe the following restrictions for user names, group names, and passwords:

- User names and group names must not be identical to Windows 2000 or Windows 2000 domain names or server names.
- Names cannot be more than 20 characters long.
- Names must be subsets of the "invariant ASCII" or the English alphanumeric set. They may not contain any of the following elements:

- Double-byte characters
- Characters below ASCII 33 and above ASCII 127
- 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 (+)

If your Windows 2000 server is either a stand-alone server or a domain member server, follow these steps to create users or groups:

1. From your server desktop, click **Start->Programs->Administrative Tools->Computer Management**.

- The Computer Management window appears.
- __ 2. Double-click **Local Users and Groups** to expand it.
 - __ 3. Select one of the following options:
 - To create a new user, select **Users**.
 - __ a. From the menu, select **Action->New User**.
The New User dialog box appears.
 - __ b. Enter valid values for the user name and password fields.
 - __ c. Specify any password or account options, and click **Create**.
 - __ d. Click **Close** to close the New User dialog box.
 - To create a new group, select **Groups**.
 - __ a. From the menu, select **Action->New Group**.
The New Group dialog box appears.
 - __ b. Enter valid values for the group name and description fields, and click **Create**.
To manually create the NSM groups, type **NSMAdmin** or **NSMUser** in the group name field.
 - __ c. Click **Close** to close the New Group dialog box.
 - __ 4. Verify that the new user or new group appears on the details area of the Computer Management window.

If your Windows 2000 server is a domain controller, follow these steps to create domain users or domain groups:

- __ 1. From your server desktop, click **Start->Programs->Administrative Tools->Active Directory Users and Computers**.
The **Active Directory Users and Computers** window appears.
- __ 2. Select **Users**.
- __ 3. Select one of the following options:
 - To create a domain user, select **Action->New->User** from the menu.
The New Object - User wizard appears.
 - __ a. Enter valid values for the first name, last name, and user logon name fields, and click **Next**.
 - __ b. Specify a password, check any account options, and click **Next**.
 - __ c. Click **Finish** to complete the wizard.
 - To create a new group, select **Action->New->Group** from the menu.
The New Object - Group dialog box appears.
 - __ a. Enter a valid group name in the group name field.
To manually create the NSM groups, type **NSMAdmin** or **NSMUser** in the group name field.
 - __ b. Select a group scope.
 - __ c. Select a group type.
 - __ d. Click **OK** to close the New Object - Group dialog box.
- __ 4. Verify that the new user or new group appears on the details area of the Active Directory Users and Computers window.

Adding Users and Groups

If your Windows 2000 server is a stand-alone server or a domain member server, follow these steps to add domain users or domain groups to the NSMUser group or NSMAdmin group:

- ___ 1. From your server desktop, click **Start->Programs->Administrative Tools->Computer Management**.
The Computer Management window appears.
- ___ 2. Double-click **Local Users and Groups** to expand it.
- ___ 3. Click **Groups**, and select **NSMUser** or **NSMAdmin** from the list of groups.
- ___ 4. From the menu, select **Action->Add to Group**, and click **Add**.
The Select Users or Groups dialog box appears.
- ___ 5. Select users or groups from the list of names, and click **Add**.
- ___ 6. Click **OK** to close the Select Users or Groups dialog box.
- ___ 7. Click **Apply**, and then click **Close**.

If your Windows 2000 server is a domain controller, follow these steps to add domain users or groups to the NSMUser group or NSMAdmin group:

- ___ 1. From your server desktop, click **Start->Programs->Administrative Tools->Active Directory Users and Computers**.
The **Active Directory Users and Computers** window appears.
- ___ 2. Select **Users**.
- ___ 3. Select **NSMUser** or **NSMAdmin** from the list of groups.
- ___ 4. From the menu, select **Action->Properties**.
The group properties dialog box appears.
- ___ 5. Click the **Members** tab, and click **Add**.
The Select Users or Groups dialog box appears.
- ___ 6. Select the domain that contains the users or groups from the pulldown list.
- ___ 7. Select users or groups from the list of names, and click **Add**.
- ___ 8. Click **OK** to close the Select Users or Groups dialog box.
- ___ 9. Click **Apply**, and then click **OK**.

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 you configure DHCP. Record your information in Table 6.

Table 6. Gathering DHCP Information

DHCP Option Number	DHCP Option Name	Description	Write Your Network Value Here
003	Router	The IP address of the default router which receives TCP/IP packets that are not addressed to your network.	

Table 6. Gathering DHCP Information (continued)

DHCP Option Number	DHCP Option Name	Description	Write Your Network Value Here
006	DNS Servers	Enables clients to use either fully qualified host names or IP addresses when they communicate with other devices.	
015	DNS Domain Name	Allows thin clients to specify their domain to other devices.	
066	Boot Server Host Name	The IP address of the server from which your thin client downloads its operating system.	

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

Table 7. Boot File Name for different thin clients

Network Station 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 Microsoft DHCP

Follow these steps to configure Microsoft DHCP:

- ___ 1. Complete Table 6 on page 33.
- ___ 2. From your Windows 2000 server desktop, click **Start->Programs->Administrative Tools->DHCP** from your server's desktop.
The DHCP window appears.
- ___ 3. Under the Tree area, highlight your server.
- ___ 4. From the menu bar, select **Action->New Scope**.
The New Scope Wizard appears.
- ___ 5. Complete the New Scope Wizard.
For more information, refer to the DHCP Help information from Microsoft.
- ___ 6. Repeat the steps above for creating additional scopes.

See the *Using IBM Network Station Manager* publication for information on configuring your thin clients to start using DHCP.

Starting and stopping services

IBM Network Station Manager starts the following servers and services:

- Internet Information Services (IIS)
- DHCP
- IBM TCP/IP Services
- NFS server

- TFTP server
- Ethernet adapter or token-ring adapter
- Network Station Login Service Version 2

Follow these steps to manually start or stop a service:

1. From your server desktop, select **Start->Programs->Administrative Tools->Services**.
2. Select the service which you want to start or stop.
3. Right-click on the service, and select **Start** or **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 5 illustrates a typical network printing setup.

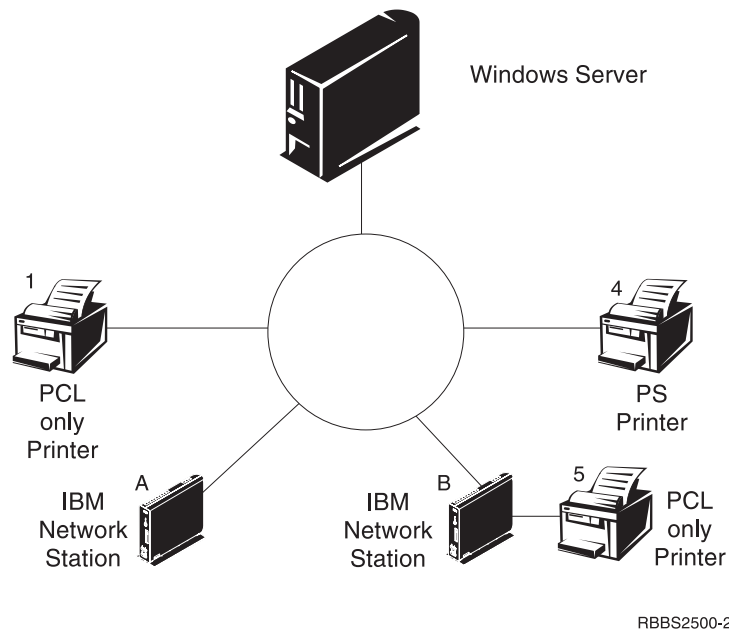


Figure 5. Possible thin client printing scenarios

Table 8 on page 36 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 8. Configuration Descriptions for Basic Printer Scenarios

Print Scenario	Print Job Flow in Figure 5 on page 35	Configuration Instructions
thin client to a LAN printer	thin client A to Printer 1	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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.
thin client to another thin client with an attached printer	thin client A to thin client B to Printer 5	<ol style="list-style-type: none"> 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 2000 server to a thin client with an attached printer	Windows 2000 to thin client B to printer 5	<ol style="list-style-type: none"> 1. Verify that Network File and Print Services is installed on your Windows 2000 server. <ol style="list-style-type: none"> a. From your Windows 2000 server desktop, click Start->Settings->Control Panel->Network and Dial-up Connections. b. Right-click on Local Area Connection, and select Properties. c. Verify that the File and Printer Sharing for Microsoft Networks is checked. If you do not see this item, refer to the Microsoft online help for information on adding the Other Network File and Print Services component. d. Click OK to close the window. 2. Add a printer connection to your Windows 2000 server. <ol style="list-style-type: none"> a. From your Windows 2000 server desktop, click Start->Settings->Printers. b. Double-click Add Printer. c. Click Next on the welcome screen. d. Select Local Printer, and click Next. e. Select Create a new port. <ol style="list-style-type: none"> 1) Select LPR Port from the pulldown list, and click Next. f. In the Add LPR compatible printer dialog box, enter the following information: <ul style="list-style-type: none"> • IP address of the thin client to which the printer is attached. • Name of the printer, or print queue SERIAL1, or PARALLEL1. g. Complete the rest of the wizard.

Printer Administration Techniques

Administering 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, thin clients can print to most types of printers.

Controlling print jobs through your Windows 2000 server

One technique to consider is to have a server control the printers for your thin clients. In Figure 5 on page 35, the Windows 2000 server could control a LAN printer like Printer 4. Network Station A and Network Station B send their print jobs to the Windows 2000 server. The Windows 2000 server controls the flow of print jobs to the printer.

Advantages	Disadvantages
This scenario reduces the work load on the thin clients when the printer buffer is full because the Windows 2000 server negotiates print jobs with the printer.	Handling these print jobs may likely decrease the CPU performance of your Windows 2000 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 thin clients to the latest level. Even if you have new thin clients, you must verify and update the boot code of your thin clients. For more information about updating the boot code, see the *Using IBM Network Station Manager* publication.

- For Series 300 and Series 1000 thin clients, 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 thin client 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 services” on page 34 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

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About this section

This section provides information for migrating IBM Network Station Manager V1R3 preference files and existing thin clients to IBM Network Station Manager V2R1 on a Windows 2000 server. You must read the information in this section before attempting the migration.

Planning the migration

Before you can migrate V1R3 preference files and existing thin clients to IBM Network Station Manager V2R1 on a Windows 2000 server, you must first complete these tasks:

- Identify an upgrade path. See “Planning the installation” on page 13 for more information.
- Read important migration information.

Important information

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

- The Windows 2000 Event Viewer maintains a status log of the migration. If you encounter problems while running migration, refer to “Resolving installation problems” on page 22 for error resolution.
- If you manually changed any configuration files in the past, refer to the online *IBM Network Station Advanced Information* publication for information on migrating these configuration files.
- You can migrate V1R3 preference files to V2R1 during the V2R1 installation, or by running the V2R1 migration utility from a command prompt after the IBM Network Station Manager installation. Migration during installation requires that you have V1R3 Service Update 10 installed on the server from which you are migrating.
- 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 run a dual-server migration. Install V2R1 on your second server before attempting a dual-server migration.
- Typically, you group thin clients that use different boot methods to start up and obtain their kernel files from your server into two client groups. NVRAM thin clients and DHCP thin clients use different client migration methods to migrate to V2R1. You use the migration utility to migrate NVRAM thin clients to V2R1. You change the DHCP configuration to migrate DHCP thin clients to V2R1.
- If you need V1R3 to support certain thin clients (see Table 1 on page 10), you need to maintain V1R3 on a Windows NT server. You can download the latest V1R3 Service Update from <http://techsupport.services.ibm.com/nc>. Refer to the latest versions of the following publications for more information:

- *Installing IBM Network Station Manager for Windows NT*
- *IBM Network Station Manager V1R3 Installation and Use*

Running the migration

To migrate the V1R3 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 the installation, or you can perform manual migration by running the migration utility from a command prompt. After you migrate your preference files, you then configure your thin clients 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, thin clients, and system defaults. For more information on migration during installation, refer to “Migration during Installation” on page 41.

If you choose not to migrate during installation, Setup installs V2R1 on your server. Your V1R3 preference files remain unchanged.

If you choose to migrate after running the V2R1 setup program, you can perform manual migration. You can manually migrate individual preferences or thin clients by using command-line instructions. You run the migration utility from the Windows 2000 command prompt to accomplish migration in stages. The command-line interface allows you to specify an individual user, group, or thin client for migration. For more information on manual migration, refer to “Manual Migration” on page 42.

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 thin client user's /NetworkStationV2/userbase/home/[username]/.netscape directory. If you want to continue using your V1R3 browser preference information, you must import these files.

Follow these steps to import your bookmarks file:

- ___ 1. Start the Netscape Communicator browser from your thin client.
- ___ 2. From the browser 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, and click **Open**.

Follow these steps to import your address book file:

- ___ 1. Start the Netscape Communicator browser from your thin client.
- ___ 2. From the browser 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, and 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.

Migration during Installation

The IBM Network Station Manager V2R1 setup program runs automatic migration when you choose to migrate during installation. Automatic migration requires V1R3 Service Update 10.

Single-Server Migration: You can perform a single-server migration if you are upgrading your V1R3 preference files from the same server where you plan to install IBM Network Station Manager V2R1.

Follow these steps to run a single-server automatic migration:

- ___ 1. Verify that you can access the following V1R3 directories:
 - [drive:]\{float}\nstation\userbase
 - [drive:]\{float}\nstation\prodbase\configs({float} is a subdirectory)
- ___ 2. Install IBM Network Station Manager V2R1. Refer to “Running the installation” on page 18 for more information.
- ___ 3. On the Migration Location window of the IBM Network Station Manager setup program, select **Yes** to confirm that you are migrating.
- ___ 4. On the same window, enter the location of the V1R3 preference files, [drive:]\nstation, in the Source Directory box, and click **Next**.
- ___ 5. Complete the setup program.

The setup program migrates your V1R3 preference files to V2R1.

You can now move your existing thin clients to your new IBM Network Station Manager V2R1 software. Refer to “Client Migration” on page 44 for more information.

Dual-Server Migration: You can perform a dual-server migration if you are upgrading your V1R3 preference files from a different server. A dual-server migration lets you maintain V1R3 on another server until you can configure and test the V2R1 software on another server.

Follow these steps to perform a dual-server preference file migration:

- ___ 1. Verify that your new server meets the server requirements and runs the prerequisite software. Refer to “Server requirements” on page 16 and “Prerequisite software” on page 17 for more information.
- ___ 2. On your new server, map a network connection to your old server.
- ___ 3. Create (or replicate) your V1R3 users and groups on your new V2R1 server.
 - ___ a. Refer to “Creating Users and Groups” on page 31 for information on creating the NSMUser and NSMAdmin groups on the new server.
 - ___ b. Copy the users from the old NSMUser and NSMAdmin groups from your old server to the new 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” on page 33 for instructions.
- ___ 4. Install IBM Network Station Manager. Refer to “Running the installation” on page 18 for more information.
- ___ 5. On the Migration Location window of the IBM Network Station Manager setup program, select **Yes** to confirm that you are migrating.
- ___ 6. On the same window, enter the location of the V1R3 preference files, [drive:]\nstation, in the Source Directory box, and click **Next**.
- ___ 7. Complete the setup program.

The setup program migrates your V1R3 preference files to V2R1.

You can now move your existing thin clients to your new IBM Network Station Manager V2R1 software. Refer to “Client Migration” on page 44 for more information.

Manual Migration

You can run manual migration from the Windows 2000 command prompt. The migration utility enables you to copy V1R3 configurations and users to the V2R1 environment.

The Migration Utility: The migration utility has the following requirements and features:

- Your V2R1 server must have access to your V1R3 preference files.
- 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: You need to maintain V1R3 on a Windows NT server to operate and maintain any Series 100 (8361-100 and 8361-200) or Series 300 (twin-axial 8361-341) thin clients. Refer to *Installing IBM Network Station Manager for Windows NT* for more information.

- Although you can run the migration utility several times, even over the same users, groups, or thin clients, 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) thin clients. However, you have to manually configure DHCP and NVRAM for each thin client. Refer to “Client Migration” on page 44 for instructions.

The migration utility is in [drive:]\{float}\NetworkStationV2\servbase\bin. You can run the migration utility from the Windows 2000 command prompt by using the following command structure:

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

Table 9 explains the different parameters for running the migration utility.

Table 9. 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 thin client clients. The command structure is <code>nsmv2migr -A</code> .
-S	Migrates system preference levels from V1R3 to V2R1. The command structure is <code>nsmv2migr -S</code> .
-U	Migrates user preference files. To migrate user preference files, the command structure is <code>nsmv2migr -U username1 <username2 . . . username#></code> . To migrate all user preference files, the command structure is <code>nsmv2migr -U *ALL</code> .
-G	Migrates group preference files. To migrate group preference files, the command structure is <code>nsmv2migr -G groupname1 <groupname2 . . . groupname#></code> To migrate all group preference files, the command structure is <code>nsmv2migr -G *ALL</code> .
-T	Migrates thin client preference files. To migrate thin client preference files, the command structure is <code>nsmv2migr -T NSname1 <NSname2 . . . NSname#></code> . To migrate all thin clients, the command structure is <code>nsmv2migr -T *ALL</code> .
-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 <code>nsmv2migr -P <drive:\nstation></code> . 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 41 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) thin clients to start from the V2R1 software, you should use this option with caution. To migrate your thin clients to V2R1, the command structure is <code>nsmv2migr -C</code> . Refer to “Client Migration” on page 44 for testing instructions. Notes: 1. This parameter only applies to NVRAM thin client 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 thin clients and Series 300 Twin-Axial thin clients (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 thin client

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

This migration utility command migrates system preferences, user preference files of *John* and *Jane*, group preference files of the *NSMAdmin* group, and thin client preference files of the *NSAlpha* thin client 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 thin clients

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

This migration utility command migrates system preferences, preference files for all users, and thin client preference files for thin clients *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 thin client NVRAM clients

```
nsmv2migr -C
```

This migration utility command migrates all NVRAM thin client 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 thin clients that were previously supported in V1R3 but you now plan to operate using V2R1. These are Series 1000 (8362 - all models) thin clients and Series 300 (8361-110 and 8362-210) thin clients.

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 thin clients⁵ 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 33.
- ___ 2. In your current DHCP configuration, set the following DHCP options so that the following values apply to all of your thin clients:
 - 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”.

5. If you support Series 100 thin clients or Series 300 Twin-Axial thin clients, you must continue to support these thin clients in V1R3 on a Windows NT server. If you start these thin clients through DHCP, you must configure a separate class for these DHCP thin clients. See the Microsoft DHCP online help for more information. 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 thin client 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 17.
- ___ 4. Restart one Series 1000 (8362 - all models) or Series 300 (8361-110 and 8362-210) thin client as a test client. The server automatically updates the boot PROM of the thin client and the test client restarts automatically.

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

- ___ 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, restart⁶ all of the remaining thin clients that you plan to move over to the new V2R1 server.
- ___ 8. Test your thin clients to see if the user profile information is correct.

Client Migration for NVRAM thin clients

Follow these steps to move your existing NVRAM thin clients to IBM Network Station Manager V2R1:

- ___ 1. Test one Series 300 thin client or Series 1000 thin client. Refer to Table 1 on page 10 for the hardware type and model.
- ___ a. Power on your thin client.
 - ___ b. Wait for the message "NS0500 Searching for Host System" to appear on your monitor, and then press **ESC** to bring up the 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 thin client.
 - ___ 3) Press **Enter** to save your changes.
 - ___ e. From the Setup Utility main screen, press **F5**, *Set Configuration Parameters*.

6. If you have several thin clients 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.

__ 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 thin client.

Your new V2R1 server automatically updates the boot PROM of your thin client when your test thin client restarts.

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

__ g. Restart the test thin client.

__ h. Test your thin client to see if the preference information is correct.

__ i. If everything appears correctly on your test thin client, go to Step 2.

__ 2. From a Windows 2000 command prompt, run the migration utility by using the client migration parameter⁷ (nsmv2migr -C). Refer to Table 9 on page 43 for the command syntax.

__ 3. Restart your thin clients.

The thin clients start from the new IBM Network Station Manager V2R1 software. The server may also automatically update the thin client boot PROM so that the thin clients restart automatically.

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

Each time you power on your thin clients, they start from the new IBM Network Station Manager V2R1 software. Verify that the user preference files on these thin clients are correct.

7. 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 thin clients and Series 300 Twin-Axial thin clients (8361-341 machine-type) on your network.

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