IBM Network Station

IBM Network Station Manager 3.0 for WorkSpace On-Demand 2.0

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Note

Before using this information and the product it supports, be sure to read the information in “Appendix E. Notices” on page 155.

Contents

About IBM Network Station Manager 3.0 For WorkSpace On-Demand 2.0

This book describes how to install, configure, and use the IBM Network Station Manager. This book contains specific instructions about how to install and configure IBM Network Station Manager on an OS/2 Warp Server which is running WorkSpace On-Demand.

How to Use this Book

Chapter 1
An introduction to Network Stations.

Chapter 2
Installing and configuring IBM Network Station Manager on your OS/2 Warp Server.

Chapter 3
Working with IBM Network Station Manager applications.

Chapter 4
Working with the IBM Network Station Manager program.

Chapter 5
Using tools to help manage the Network Station environment.

Chapter 6
Using the Setup Utility to view or set configurations.

Who should read this book

This information is intended for the person who is installing and administering the IBM Network Station Manager.

Chapter 1. Understanding the Network Station

What Is the Network Station?

Traditionally, the user's interface with the server has been either the nonprogrammable workstation or the personal computer (PC). The IBM Network Station network computer (hereafter referred to as Network Station) offers an attractive alternative to traditional methods of network computing. Individual diskless workstations connect to a server (or series of servers), and you can manage them centrally with the IBM Network Station Manager program.

Using a Network Station is similar to using a PC. The Network Station uses a keyboard, mouse, and display. The biggest difference is that the Network Station files reside on a network server rather than on a hard drive inside of each user's machine. The Network Station presents a graphical user interface (GUI), which provides the user access to many resources. Network Stations can access the following kinds of resources:

- 5250 emulator
- 3270 emulator
- Remote X applications
- Web browser
- Java applets or applications
- Microsoft Windows NT applications
- Local and remote printers

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

Each Network Station runs the common client program, and the server runs the IBM Network Station Manager program and several other application programs.

How Do Network Stations Work?

Figure 1 shows what happens when you power on an IBM Network Station.

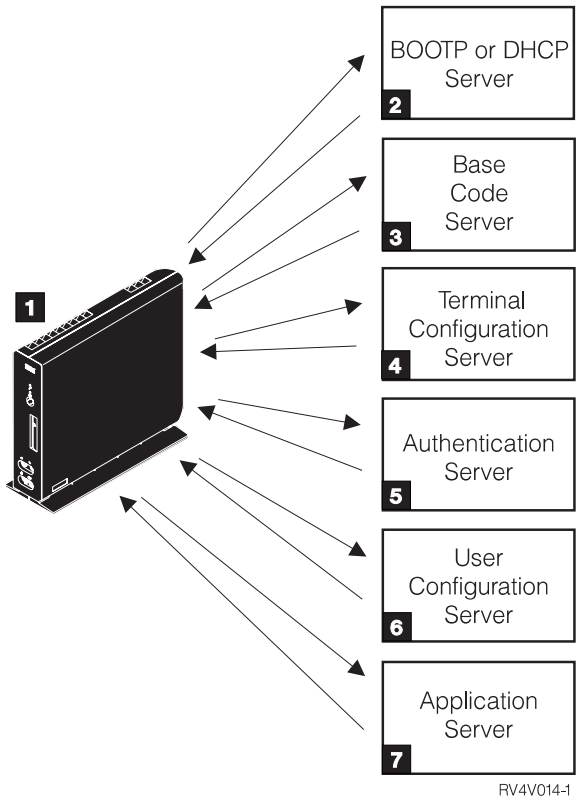


Figure 1. Network Station Power-On Sequence

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

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

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

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

5 The Network Station presents a log-on screen. When the user enters a userid 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 accesses applications on the servers where they reside.

The IBM Network Station Manager program allows you to set and change configurations for Network Stations and Network Station users. Your HTTP server makes the IBM Network Station Manager program available to your Web browser. See "Chapter 4. Using the IBM Network Station Manager Program" on page 55 for more information about the IBM Network Station Manager program.

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.

Each Network Station can display the IBM Network Station Setup Utility. The IBM Network Station Setup Utility allows you to **View** or **Set** (change) configuration settings on a particular Network Station. For example, you can view the MAC address or set the monitor resolution of the Network Station. See "Chapter 6. Working With the IBM Network Station Setup Utility" on page 101 for more information.

After the Network Station base code is loaded, the User Services programs become available. User Services are programs that provide users with tools to manage the Network Station's operational environment. Listed below are some of the user services:

- Monitoring messages applicable to a specific Network Station
- Locking your screen (with password control)
- Monitoring statistics (for example, how much memory is available on a specific Network Station)

See "Chapter 5. Working with User Services" on page 97 for more information on User Services.

What Do I Need To Know About TCP/IP Networks?

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

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

Note: You do not need to be an expert in order to set up a TCP/IP network. However, you should have an understanding of basic TCP/IP. A detailed introduction to TCP/IP is beyond the scope of this book. If you need to improve your understanding of TCP/IP, you can contact your IBM sales representative, who has information about classes in your area.

LAN Network Examples

LAN Network Example 1

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

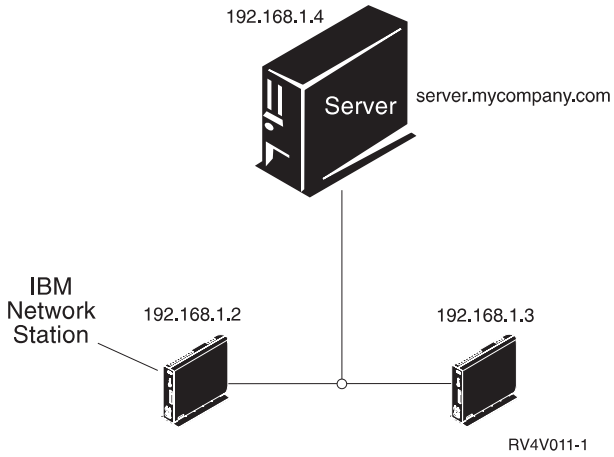


Figure 2. Two Network Stations Connected to the Server over a Simple LAN

LAN Network Example 2

Figure 3 on page 5 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.

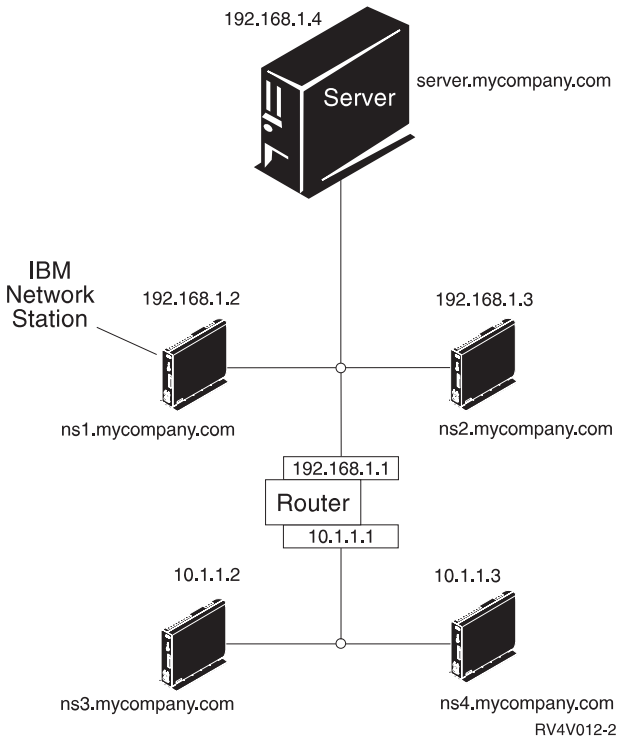


Figure 3. Two Network Stations Connected to the Server over a Local LAN and Two Network Stations Connected to the Server through a Router over a Remote LAN

LAN Network Example 3

In Figure 4 on page 6, additional Network Stations connect to the server using both Ethernet and token-ring connections. Two token-ring LANs connect via a router. A Domain Name Server also connects to the network.

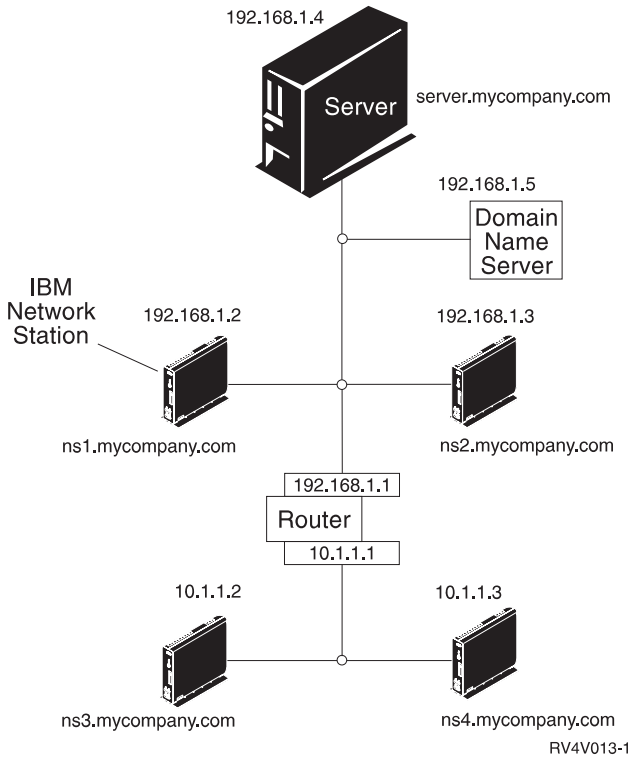


Figure 4. Four Network Stations Connected to a Network Using a Router and a Domain Name Server

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 (see Figure 5 on page 7). If you no longer have the box, see “Finding the Default MAC Address” on page 105 for instructions on how to find the MAC address.

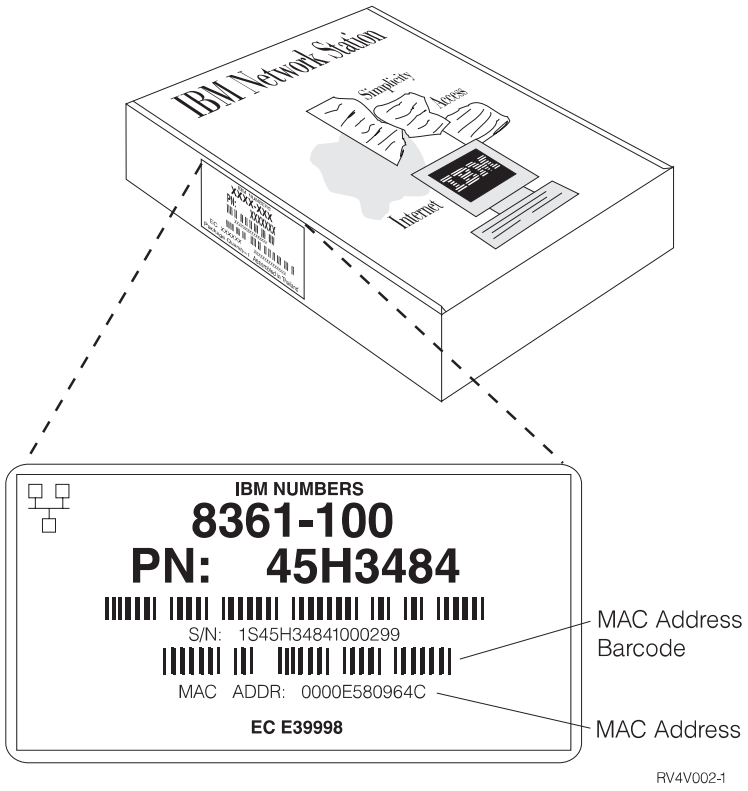


Figure 5. MAC Address on the Box

You can override the burned-in MAC address with a customer-assigned MAC address. See “Specifying a User-Configurable MAC Address” on page 106 for instructions on how to override the burned-in 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
WWW: http://rs.internic.net

Subnets and Subnet Masks

A subnet is a division within a computer network. Some administrators of large networks need to divide their networks into subnetworks (or subnets). Subnets allow certain groups of users to share access to certain files or resources. Other administrators divide their networks in order to make the most efficient use of a relatively small address pool. Most small networks do not require subnetting. A basic introduction to subnets and subnet masks is in the paragraphs that follow. You should read this discussion only if it is up to you to subnet your network or to find out the subnet mask.

The subnet mask is a value that allows the system to determine which are the network parts and which are the host parts of an IP address. In IP addressing, there are many different subnet masks. Sometimes the first six digits of an IP address indicate the network; other times the first nine digits indicate the network. The subnet mask is the code that determines which digits indicate the network and which indicate the host.

Later in the book, you will record your network's subnet mask on a table. If you belong to a large subnetted network that someone else set up, you can ask that person for the subnet mask value. If you know that your network is not subnetted, use the following table to find your subnet mask.

Remember: You should use Table 1 only if you are sure that your network is **not** subnetted.

Table 1. Subnet Mask Default Values According to Network Class

Network Type	Left-Most Value of IP Address	Subnet Mask Default
Class A	0 through 126	255.0.0.0
Class B	128 through 191	255.255.0.0
Class C	192 through 223	255.255.255.0

An IP address such as 192.168.1.2 is really a dotted decimal expression of a 32-bit binary value. In binary numbers, 192.168.1.2 is expressed as 11000000.10101000.00000001.00000010. Each set of eight numbers (0 or 1) represents eight bits of the IP address. Every IP address contains some bits that identify it as belonging to a particular network. The other bits identify a single host (such as a Network Station) along the network.

Most networks fall into one of three classes: Class A, Class B, or Class C. As Table 1 shows, the network's class can be determined by examining the first eight bits of the network's IP address. When expressed in dotted decimal notation, those first eight bits are the leftmost number of the address, the number that comes before the first dot. In Class A networks, the first eight bits are expressed in decimal as a number from 1 to 126. For Class B networks, that number ranges from 128 to 191. For Class C networks, the value of the first eight bits of the IP address ranges from 192 to 223.

The class of the network determines how much space is available for subnetting. For example, in a Class A network, the network portion of the address is only the first eight bits. In other words, the first eight bits are all that is necessary to indicate the network to which the IP address belongs. That leaves the remaining 24 bits to serve as pointers toward the subnet and the individual hosts that lie on the network. In this discussion, host means any device that has a unique IP address including Network Stations. The IP address of a Class A network is `network.host.host.host`. The `host.host.host` does not indicate three separate hosts, but rather that three eight-bit segments (or 24 bits) are required to indicate a single host on the network. Obviously, there can be only a very small number of true Class A networks. In fact, there are only 126 such networks. Most of these belong to large corporations or universities, which acquired their Class A networks in the early days of the Internet when network addresses were plentiful. All Class A network addresses are assigned.

In a Class B network, the first 16 bits of an IP address indicate the network while the remaining 16 are available for subnetting. IP addresses that belong to Class B networks are `network.network.host.host`.

In a Class C network, the first 24 bits indicate the network, while only the last eight can be used for subnetting or to identify the host. IP addresses that belong to Class C networks are `network.network.network.host`. Class C networks are the most common type of network.

You must know more than the class of the network to determine how an IP address is deciphered. When you subnet a network, it is not always apparent what subnet a device belongs to unless you know the subnet mask. For example, given the Class C IP address 192.168.1.45, you know that the network to which the device belongs is 192.168.1.0. You can tell this by applying the simplified formula `network.network.network.host`. However, you do not know how the network is subnetted or to what subnet the device belongs. Additionally, the class of the network is not always apparent. The subnet mask allows you to determine all of these things.

Like IP addresses, subnet masks are 32–bit values expressed in dotted decimal notation. The subnet mask 255.255.255.0 is expressed in binary as 11111111.11111111.11111111.00000000. A binary 1 in the subnet mask indicates that the corresponding bit in the IP address is treated as part of the network address. Using Boolean algebra, if you perform an ″AND″ operation on the binary IP address and subnet mask, the result is the IP address of the network. In Boolean algebra, the ″AND″ function means that if both numbers are 1s, the result is 1. If either number is not a 1, the result is 0. For example, given the IP address 192.168.1.2 and the subnet mask 255.255.255.0, the ″AND″ operation is as follows:

```
11000000.10101000.00000001.00000010 = IP add. 192.168.1.2
11111111.11111111.11111111.00000000 = Subnet Mask 255.255.255.0
11000000.10101000.00000001.00000000 = Subnet add. 192.168.1.0.
```

You can think of the subnet mask as a code for deciphering what an IP address means. You can use Table 2 on page 10 to determine how many subnets are indicated by specific eight-bit mask values. For example, if you see the address 192.168.1.35 and you know that the subnet mask of the Class C network to which that address belongs is 255.255.255.128, you know how to decipher the address. By using Table 2 on page 10, you can say that the network address is 192.168.1.0 and that the host whose IP address ends in .35 belongs to the first of two subnets.

To put it more simply, the network address 192.168.1.0 means that devices whose addresses begin with 192.168.1 belong to the 192.168.1 network. The first 24 bits of the address indicate the network, and the last eight bits of the address indicate the subnet and host. The way that you arrived at this distinction was by applying the subnet mask. Because the subnet mask ends in 128, you know that the network is broken into two subnets. If you want to divide the Class C network 192.168.1.0 into two subnets, you should use a subnet mask of 255.255.255.**128**. The first 24 bits of the address indicate the network. The last eight bits of the address indicate the hosts.

Since the maximum value of each eight bits is 11111111 in binary or 255 in decimal, there are, theoretically, 255 possible hosts in the two subnets. Therefore, the theoretical number of possible hosts per subnet is 255 hosts that are divided by two subnets, or 128 hosts per subnet. You could theoretically use the IP addresses 192.168.1.**0** through 192.168.1.**127** for the first subnet and 198.165.1.**128** through 192.168.1.**255** for your second subnet. In reality, you would have to give up some of these addresses. The first and last addresses in each subnet have special values. You cannot assign the first and last addresses to any devices on the network. The first address in each subnet is the subnet address; the last address is the broadcast address. Therefore, the true range of your addresses is 192.168.1.**1** to 192.168.1.**126** and 192.168.1.**129** to 192.168.1.**254**.

If you need to subnet a Class C network, the way in which you specify the last eight bits of the subnet mask determines how you divide your network. Table 2 shows the number of available subnets according to the value that is given to an eight-bit subnet mask in a Class C network.

Table 2. Subnet Mask Values For Class C Addresses

Subnet Mask	**Binary Value**	**Number of Subnets**	**Number of Hosts Per Subnet**
255.255.255.0	00000000	1	254
255.255.255.128	10000000	2	126
255.255.255.192	11000000	4	62
255.255.255.224	11100000	8	30
255.255.255.240	11110000	16	14
255.255.255.248	11111000	32	6
255.255.255.252	11111100	64	2
255.255.255.254	11111110	128	0
255.255.255.255	11111111	254, Do not use on Class C networks	0

Suppose that you want to break the same Class C network into four subnets instead of two. Using Table 2, you choose the subnet mask 255.255.255.192. You can then configure a network with 248 hosts on four subnets. Since 248 hosts divided by four subnets equals 62, you could have 62 hosts on each of your four subnets. You can create a table for planning your network that looks like Table 3 on page 11.

By planning ahead, you should allocate IP and mask addresses to anticipate a maximum number of controllers and Network Stations. If you do not do this and your network environment changes, you will have to reallocate your initial assignments. Then your initial devices will receive different IP addresses.

Table 3. Subnet Mask 255.255.255.192 Example

Subnet	IP Address	Comments
1st Subnet	192.168.1.0	Network Address (not assigned to any host)
1st Subnet	192.168.1.1	Network Station #1
1st Subnet	192.168.1.2	Network Station #2
. . .	. . .	. . .
1st Subnet	192.168.1.62	Network Station #62
1st Subnet	192.168.1.63	Broadcast Address (not assigned to any host)
2nd Subnet	192.168.1.64	Network Address (not assigned to any host)
2nd Subnet	192.168.1.65	Network Station #63
2nd Subnet	192.168.1.66	Network Station #64
. . .	. . .	. . .
2nd Subnet	192.168.1.126	Network Station #124
2nd Subnet	192.168.1.127	Broadcast Address (not assigned to any host)
3rd Subnet	192.168.1.128	Network Address (not assigned to any host)
3rd Subnet	192.168.1.129	Network Station #125
3rd Subnet	192.168.1.130	Network Station #126
. . .	. . .	. . .
3rd Subnet	192.168.1.190	Network Station #186
3rd Subnet	192.168.1.191	Broadcast address (not assigned to any host)
4th Subnet	192.168.1.192	Network Address (not assigned to any host)
4th Subnet	192.168.1.193	Network Station #187
4th Subnet	192.168.1.194	Network Station #188
. . .	. . .	. . .
4th Subnet	192.168.1.254	Network Station #248
4th Subnet	192.168.1.255	Broadcast Address (not assigned to any host)

Of course, you could assign any network device to any IP address. We simply filled the Comment section of our sample tables with ″Network Station #X″ by way of illustration. In reality, you must devote IP addresses to routers, Domain Name Servers, and other devices on your network.

Class C networks are not the only networks to be subnetted. Class B networks are often subnetted. The only difference in subnetting a Class B network is that the network portion of its address is shorter (and its host portion is longer) than that of a Class C address. For example, the network portion of the Class B address 192.168.0.0 is 192.168. That leaves the last 16 bits (the 0.0) free for subnetting. To divide that network into two large subnets, you would use the subnet mask 255.255.192.0. That configuration results in the two subnets 192.168.**0.0** through 192.168.**127.0** and 192.168.**128.0** through 192.168.**254.0**.

Subnets are meaningful only to hosts on your physical network. Hosts outside of your network are concerned only with the network portion of the IP address.

Routers inside your network apply the subnet mask to IP addresses to determine how to deliver information packets inside the network.

For more information about subnets, refer to the Redbook, *TCP/IP Tutorial and Technical Overview*, GG24-3376.

Boot Methods

Because a Network Station has no disk from which to boot, 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 must use one of three methods to request and receive this information:

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

Each platform supports a different set of boot methods. Table 4 shows the boot methods that are available for each platform.

Table 4. Boot Methods Supported by Various Operating Systems

	OS/390	**VM/ESA**	**OS/400**	**AIX**	**NT**	**OS/2**
Boot Methods	NVRAM, BOOTP, DHCP	NVRAM, BOOTP, DHCP	NVRAM, BOOTP, DHCP	NVRAM, BOOTP, DHCP	NVRAM, DHCP	NVRAM, DHCP

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

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

NVRAM

Non-Volatile Random-Access Memory (NVRAM) refers to the 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 base code file download from the server.

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

- As a method to avoid routers that block BOOTP and DHCP broadcast requests. BOOTP and DHCP broadcast requests for IP addresses can create unnecessary traffic on the network. Many network routers are configured not to pass these broadcast requests. Since NVRAM does not need to request its IP address (because it has been entered in the memory of the Network Station), it does not make the broadcasts.

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

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

- You must enter setup data into each Network Station manually.
- DHCP and BOOTP can configure many more parameters (such as the DNS address) that cannot be easily configured with this method.

For information about how to configure NVRAM, see “Configuring an IBM Network Station to Boot from the NVRAM Setting” on page 108.

BOOTP

Bootstrap protocol (BOOTP) is a TCP/IP protocol that allows the Network Station to request an IP address and the location of the base code file from a server. If you are using an OS/2 Warp Server, BootP is not supported as a method of booting the Network Station.

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

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

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

DHCP

Dynamic Host Configuration Protocol (DHCP) is also 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. It is also capable of assigning IP addresses either statically or dynamically.

The static assignment is similar to the way BOOTP allocates IP addresses. You define the MAC address of every Network Station in the DHCP server configuration along with an IP address, which is reserved for the station with this MAC address. When the Network Station sends a request into the DHCP server, identifying itself by its MAC address, the server 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, it 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 if its MAC address is not defined in the DHCP configuration, may request an IP address from the pool of available addresses. The use of unlisted clients might be appropriate in an environment in which it is not necessary or preferable to keep track of MAC addresses.

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

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

Finally, DHCP provides a large set of configuration options, including user-defined options. These options configure many advanced network environments. See "Taking Advantage of Multiple Server Environments" on page 17 for more information.

TFTP or NFS for Boot File Service

The Network Station can use either of two protocols to receive the base code file from the base code server. The protocol that you use may depend on the operating system platform of your base code server (see Table 5).

Trivial file transfer protocol (TFTP) is a simple protocol that is used to transfer files. TFTP is available on every platform.

The network file system (NFS) makes files and directories available to clients. NFS is generally more reliable than TFTP.

Table 5. Protocols Supported by Various Operating Systems

	OS/390	**VM/ESA**	**OS/400**	**AIX**	**NT**	**OS/2**
Protocols	TFTP, NFS	TFTP, NFS	TFTP	TFTP, NFS	TFTP, NFS	TFTP, NFS

Note: If you are booting WorkSpace On-Demand clients by using TFTP on an OS/2 system, you must use NFS to boot Network Stations.

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 a Java Virtual Machine (JVM). Using the 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. You can download a JVM from servers, making it possible to start and configure Java programs.

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 since 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.

The Network Station can run Java applets and applications. Only a single Java application can run within the Network Station. When a Java application is running, it precludes applets from running, both on the desktop and in the browser.

For more information about Java, see the following Web sites:

- `http://www.javasoft.com`
- `http://www.ibm.com/java`

Windows Applications on the Network Station

Network Stations can run Windows 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 based on Microsoft Windows NT 3.51. Citrix WinFrame communicates to the Network Station using the independent computer architecture (ICA) protocol.
- NCD WinCenter is a multi-user windows application product that requires Citirix WinFrame. NCD WinCenter communicates to the Network Station using the X11 protocol.
- Citrix MetaFrame is a multi-user windows application product that requires Microsoft Windows NT Server 4.0, Terminal Server Edition. Citrix MetaFrame communicates to the Network Station using the ICA protocol.

Network Stations that boot from a Release 2.5 IBM Network Station Manager licensed program server can communicate to a multi-user windows server using the X11 protocol. Network Stations that boot from a Release 3 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
- Microsoft Windows NT Server 4.0, Terminal Server Edition - http://www.microsoft.com

Network Station Memory Requirements

Each of the applications that are downloaded to the Network Station require memory. Use Table 6 as a guide in determining how much memory each Network Station requires.

Table 6. Minimum Memory Requirements for Network Stations

Item Requiring Memory	Languages With Non-extended Fonts (MB)	Languages with Extended Fonts[1] (MB)	Double Byte Character Set Languages[2] (MB)
Base System	8.0	14.0	12.0
ICA client, if used	2.0	2.0	2.0
For JAVA applets or applications			
• Minimum buffer size	• 5.0	• 5.0	• 5.0
• Recommended buffer size	• 7.0	• 7.0	• 7.0
• Minimum buffer size for eSuite	• 14	• 14	• 14
• Recommended buffer size for eSuite	• 18	• 18	• 18
• Recommended buffer size for JITC	• 18	• 18	• 18
3270 Emulator (1st session)	4.0	9.6	7.5
each additional 3270 session	1.0	1.5	1.5
5250 Emulator (1st session)	4.2	10.3	7.5
each additional 5250 session	1.1	1.0	1.0
x-Terminal Client	0.3	0.3	.3
each additional x-Terminal session	0.12	0.12	0.12
NC Navigator Browser	7.2	8.0	17
Lotus eSuite Desktop	4.6	4.6	4.6
• Web Browser	• 2.4	• 2.4	• 2.4
• Calendar	• 3.0	• 3.0	• 3.0
• Mail	• 2.2	• 2.2	• 2.2
• Address book	• 1.4	• 1.4	• 1.4
• Work Files	• 0.9	• 0.9	• 0.9
• Instructions	• 0.3	• 0.3	• 0.3
• Word Processor	• 1.9	• 1.9	• 1.9
• Spreadsheet	• 1.1	• 1.1	• 1.1
• Presentation	• 1.8	• 1.8	• 1.8
VTxxx emulation (first session)	0.6	0.6	0.6
each additional VTxxx session	0.2	0.2	0.2

Notes:

1. SBCS and extended fonts: Bulgarian, Byelorussian, Croation, Macedonian, Russian, Serbian and Ukrainian
2. DBCS: Traditional Chinese, Simplified Chinese, Japanese, and Korean
3. Invokes Java applets. You must include Java memory requirement (from above) too.

Taking Advantage of Multiple Server Environments

You can install the IBM Network Station Manager licensed program on multiple computer systems. Each of these computer systems can perform specific server roles. On any particular computer, the IBM Network Station Manager program can perform more than one server role. A brief description of each server role follows:

BOOTP/DHCP Server
The BOOTP or DHCP server provides the Network Station with information such as its IP address, the base code server address, and the address of the terminal configuration server. You can change these addresses on DHCP servers. See “Load Balancing Example” on page 18 for an example of how to specify a different address for the base code server and terminal configuration server. You do not need to install the IBM Network Station Manager program on this server.

Base Code Server
The IBM Network Station Manager program on this server provides the operating system and the application programs that are downloaded to the Network Stations. You do not use this server to configure Network Stations.

Terminal Configuration Server
The IBM Network Station Manager program on this server provides terminal-based configuration settings. The IBM Network Station Manager program manages these settings. Examples of items to configure on this server are a printer that is attached to the Network Station or the Network Station’s keyboard language. The address of the terminal configuration server is the same as the address of the base code server by default. The inventory server (AS/400 only) runs on this server.

Authentication Server
The IBM Network Station Manager program on this server provides user authentication (where the user logs in) and user-based configuration settings. The IBM Network Station Manager program manages these settings. Examples of what you might configure on this server are a user’s start-up programs or a user’s browser preferences. The address of the authentication server is the same as the address of the base code server by default. See “Roaming User Example” for an example of how to specify a different address for the authentication server.

Some examples when you might want to take advantage of multiple servers, are as follows:

- A user from Chicago is visiting New York and expects to sign on and use the same configuration that he has at home. For more information, see “Roaming User Example”.
- All users power on their IBM Network Station at 8:00 AM and create network congestion. For more information, see “Load Balancing Example” on page 18.

Note: All servers must be running version 1 release 3 of the IBM Network Station Manager licensed program for these examples to work.

Roaming User Example

Figure 6 on page 18 shows how multiple servers can allow visiting users to obtain their home configurations.

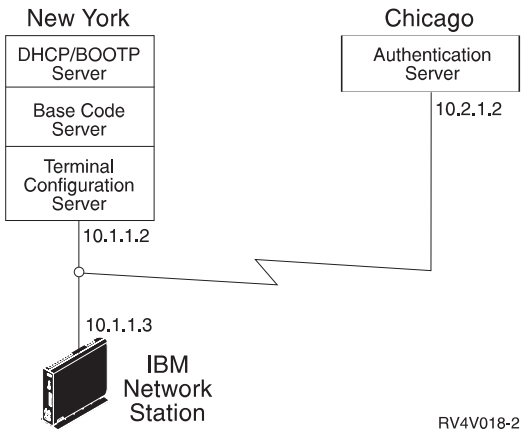


Figure 6. Roaming User Example

In the case of a user from Chicago visiting New York, one server is in Chicago, and one server is in New York.

The server in New York provides the following information:

- The IBM Network Station IP address
- The operating system and applications
- The terminal-based configuration information
- A log-on dialog

The visiting user selects the **Roam** button on the login dialog. The user then enters the name or address of the Chicago authentication server (10.2.1.2).

The Chicago authentication server provides the following information:

- The authentication of the user
- The user-based configuration information

The IBM Network Station Manager program on the server in New York manages the terminal-based configuration information. The IBM Network Station Manager program on the server in Chicago manages the user-based configuration information.

Load Balancing Example

Figure 7 on page 19 shows how multiple servers can reduce network congestion when a large number of Network Stations power on simultaneously. The administrator installs the IBM Network Station Manager program on multiple servers that act as base code servers. This distributes copies of the large executable files (operating system and applications) across servers. You can use DHCP to configure groups of Network Stations to access different base code servers.

Note: There is no way to separate the base code server from the terminal configuration server when using BOOTP. You can only do this by using DHCP.

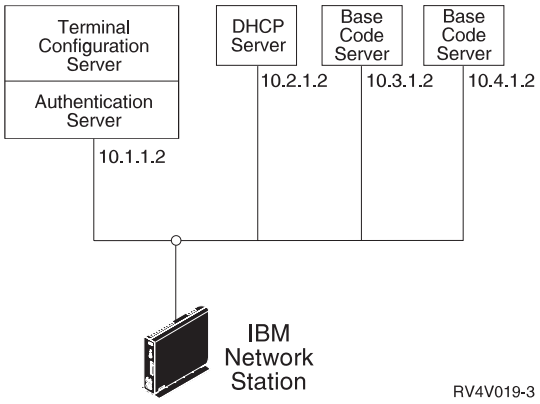


Figure 7. Load Balancing Example

This example uses four systems to divide up the work load:

- Two Microsoft Windows NT systems are performing the role of base code servers (host 10.3.1.2, the base code server that we use in our example, and host 10.4.1.2). This example uses two base code servers to divide the work load. Any number of base code servers is possible.
- An RS/6000 system is performing the role of a DHCP server (host 10.2.1.2). You do not need to install the IBM Network Station Manager program on this system.
- An AS/400 system is performing the role of terminal configuration and authentication server (host 10.1.1.2). We use the IBM Network Station Manager program that is installed on the terminal configuration and authentication server to centrally manage all user configurations and terminal configurations. One IBM Network Station Manager program should manage all IBM Network Stations to prevent conflicts.

A user would see a log-on dialog from the base code server and do the following:

1. Click the **Roam** button.
2. Enter the address of the authentication server (10.1.1.2).

Tip: If you want to use DHCP, you should use the IBM Network Station Manager program to check that DHCP is configuring DNS. Ensure that you have selected **DNS Configuration from BOOTP or DHCP server**. To find this setting, click **Hardware**, click **Workstations**, and then select **System Defaults**.

For this configuration to work, you must configure the items in Table 7 in the DHCP server settings.

Table 7. DHCP Options for Load Balancing

Description	Example
Option 66 or bootstrap server - base code server IP address	10.3.1.2
Option 67 - bootfile path	/netstation/prodbase/kernel
Option 211 - protocol to use for the base code server. Possible values are tftp, nfs or rfs/400.	nfs

Table 7. DHCP Options for Load Balancing (continued)

Description	Example
Option 212 - terminal configuration server IP address. Up to two addresses separated by a blank can be specified.	10.1.1.2
Option 213 - Configuration files path name for option 212. Up to two paths separated by a blank can be specified.	/QIBM/ProdData/NetworkStation/configs/
Option 214 - Protocol to use for option 212. Possible values are tftp, nfs, or rfs/400. Up to two values separated by a blank can be specified.	rfs/400
Notes: 1. Options 211, 212, 213, and 214 are site specific options in DHCP. If you are already using these options for another purpose, you will need to configure DHCP to avoid conflicts. See “Configuring DHCP to Avoid Conflicts”. 2. When two configuration servers are specified, the first server is tried. If that fails, then the second server is tried. If the second server is successful, then the second value in options 213 and 214 are used. 3. The IBM Network Stations must be using boot monitor version 3.0.0 or later. See “Viewing the Boot PROM Version of an IBM Network Station” on page 107 for information on how to view the boot monitor version.	

Refer to “Configuring DHCP for Load Balancing” on page 31 for instructions on how to configure DHCP for load balancing on OS/2 Warp Server.

Configuring DHCP to Avoid Conflicts

The DHCP options in Table 7 on page 19 have the flexibility to apply on a network, subnet, class, or client basis. If you find that options 211-214 are already in use for other purposes, you can separate these options by subnet or class. Use Table 8 to determine the Network Station classes.

Determining DHCP Classes

Table 8 lists the DHCP classes assigned to each IBM Network Station type and model.

Table 8. IBM Network Station DHCP Classes

Type-Model	Class
8361-100	IBMNSM 2.0.0
8361-110	IBMNSM 2.1.0
8361-200	IBMNSM 1.0.0
8361-210	IBMNSM 1.1.0
8361-341	IBMNSM 3.4.1
8362-A22	IBMNSM A.2.0
8362-A23	IBMNSM A.2.0
8362-A52	IBMNSM A.5.0
8362-A53	IBMNSM A.5.0

Table 8. IBM Network Station DHCP Classes (continued)

If you cannot find the type and model number of your Network Station listed in the table, then do the following:

1. Power on the Network Station.
2. As soon as the Network Station begins to search for its host server (message NS0500), press the Escape key.
3. Press the F2 key to view the hardware configuration. The class number is in the **DHCP** field.

Chapter 2. Installing and Configuring an IBM Network Station on OS/2 Warp Server

This chapter describes how to install and configure an IBM Network Station Manager on an OS/2 Warp Server running WorkSpace On-Demand 2.0.

Planning

Review the following requirements before you install IBM Network Station Manager.

Prerequisite Software and Hardware

OS/2 System	OS/2 Warp Server (Entry, Advanced, SMP)
Hard Disk	Local drive (formatted with a file system that supports long file names) with 500 MB available. For machines with 32 MB of RAM, the SWAPPER.DAT file may grow as large as 50 MB during the installation process.
Memory	see WorkSpace On-Demand 2.0
Software Prerequisites	WorkSpace On-Demand 2.0 with Feature Install and TCP/IP configured.
Web Server	Lotus Domino Go Webserver, Version 4.6.2.5 or later.
Browser	Netscape Navigator for OS/2, Version 2.02 or later.

Note: Lotus Domino Go Webserver and Netscape Communicator 4.04 for OS/2 are included on the IBM Network Station Manager CD.

Before You Begin the Installation Process

Review the Readme file, located in the root directory of the IBM Network Station Manager CD, for any last minute updates to the installation process. A printable Portable Document Format (.PDF) version of the Network Station Manager 3.0 for WorkSpace On-Demand 2.0 book is located on the Network Station Management CD at X:\DOC\UserGuid\os2nsm.pdf (where X: is the CD-ROM drive letter). An HTML version of the book can be found at X:\DOC\UserGuid\HTML\index.htm.

A printable Post Script (.PS) version of this install chapter is located at X:\DOC\install\nsminst.ps, and a (.INF) version of this install chapter is located at X:\DOC\install\nsminst.inf.

To make sure IBM Network Station Manager groups are created on your server during the installation process, start the IBM Warp Server File and Print Services.

Installing

You can install IBM Network Station Manager using one of the following methods:

Attended

From the CD or a redirected LAN drive, use the IBM Network Station Manager **install** command. See “Attended Installation” on page 24 for step-by-step directions.

Unattended (CID)
From a remote machine, use a software distribution manager (SDM) install command or program. See “Unattended (CID) Installation” for more information.

Attended Installation

To install IBM Network Station Manager:

1. Insert the IBM Network Station Manager CD into the CD-ROM drive.
2. Open an OS/2 window.
3. Change the drive letter to your CD-ROM drive.
4. Type `cd NSM` and press **Enter**.
5. Type `install` and press **Enter**.
6. The Netscape browser starts. Follow the instructions in the window.

Unattended (CID) Installation

Configuration, Installation, and Distribution (CID) refers to an installation method that requires limited or no interaction during the installation process. A response file provides the requested installation information and a software distribution manager (SDM) controls the installation process.

CID-Enabled Program Support

You can use any SDM program, such as NetView Distribution Manager/2 (NVDM/2), to remotely install IBM Network Station Manager. An example of a NVDM/2 profile to install NSM is as follows:

```
TargetDir = C:\

Section Catalog
Begin
     ObjectType = SOFTWARE
     GlobalName = IBM.NSM.INSTALL.REF.3.0
     Description = "Install IBM Network Station Manager 3.0 for OS/2"
End

Section Install
Begin
     Program = SA:\IMG\NSM\INSTALL.CMD
     Parms = /S:$(SourceDir) /B:C /R2:$(ResponseFile) /L1:$(Logfile)
     ResponseFile = SA:\RSP\NSM\$(WorkStatName).RSP
     SourceDir = SA:\IMG\NSM
     LogFile1 = SB:\LOG\NSM\$(WorkStatName).LOG
End
```

Refer to your program documentation for more information.

CID-Enabled Command-Line Support

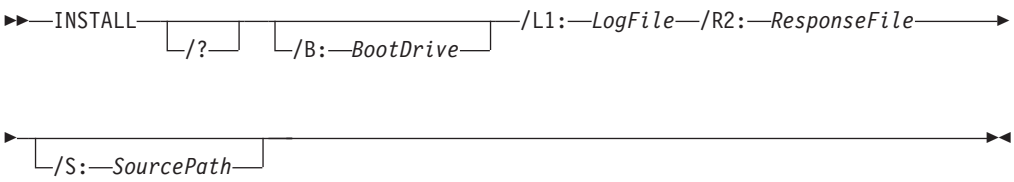
Feature Install provides a command-line method for remote installation. The default IBM Network Station Manager response file is X:\NSM\NSM.RSP. The user can overwrite options in this file by editing the secondary response file X:\NSM\NSMR2.RSP in an ASCII text editor.

Note: Do not edit the primary response file; only the secondary response file should be edited.

Install

Purpose: The **INSTALL** command enables you to perform an unattended installation from the command line.

Syntax:



Parameters:

Note: The parameters are not order specific.

/B: BootDrive
The boot drive of the target machine. This is an optional parameter. If it is not specified, the default value of c is used. For example: `/B:D`

/L1: LogFile
The fully qualified name of the log message file that is created during the installation. This is a required parameter for unattended installations. For example: `/L1:Y:\LOGS\NSMINST.LOG`

/R2: ResponseFile
The fully qualified file name of the secondary response file. This is a required parameter for unattended installation. For example: `/R2:X\NSM\OVERRIDE.RSP`

/S: SourcePath
The drive letter and path for the installation files. This is an optional parameter. If not specified, the path to the INSTALL.CMD file is used.

/? Displays the syntax and help for commands. If you type an incorrect parameter, help is automatically displayed. This is an optional parameter.

Examples: A command line to install IBM Network Station Manager:

```
INSTALL /R2:X:\NSM\NSMR2.RSP /L1:Y:\LOG\NSMINST.LOG /B:E /S:Z:\NSM
```

Uninstalling IBM Network Station Manager

IBM Network Station Manager can be uninstalled in two ways:

Attended
From the **Uninstall IBM Network Station Manager** icon. See “Attended Installation” on page 24 for step-by-step directions.

Unattended (CID)
From a command line. See “Unattended (CID) Installation” on page 24 for more information.

Attended Uninstallation

To uninstall IBM Network Station Manager using the **Uninstall IBM Network Station Manager** icon:

1. Open the **OS/2 System** folder.
2. Open the **System Setup** folder.
3. Open the **Uninstall Features** folder.
4. Double-click the **Uninstall IBM Network Station Manager** icon.
5. Verify the **NSM-Inventory** check box is selected.
6. Click the **Uninstall** button.

Unattended (CID) Uninstallation

To uninstall IBM Network Station Manager using the command line:

1. Open an OS/2 window.
2. Change the drive letter to the drive on which IBM Network Station Manager is installed.
3. Type `cd \NSTATION` and press **Enter**
4. Type `NSMUINST /CID` and press **Enter**

Configuring

Review the following procedures before you configure your IBM Network Station Manager environment.

Configuring Netscape Navigator 2.02 for OS/2

To administer IBM Network Station Manager from OS/2, you must configure Netscape Navigator 2.02 as follows:

1. Select the **Netscape Navigator for OS/2** icon.
2. Right-click and select **Settings** from the pop-up menu.
3. Click the **Program** tab if it is not already selected.
4. In the **Parameters** field, type `-3`.
5. Close the dialog box.

If you are using Netscape Navigator 2.02, you must also configure the **IBM Network Station Manager** icon as follows:

1. Select the **IBM Network Station Manager** icon.

2. Right-click and select **Settings** from the pop-up menu.
3. Click the **Program** tab if it is not already selected.
4. In the **Parameters** field, type -3 before the URL.
5. Close the dialog box.

Note: If you are using Netscape Communicator 4.x, no additional configuration changes are required.

Configuring DHCP on OS/2 Warp Server

The following sections explain how to configure Dynamic Host Configuration Protocol (DHCP) on OS/2 Warp Server. You will need the following information before you begin:

- Dynamic Domain Name System (DDNS) server with an IP address
- Host name
- Domain name
- Subnet address
- Subnet mask
- IP address range
- Lease time

Configuring TCP/IP Support for the Server System

Note: If you configured TCP/IP during the WorkSpace On-Demand 2.0 installation, you can skip to “Starting the DHCP Server” on page 28.

To configure the TCP/IP support for the server, do the following:

1. From the OS/2 Desktop, open the **TCP/IP Shadows** folder.
2. Open the **TCP/IP Configuration** notebook.
3. Select the **Network** tab.
   a. In the **Interface to Configure** list box, select **LAN Interface 0**.
   b. Under **Configuration Options**, select **Enable Interface**.
   c. Select the **Manually, Using** radio button.
   d. Type your **IP Address**.
   e. Type your **Subnet Mask**.
4. Select the **Routing** tab:
   a. Click the Add button to display the Route Entry window.
   b. Type your **Destination address**.
   c. Type your **Route address**.
   d. Type your **Subnet mask**.
   e. Click **Add**.
5. Select the **Hostnames** tab:
   a. Type your **Computer’s Host Name**.
   b. Type your **Local Domain Name**.
   c. Select the **Name Server Addresses** list box.
   d. Click **Add**.
   e. Type your **Name Server Address**.
   f. Click **OK**.

6. Select the **Autostart** tab:
   a. Select **nfsd** in the **Autostarted Services** list box.
   b. Check **Autostart Services**, **Foreground Session**, and **Minimized** radio buttons.
   c. Click **OK**.
7. Click **OK** to exit the notebook and save your changes.

Starting the DHCP Server

To start the DHCP server, do one of the following:

- Open the **DHCP Server** icon in the **DHCP Server Services** folder (in the **TCP/IP Shadows** folder).
- At the OS/2 command line, type `dhcpsd`.

Note: To display messages, do one of the following:

- Type `-v` (verbose) on the **dhcpsd** command, for example:
  ```
  dhcpsd -v
  ```
- Edit the properties of the icon:
  1. Right-click the **DHCP Server** icon to display the pop-up dialog box.
  2. Select **Properties** from the pop-up dialog box.
  3. Select the **Program** tab if it is not already selected.
  4. In the **Parameters** field, type **-v**.
  5. Close the dialog box.

Configuring the DHCP Server

Use the Dynamic Host Configuration Protocol (DHCP) Server Configuration program to create, modify, and validate configuration files for your IBM DHCP servers. Data validation occurs for each configuration entry as you make it.

Configure the DHCP server and place the DHCP server configuration file in the subdirectory identified by the ETC environment variable. This assigns an address and options to the subnet the client is in. To do this:

1. Start the **DHCP Server Configuration** program.
2. Click the **Global** icon.
3. From the **Configure** menu, click **Add Subnet** to open the **Subnet** notebook.
4. On the **Subnet Definition** page:
   - Type these values:
     - Subnet name
     - Subnet address
     - Subnet mask
     - IP Address range
   - (Optional) In the **Addresses Excluded from Range** field, type the server's address in the **From** field and then click **Add** to add the server's address to the Exclusion List.
   - In the **Lease Time and Comment** field, click the **Enter a Lease Time** radio button and set the time.
5. On the **DHCP Options** page:
   - In the options list, click **option 1, Subnet Mask**. Type your Subnet Mask.

- In the options list, click **option 6, Domain Name Server**. Type your IP Address and then click **Add**.
- In the options list, click **option 15, Domain Name**. Type your Domain Name.

To help you configure DHCP, record your network information in Table 9.

Table 9. Gathering DHCP Information

DHCP Option Number	Field	Description	Write Your Network's Value Here
		Defining the Subnet Options	
N/A	Subnet Number (Subnet IP Address)	The IP address associated with a particular subnet. For Class C networks whose subnet mask is 255.255.255.0, the subnet address is the same as the network address. For Figure 4 on page 6, the subnet IP address is 192.168.1.0. If the subnet mask of your network is not 255.255.255.0, see "Subnets and Subnet Masks" on page 8 for more information.	
N/A	Start DHCP Pool Address (IP Range From)	The first IP address in the range which you have specified for your pool of available addresses. In Network Example 3, for the subnet 192.168.1.0, the Start DHCP Pool Address can be 192.168.1.2.	
N/A	Last DHCP Pool Address (IP Range To)	The last IP address in the range which you have specified for your pool of available addresses. In Network Example 3, for the subnet 192.168.1.0, the Last DHCP Pool Address can be 192.168.1.3.	
		Defining DHCP Options	
Option 1	Subnet Mask	A value that enables network devices to direct packets of information accurately in a subnetted environment. For Figure 4 on page 6, the subnet mask is 255.255.255.0. For a discussion of subnet masks, refer to "Subnets and Subnet Masks" on page 8.	
Option 3	Router IP Address (Default Gateway)	The IP address of the default router to which TCP/IP packets not addressed to your network will be sent. In Network Example 3, for the subnet 192.168.1.0, the default gateway IP address is 192.168.1.1.	
Option 6	Domain Name Server (IP Adress)	Delivering the Domain Name Server IP address to clients allows them to use either fully qualified host names or IP addresses when they communicate with other devices. In Figure 4 on page 6, the IP address of the Domain Name Server is 192.168.1.5.	
Option 15	Domain Name	The domain name allows the Network Station to specify its domain to other devices. In Figure 4 on page 6, where the fully qualified host name is `server.mycompany.com`, the domain name is `mycompany.com`.	

Table 9. Gathering DHCP Information (continued)

DHCP Option Number	Field	Description	Write Your Network's Value Here
Option 66	TFTP Server Name (TFTP or NFS)	The server from which the Network Station downloads its operating system. This option serves the operating system kernel using both NFS and TFTP. When you specify this option, you must use an IP address, not the computer name of the server. NFS is the recommended download protocol. Enable the NFS download with Option 211.	
Option 67	Boot File name	The name of the file that contains the Network Station operating system. This value is a constant and has been entered for you on the table.	/netstation/prodbase/kernel **Note:** This is the NFS pathname.
Option 211	Base Code Server Protocol	This option sets the protocol used for the operating system kernel download. Specifiy this option to enable Option 66 to serve the kernel using NFS.	nfs

6. On the **Miscellaneous** page, in the **DDNS Server for PTR Record Updates** field, type the server's IP address. A key for the DHCP server is created automatically when you close the program. The key enables the DHCP server to send host name updates for the addresses it allocates to the primary DDNS server.
7. Click **OK** to close the notebook.
8. Double-click the **DHCP Server** icon to open the **DHCP Server Parameters** notebook.
9. On the **DDNS PTR Records** page, check the **Automatically Update or Delete PTR Records** check box to specify DHCP server support for DDNS PTR records.
10. Click **OK** to close the notebook.
11. (Optional) You can view the resulting configuration file. To do this, click the **subnet**, and, on the **View** pull-down, click **View Entire File** to see the file.
12. Click **File -> Exit** to exit the program.

For more information on using the **DHCP Server Configuration** program, see the online help.

Configuring and Starting the DDNS Server

To configure the DDNS Server, do the following:

1. Start the **DDNS Server Administrator** program.
2. In the **Domain Name Server** notebook, select the **Server** tab to verify that the information for the name server is correct. Click **OK**.
3. Define the DDNS server as the primary server for your domain as follows:
   a. Click **Add Primary Domain** on the tool bar to open the **Primary Domain** notebook.
   b. On the **Domain Configuration** page, be sure the domain type is dynamic (the default); then, type the your complete domain name.
   c. Click **OK** to close the notebook. When you close the notebook, the zone key for the domain is created automatically for you. An alias is also created for this server.

4. Define the DDNS server as the primary server for the reverse domain as follows:
   a. Click **Add Primary Domain** on the tool bar to open the **Primary Domain** notebook.
   b. On the **Domain Configuration** tab, be sure the domain type is dynamic (the default), and type your complete reverse domain name.
   c. Click **OK** to close the notebook. When you close the notebook, the zone key for the domain is created automatically for you.
5. Click **File -> Save** on the menu bar to save the configuration.
6. Click **Server -> Start the Name Server** on the menu bar to start the DDNS server.
7. Click **File -> Exit** to exit the program.

Configuring DHCP for Load Balancing

You can configure DHCP so a client obtains its IP address from the DHCP server, loads the kernel from a second server, and loads configuration from a third server. To simplify DHCP administration in your network, give your IBM Network Station Manager servers permanent IP addresses.

Configuring IBM DHCP

To configure DHCP options for load balancing, use the IBM DHCP interface and the DHCP starter file (`dhcpsd.cfg`). The DHCP starter file contains the class information and the options that are not provided from the IBM DHCP interface. To configure IBM DHCP for load balancing, open this template file from the DHCP configuration utility.

If you chose not to run the DHCP starter file, create DHCP options 212, 213, and 214. Configure DHCP option 66, the base code server IP address. Use the following steps:

1. Open the **TCP/IP Shadows** folder.
2. Open the **TCP/IP Configuration** folder.
3. Open the **TCP/IP Configuration (Local)** notebook.
4. Open the **DHCP Server Configuration** icon.
5. Select **Global**.
6. Select **Configure -> Modify selected item**.
7. Select the **DHCP Options** tab.
8. Click the **New** button.
9. Fill in the **Create New Option** screen once for each of the options. Use the information in Table 10 as a reference for the options that you create.

Table 10. Options to Create Load Balancing

Value Format	Option Name	Option Number	Brief Description of Option	Option Value Description	Value You Should Specify
String	Terminal Configuration Server	212	IP address of server to deliver terminal configuration data.	IP address of terminal configuration server.	Your IP address of terminal configuration server.

Table 10. Options to Create Load Balancing (continued)

String	Terminal Configuration path	213	The path to access terminal configuration information for option 212 (terminal configuration server).	Path name	/netstation /prodbase /configs
String	Terminal Configuration Protocol	214	Protocol to use for option 212 (terminal configuration server).	NFS or TFTP	NFS

10. After you create all four DHCP options, click **OK** to return to the main DHCP configuration page.
11. Select **Global** or the class, subnet, or client for which you want to configure your new DHCP options.
12. When the parameters window appears, select option 66, base code server. Type the IP address of the server you want to download the kernel from.
13. Select each of the four DHCP options you create and use the last column of Table 10 on page 31 to type the appropriate values.
14. When you are finished, click **OK** to save your changes and exit the DHCP configuration utility.

Adding IBM Network Stations to OS/2 Warp Server

To add Network Stations to an existing OS/2 Warp Server environment, complete the following tasks:

- Add a user account for the Network Station. See “Adding a User”.
- Add the new user account to either the NSMADMIN or NSMUSER group.
- Configure DHCP configuration as specified in “Making Configuration Changes to DHCP” on page 34.

Adding a User

You must add a user to the domain before that user can access the network. You can use the **LAN Server Administration** GUI to add approximately 16,000 users to each domain.

Note: You can also use the `NET USER` command to define approximately 1800 users on a domain. If you use **User Profile Management** to view user definitions, you can see approximately 1260 users on each domain.

To add a user:

1. Open the **LAN Server Administration** folder.
2. Open the appropriate domain object.
3. To display the **User Accounts** folder, open **User Accounts**.
4. To display the **User Account - Create** notebook, drag a copy of the **Template** to a convenient location in the folder.
5. Complete the required fields (indicated by an asterisk (*))and modify other fields as needed.

6. To display the first Password page, select the **Password** tab.
7. Type the new password in the **New Password** field.

   Note: For security purposes, the password is displayed as asterisks (*) when you type it.
8. Type the new password again in the **Confirmation** field.
9. To continue to the second **Password** page, select the folded page corner.
10. (Optional) Complete the remaining fields on this page.
11. (Optional) Complete the fields on other pages.
12. Select **Create**.

Adding a Group

To work with several users at the same time, create user groups. On the OS/2 LAN, groups are used for access control and for message purposes.

To add a group:

1. Open the **LAN Server Administration** folder.
2. Open the appropriate domain object.
3. To display the **Groups** folder, open **Groups**.
4. To display the **Group - Create** notebook, drag a copy of the **Group Template** to a convenient position in the folder.
5. To add a group, complete the pages under each tab.
6. After you complete and check the properties, select **Create**.

Adding Users to Groups

Use the following steps to add users to a group.

Note: A user must be in the NSMADMIN or NSMUSER group to use IBM Network Station Manager.

To add users:

1. Open the **LAN Server Administration** folder.
2. Open the appropriate domain object.
3. To display the **Groups** folder, open **Groups**.
4. To display the **Group** notebook, open the group you want to update.
5. To display the **Users** page, select the **Users** tab.
6. To display the **Add Users to Group** window, select **Add**.
7. Select one or more users to add.
8. Select **Add**. The selected users are added.
9. Select **Set** or **Apply**.

Modifying a User

Using the **LAN Server Administration** GUI, you can make the following updates to user account information:

- User type (user, user with operator privilege, or administrator)
- Optional description about the user account
- Password

- Password options
- Home directory
- Logon workstation
- Logon authority (whether the user can log on to the domain)
- Group memberships (such as adding a user to a group and deleting a user from a group)
- Logon assignments
- Public applications

For more information, consult the *LAN Administration Guide*, located in the **Information** folder.

Making Configuration Changes to DHCP

When you change your network configuration, ensure that the DHCP configuration reflects those changes. When you add an IBM Network Station to your network, consider the following:

- Will the addition of this Network Station cause a shortage of available IP addresses?
- Should this Network Station belong to a particular subnet?
- Will this Network Station receive its address dynamically, or will it have a permanently assigned address?
- Do I need to consider any configuration information that is unique to this particular Network Station?

If you make any changes to the DHCP configuration, see “Configuring DHCP on OS/2 Warp Server” on page 27.

Verifying Network Servers and Services

To be sure IBM Network Station Manager functions correctly, you must verify that the following servers and services are up and running :

IBM Warp Server File and Print Services
: Verify that ″net start server″ is in `STARTUP.CMD`.

IBM TCP/IP Services
: Verify that `TCPSTART.CMD` is in the **Startup** folder in the **OS/2 System** folder.

IBM DHCP server
: Verify that this option is configured in the **TCP/IP Configuration** notebook.

NFS or TFTP server
: Verify that these options are configured and enabled for autostart in the **TCP/IP Configuration** notebook.

Lotus Domino Go Webserver
: Verify that the **Lotus Domino Go Webserver** icon is in the **Startup** folder in the **OS/2 System** folder.

Network Station Login Daemon
: Verify that ″start nsld.exe″ is in `\TCPIP\BIN\TCPEXIT.CMD`.

Configuring Printers on OS/2 Warp Server

If the datastream generated by the application matches a datastream that your printer understands, you can configure printers for your Network Stations with the IBM Network Station Manager. Table 13 on page 54 identifies which datastreams are compatible.

Configuring Basic Printer Scenarios

Table 11 explains the basic steps to configure the printers shown in Figure 8.

Note: Review the online help information text for IBM Network Station Manager Printer Settings to become more familiar with the Print function for Network Stations.

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

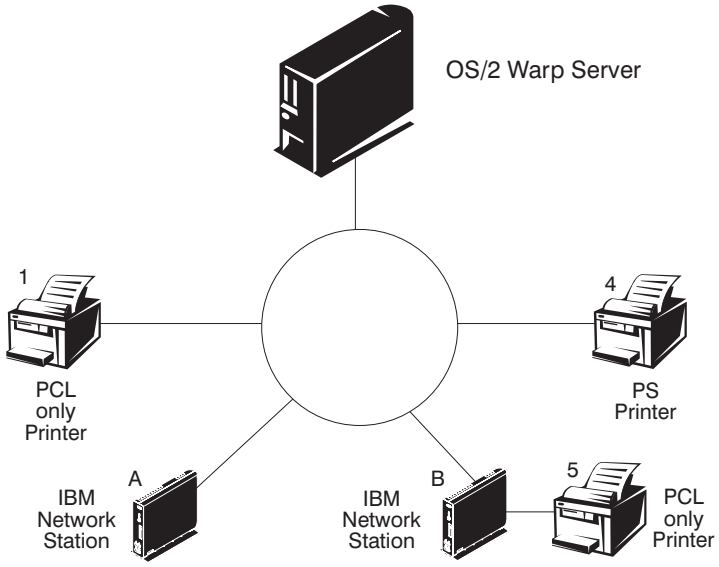


Figure 8. Possible Network Station Printing Scenarios

Table 11. Configuration Descriptions for Basic Printer Scenarios

Print Configuration	Print Job Flow in Figure 8	Instructions
Network Station to a LAN printer	Network Station A to Printer 1	In the IBM Network Station Manager software, configure an entry in the **Remote Printer Server** field for the LAN printer.
Network Station to a local printer	Network Station B to Printer 5	In the IBM Network Station Manager software, configure an entry in the **Local Parallel Printer** or the **Local Serial Printer** field, depending on how the printer connects to the Network Station.
Network Station to another Network Station with an attached printer	Network Station A to Network Station B to Printer 5	In the IBM Network Station Manager software, configure an entry in the **Remote Printer Server** field with the IP address of the Network Station to which the printer is attached. In the **Queue name** field, type `PARALLEL1` or `SERIAL1`, depending on how the printer connects to the Network Station.

To configure an OS/2 Warp Server to an IBM Network Station with an attached printer, do the following:

1. Open the **TCP/IP Shadows** folder.
2. Open the **TCP/IP Configuration** folder.
3. Open the **TCP/IP Configuration (Local)** folder.
4. In the **TCP/IP Configuration** notebook, select the Autostart tab.
5. Select **lprportd** from the services in the left hand column.
6. If the **Autostart Service** option is already selected skip to step 9. Otherwise, select the option and the Detached option.
7. Press the **OK** button to close the TCP/IP Configuration notebook and save the changes.
8. Shutdown and restart the server.
9. Boot the Network Station from the OS/2 Warp Server.
10. Open the **OS/2 System** folder.
11. Open the **Templates** folder.
12. Right-click on the **Printer** template and select **Install** from the pop-up menu.
13. In the **Create a Printer** window, enter the name of the printer.
14. Select the default printer driver for the type of printer attached to the Network Station. If the correct printer driver is not installed, select the **Install new printer driver** button to add the correct driver.
15. Select an available LPR output port to use for the printer. The LPR ports have a name in the form `\PIPE\LPDx` where the `x` is a number. Currently used ports are cross-hatched.
16. Open the selected port by double-clicking it.
17. In the **LPD Server** field, type the name or IP address of the Network Station to which the printer is attached. In the **LPD Printer** field, type the name of the printer or print queue (`SERIAL1` or `PARALLEL1`) on that Network Station. Optionally, you may enter the Warp Server's host name in the ″Host Name″ field.
18. Press **OK** to save the printer port settings.
19. Press the **Create** button to create the printer.

Printer Administration Techniques

Network Stations can print to most types of printers. To set up your printer environment, create a print network diagram. This will help you develop a printing strategy.

Consider the following techniques:

Table 12. Advantages and Disadvantages of Printer Techniques

Technique	Advantages	Disadvantages
Print jobs sent to the OS/2 Warp Server, which controls the printers.	Reduces workload on Network Station when print buffer is full. Works well in an environment with mixed printer datastreams.	Increases printing time. Increases workload on the server. Increases network traffic. Increases chance of the server misinterpreting the datastream.

Table 12. Advantages and Disadvantages of Printer Techniques (continued)

Print jobs sent directly to the printers.	Reduces printing time. Decreases workload on the server. Decreases network traffic. Reduces chance of the server misinterpreting the datastream.	Does not work well in an environment with mixed printer datastreams. Increases workload on the Network Station; may hinder performance.

Running Java Applications and Applets on OS/2 Warp Server

When you load Java applications and applets from the network file system, put them in the subdirectory AppBase under the directory \nstation\. Create subdirectories in the AppBase directory, as needed. Because this is a read-only directory through NFS (Network File System), save data to the user directory.

To create a button to access an applet in the \nstation\ directory, do the following:

1. Use an ASCII text editor to open the file x:\nstation\prodbase\configs\defaults.dft, where x is the drive on which you installed the IBM Network Station Manager.
2. In the empty defaults.dft file, add the following line:

   ```
   set file-service-table[-1] = {"/netstation/AppBase" nil
   x.x.x.x nfs "/netstation/Appbase" unix 3 30 1024 1024}
   ```

   where x.x.x.x is your server IP address.
3. Save your change.
4. Start the IBM Network Station Manager in your browser.
5. Select the **Startup** tab.
6. Select **Menus**.
7. Scroll down to the Java Applications menu items.
8. Add the menu item label.
9. In the **Applet URL** field, type `/netstation/AppBase/applet.html`.
10. Click **Finish**.

    The button loads the applet through NFS into Applet Viewer on the Network Station.

To set up a button for an application in the `\nstation\` directory:

1. Use an ASCII text editor to open the file x:\nstation\prodbase\configs\defaults.dft, where x is the drive on which you installed the IBM Network Station Manager.
2. In the empty defaults.dft file, add the following line:

   ```
    set file-service-table[-1] = {"/netstation/AppBase" nil
   x.x.x.x nfs "/netstation/Appbase" unix 3 30 1024 1024}
   ```

   where x.x.x.x is your server IP address.
3. Save your change.
4. Start the IBM Network Station Manager in your browser.
5. Select the **Startup** tab.
6. Select **Menus**.
7. Scroll down to the Java Application menu items.
8. Add the menu item label.

9. In the **Application (class) Name** field, type the class name, for example, `application`.
10. In the **Class Path** field, type `/netstation/AppBase`.
11. Select **Finish**.

Before You Continue . . .

- Verify that the Network Parameters, configured in the Setup Utility of each Network Station, are compatible with your boot method. For example, to serve IP addresses to an IBM Network Station through a DHCP server, you need to set the **IP Address From** field in the Setup Utility to Network.
- Verify that your DHCP server, NFS or TFTP server, and HTTP server are started. See “Verifying Network Servers and Services” on page 34.
- Verify that you excluded any statically addressed devices in your DHCP addressing range.
- If you use DHCP and you have a router between your IBM Network Stations and your boot server, verify that the router handles DHCP requests.
- For more information about IBM Network Station Manager client tasks, refer to “Chapter 3. Logging On and Working With IBM Network Station Manager Applications” on page 39.
- For more information about IBM Network Station Manager administrator tasks, refer to “Chapter 4. Using the IBM Network Station Manager Program” on page 55.

Chapter 3. Logging On and Working With IBM Network Station Manager Applications

Logging On

After you power on your IBM Network Station network computer, the login screen appears. Figure 9 shows the initial login screen. You can sign on by typing your user ID and password in the appropriate entry box.

Note: The mouse pointer must be inside the window to make the window active.

Figure 9. Network Station Login Screen

Roam Button

The Roam button allows a user to log in to a server other than the server that is displayed on the login screen.

To log in to a server other than the server name that is displayed on the login screen, take the following steps:

1. Click the **Roam** button on the login screen. A screen similar to the one that is shown in Figure 10 appears.
2. Type in the name or IP address of the host where your user ID account is established and click **OK**. Your personal desktop will appear on the Network Station that you are using.

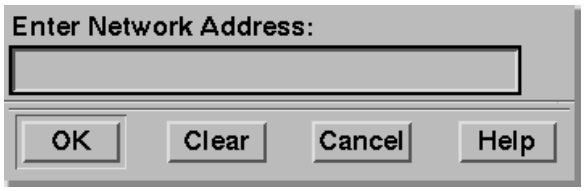


Figure 10. Network Address Screen used for Roaming

For more information about roaming and working with multiple servers, see “Taking Advantage of Multiple Server Environments” on page 17.

After You Log In

Whether you log in as usual or log in using the Roam button, your regular set of Network Station applications appear.

Figure 11 shows the Network Station Menu bar, which contains the applications available to select. The applications will appear on your screen if the IBM Network Station Manager program specified them to autostart. See “Chapter 4. Using the IBM Network Station Manager Program” on page 55 for more information. If no applications autostart, you can select an application from the Menu bar. Available default application buttons are 5250, 3270, and NC Navigator (a browser).

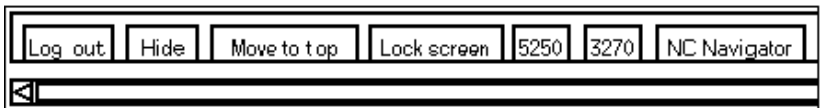


Figure 11. Network Station Menu Bar

The buttons within the Menu bar are as follows:

- Log out

  Clicking **Log out** logs you off the Network Station.
- Hide or Show

  Clicking **Hide** makes the Menu bar float out of view when you move the mouse pointer off the Menu bar. To retrieve the Menu bar, move your mouse pointer to the very bottom of your screen. (If you clicked the **Move to top** button, go to the

very top of the screen instead.) The **Hide** button or **Show** button is useful if the Menu bar covers part of an application window. Click the **Show** button to display the Menu bar.

- Move to top or Move to bottom

  Clicking **Move to top** moves the Menu bar to the top of the screen. The **Move to top** button changes to read **Move to bottom** after the Menu bar moves to the top. Clicking the **Move to bottom** moves the Menu bar back to the bottom.

- Other buttons

  Other buttons on the Menu bar represent applications you can use.

- Lock screen

  The **Lock screen** button allows you to lock the screen when you leave the workstation. Clicking the **Lock screen** button enables a prompt for the password.

Note: You can control the presentation of buttons on the Menu bar. In your environment, you may or may not want users to have access to various applications (for example, additional 5250 sessions). The IBM Network Station Manager program allows you the flexibility of controlling access to various applications through Menu Bar Options. See “Working with Menu Bar Options” on page 76 for more information about working with Menu Bar Options.

Working with the 5250 Emulation Application

The 5250 application provides access to an AS/400 system. How each 5250 session is presented on the Network Station depends on how you configured the session using the IBM Network Station Manager program.

If, using the IBM Network Station Manager program, the 5250 session was set to autostart, a 5250 session appears on your Network Station as shown in Figure 12.

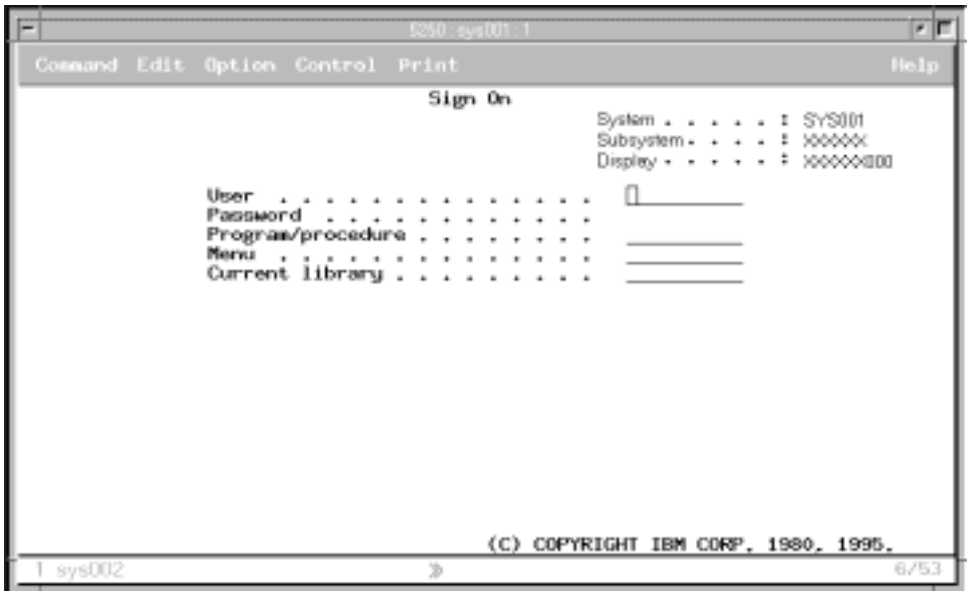


Figure 12. 5250 Session Display

If you click the 5250 button within the Network Station Menu bar, a New 5250 Session window appears. See Figure 13.

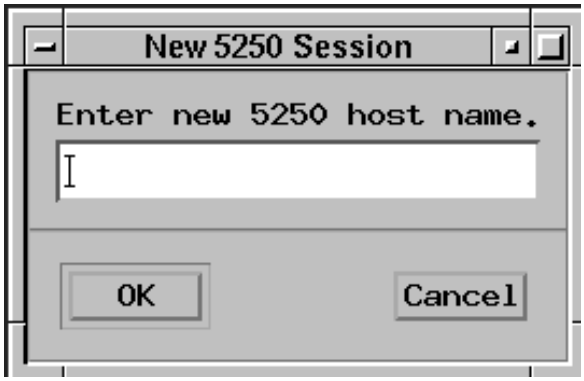


Figure 13. New 5250 Session Dialog Box

Note: You can use the name of the system or the IP address of the system to connect to or start a session. To use a system name, you must set up name translation (using the Domain Name Server (DNS)) information in your TCP/IP configuration.

Depending on the volume of network traffic, it can take from several seconds to a minute to see the sign-on display.

Learning About the 5250 Emulation Function

5250 emulation provides AS/400 system users with greater function than they normally receive if they use only a nonprogrammable work station (NWS) to access the system. This additional function is available by clicking various pull-down options from the 5250 Menu bar. See Figure 14.

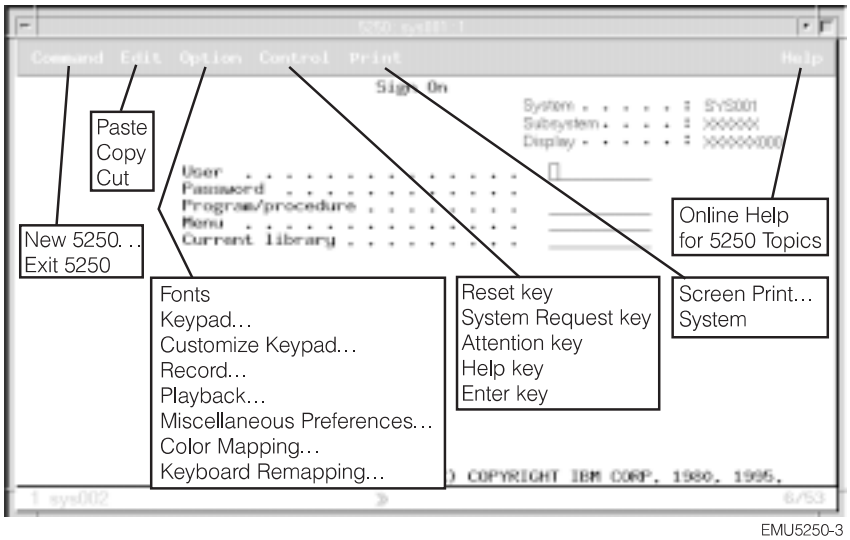


Figure 14. 5250 Emulation Session with Expanded Pull-downs

Pull-downs are available to allow you to quickly access 5250 emulation functions. See Figure 14 on page 42. For example, multi-session support (Command pull-down), font selection by session (Option pull-down), screen print (Print pull-down), and online help (Help) information.

The following list shows additional 5250 emulation support:

- Keyboard remapping[1]
- Color mapping (basic and advanced)[1]
- Record/playback capability[1]
- Autostart of playback file (from the Record/playback function)[1]
- Auto-logon[1]
- User customized keypads[1]
- Enter/Field Exit key locations (you can specify your choice of keys to be used for the Enter and Field Exit keys)
- Multiple screen size support (for example: 24 X 80, 27 X 132)
- Office Vision/400 controller text assist
- Cut, copy, paste function[1]
- Hotspot support
- Cursor style options (Cursor style options are block, underscore, blink, and no blink.)
- Rule line support
- Row indicator and column indicator
- Customizable window title[1]
- Column separator function

All the 5250 emulation functions have shipped defaults. Those functions that are managed by the IBM Network Station Manager program also have IBM-supplied defaults. See “Appendix C. IBM Network Station Manager Program Shipped Default Settings” on page 147 for a listing of all 5250 emulation defaults controlled by the IBM Network Station Manager program.

Accessing the online 5250 Emulation Help (by clicking the Help button) provides more information about how to make each of these 5250 Emulation functions work.

Eliminating the 5250 Emulator New Session Dialog Box for Japanese Users

The IBM network Station Manager program (by default) displays a New Session Dialog box coupled with a Language ID Selection Dialog box for Japanese users. The New Session Dialog box and Language ID Selection box are shown in Figure 15 on page 44 and Figure 16 on page 44.

1. The IBM Network Station Manager program controls these 5250 Emulation functions. See “Chapter 4. Using the IBM Network Station Manager Program” on page 55 for more information. The online help information in the IBM Network Station Manager program provides more information along with all default settings.

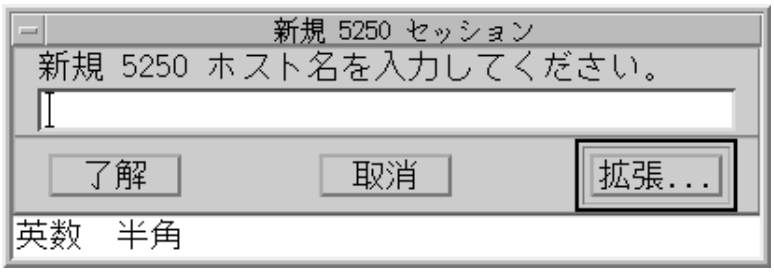


Figure 15. Japanese New Session Dialog Box

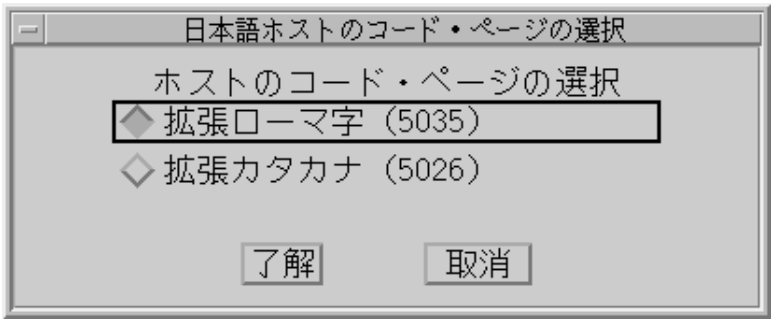


Figure 16. Language ID Selection Dialog Box

These dialog boxes are presented because the IBM Network Station Manager program needs to know which language ID to use. Japanese users have two language options: Japanese Extended Katakana and Japanese Extended Latin.

Having to choose the language option makes Japanese users go through the extra steps of selecting their host and language ID.

These extra steps (New Session Dialog box and Language ID Selection Dialog box) can be eliminated by adding the LANGID parameter value to the 5250 Startup configurations. Figure 17 shows the configuration information needed to eliminate the New Session Dialog box and Language ID Selection Dialog box.

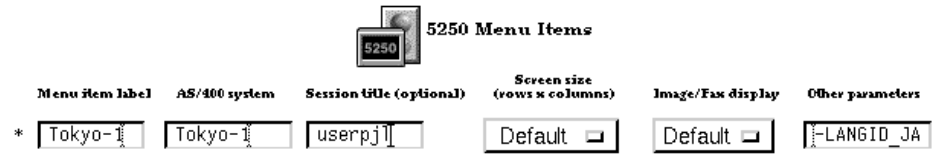


Figure 17. Network Station Manager Program with 5250 -LANGID used.

Following is an example of the -LANGID coding for the two language options:

```
Japanese Extended Katakana:   -LANGID JA_JP.IBM930
Japanese Extended Latin:      -LANGID JA_JP.IBM939
```

Notes:

1. You can configure the LANGID parameter in either the Program or Menu functions of Startup.
2. You must type the parameter values in uppercase.

Accessing Help

You can access help for the 5250 Emulator or your AS/400 session.

For 5250 emulator help, click Help in the emulator's Task bar. To access help for AS/400, sign on to AS/400 and press F1.

Working with the 3270 Application

The 3270 application provides access to a System/390. How a 3270 session is presented on the Network Station depends on how you configured the session using the IBM Network Station Manager program.

If you have set the 3270 session to autostart, a 3270 session appears on the screen of your Network Station. See Figure 18.

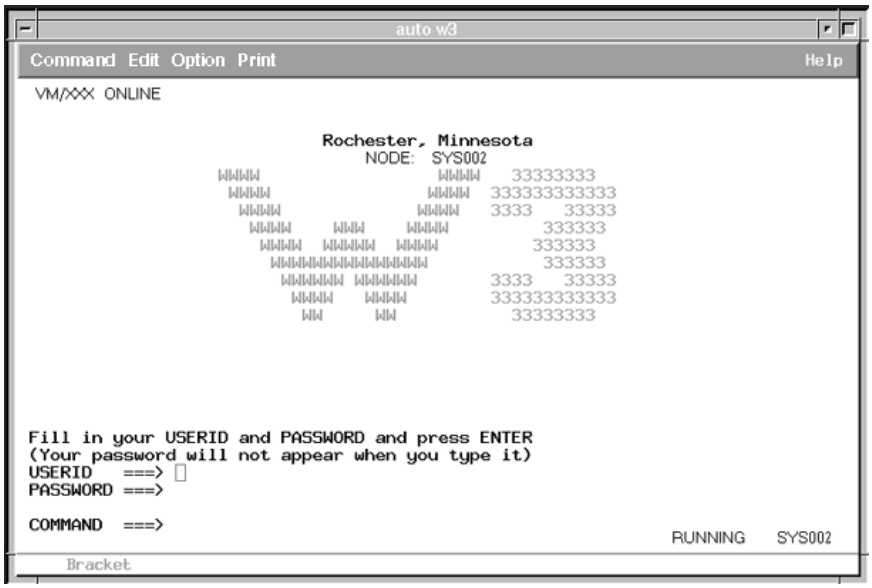


Figure 18. 3270 Session Display

If the 3270 session is configured not to autostart, and you click the 3270 button on the Menu bar, a New 3270 Session window appears. See Figure 19.

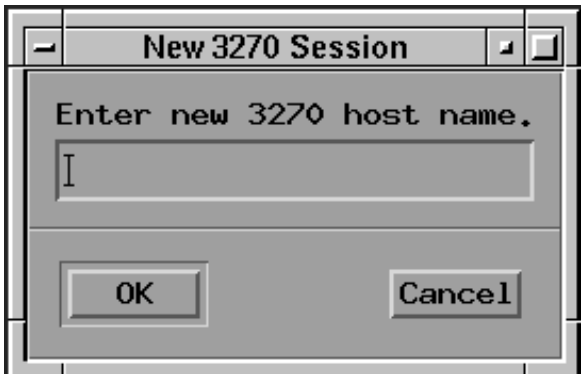


Figure 19. New 3270 Session Dialog Box

Note: You can use the system's name or IP address to log on. To use a system name, you must set up name translation information (using the Domain Name Server (DNS)) in your TCP/IP configuration.

Depending on the volume of network traffic, it can take from several seconds to a minute for the *Host Login Session* screen to appear.

Learning About the 3270 Emulation Function

3270 emulation provides users with greater function than they normally receive using a 3270 nonprogrammable work station (NWS) to access a System/390. This additional function is available by clicking various pull-down options from the 3270 Menu bar. See Figure 20:

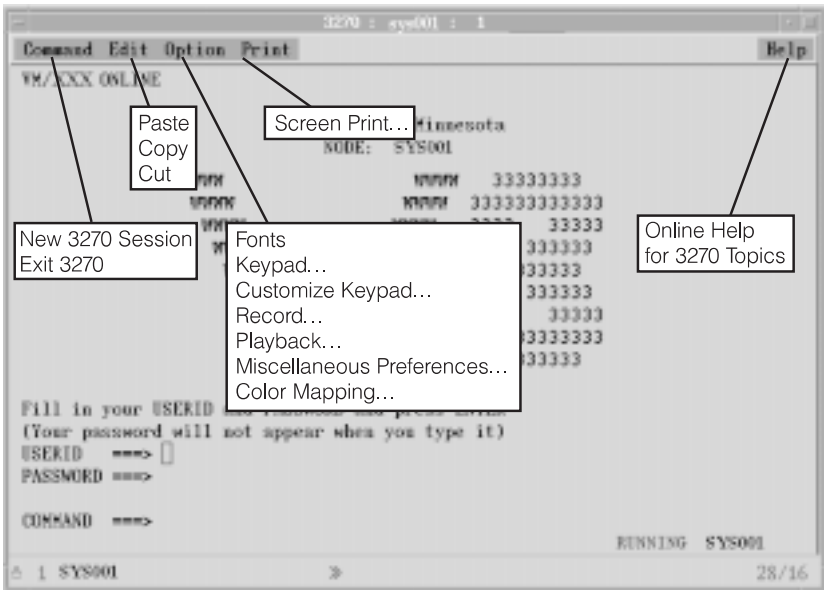


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Figure 20. 3270 Emulation Session with Expanded Pull-downs

Figure 20 shows the pull-downs that are available to allow you to quickly access 3270 emulation functions such as the following:

- Multi-session support (Command pull-down)
- Font selection by session (Option pull-down)
- Print support (Print pull-down)
- Edit support (Edit pull-down)
- Online help (Help) information

The following list shows some of the 3270 emulation support:

- Keyboard remapping[2]
- Color mapping[2]
- Record/playback[2]

2. The IBM Network Station Manager program controls these 3270 emulation functions. See "Chapter 4. Using the IBM Network Station Manager Program" on page 55 for more information. Also, the online help information in the IBM Network Station Manager program provides information along with all default settings for 3270 emulation.

- Autostart of playback file (from the Record/playback function)[2]
- Auto-logon[2]
- User customized keypads[2]
- Graphics support[2]
- Choosing an Enter key location[2]
- Screen size support (for example: 24 x 80, 32 x 80, 43 x 80, and 27 x 132)[2]
- Cut/Copy/Paste function[2]
- Auto action (hotspot support)
- Cursor style options (The cursor style options are block or underscore and blink or no blink.)[2]
- Rule line[2]
- Row and column indicator[2]
- Customizable window title[2]

All the 3270 emulation functions have shipped defaults. Those functions that are managed by the IBM Network Station Manager program also have IBM-supplied defaults. See “Appendix C. IBM Network Station Manager Program Shipped Default Settings” on page 147 for a listing of all 3270 emulation defaults controlled by the IBM Network Station Manager program.

Accessing the 3270 emulation Help (clicking the Help button) provides more information about how to make each of these 3270 emulation functions work.

Eliminating the 3270 Emulator New Session Dialog Box for Japanese Users

The IBM Network Station Manager program (by default) displays a New Session Dialog box and a Language ID Selection Dialog box for Japanese users. The New Session Dialog box and Language ID Selection box are shown in Figure 21 and Figure 22 on page 48.

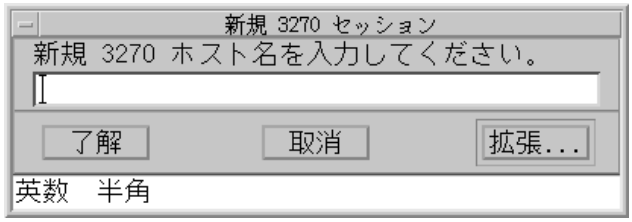

Figure 21. Japanese New Session Dialog Box

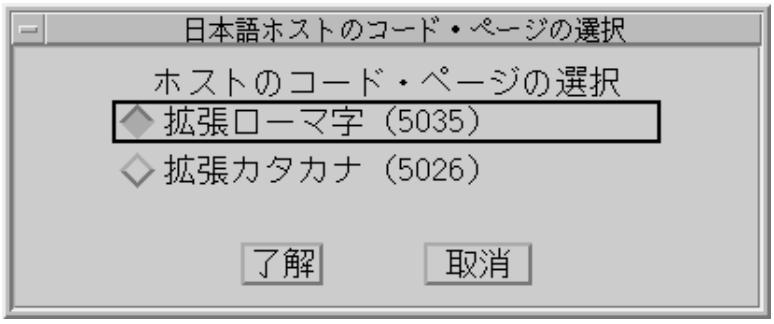

Figure 22. Language ID Selection Dialog Box

These dialog boxes are presented because the IBM Network Station Manager program needs to know which language ID to use. Japanese users have two language options: Japanese Extended Katakana and Japanese Extended Latin.

Having to choose the language option makes Japanese users go through the extra steps of selecting their host and language ID.

These extra steps (New Session Dialog box and Language ID Selection Dialog box) can be eliminated by adding the LANGID parameter value to the 3270 Startup configurations. Figure 23 shows the configuration information needed to eliminate the New Session Dialog box and Language ID Selection Dialog box.

Figure 23. Network Station Manager Program with 3270 -LANGID used.

Following is an example of the -LANGID coding for the two language options:

```
Japanese Extended Katakana:   -LANGID JA_JP.IBM930
Japanese Extended Latin:      -LANGID JA_JP.IBM939
```

Notes:

1. You can configure the LANGID parameter in either the Program or Menu functions of Startup.
2. You must type the parameter values in uppercase.

Accessing Help

You can access help for the 3270 Emulator or your Host session.

You can access 3270 emulator help by clicking **Help** in the emulator tool bar. In general, to access help for the 3270 application, place your mouse pointer inside the *Host session* window and press F1.

Working with the NC Navigator Browser

You can use NC Navigator to access the Internet and the IBM Network Station Manager program. See “Chapter 4. Using the IBM Network Station Manager Program” on page 55 for more information.

If you configured the NC Navigator session to autostart, a NC Navigator session will appear on the screen of your Network Station. See Figure 24.

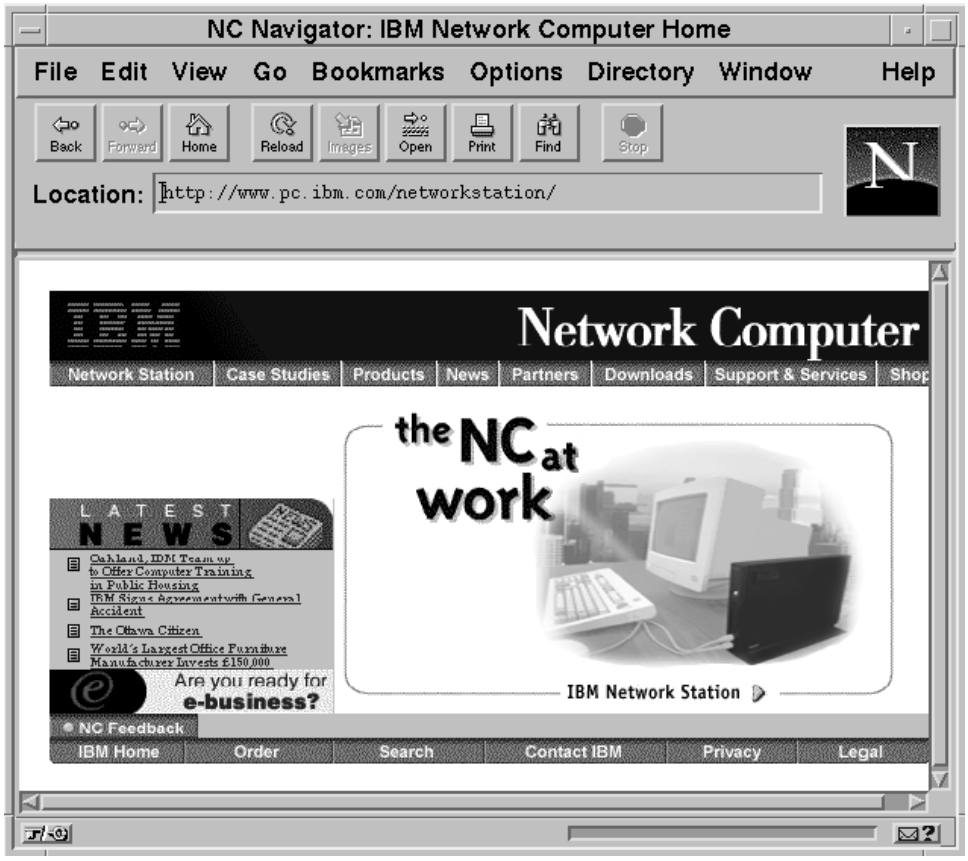

Figure 24. NC Navigator Browser Session Display

If you did not configure NC Navigator to autostart, and you click the **NC Navigator** button within the Menu bar, an NC Navigator session will appear. Depending on the volume of network traffic, you can expect it to take from several seconds to a minute for the *NC Navigator* screen to appear.

Some of the NC Navigator functions have defaults that are managed by the IBM Network Station Manager program. For example, you can configure proxies, SOCKS, mail servers, and news servers by using the IBM Network Station Manager program. See “Working with Your Network Proxies” on page 88 for more information.

Many of the NC Navigator functions, including those functions that are managed by the IBM Network Station Manager program, have shipped or IBM-supplied defaults. See “Appendix C. IBM Network Station Manager Program Shipped Default Settings” on page 147 for a listing of all NC Navigator defaults controlled by the IBM Network Station Manager program.

Learning About NC Navigator Browser Functions

The NC Navigator browser has many capabilities to help you manage Internet access and quick connection to the IBM Network Station Manager program. These

functions and others are available by clicking various pull-down options from the browser Menu bar. See Figure 25.

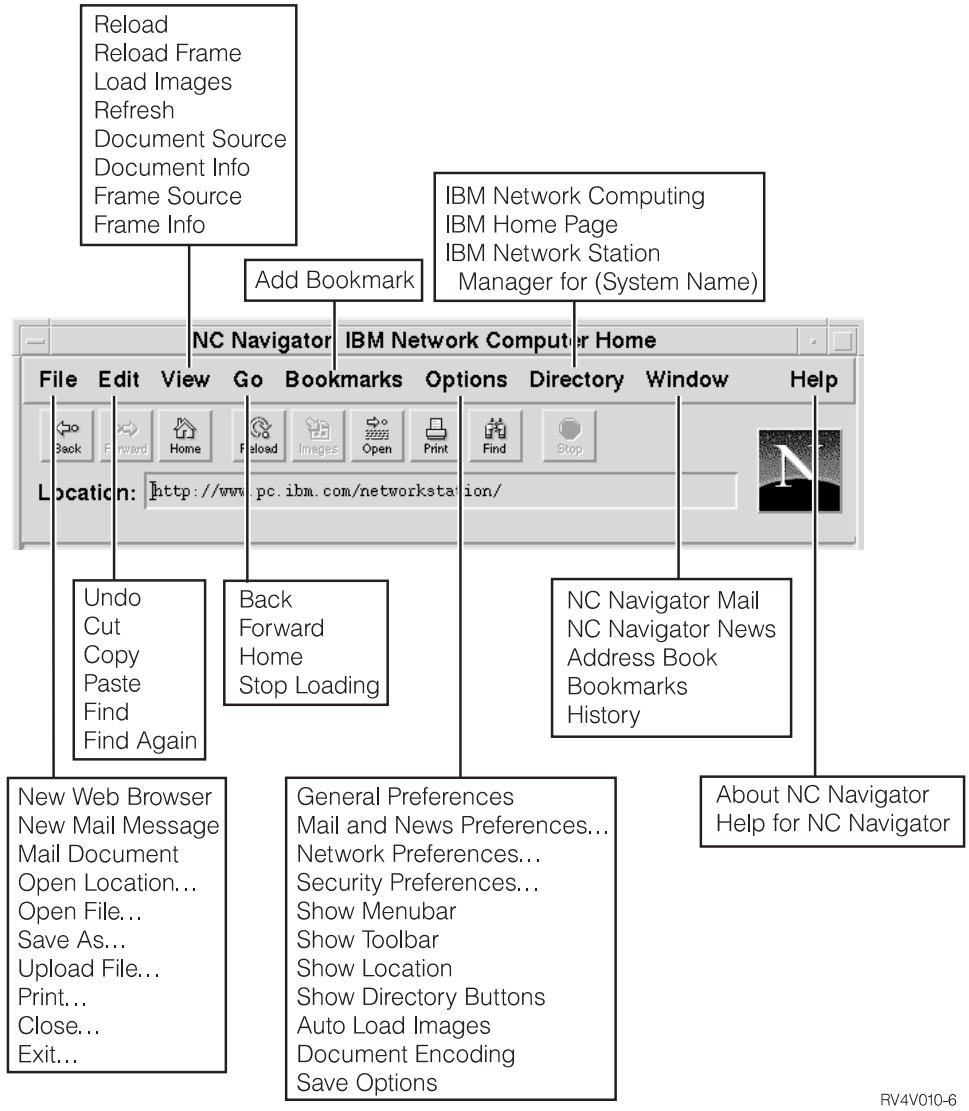

Figure 25. NC Navigator Browser with Extended Pull-downs

Figure 25 shows the pull-downs that are available to allow you to quickly access NC Navigator functions. For example:

- Multiple NC Navigator session support (New Web Browser in the File pull-down)
- E-mail (Netscape Mail in the Window pull-down)
- Font selection by user (General Preferences in the Option pull-down)
- Online help (Help) information

Creating NC Navigator Directory Buttons

Directory buttons provide quick access to frequently used URLs.

The directory buttons appear (when configured) below the URL input field of the NC Navigator.

Use the Network Station Manager program to administer the directory buttons. See Figure 58 on page 87 for additional information.

Learning About NC Navigator Mail Functions

NC Navigator mail has many capabilities to help you read and manage E-mail messages. These functions, and others, are available by clicking various pull-down options from the NC Navigator Mail menu bar. See Figure 26.

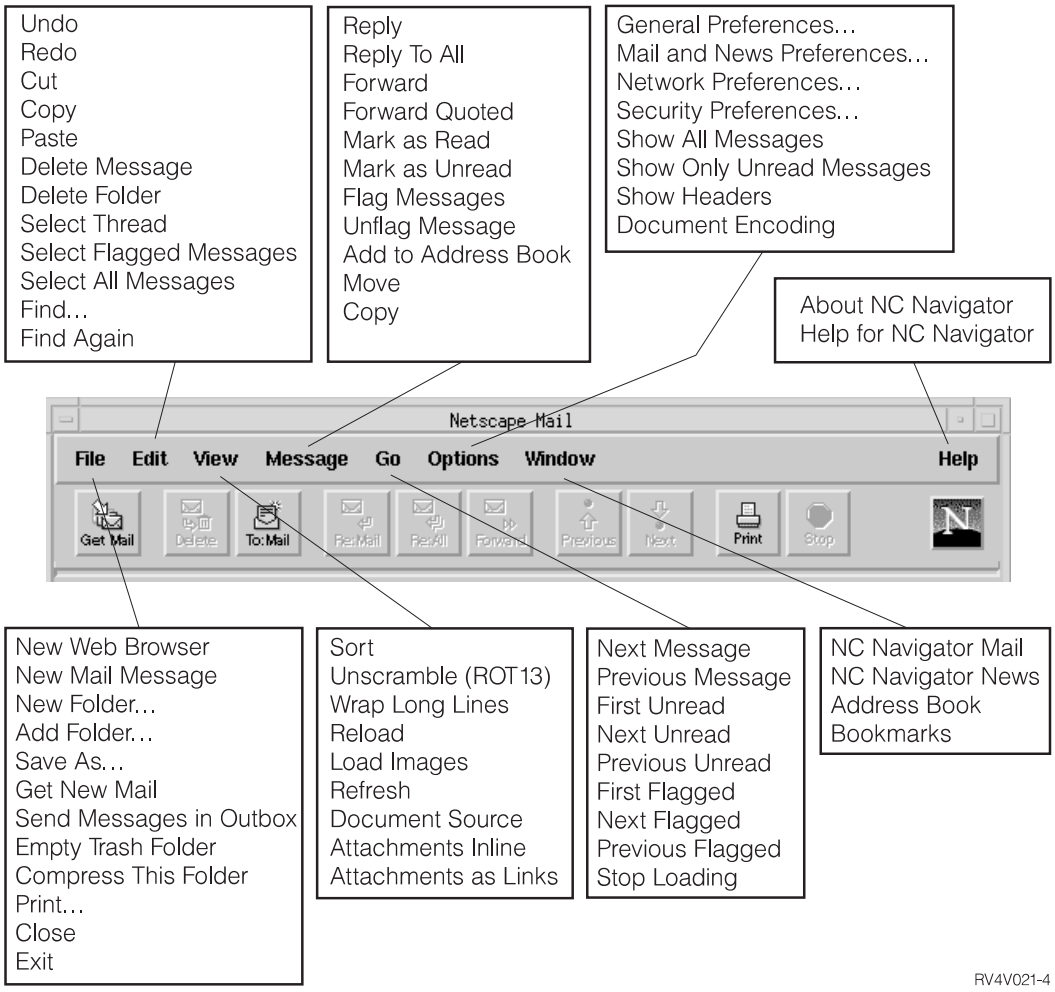

Figure 26. NC Navigator Mail with Extended Pull-downs

Figure 26 shows the pull-downs that are available to allow you to quickly access NC Navigator functions. For example:

- Reply to mail (Reply in the Message pull-down)
- News reader (Netscape News in the Window pull-down)
- Online help (Help) information

Learning About NC Navigator News Functions

NC Navigator news has many capabilities to help you read and manage newsgroup messages. These functions and others are available by clicking various pull-down options from the NC Navigator Mail menu bar. See Figure 27.

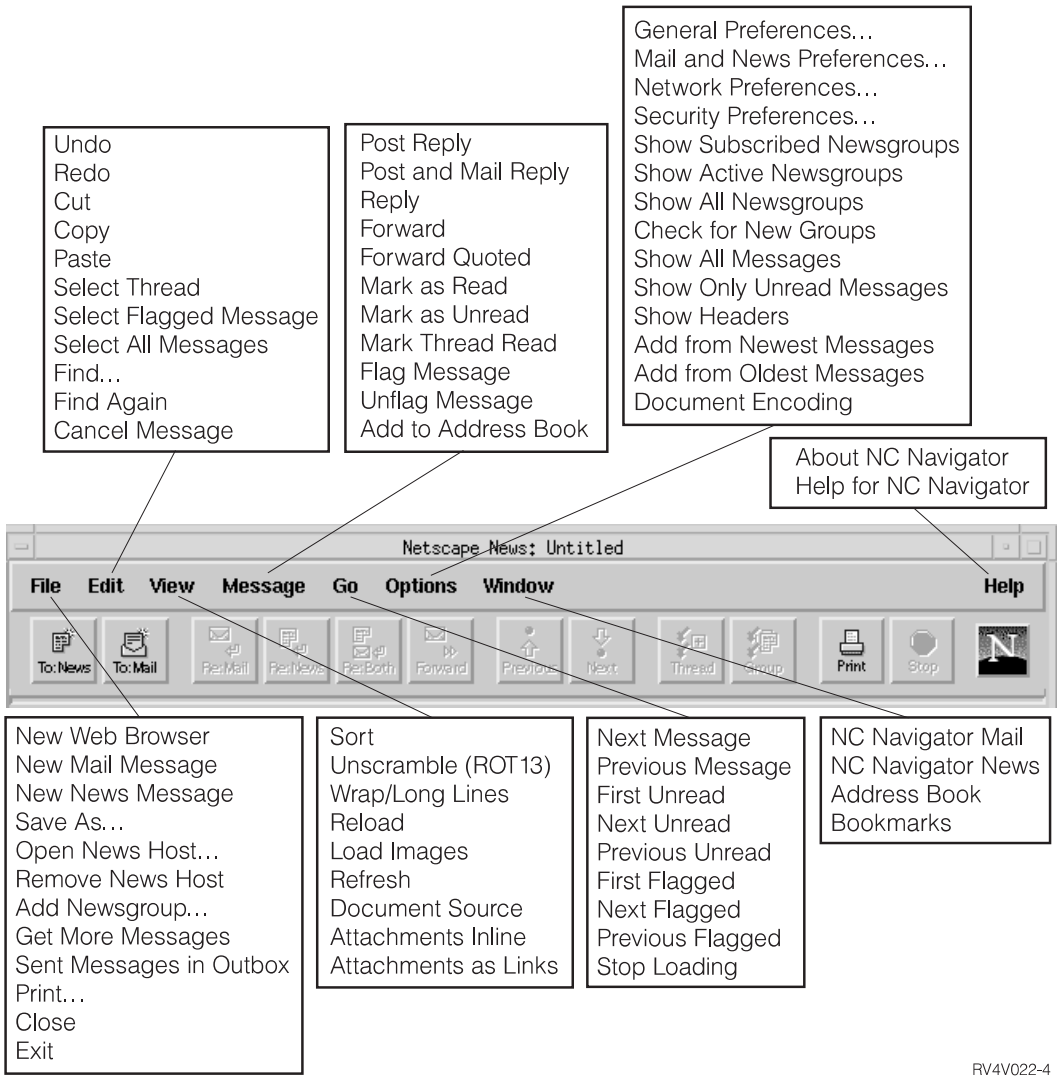

Figure 27. NC Navigator News with Extended Pull-downs

Figure 27 shows the pull-downs that are available to allow you to quickly access NC Navigator functions. For example:

- Reply to news message (Reply in the Message pull-down)
- E-mail (Netscape Mail in the Window pull-down)
- Online help (Help) information

Accessing Help

You can access help for the NC Navigator by using the **Help** menu option. The help includes a Frequently Asked Questions (FAQ) section and an addendum for last-minute changes.

For NC Navigator help, place your mouse pointer in the NC Navigator Menu bar and click **Help**.

JAVA Virtual Machine

You can set up Java applets and applications by using the IBM Network Station Manager program. You can configure applets and applications to autostart on your workstation, or configure them as menu items (buttons in the Menu bar).

Note: Only a single Java application can run within the Network Station and, if running, also precludes applets from running in both the desktop and the browser. Many applets can run simultaneously.

Starting an Application

You must install applications on the file system of the server.

Notes:

1. Only a single Java application can run on the Network Station. No Java applets can run if a Java application is running. However, you can run many Java applets simultaneously.
2. You must use the IBM Network Station Manager program to run a Java application. You can set the Java application to autostart, or (if a button exists for the application) you can click the button).

Starting an Applet

You can install Applets on the file system of your boot host, or downloaded from a remote system with a Universal Resource Locator (URL). You can load the applet by specifying tags on an HTML page.

You can run applets three different ways:

- By creating a button on the Menu bar for an applet
- By creating a button for a browser URL
- By starting a browser and then loading an HTML page which contains an applet

You manage configuration of the applet through parameter tags within the HTML file (the applet vendor determines the specific parameter names). Applets that load from the file system of your boot host should be well-known and trusted applets (the source of the applet is reliable). There are no security restrictions for Applets running on the local file system. The applet may write to files and communicate with other machines. Writing to other machines may be desirable if you are saving your spreadsheet. However, writing to other machines could be a problem if a malicious applet erased your files.

Working with the Time Zone Environment Variable

The TZ environment variable is important in the sending and receiving of mail, running applications, and time-stamping documents. Setting the TZ environment variable becomes even more important when you work across multiple time zones.

You should set the time zone (TZ) environment variable by using the Network Station Manager program.

See “Setting the Time Zone (TZ) Environment Variable” on page 78 for an example.

Learning About Printer Datastreams

You need to know the datastream your default applications (applications shipped with the IBM Network Station Manager licensed program) produce. Knowing which datastream the applications produce allows you to choose a printer capable of processing and printing the files your applications create. Table 13 shows the supported datastreams for each application.

Table 13. Applications and Datastreams

Default Application Name	PostScript Datastream	PCL Datastream
5250 Session	X	X
3270 Session	X	X
NC Navigator	X	
Lotus eSuite WorkPlace	X	

Each platform (OS/2, AS/400, Microsoft NT, RS/6000, OS/390, VM/ESA) has a process for managing printers. See “Configuring Printers on OS/2 Warp Server” on page 35 for information on how OS/2 Warp Server manages printers for use with Network Stations.

Use the IBM Network Station Manager program to administer printers for your Network Station users.

“Chapter 4. Using the IBM Network Station Manager Program” on page 55 contains two examples about using printers with Network Stations:

1. “Configuring a Local Area Network Attached Printer” on page 73
2. “Configuring a Network Station-Attached Printer for Other Users” on page 74

Chapter 4. Using the IBM Network Station Manager Program

IBM Network Station Manager Program - an Overview

The IBM Network Station Manager program is a browser-based application program. This application program allows you to perform the setup tasks and management tasks that are associated with the following:

- All IBM Network Station Network Computers or all Network Station users
- A group of Network Stations users
- A specific (one) Network Station or Network Station user

Figure 28 shows the main screen of the IBM Network Station Manager program. The left-most frame of the screen contains a selection list of the Setup Tasks. Setup Tasks are selected functions of various applications that are managed with the IBM Network Station Manager program. For example, 5250 and 3270 emulation sessions, NC Navigator sessions, and Lotus eSuite WorkPlace.

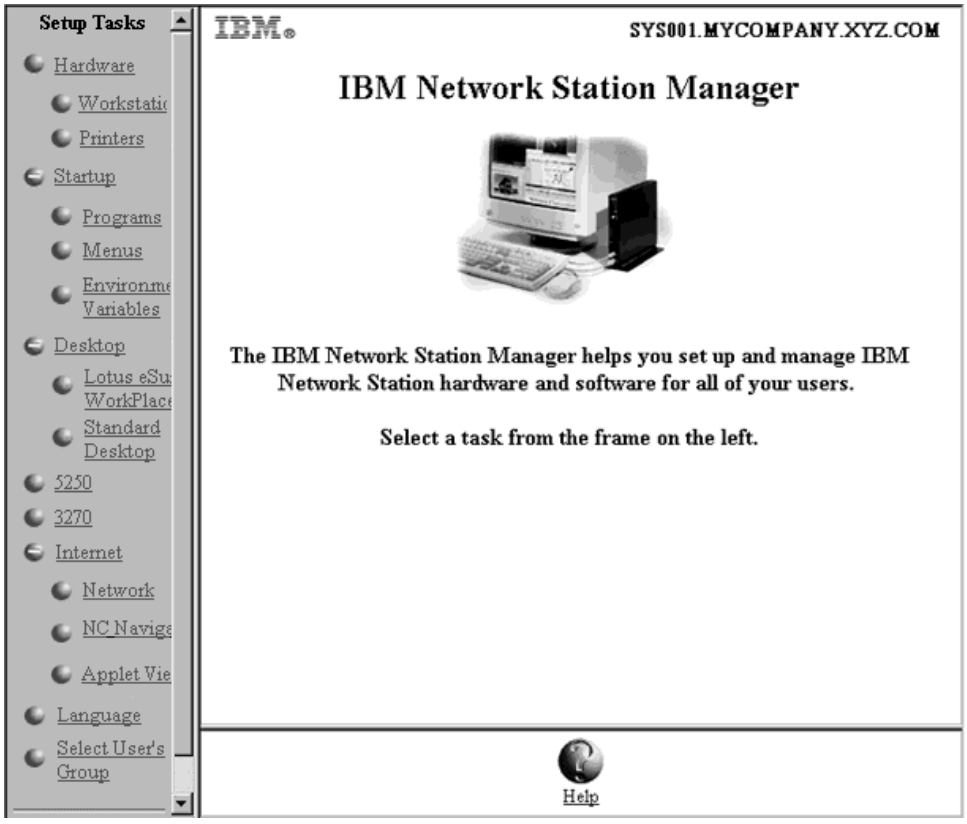

Figure 28. Network Station Manager Program Main Screen

Figure 29 on page 57 provides an expanded list of Setup Tasks that you can manage with the IBM Network Station Manager program:

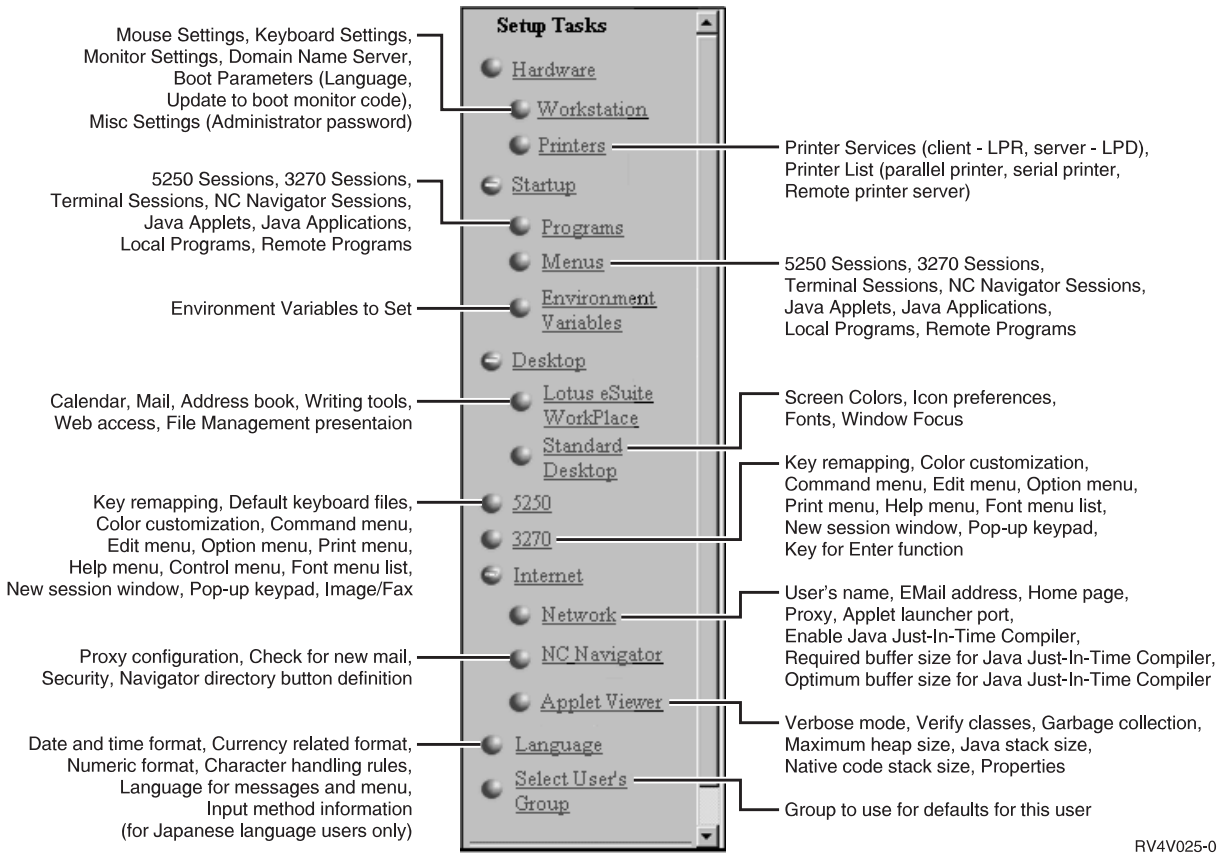

Figure 29. Setup Tasks Supported by the IBM Network Station Manager Program

IBM Network Station Manager Program Flow

Figure 30 on page 58 provides a graphical view of how the IBM Network Station Manager program flows. Take a moment to study Figure 30 on page 58; it highlights the differences between the defaults and setup tasks that a system administrator and end user can work with.

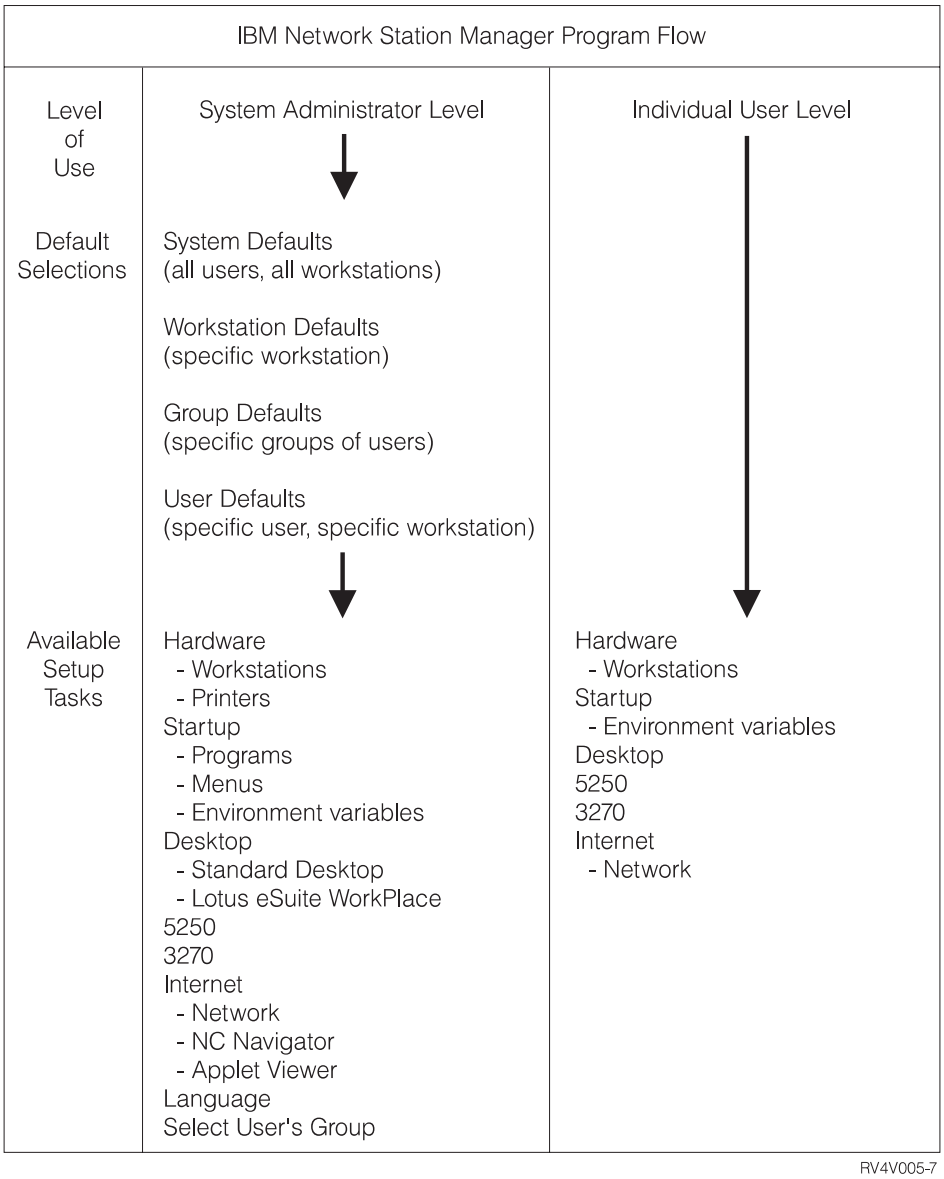

Figure 30. IBM Network Station Manager Program Flow

Who Can Use the IBM Network Station Manager Program?

Figure 30, shows that both system administrators and individual end users can access and use the program.

The special authorities defined on the Host server determine the level of function a user can access.

System Administrators

System administrators have full use of the program. System administrators can work at a level that is either system-wide, for a specific group, for a specific user, or for a workstation. For example, an administrator could specify that all Network Station users have one 5250 emulation session available and that one particular user could have an additional 5250 emulation session.

For information about how to sign on to the IBM Network Station Manager program, see “Starting the IBM Network Station Manager Program Using a Browser” on page 64.

Figure 31 shows the screen a system administrator sees after signing onto the IBM Network Station Manager program. Look at the range of functions that are presented in the *Setup Tasks* frame.

Note: This screen can vary in how it appears depending on the Web browser you are using.

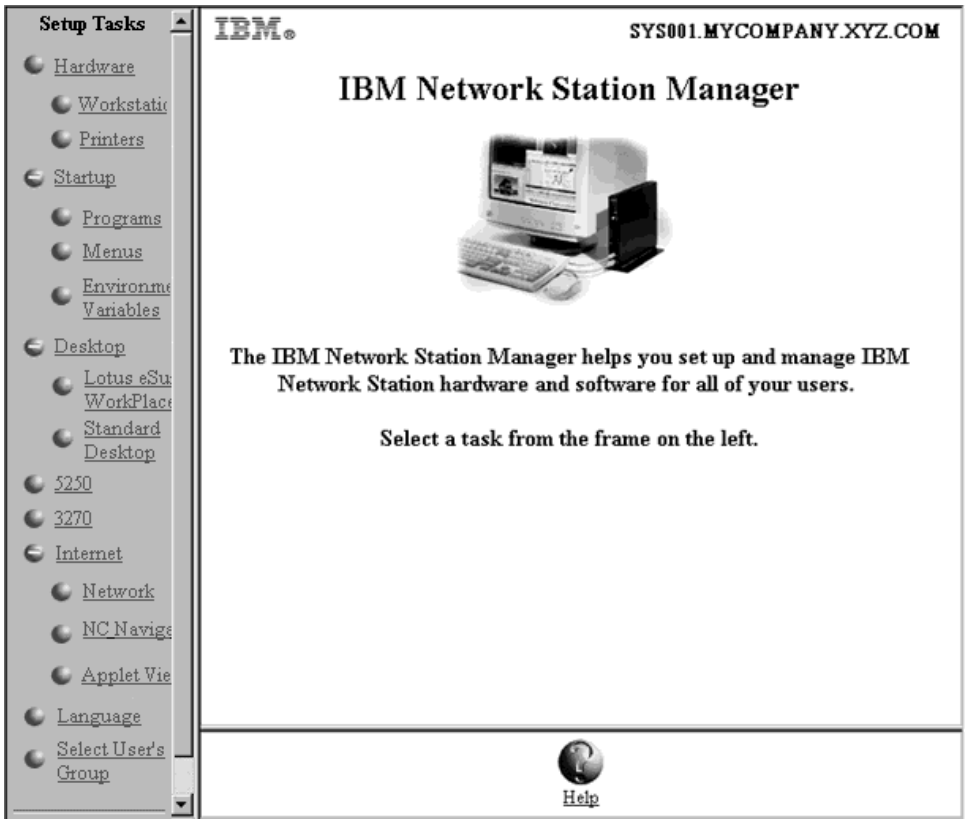

Figure 31. System Administrator Level

Figure 32 on page 60 compares these functions to the range of functions that are available to individual end users.

Individual End Users

End users also have access to the IBM Network Station Manager program. However, the functions that an end user can work with are limited.

Figure 32 on page 60 shows the screen that an end user would see after signing on to the IBM Network Station Manager program. Look at the range of functions that are presented in the *Setup Tasks* frame.

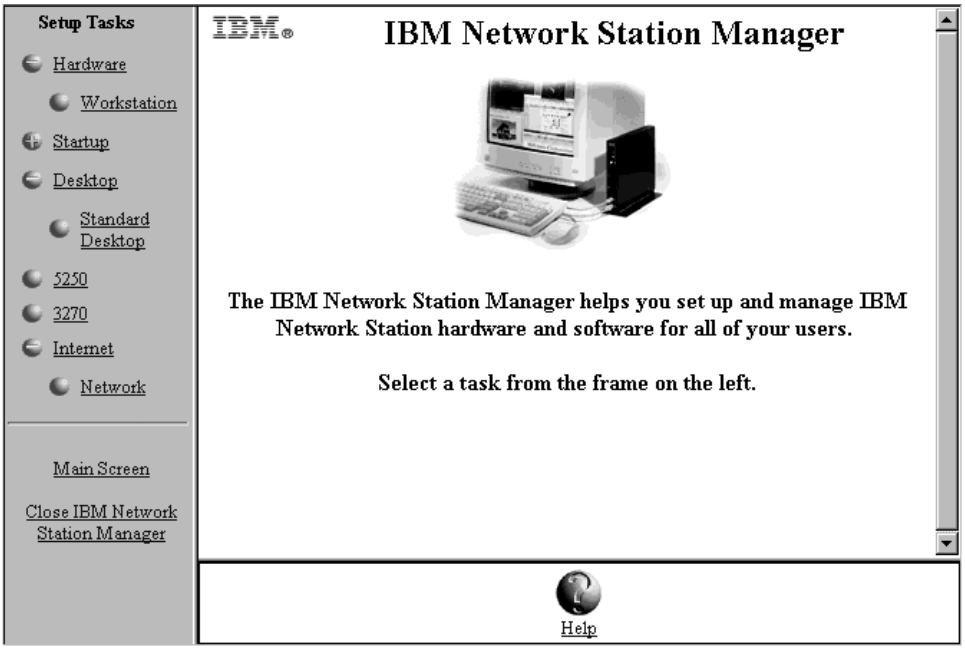

Figure 32. End-User Level

As you can see, the program's flexibility allows broad system-wide settings management by the administrator and individual settings management by the end user.

Working with IBM Network Station Manager Program Defaults

There are four levels of defaults. They are:

- IBM-supplied defaults. The IBM-supplied defaults provide settings that are supported by the IBM Network Station Manager program.

  You can not change IBM-supplied defaults. You can override IBM-supplied defaults by using the IBM Network Station Manager program feature of System defaults or User level defaults.

  See "Appendix C. IBM Network Station Manager Program Shipped Default Settings" on page 147 for a complete list of all IBM-supplied default values for the IBM Network Station Manager program.
- System defaults. You can use system defaults to change settings for all users or all workstations. System defaults take precedence over IBM-supplied defaults.
- Group defaults. You can use group defaults to change settings for all users that are in a specific group. Group defaults take precedence over system-wide defaults and IBM-supplied defaults.
- User defaults. You can use user defaults to change settings for an individual user. User defaults take precedence over IBM-supplied defaults, system defaults, and group defaults.
- Workstation defaults. You can use workstation defaults to change settings for workstations. Workstation defaults take precedence over IBM-supplied defaults and System Defaults.

Note: Settings work differently in the Startup function of Setup Tasks. For Programs, Menus, and Environment Variables, the IBM-supplied, System-specified, and User-specified, are additive. However, for the same

environment variable, the value set at the user level takes precedence over the value set at the system or IBM-supplied levels. (The values for a given environment variable are not additive.) Any settings that are specified at the system or user level are added to those that are specified in the IBM-supplied default settings.

For example, every Network Station user has one 5250 session specified as the IBM-supplied default. If the administrator used the System defaults function to assign all users an additional 5250 session, then all users would have two 5250 sessions available. If the administrator then used the User level defaults to assign USERXYZ another 5250 session, then USERXYZ would have three 5250 sessions. The origin of these sessions would be one each from IBM-supplied defaults, System defaults, and User defaults.

IBM Network Station Manager Program Defaults - Example

This example uses the Desktop background setting. You can locate the Desktop background setting in the Workstations function of Hardware Setup Tasks.

The IBM-supplied setting for Desktop background is the IBM bitmap.

At this point, the administrator sets all Desktop backgrounds to dark red. Using the IBM Network Station Manager program, the administrator applies the change by working through the System Defaults level. This change, to the color dark red, overrides the IBM-supplied value of the IBM bitmap for Desktop background.

After viewing the color of dark red, a user determines that dark red is too difficult to look at for long periods of time. The user then requests his Desktop background color be changed to green. The user can either change the Desktop background color or request the administrator to do it.

The administrator can make the change by selecting the Hardware Setup Task, Workstations, User defaults and specify the user ID of the person who is requesting the change. The administrator can then scroll to the Desktop background field, specify green, and then click **Finish** to apply the change. This change, to a User default setting, overrides the IBM-supplied default and the administrator set System Default value of dark red.

Notes:

1. If a user changes the background setting, they go directly to the *Hardware* and *Workstation* settings panel. You will bypass the *Default selection* panel.
2. To see the Desktop background change, you must log off and then log on to the workstation.

Working with System-Wide Defaults

Figure 33 on page 62 is representative of the panel that appears when a selection occurs from the *Setup Tasks* frame. This example uses the *Workstation Defaults* panel.

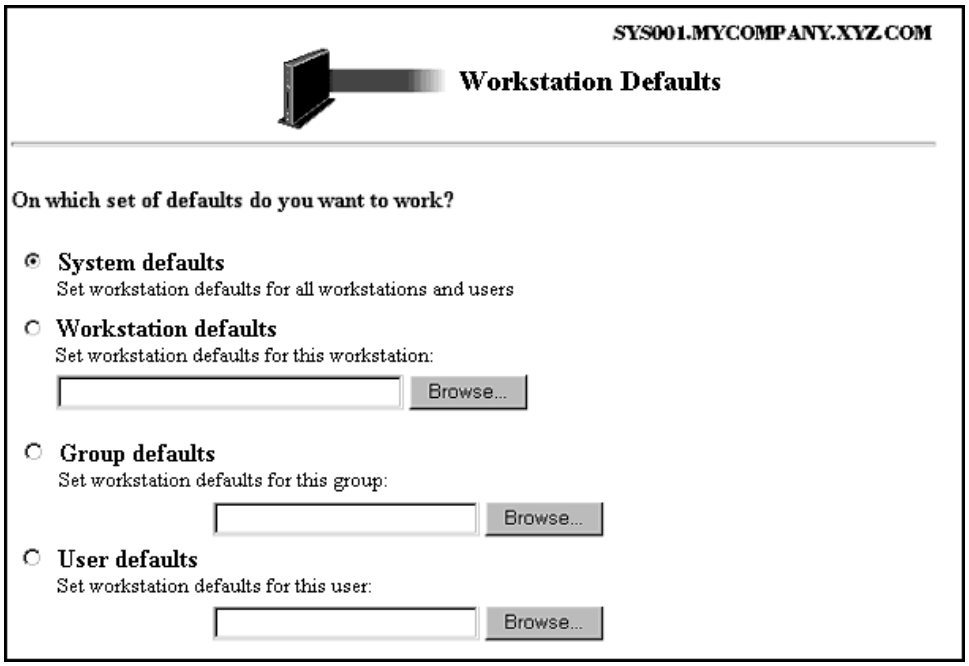

Figure 33. Hardware Defaults

As you can see, the *Workstation Defaults* panel allows you to work with the following:

- System defaults for all workstations and users
- Workstation defaults for a particular workstation
- Workstation defaults for a specific group
- Workstation defaults for a particular user

Note: The *Workstation Defaults* panel is unique in that it allows you to specify settings for workstations in addition to specific groups or users.

System defaults have settings that are not available when working with an individual user, a specific group, or specific workstation.

Working with Workstation Defaults

You may configure each Network Station using either DHCP, BOOTP, or NVRAM. You can identify each Network Station by TCP/IP hostname, IP address, or MAC address. If TCP/IP hostname is entered it must exactly match what the Network Station is told that its hostname is (lower case). BOOTP or DHCP tell each Network Station their hostname. Only include the hostname option specified on the Network Station's client statement in BOOTP or DHCP. If you specify a separate domain name option in BOOTP or DHCP, do not include that in the workstation name. You must type MAC addresses separated by colons (for example, 00:00:e5:80:7c:8f). You must type IP addresses as dotted decimals (for example, 9.1.2.3).

Tips on Identifying or Referring to your Network Station: Following are some tips for addressing your Network Station:

IP addressing

You can use the IP address when you are booting the Network Station using NVRAM, BOOTP, or DHCP. When you use the IBM Setup Utility you can type the IP address you configured using DHCP, BOOTP, or NVRAM.

However, be aware that the Network Station's IP address may change on every boot if you use the address pool feature of DHCP.

TCP/IP hostname
You can use the TCP/IP host name when you are booting the Network Station using BOOTP or DHCP. It is unlikely that the Network Station knows its hostname when it boots using NVRAM. Type the hostname you configured into DHCP or BOOTP as instructed above. By using the TCP/IP hostname or IP address you can replace a Network Station and have the new Network Station pick up the old Network Station's configuration. You would set up the new Network Station with the old Network Station's hostname or IP address.

MAC address
You can use the MAC address when you are booting the Network Station using NVRAM, BOOTP, or DHCP. The MAC address is tied to the physical Network Station and will not change if your network is reconfigured. The MAC address only changes if you decide to reprogram it on the Network Station. The MAC address can be found using the IBM Setup Utility and by selecting F2.

Using the Workstation Browse Button: The Workstation Browse button, when clicked, provides a list of all workstations configured using the IBM Network Station Manager program.

Working with Group Defaults

Use group defaults to add or change settings on a group-by-group basis.

Any group that you want to work with must already exist on the host server. You can not create groups by using the IBM Network Station Manager program. The user must already be in the group.

To get started, do the following:

- Click **Select User's Group** from the *Setup Tasks* frame.
- Type the name of the user whom you want to inherit a particular group's settings and click **Next**.
- Type the name of the group and click **Next**.

Note: If you do not know a group name, click the **Browse** button and a list of groups is presented for you to choose from.

Working with Individual User Defaults

Use user defaults to change settings on a user-by-user basis, one user at a time. Using user defaults gives you flexibility that allows customization of individual sessions.

From any of the Default panels, select **User defaults**, type the user ID name, and press the **Next** button.

Note: If you do not know a user ID name, you can click a **Browse** button for a list of users.

Working with Settings

Settings are fields that you see after you have selected the defaults (System, Workstation, Group, or User) that you want to use. For example, Figure 34 shows the *Standard Desktop Settings* fields for Screen colors, Icon preferences, Fonts, and Window focus.

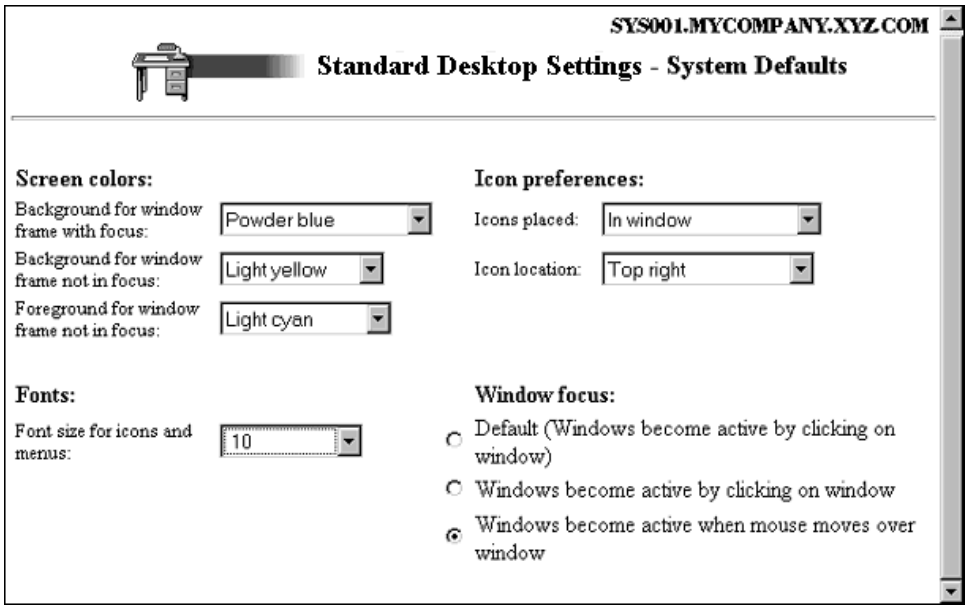

Figure 34. Desktop Manager Settings Fields

Figure 34 shows that Standard Desktop settings that are being worked with from the System Defaults level. Choosing System Defaults settings changes applies changes to **ALL** users.

Starting the IBM Network Station Manager Program Using a Browser

To best understand and learn how the IBM Network Station Manager program works, you should sign on and follow the examples in this chapter.

To start working with the IBM Network Station Manager program, power on your Network Station. Click **NC Navigator** from the Menu bar on your Network Station. See Figure 35.

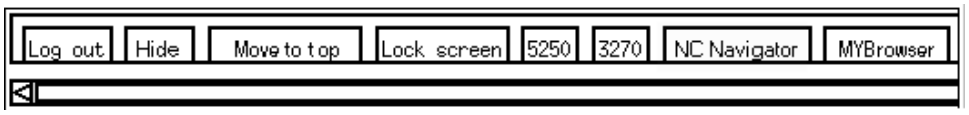

Figure 35. IBM Network Station Menu Bar

Notes:

1. You can also use the following Web browsers to sign on to the IBM Network Station Manager program:
   - Netscape 4.0 or later:
     – Microsoft Windows 95

- Microsoft Windows NT
- AIX
- OS/2

• Microsoft Internet Explorer 4.0 or later

2. To access the IBM Network Station Manager program using NC Navigator, click the **Directory** pull-down and select **IBM Network Station Manager for (Your Server Name)**. Your server name is the name of the system where your Network Stations get their boot file.

The NC Navigator browser appears. See Figure 36.

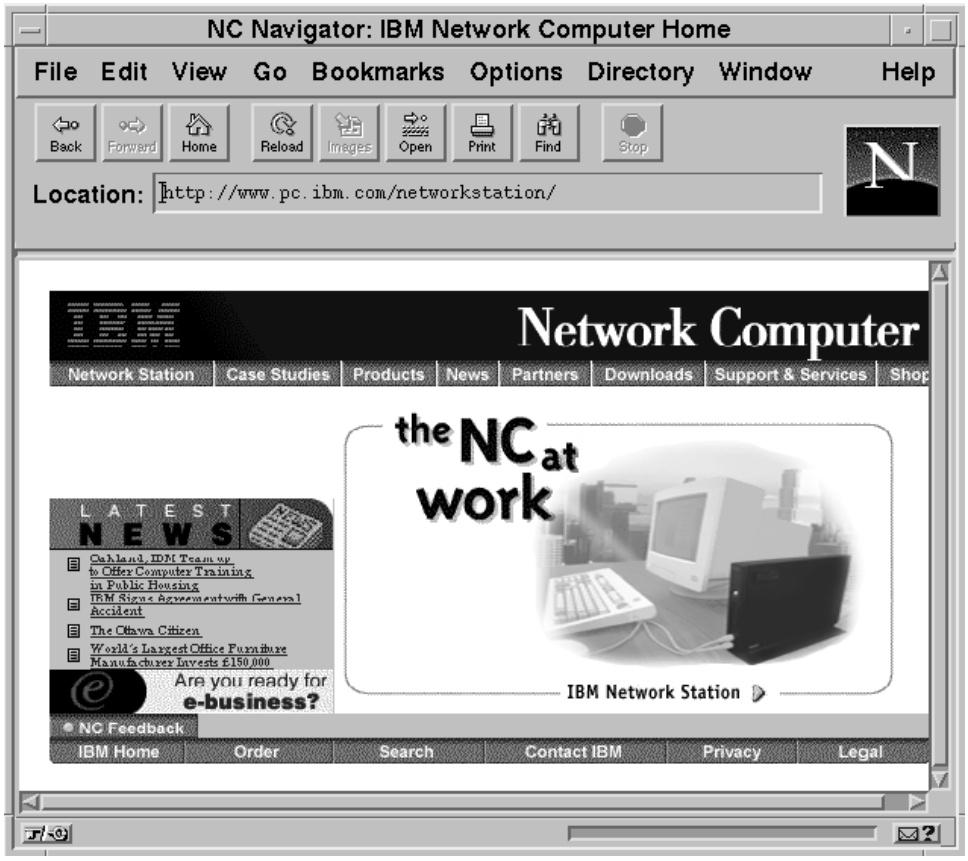

Figure 36. NC Navigator Browser

Click the **Directory** pull-down and select **IBM Network Station Manager for (Your Server Name)**. See Figure 37 on page 66.

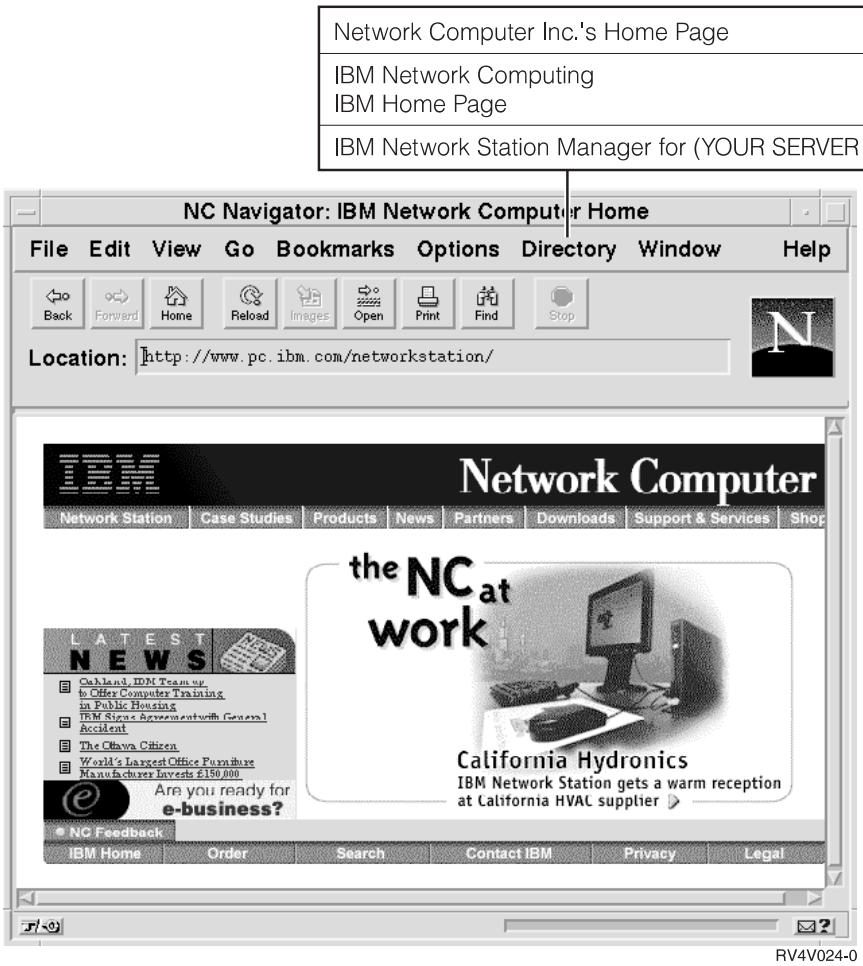

Figure 37. NC Navigator Browser with Directory Pull-down

The IBM Network Station Manager sign on screen appears:

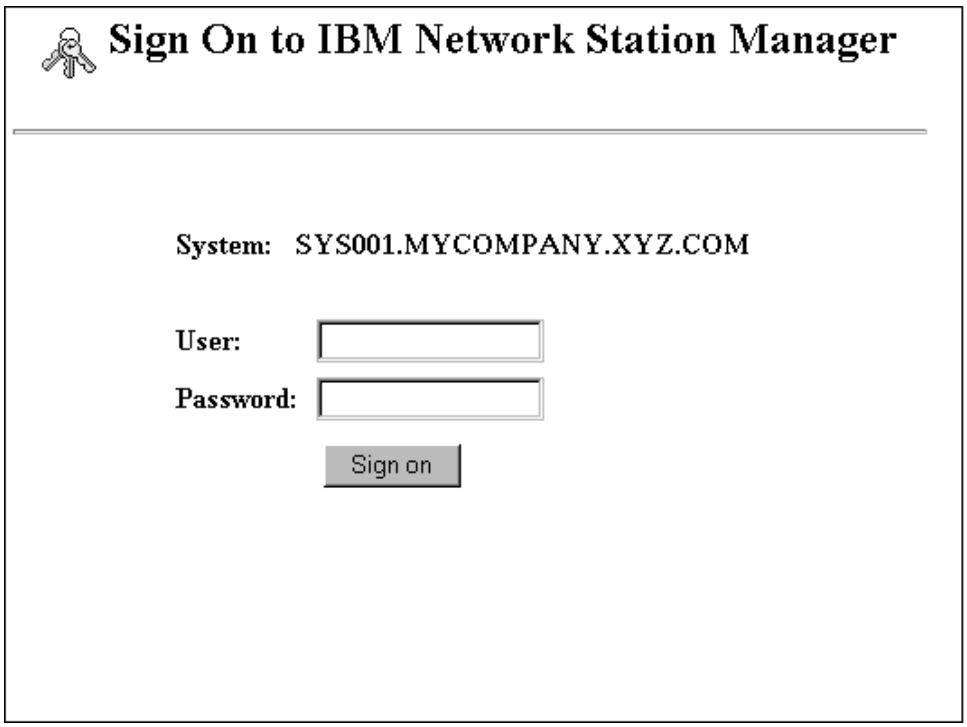

Figure 38. Sign on Screen

Note: An alternative way to reach the sign-on screen is to enter the following case-sensitive URL in your browser's URL field:

http://yourservername/networkstation/admin

Where *yourservername* is the Host name or TCP/IP address.

If you are using a VM/ESA system, the URL you specify depends on the location of the Network Station Manager program. Use the following URL if the Network Station Manager program is in the root directory of the server:

http://yourservername:port/admin.htm

Use the following URL if the Network Station Manager program is located in a subdirectory of the root directory of the server:

http://yourservername:port/nsmhtml/admin.htm

Type your user ID and password, then click **Sign on**.

The main screen of the IBM Network Station Manager appears.

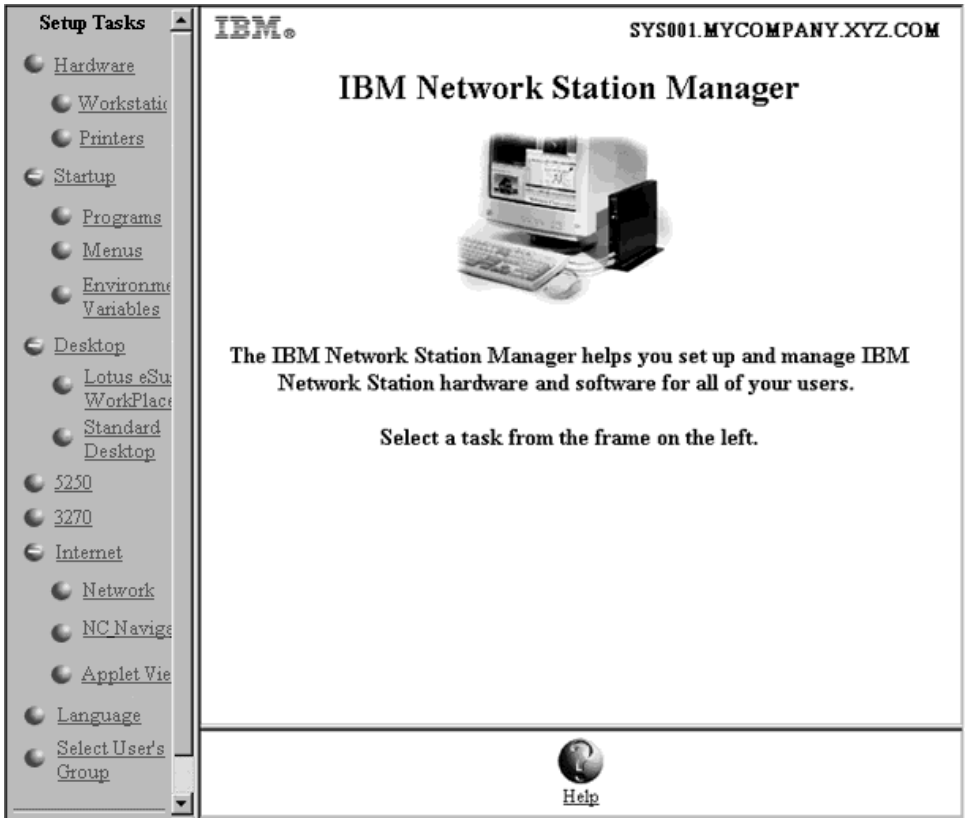

Figure 39. System Administrator Level

Working with the IBM Network Station Manager Program Setup Tasks - Examples

Note: You must be a system administrator to work with these examples.

Figure 39 shows that radio buttons represent Setup Tasks and text in the left-most frame of the screen.

Clicking on any radio button or text presents a panel from which you select a set of defaults you want to work with.

When working with these examples, select **User defaults** and use your own user ID. Then, when you are finished with the examples, you can see the results on your workstation.

To see the changes you make using the IBM Network Station Manager program, you must log off and then log on to your workstation.

Notes:

1. Not shown in most examples are the *main* panel and the *Default selection* panel.
2. See “Additional IBM Network Station Manager Program Examples” on page 91 for information about working with remote programs, such as AIX sessions and WinCenter Pro for PC applications.

Changing your Desktop Style to Lotus eSuite WorkPlace

Notes:

1. Lotus eSuite WorkPlace is not available for VM/ESA and OS/2 systems.
2. You must use an IBM Network Station Series 1000 with 64 MB of memory to run Lotus eSuite WorkPlace.
3. This example, when complete, changes your desktop style from Standard desktop with menu bar (the default) to Lotus eSuite WorkPlace with menu bar.

Complete the following steps to change your desktop style:

__ 1. From the *Setup Tasks* frame, click **Startup** and then click **Menus**.

__ 2. Select **User defaults** and type in your user ID (`USER001` in this example). Click **Next** to continue.

__ 3. In the *Desktop and Menu Bar Options* section, click the **Desktop Style** list box and select *Lotus eSuite WorkPlace with menu bar support*. See Figure 40.

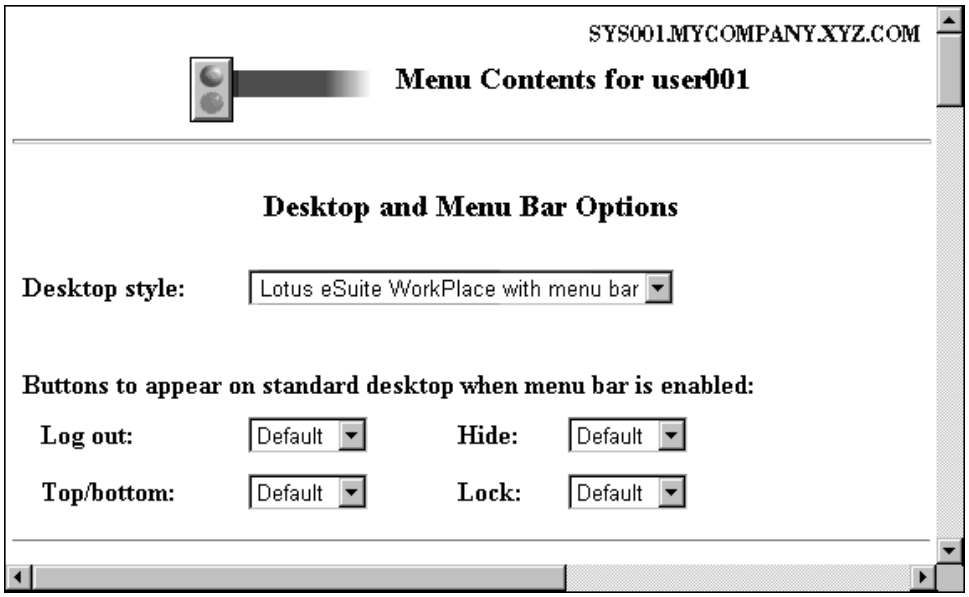

Figure 40. Desktop Style Selection

__ 4. Click **Finish** to apply the change.

Changing Your Desktop Background

You may have requirements for providing different desktop backgrounds; for example, your company logo. Complete the following steps to see how to change desktop backgrounds:

__ 1. From the *Setup Tasks* frame, click **Hardware** and then click **Workstations**.

__ 2. Select **User defaults**, and type in your user ID (`USER001` in this example). See Figure 41 on page 70.

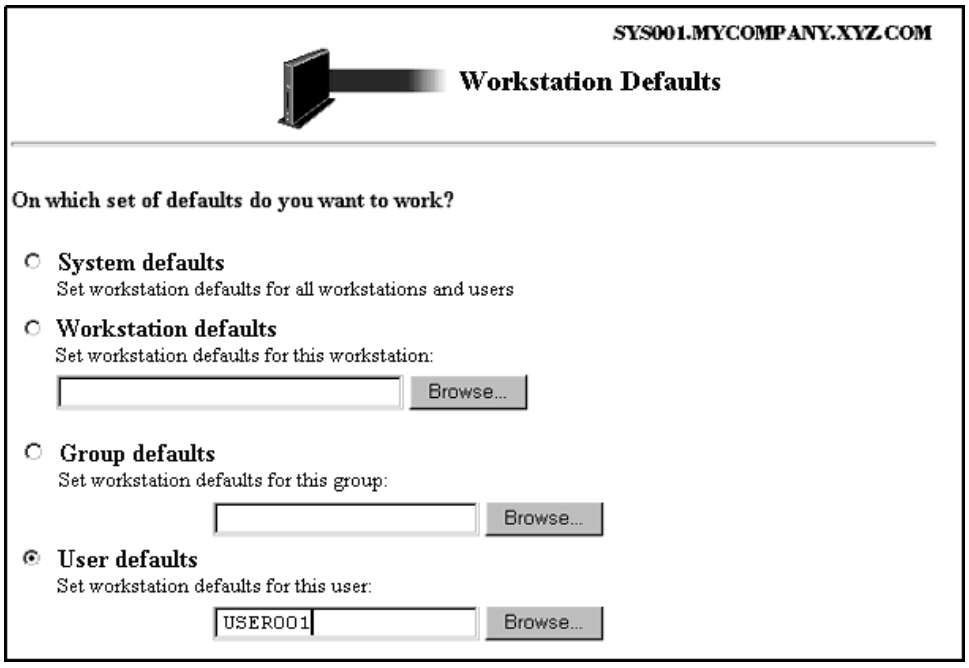

Figure 41. Workstation Defaults Panel with User Defaults Selected

__ 3. In the bottom frame, click **Next** to continue.

The *Workstation Settings* frame appears as shown (scrolled-down) in Figure 42.

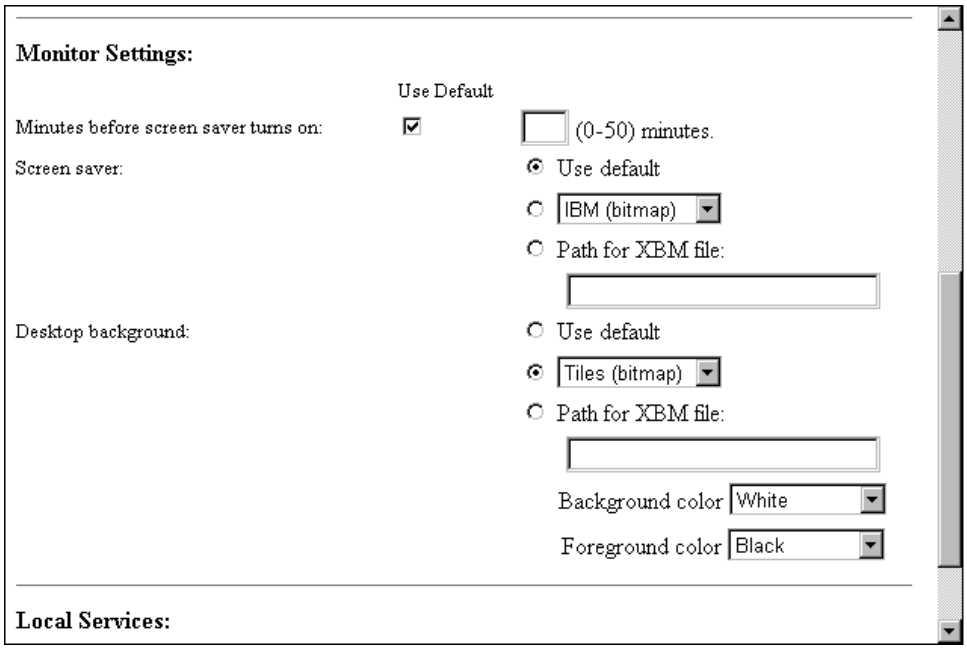

Figure 42. Hardware Settings Example

__ 4. Scroll to *Desktop background* and select **Tiles (bitmap)**.

__ 5. Click **Finish** to apply the change.

Tips for working with the screen saver fields and the desktop background fields:

1. You can use your own bitmaps for a screen saver or your desktop background.
2. Place the bitmap in a directory where the IBM Network Station Manager program can find it. For AS/400, place these bitmaps in:
   `/QIBM/ProdData/NetworkStation/SysDef/`

Updating the Boot Monitor Code

Update your boot monitor code to ensure that the boot monitor code on your Network Stations matches the boot monitor code on your boot server. Updating the boot monitor code provides access to the latest function of the IBM Network Station Manager licensed program. You must update any Network Station that has a boot monitor code version less than 3.0.0.

You may want to alert your users that a warning message will appear, on their workstation, during the boot monitor code update. The warning indicates not to power off the workstation during the update. To power off the workstation could cause physical damage to the workstation.

You do not have to use the update boot monitor function if you are working with Microsoft Windows NT. Microsoft Windows NT performs the boot monitor code update automatically.

__ 1. From the *Setup Tasks* frame, click **Hardware** and then click **Workstations**.
__ 2. Select **System defaults** or **Workstation defaults**, and type in the workstation name or click the **Browse** button for a list of configured Network Stations .
__ 3. In the bottom frame, click **Next** to continue.
__ 4. Scroll to the *Update to boot monitor installed on the boot server* field. Select **Update**. See Figure 43.

Figure 43. Updating the Boot Monitor

__ 5. Click **Finish** to apply the change.

Overriding the Network Station Boot Setting

__ 1. From the *Setup Tasks* frame, click **Hardware** and then click **Workstations**.

__ 2. Select **System defaults** or **Workstation defaults**, and type in the workstation name or click the **Browse** button for a list of configured Network Stations .

__ 3. In the bottom frame, click **Next** to continue.

__ 4. Scroll to the *Enable boot using BOOTP or DHCP* field as shown in Figure 44.

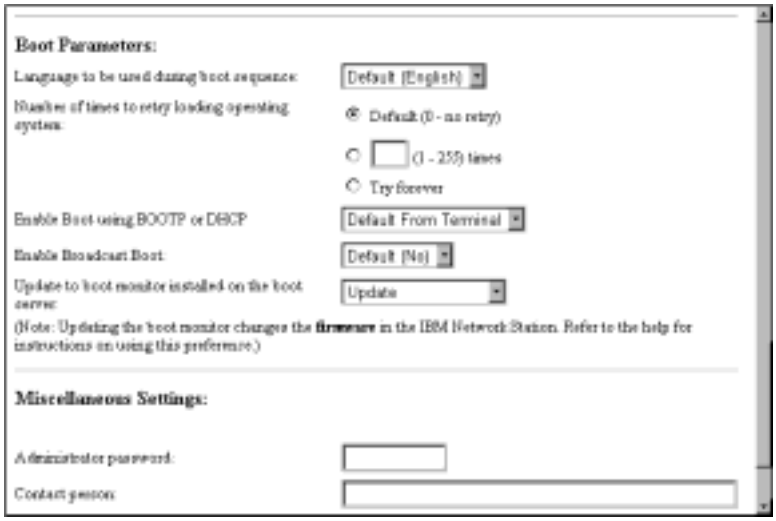

Figure 44. Overriding the Network Station Boot Setting

__ 5. Click the **Drop box**The possible choices are:

Default from terminal
Selecting this choice means the boot is determined by the value set in the IBM Network Station Setup Utility under the *Set Network Parameters* function. The value can be either Network or NVRAM.

Yes
Selecting this choice means the boot method is Network.

This means that the boot method is either DHCP or BOOTP and is determined on how you configured the Network Stations.

No
Selecting this choice means the boot method is NVRAM.

The Network Station boots from the server specified in the *Boot Host IP Address* field in the Set Network Parameters function in the IBM Network Station Setup Utility.

__ 6. Click **Finish** to apply the change.

Updating the Domain Name Server (DNS) Configuration on the Network Station

You can use the Network Station Manager program to update the DNS information on a Network Station.

The domain name server (DNS) or host name table on the host keeps track of all hosts in a particular domain. You can also store this information on the Network Station.

There are two fields from which to select DNS support. They are:

- DNS Configuration from BOOTP or DHCP server

  If you select this field, the Network Station gets its DNS and domain name configuration from a BOOTP or DHCP server.

  You must use BOOTP or DHCP to configure your Network Stations. DHCP allows you to specify the IP address of your domain name server. DHCP also resolves BOOTP requests from Network Stations.

  You must use DHCP to configure your Network Stations. DHCP allows you to specify the IP address of your domain name server. DHCP also resolves BOOTP requests from Network Stations.
- DNS Configuration created by Network Station Manager

  If you select this field, the Network Station gets its DNS and domain name configuration from a file created by Network Station Manager. The Network Station Manager copies the DNS and domain name configuration of the server where it is running to the file. The Network Station reads this file on its next boot to pick up the DNS and domain name.

  In addition, if you select this field, the Network Station Manager copies the Host table from the server where it is running to the configuration file. The Host table contains names and their corresponding IP addresses. The Host table information is also picked up by the Network Station on its next boot. Placing Host table information on the Network Station allows the Network Station to resolve network names when there is no DNS.

  You can update the file on the Network Station when changes occur to the DNS, domain name, or Hosts table. You do this by checking the *Update Network Station Manager DNS file* field.

  Placing the Host Table information on the Network Station allows network name resolution to occur on the Network Station rather than on the Host Table on the server.

Configuring a Local Area Network Attached Printer

Local Area Network (LAN)-attached printers are printers not necessarily attached to a Network Station or other devices. They typically have their own host name or IP address.

__ 1. From the *Setup Tasks* frame, click **Hardware** and then click **Printers**.

__ 2. Select **User defaults**, and type in your user ID (USER001 in this example).

__ 3. In the bottom frame, click **Next** to continue.

__ 4. Scroll to *Printer List*. For all users, you must define LAN-attached printers as remote printers. Therefore, scroll (if necessary) to the *Remote Printer Server* section. Fill out the Remote Printer Server section with the following information:

   Remote Printer Server
   The Host name or IP address of the LAN-attached printer.

   Queue Name
   The name of the queue associated with the LAN-attached printer.

Some LAN-attached printers require queues for their configuration, and some LAN-attached printers do not. If the LAN-attached printer has a queue name associated with it, place that name in the Queue Name field. Leave the Queue Name field blank if you do not have a queue associated with the LAN-attached printer.

When you make print requests, the Print Selector List displays the queue name. The Print Selector List displays the @ sign that is followed by either the host name or the IP address. If you did not use a queue name the Print Selector List displays a @ sign followed by the IP address. For example, in the queue name field could be @ 10.1.12.34.

Stream Type
The type of printer data stream the LAN-attached printer supports.

Description
You can type anything in this field. Important information to put in the Description field could be the physical location of the printer.

Figure 45 shows you how to describe a LAN-attached printer.

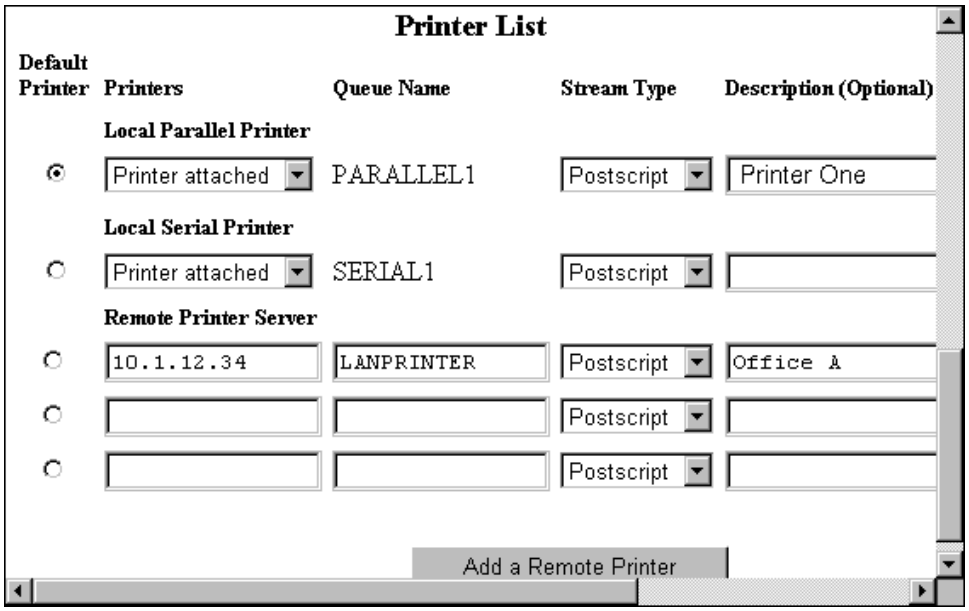

Figure 45. Configuring a LAN-attached Printer

__ 5. Click **Finish** to apply the change.

When you type information in the Remote Print Server section, that information constructs fields in the Print Selector List. The Print Selector List appears when users request a print action. The Queue Name and Description fields are the most useful fields. You can use the Queue Name to identify the print queue and the IP address. Description can be anything you typed in when configuring the printer. The physical location of the printer may be something users need to know.

Configuring a Network Station-Attached Printer for Other Users

Complete the following steps to configure a Network Station-attached printer:

__ 1. From the *Setup Tasks* frame, click **Hardware** and then click **Printers**.

__ 2. Select **User defaults**, and type in your user ID (USER001 in this example).

__ 3. Scroll to *Printer List*. Your Network Station-attached printer is considered a remote printer for all users except users to whose Network Station the printer is attached. Therefore, scroll (if necessary) to the *Remote Print Server* section. Fill out the Remote Printer Server section with the following information:

Remote Printer Server
The Host name or IP address of the Network Station to which the printer is attached.

Queue Name
The name of the queue associated with the Network Station-attached printer.

Stream Type
The type of printer data stream the Network Station-attached printer supports.

Description
You can type anything in this field. Important information to put in the Description field could be the physical location of the printer.

You can configure a Network Station-attached printer. See Figure 46.

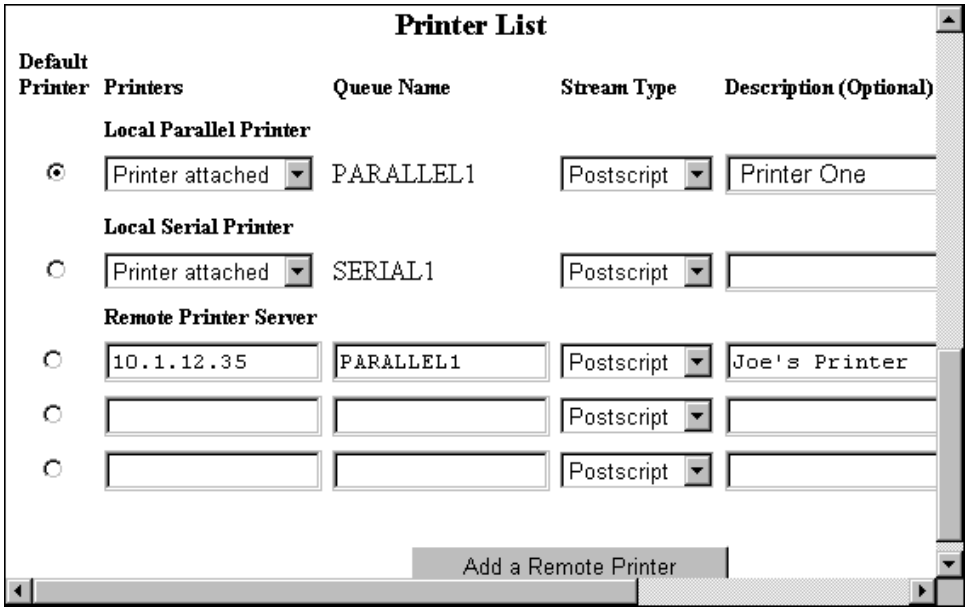

Figure 46. Configuring a Network Station-Attached Printer as a Remote Printer for Other Users

In the example where a locally-attached printer is configured as a remote printer for other users, you must pay close attention to the following:

Queue name field
On locally attached printers the Queue name is, by default, either PARALLEL1 or SERIAL1. When you configure a locally attached printer for others use, the Print Selector List contains a queue name of either

PARALLEL1 or SERIAL1 for that printer. The resulting Print Selector Lists for a user could then contain two Queue name entries, each reading PARALLEL1.

Description field
In this example, where a user's Print Selector List could have two identical Queue name entries, the Description field can determine which printer to choose.

__ 4. Click **Finish** to apply the change.

Working with Menu Bar Options

This example discusses default Menu bar buttons, hiding Menu bar buttons, and customizing Menu bar buttons.

__ 1. From the *Setup Tasks* frame, click **Startup**, click **Menus**, and select **System defaults**. In the bottom frame, click **Next** to continue.

The Desktop and Menu Bar Options frame appears. See Figure 47.

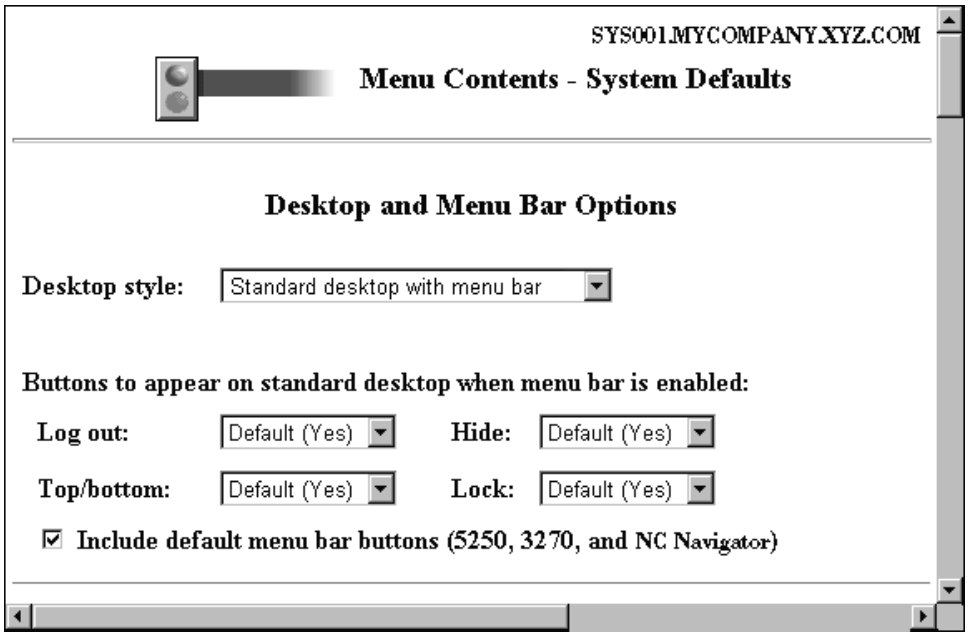

Figure 47. Startup Settings Example Working With Desktop and Menu Bar Options

__ 2. Scroll to the *Buttons to appear on standard desktop when menu bar is enabled* field.

__ 3. The Menu bar options that are shipped from IBM. See Figure 47.

__ 4. Make any changes that are appropriate for your working environment.

If you do not change the Menu bar options fields, each of your Network Station users will have a fully populated Menu bar displayed on their workstation. Fully populated means the Menu bar on each workstation has the following buttons:

- Log out
- Hide
- Move to top or Move to bottom

- Lock screen
- 5250
- 3270
- NC Navigator (browser)

__ 5. Click **Finish** to apply the change.

Hiding the Menu Bar

Using the IBM Network Station Manager program, you can hide the presence of the Menu bar from your Network Station users.

You may have situations in which you do not want the Menu bar to be available. For example, you may not want anyone to be able to log out or end any applications that may be running on the Network Station. Or you might not want to provide an opportunity for someone to lock the screen. You may have a Network Station publicly available, and if the Lock Screen button is available, anyone could lock the screen with a password known only to them.

You can hide the Menu bar from all Network Station users by making the Desktop style field value *Standard desktop without menu bar*. See Figure 48.

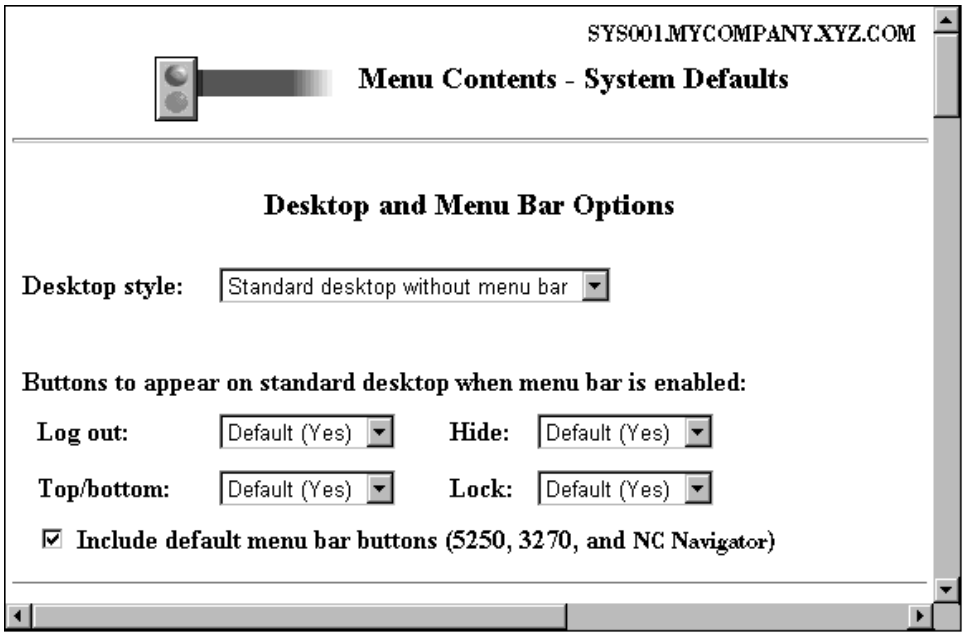

Figure 48. Hiding the Menu Bar

Customizing the Menu Bar Buttons

You can customize the Menu bar, selectively specifying values for the Menu bar options.

For example, Figure 49 on page 78 shows the fields and their values that would exclude the following Menu bar buttons:

- Log out - The value changes to No.
- Lock - The value changes to No.

- Buttons for 5250, 3270, and NC Navigator. You receive these buttons with the IBM Network Station Manager program. The check box is now deselected.

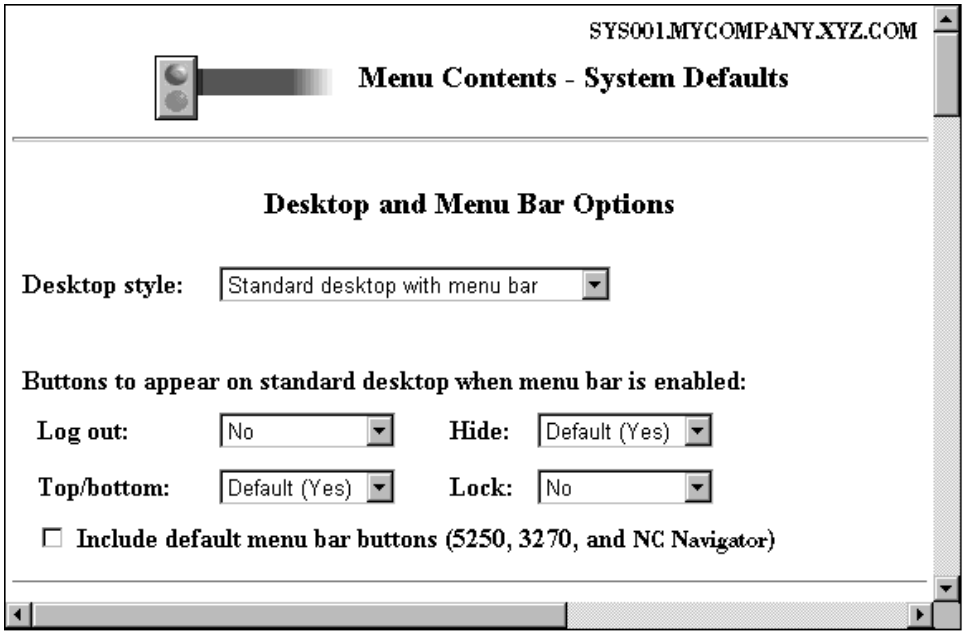

Figure 49. Customizing the Menu Bar Buttons

Menu Bar Options Summary

If you hide the Menu bar (using System defaults, Group defaults, or User defaults), only applications that are specified to automatically start appear on the workstations of users. You manage automatically starting applications in Setup Tasks using the Programs function.

The User level (individual user preferences) does not support enabling or disabling the shipped menu bar buttons for 5250, 3270, or browser buttons.

If you have created customized Menu bar settings but have hidden the Menu bar, no buttons from the customization are available.

Setting the Time Zone (TZ) Environment Variable

Setting the TZ environment variable is important when working across multiple time zones and in particular if you use Java applications.

You must be aware of the following requirements:

- All characters must be typed in upper case
- The time zone value on your server must be set correctly
- You must use standard time (for example, Central Standard Time (CST) not Central Daylight Time (CDT)

Complete the following steps to set the TZ environment variable:

__ 1. From the *Setup Tasks* frame, click **Startup**, click **Environment Variable**, and select **User defaults**. In the bottom frame click **Next** to continue.

__ 2. The Environment Variable Settings frame appears. See Figure 50 .

Figure 50. Setting the Time Zone (TZ) Environment Variable

__ 3. Scroll to *Environment Variables*. This setting, when completed, sets the time zone environment variable. Complete the following fields:

Environment Variable
Type TZ. TZ means time zone.

Value
Type CST. This means Central Standard Time. Following are other possible values for the TZ environment variable:

Hours From Greenwich Mean Time (GMT)	Value	Description
0	GMT	Greenwich Mean Time
+1	ECT	European Central Time
+2	EET	Eastern European Time
+2	ART	(Arabic) Egypt Standard Time
+3	EAT	Eastern African Time
+3.5	MET	Middle East Time
+4	NET	Near East Time
+5	PLT	Pakistan Lahore Time
+5.5	IST	India Standard Time
+6	BST	Bangladesh Standard Time
+7	VST	Vietnam Standard Time
+8	CTT	China Taiwan Time
+9	JST	Japanese Standard Time
+9.5	ACT	Australia Central Time
+10	AET	Australia Eastern Time
+11	SST	Solomon Standard Time
+12	NST	New Zealand Standard Time

Hours From Greenwich Mean Time (GMT)	Value	Description
-11	MIT	Midway Islands Time
-10	HST	Hawaii Standard Time
-9	AST	Alaska Standard Time
-8	PST	Pacific Standard Time
-7	PNT	Phoenix Standard Time
-7	MST	Mountain Standard Time
-6	CST	Central Standard Time
-5	EST	Eastern Standard Time
-5	IET	Indiana Eastern Standard Time
-4	PRT	Puerto Rico and US Virgin Islands Time
-3.5	CNT	Canada Newfoundland Time
-3	AGT	Argentina Standard Time
-3	BET	Brazil Eastern Time
-1	CAT	Central African Time

__ 4. Click **Finish** to apply the change.

Automatically Starting a 5250 Session on a Network Station

You can automatically start a 5250 session (sign on display) on a Network Station. This eliminates using the default 5250 button on the Menu bar. Using the 5250 button requires you to specify the host or IP address before the 5250 sign on screen is available. Complete the following steps to automatically start a 5250 session on a Network Station:

__ 1. From the *Setup Tasks* frame, click **Startup**, click **Programs**, and select **User defaults**. In the bottom frame click **Next** to continue.

__ 2. The Programs Settings frame appears. See Figure 51.

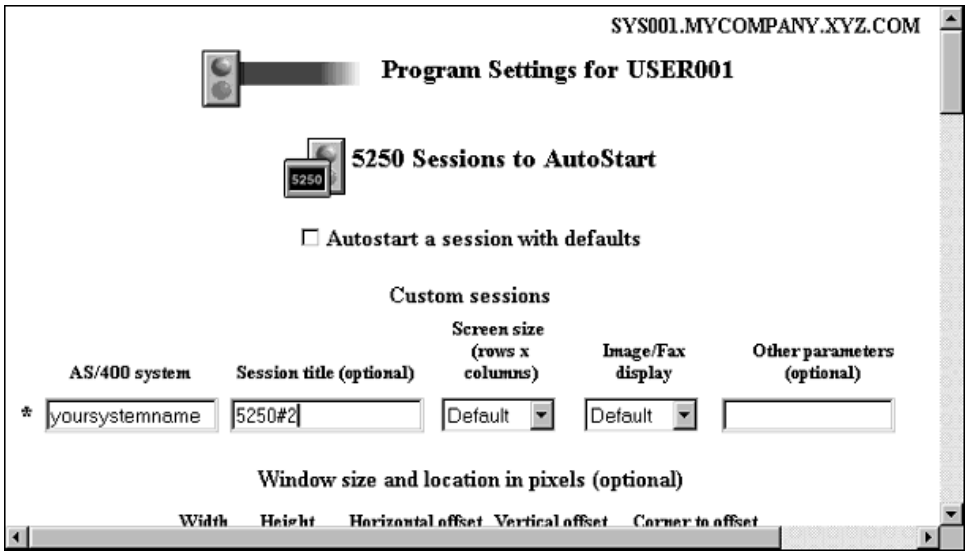

Figure 51. Automatically Starting a 5250 Session on an IBM Network Station

__ 3. Scroll to *5250 Sessions to Autostart*. This setting, when completed, automatically starts a 5250 session for you when you sign on to your workstation. Complete the following fields:

AS/400 system
Type the name or TCP/IP address of the AS/400 from which your workstation receives its boot file.

Session title
Type in a text string that represents your 5250 session, for example, 5250#2. This text string will appear in the Title bar of your 5250 session. This field is optional, and you do not need a value. However, if you work with multiple 5250 sessions, the title helps the session.

Other fields
Use the default settings.

__ 4. Click **Finish** to apply the change.

Configuring a Local (ICA) Client Session Menu Button for a Network Station

Note: Independent Computing Architecture (ICA) is a general-purpose presentation services protocol. You can use ICA to access Microsoft Windows applications from a Network Station or PC client.

Complete the following steps to configure a local (ICA) client session Menu button:

__ 1. From the *Setup Tasks* frame, click **Startup**, click **Menus**, and select **User defaults**. In the bottom frame, click **Next** to continue.

__ 2. The Menu Contents frame appears (scrolled forward to Local Program Menu Items). SeeFigure 52.

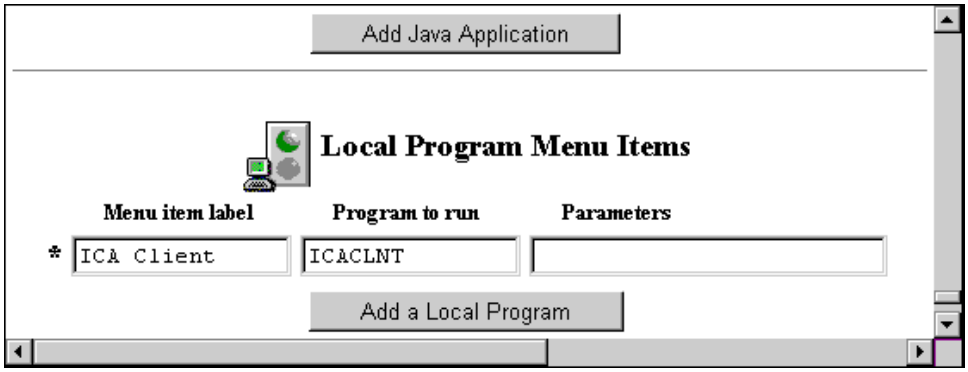

Figure 52. Starting a Local Client Session on an IBM Network Station

__ 3. This setting, when completed, creates a menu button that, when clicked, starts the specified Local program. Complete the following fields:

Menu item label
The text you type in this field appears in the menu button on your Network Station.

Program to run
Type the name of the local program that runs when you click the Menu button.

Parameters

In this field you can use parameters that can be passed to the local program. Following is a list of parameters and their descriptions:

-h(ost)
Identifies the PC server the ICA client connects to. This is a required parameter.

-ti(tle) Specifies the text to be displayed by the window manager. The text string must be enclosed with quotation marks. For example, -ti 'ICA Client'.

-c(olor)
Specifies the number of colors the ICA client may use. This value can be either 16 or 256.

-g(ometry)
Specifies the position (location) on the display where the window is placed. The value is expressed in the form: width x height.

-ca(ache)
Specifies the size of the memory cache for video display. The possible choices are: 0, 512, 1024, 2048 (default), 3072, 4096, and 8192.

-(w)orkdir
The directory specified becomes the logged on user's default directory on the PC server. You must insert additional slashes into the directory name (for example, \users\sdh must be specified as \\users\\sdh).

-domain
Specifies the domain that is automatically entered into the PC Login menu.

-username
Specifies the user name that is automatically entered into the PC Login menu.

-password
Specifies the password that is automatically entered into the PC Login menu.

-lb Specifies to turn on load balancing for this connection.

- -en(cryption)
Turns off the simple encryption protocol driver (The -en parameter has nothing to do with Secure ICA option pack).

Note:
The encryption parameter must have two consecutive dashes preceding the en. It is also must be the last parameter specified. You must insert additional slashes into the directory name (for example, \users\sdh must be specified as \\users\\sdh).

__ 4. Click **Finish** to apply the change.

Implementing ICA Load Balancing

You implement load balancing by specifying the -lb parameter in the Other parameters field of the Local (ICA) Client Session configuration. Load balancing

provides the client access to a quantity or 'FARM' of PC servers in a PC server network. The load balancing function determines which PC server is doing the least amount of work. When the Local (ICA) client that requests an application be served, the client receives it from the PC server identified as performing the least amount of work.

Configuring a Terminal Session for a Network Station

Terminal sessions, when configured, provide the function to have a X session on your Network Station. Complete the following steps to configure a X session:

__ 1. From the *Setup Tasks* frame, click **Startup**, click **Programs**, and select **User defaults**. In the bottom frame click **Next** to continue.

__ 2. The Program Contents frame appears (scrolled forward to Terminal Sessions). SeeFigure 53.

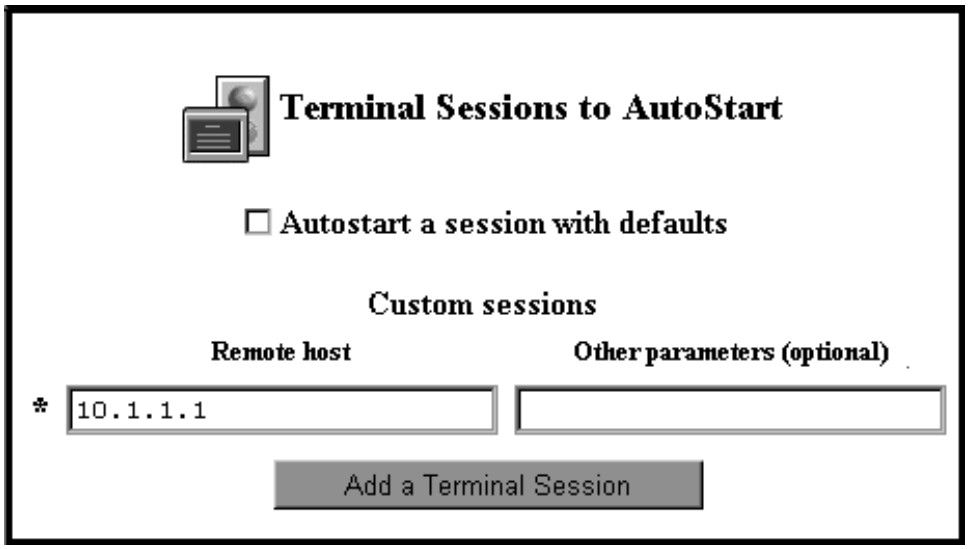

Figure 53. Starting a Terminal (X) Session on an IBM Network Station

__ 3. This setting, when completed, allows the user to initiate a X session on the Network Station.

__ 4. Click **Finish** to apply the change.

Note: You can use the Menus function of Startup to give users a Menu bar button. Clicking that Menu bar button allows them to type in the name of the host to which they want to Telnet.

Choose a name for the Menu item label and leave the Host field blank. Click Finish to complete the task. The next time the user logs on the Network Station they will have a button that, when clicked, prompts for the remote host name.

Using Debug Log in a Terminal Session

The debug log can assist in isolating problems in a Terminal Session. Use the following steps to setup a debug log:

1. From the *Setup Tasks* frame, click **Startup**, click **Menus**. In the bottom frame click **Next** to continue.

2. Scroll forward to **Terminal Sessions**.
3. In the **Other Parameters** field type:

```
-xrm '"NCDterm*logDirectory: <directory_name>"'
```

4. The directory must already exist. Make sure to type the single quote mark followed by the double quote mark where indicated.
5. Following is a complete example that shows the debug log being created in the user's directory:

```
-xrm '"NCDterm*logDirectory:
           /QIBM/UserData/NetworkStation/users/${USER}"'
```

Changing Your Icon Location

Complete the following steps to change icon locations:

__ 1. From the *Setup Tasks* frame, click **Desktop**, click **Standard Desktop**, and select **User defaults**. In the bottom frame, click **Next** to continue.

__ 2. The Standard Desktop Settings frame appears. See Figure 54.

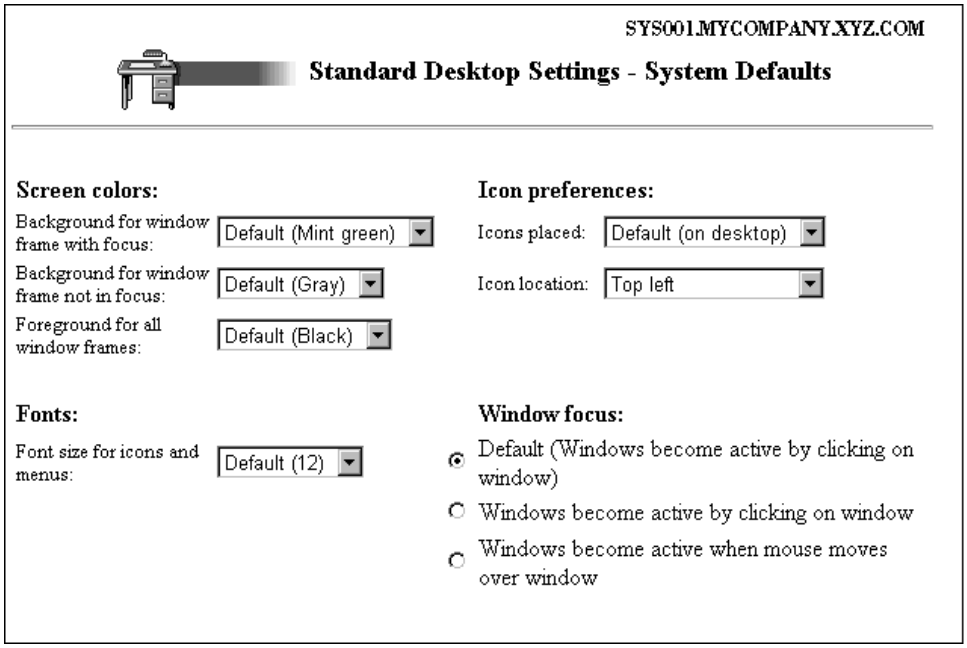

Figure 54. Desktop Settings Example

__ 3. Scroll to *Icon preferences*. In the Icon location field, select **Top left**.

__ 4. Click **Finish** to apply the change.

Disabling the Control Menu for a 5250 Session

Disabling the Control Menu prevents users from accessing the 5250 emulator functions available through the Control pull-down.

__ 1. From the Setup Tasks frame, click **5250** and select **User defaults**. In the bottom frame, click **Next** to continue.

__ 2. The 5250 Settings appear. See Figure 55 on page 85.

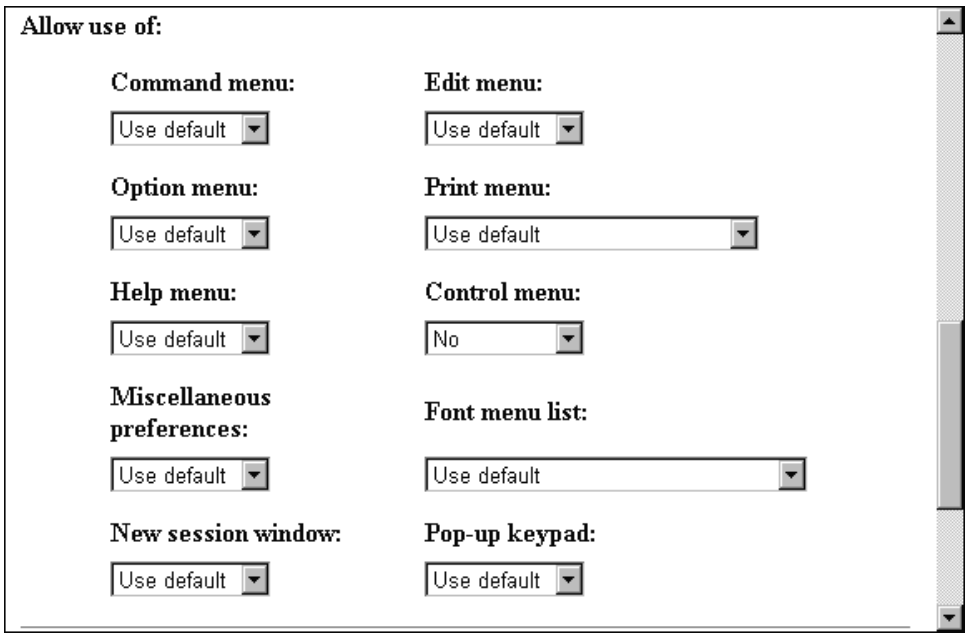

Figure 55. 5250 Setting Example

__ 3. Scroll to the *Allow use of* section.

__ 4. In the Control menu drop box, select **No** to disable the Control menu. (The default is Yes, meaning that you can use the Control menu).

By disabling use of the Control menu, your 5250 sessions will not have the Control pull-down displayed for use.

__ 5. Click **Finish** to apply the change.

Enabling the 5250 or 3270 Emulator for Euro Currency Support

5250 or 3270 emulation can support access to the Euro currency symbol. Follow the steps below to implement the Euro currency support:

__ 1. From the Setup Tasks frame, click **Startup**. Click **Menus or Programs**(this example uses Menu Items) and click your choice of default. In the bottom frame, click **Next** to continue.

__ 2. Scroll to either the *3270 or 5250 Menu Items* (this example uses 5250 Menu Items) section.

__ 3. The 5250 Menu Items appear.

__ 4. Type in the values for Menu Item Label, AS/400 or OS/390 system name, and -EURO in the Other parameters field.

Note: The Other parameter value of -EURO must be typed in upper case characters.

__ 5. Click **Finish** to apply the change.

Changing the Screen Size of a 3270 Session

Your organization may have requirements for varying 3270 session screen sizes. Complete the following steps to change screen sizes of your 3270 emulation sessions:

__ 1. From the *Setup Tasks* frame, click **3270** and select **User defaults**. In the bottom frame, click **Next** to continue.

__ 2. The 3270 Settings panel appears. See Figure 56.

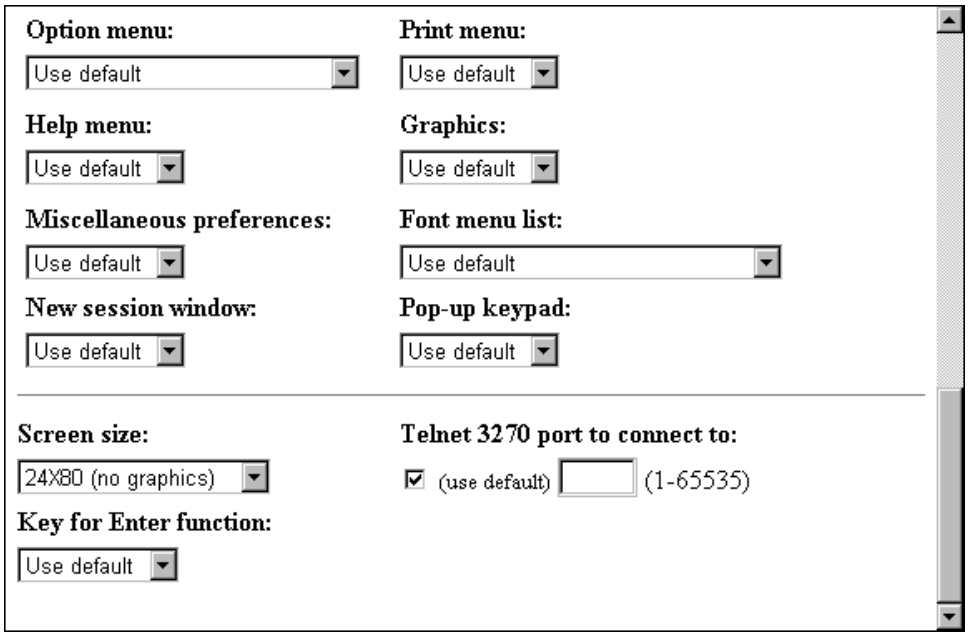

Figure 56. 3270 Settings Example

__ 3. Scroll to the *Screen size* field. Select **24 x 80**.

This action changes your 3270 session screen size from 32 x 80 (the default) to 24 x 80.

__ 4. Click **Finish** to apply the change.

Enabling Java Applets for NC Navigator

Java applets can add function to your browser sessions if your browsers are allowed to run them. Complete the following steps to enable Java applets on your browser:

__ 1. From the *Setup Tasks* frame, click **Internet**, click **NC Navigator**, and select **User defaults**. In the bottom frame, click **Next** to continue.

__ 2. The NC Navigator Settings frame appears. See Figure 57 on page 87.

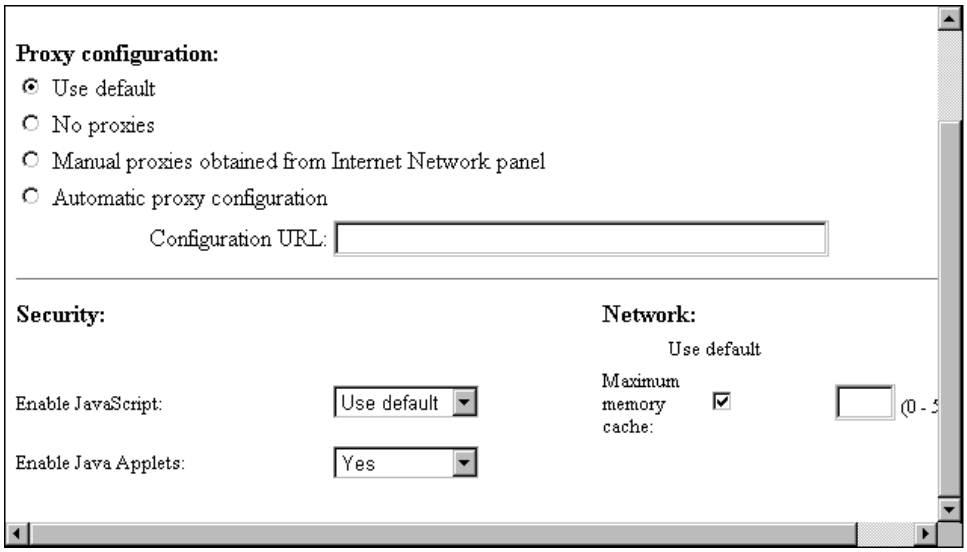

Figure 57. NC Navigator Browser - Enabling Java Applets

__ 3. Scroll to the *Security* section. In the *Enable Java Applets* field, select **Yes** as the value.

Selecting this value enables Java applets to run on user001's workstation.

__ 4. Click **Finish** to apply the change.

Creating Directory Buttons for NC Navigator

Directory buttons provide quick access to specified URLs. As administrator, you can control the creation and access to directory buttons. Complete the following steps:

__ 1. From the *Setup Tasks* frame, click **Internet**, click **NC Navigator**, and select one of the available **defaults**. In the bottom frame, click **Next** to continue.

__ 2. The NC Navigator Settings frame appears. See Figure 58.

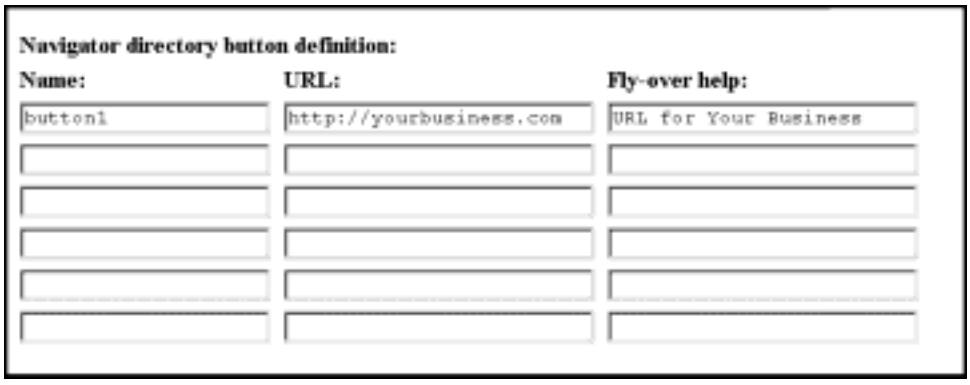

Figure 58. NC Navigator Browser - Creating Directory Buttons

__ 3. Scroll to the *Navigator directory button definition* section.

__ 4. Type in the values you want to use for each directory button. In this example Figure 58 shows:

Name Button1

URL http://yourbusiness.com

Fly-over help
URL or name for YourBusiness

__ 5. Click **Finish** to apply the change.

Working with Your Network Proxies

Following are Network proxies you can work with when using the IBM Network Station Manager program:

- File Transfer Protocol (FTP)
- HTTP
- GOPHER
- Security
- SOCKS
- Outgoing mail (Simple Mail Transfer Protocol (SMTP))
- Incoming mail (POP3)
- News (NNTP)

__ 1. From the *Setup Tasks* frame, click **Internet**, click **Network**, and select **User defaults**. In the bottom frame, click **Next** to continue.

__ 2. Scroll to the *Proxy* section.

__ 3. The Network Settings frame appears. See Figure 59.

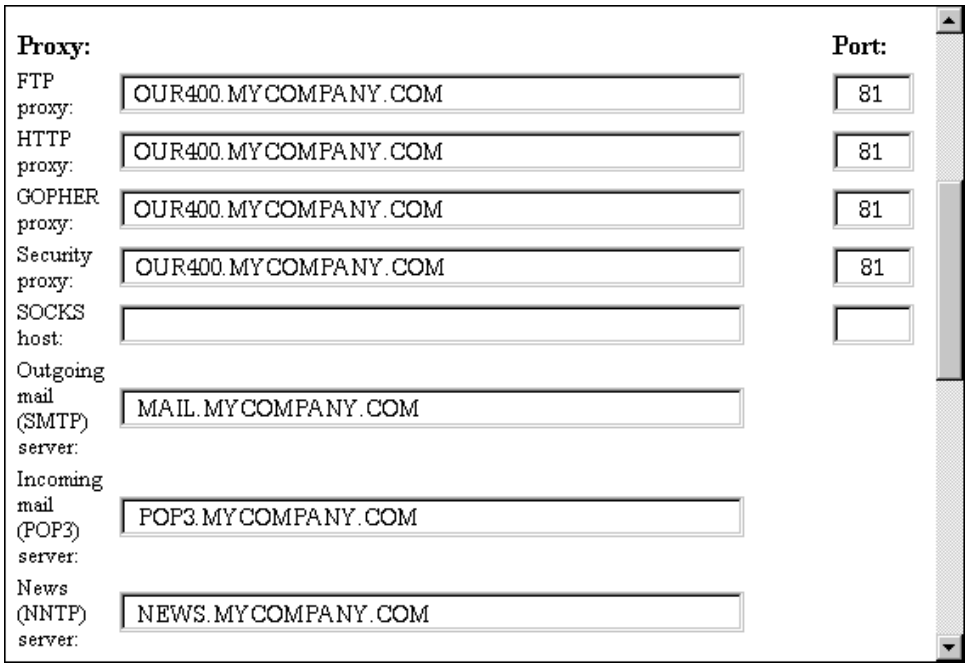

Figure 59. Working with Your Network Proxies

The values in Figure 59 are examples only. You must know the names, (and in some cases port numbers) to be used for these proxies. If you do not know the names, you may have to work with your network administrator or your network service provider.

__ 4. Click **Finish** to apply the change.

Changing the Menus and Messages Language Type

There may be times when you want to have some users work in a language other than the primary language of the host. Complete the following steps to change the language for messages and menus:

__ 1. From the *Setup Tasks* frame, click **Language**, and then select **User defaults** using user ID user001. In the bottom frame, click **Next** to continue.

__ 2. The Language Settings frame appears. See Figure 60.

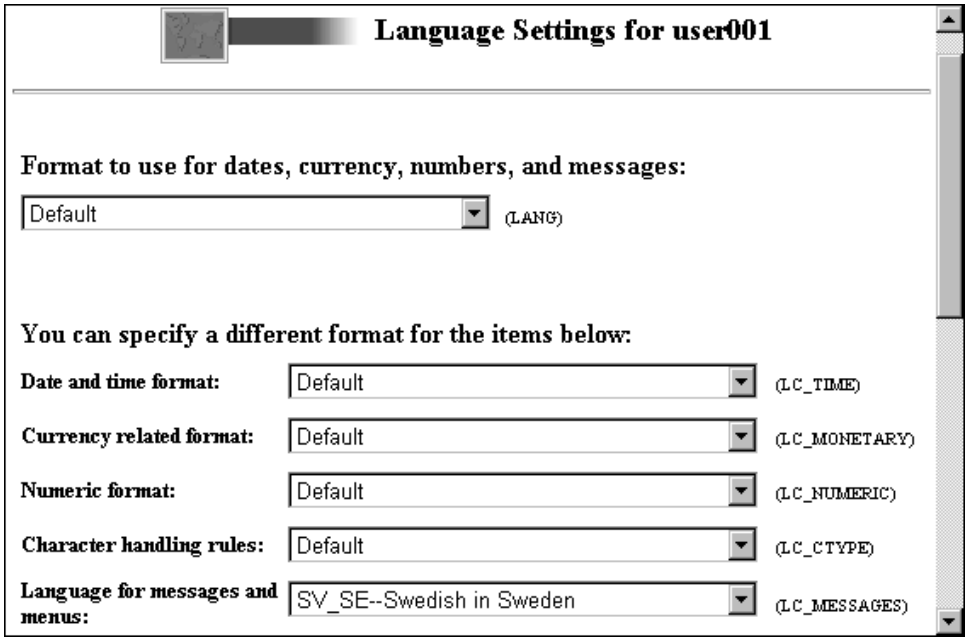

Figure 60. Changing the Menus and Messages Language Type

__ 3. Scroll to the *LC_MESSAGES* field. In the *LC_MESSAGES* field, select **SV_SE** (Swedish in Sweden) as the value.

Selecting this value makes all menus, and messages appear in Swedish for user001.

Note: If you change the LANG parameter values, the keyboard mapping language for a user's keyboard should also be the same. You can find the keyboard mapping language parameter in the Workstations function under the Hardware Setup Task.

__ 4. Click **Finish** to apply the change.

Assigning Group Settings to a User

Note: A user must belong to the group before you can specify that the user inherit that group's settings. Also, the group must have settings before you can assign those settings to a user.

You create groups on the Host server. Associating users with groups is also done on the Host server.

__ 1. From the *Setup Tasks* frame, click **Select User's Group**. Type in **user001** in the *For which user do you want to select a group* field. See Figure 61.

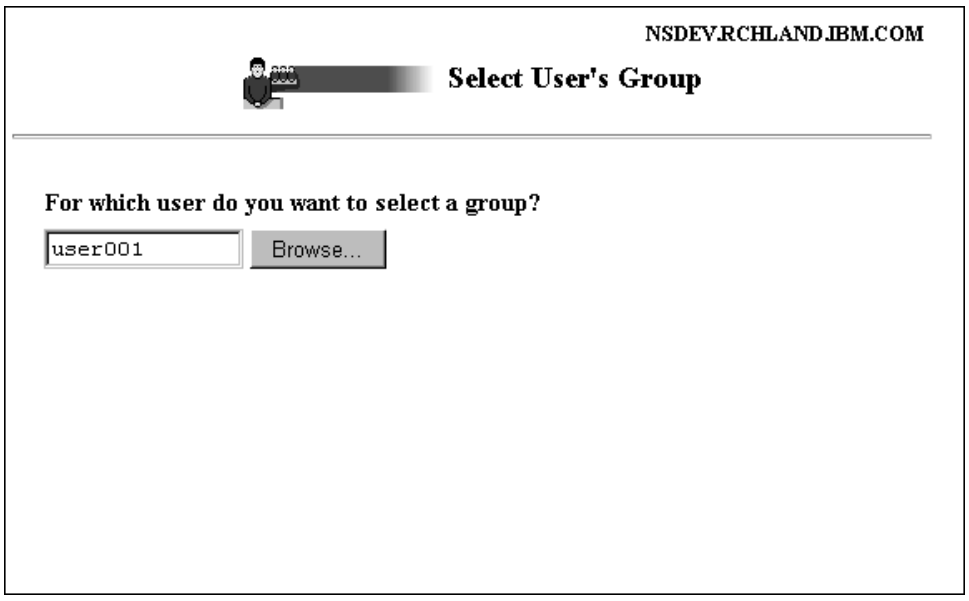

Figure 61. Selecting a User to be Associated with a Group

__ 2. In the bottom frame, click **Next** to continue.
The *Select Group for user001* panel appears. See Figure 62.

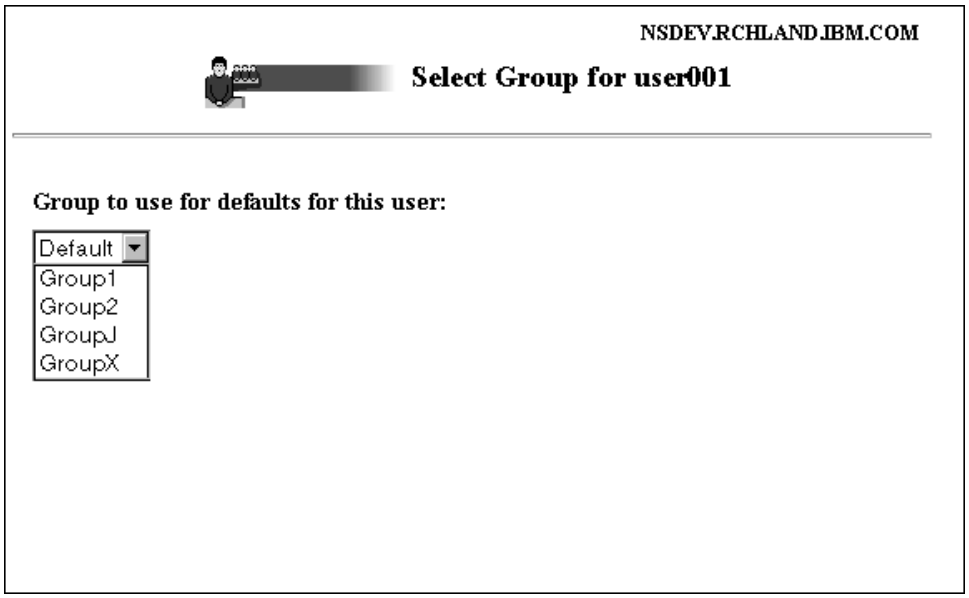

Figure 62. Selecting a Group to Use for Defaults

__ 3. Click the **Group to use for defaults for this user** drop box. Select the group whose settings you want user001 to inherit. In this example that is GROUPX.

When user001 logs on next time, user001 will have any settings configured for GROUPX.

__ 4. Click **Finish** to apply the change.

IBM Network Station Manager Program Education

You should provide some hands-on education, similar to what you just experienced, for your users of the Network Stations.

Practice choosing and applying settings within the various Setup Tasks to build skills among your users.

Accessing and Using How To Help

The IBM Network Station Manager program contains a How To help category.

The How To category is organized by the tasks you can perform while using the IBM Network Station Manager program. For example, it contains instructions about how to create 5250 sessions, change your desktop to Lotus eSuite WorkPlace, and configure NC Navigator sessions.

How To help can be accessed by clicking the Help button at any time. Figure 63 shows a view of the Help Contents where How To... is located.

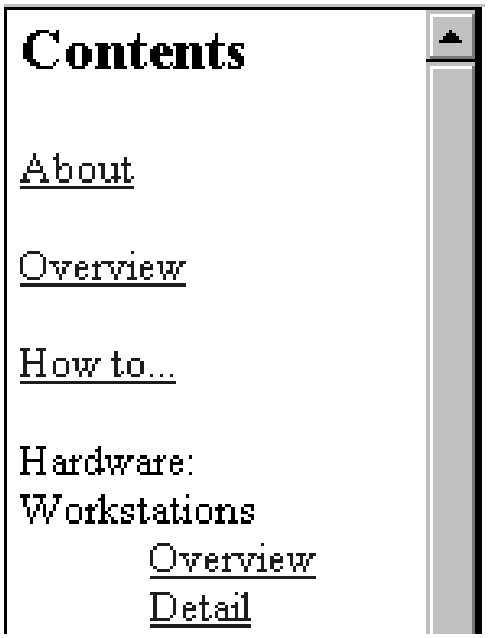

Figure 63. Finding How To Help

Additional IBM Network Station Manager Program Examples

Following are examples that use the IBM Network Station Manager program:

- Setting up an AIX session on your IBM Network Station by using Remote Program support
- Setting up a Microsoft Windows NT session on your IBM Network Station by using Remote Program support

Setting Up an AIX Session Using the IBM Network Station Manager Program

Complete the following steps to set up an AIX session using the IBM Network Station Manager program:

__ 1. Verify that the user ID and password on the Host system match the user ID and password on the authentication server.

__ 2. You must create a .rhosts file on the AIX server. This file must contain the Network Station's name and the name that the user logs into AIX with. This file resides on the AIX server under the user's directory. An example for a user ID of user001 would be:

Location and name of file
/home/user001/.rhosts

Contents of .rhosts file

```
NWS1.mycompany.ABC.com user001
```

The .rhosts file can contain multiple lines. Each line should have one Network Station name and one user name on it. If a user will be working from more than one Network Station, create an entry for each Network Station. Following is an example of the contents of an .rhosts file that allows user001 to sign on to multiple Network Stations:

Location and name of file
/home/user001/.rhosts

Contents of .rhosts file

```
NWS1.mycompany.ABC.com user001

NWS2.mycompany.ABC.com user001

NWS2.mycompany.ABC.com user001
```

If you want to allow user001 to sign-on to any Network Station, the path name and contents of the .rhosts file would be as follows:

Location and name of file
/home/user001/.rhosts

Contents of .rhosts file

```
+ user001
```

__ 3. On the RS/6000, run the following command:

```
CHMOD 600 .rhosts
```

Running the CHMOD command changes the access permissions to the .rhosts file. Changing the access permissions allows checking of the .rhosts file to verify that a user (user001 in this example) is listed in the .rhosts file.

__ 4. You can verify that the access permissions worked by running the following command:

```
ls -al .rhosts
```

You should see **-rw - - - - - - - 1 user001 system**.

__ 5. Sign on to the IBM Network Station Manager program.

__ 6. From *Setup Tasks*, click **Startup**, then click **Menu**.

__ 7. From *Program Defaults*, click **User defaults**.

If you are setting this up for someone else, type the **user ID** of that user or click **Browse** to select the user ID.

__ 8. Click **Next** to continue.

__ 9. Scroll ahead to *Remote Programs Menu Items* and type in the information. See Figure 64.

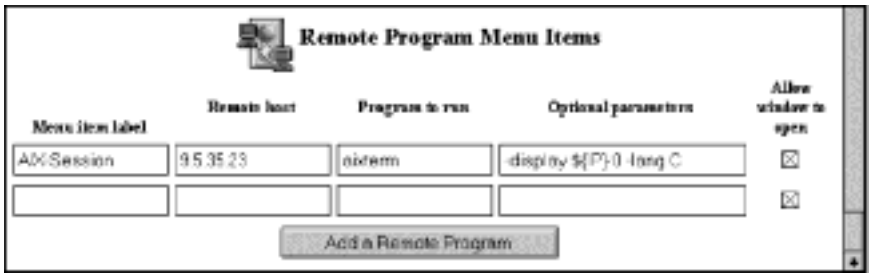

Figure 64. Remote Program Example for AIX

Where:

Menu item label
This text string appears in the Menu bar on the Network Station.

Remote host
The name or IP address of the AIX server.

Program to run
This identifies the program to run on the AIX server.

Optional parameters
-display is an AIX requirement that causes the program to display on the Network Station rather than on the remote host. ${IP} is an IBM-supplied environment variable that is replaced with the IP address of the Network Station. -lang C is an AIX requirement that is used by programs such as Netscape on AIX.

The required parameters for AIX-Session are:

```
-display
${IP}:0
```

__ 10. Click **Finish** to apply the AIX remote program setting.

__ 11. Log off and then log on your Network Station. The Menu bar should have a button labeled AIX-Session. See Figure 65.

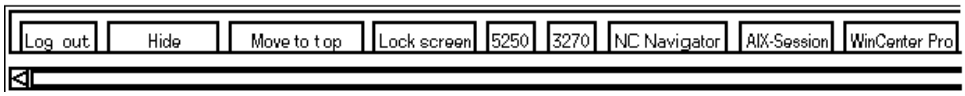

Figure 65. Menu Button for Remote Program Example for AIX

__ 12. Click **AIX-Session**. A window opens with your X-station session. From the Aixterm window, you can run additional programs.

Setting Up a Microsoft Windows NT Session Using the IBM Network Station Manager Program

Complete the following steps to set up a Microsoft Windows NT session by using the IBM Network Station Manager program:

__ 1. Verify that you have a Microsoft Windows NT machine in your network that has the WinCenter Pro application loaded on it.

__ 2. Verify that the user has a valid user profile and password on the Microsoft Windows NT server. When you request a session from the Microsoft Windows NT server (for the IBM Network Station), the user must sign on.

__ 3. Sign on to the IBM Network Station Manager program.

__ 4. From *Setup Tasks*, click **Startup**, then click **Menu**.

__ 5. From *Program Defaults*, click **User defaults**.

If you are setting this up for someone else, type that user's ID or click **>Browse** to select the user ID.

__ 6. Click **Next** to continue.

__ 7. Scroll ahead to *Remote Programs Menu Items* and type in the information. See Figure 66.

Figure 66. Remote Program Example for Microsoft Windows NT

Where:

Menu item label
This text string appears in the Menu bar on the Network Station.

Remote host
The name or IP address of the Microsoft Windows NT server.

Program to run
This identifies the program to run on the Microsoft Windows NT server.

Optional parameters
-display is a WinCenter Pro requirement that causes the program to display on the Network Station rather than on the remote host. ${IP} is an IBM-supplied environment variable that gets replaced with the IP address of the Network Station.

The required parameters for WinCenter Pro are:

```
-display
${IP}:0
```

__ 8. Click **Finish** to apply the WinCenter Pro remote program setting.

__ 9. Log off and then log on your Network Station. The Menu bar should have a button labeled WinCenter Pro. See Figure 67 on page 95.

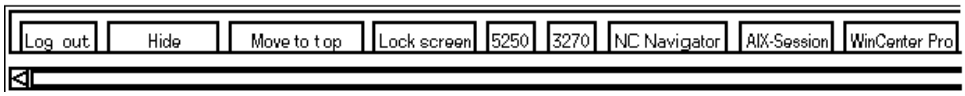

Figure 67. Menu Button for Remote Program Example for Microsoft NT

__ 10. Click **WinCenter Pro** and a window opens with your WinCenter session.

Chapter 5. Working with User Services

User services are programs that provide administrators with tools to manage the IBM Network Station's environment. You can work with User Services whenever you want, including when an application is running. Following are a list of User Services:

- Console
- Login (The Login User Service is not available.)
- Terminals (The Terminals User Service is not available.)
- WindowMgr
- Utilities
- Setup (The Setup User Service is not available.)
- Statistics

Accessing User Services

Access User Services by pressing the Shift, Alt, and Home keys all at the same time.

Figure 68 shows the User Services window with all the service programs that are displayed within the menu bar.

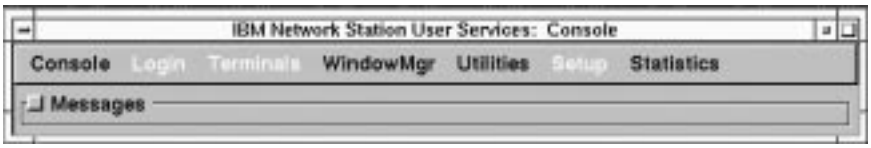

Figure 68. User Services Window

Console

This function provides a menu bar option (Console) for handling messages. Figure 69 on page 98 shows the tools available through the Console services option.

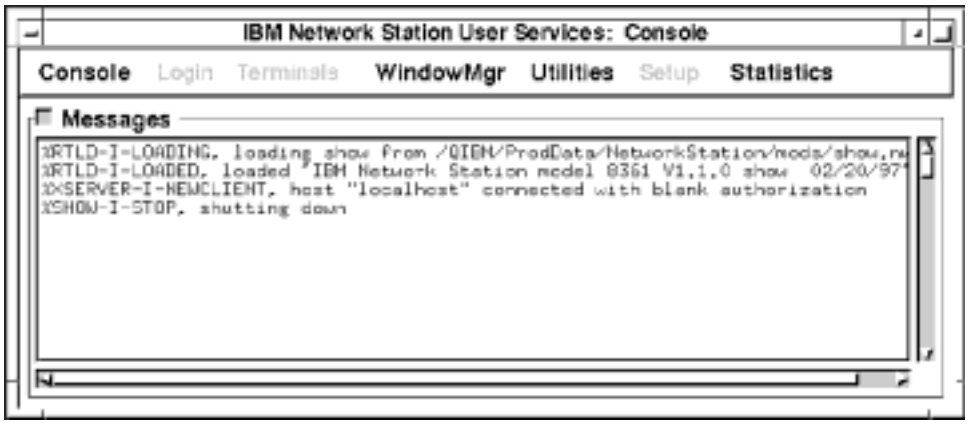

Figure 69. User Services: Console View

Click the button by Messages to display messages that record Network Station activity.

The list below contains the name of the tool and a description of its function.

Clear Messages
Selecting this option clears all the current messages from the console display.

Rescan Messages
Selecting this option refreshes messages in the console window. Messages that are not displayed appear in the refreshed window.

Close Selecting this option closes the console function of User Services.

Login

The Login services option is disabled. The IBM Network Station Manager licensed program provides a login capability.

Terminals

The Terminal services option is disabled. The IBM Network Station Manager Program provides terminal or workstation management.

WindowMgr

Figure 70 shows the tools available through the WindowMgr services option.

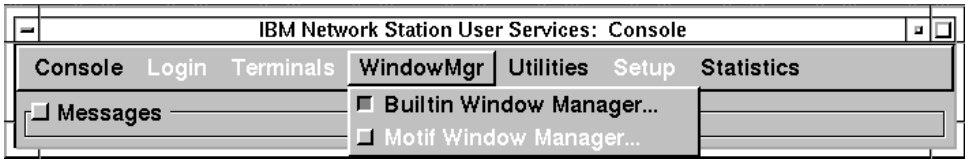

Figure 70. User Services: Window Manager View

The list below contains the name of the tool and a description of its function:

Builtin Window Manager
Selecting this option starts the Builtin Window Manager (an OSF or Motif-style). Deselecting this option ends the Builtin Window Manager.

The Builtin Window Manager function provides you with the ability to size, move, and make active (clicking) all the windows open on your monitor.

Utilities

Figure 71 shows the tools available through the Utilities services option.

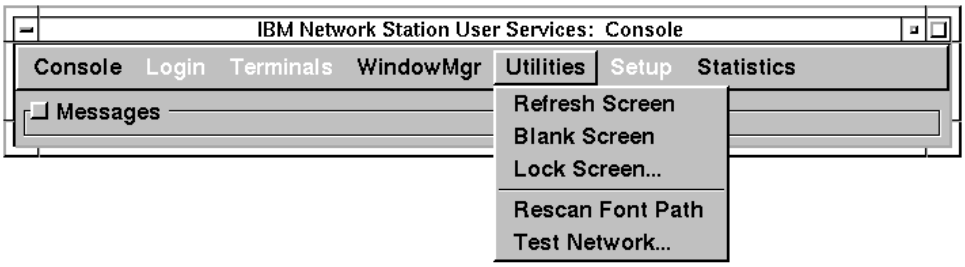

Figure 71. User Services: Utilities View

The list below contains the name of the tool and a description of its function.

Refresh Screen
Selecting this option refreshes the active window.

Blank Screen
Selecting this option starts the screen-saver program.

Lock Screen
Selecting this option locks the screen after prompting for a password. The Lock Screen function keeps anyone without the password from using the workstation.

Rescan Font Path
Selecting this option refreshes any font changes that are provided by the system administrator.

For example, if the font used is so large, you can not display an entire 5250 session, have the administrator provide a smaller font. Select the smaller font by clicking the Option pull-down, clicking Font, and selecting the smaller font.

Another use of fonts would be to make your windows smaller. Using smaller fonts enables several full windows on a screen.

Note: The 5250 Emulation program provides multiple fonts. From the 5250 Tool bar, select the Option pull-down and click Fonts.

Test Network
Selecting this option runs the network test, similar to the Transmission Control Protocol/Internet Protocol (TCP/IP) command PING.

Setup

The Setup services option is disabled.

Statistics

Figure 72 shows the tools available through the Statistics services option.

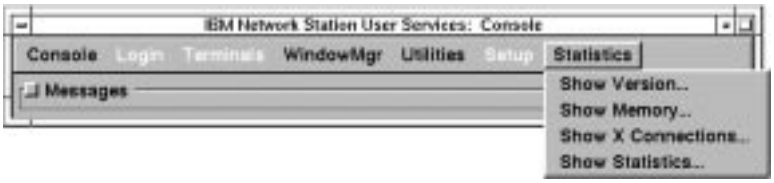

Figure 72. User Services: Statistics View

The list below contains the name of the tool and a description of its function within the statistics services function.

Show version
Selecting this option displays version numbers and other information about the current state of the IBM Network Station.

Show Memory
Selecting this option displays information about free and installed memory in the IBM Network Station.

Show Connections
Selecting this option displays information about all the current X clients that are connected to the IBM Network Station.

Show Statistics
Selecting this option displays statistics that pertain to the IBM Network Station.

Chapter 6. Working With the IBM Network Station Setup Utility

This chapter contains information about using the Setup Utility of the IBM Network Station network computer, hereafter referred to as the Network Station. The Setup Utility menu allows you to **View** or **Set** (change) configuration settings that relate to a particular IBM Network Station. The Setup Utility is primarily a tool for administrators to find and correct problems on the network. You can use the IBM Network Station Manager to restrict a user's privileges in the Setup Utility.

Accessing the IBM Network Station Setup Utility

Access the Setup Utility by carrying out the following steps:

1. Power on the Network Station.
2. When the NS0500 *Search for Host System* message appears on the black screen, press the Escape key.
3. If password control is active, you must enter the case-sensitive administrator password.

   Note: You can specify the administrator password through the IBM Network Station Manager in the Hardware setup tasks under *Miscellaneous Settings*.

The following screen appears:

```
SCRN02                IBM Network Station
                          Setup Utility

F2 = View Hardware Configuration
F3 = Set Network Parameters
F4 = Set Boot Parameters
F5 = Set Configuration Parameters
F6 = Set Monitor Parameters
F7 = Set Language Parameters


F10 = Set Verbose Diagnostic Messages Disabled









Enter=Reboot
```

Notes:

1. If the administrator has not set the password in the IBM Network Station Manager, any user can access the configuration settings in the IBM Setup Utility.
2. If you attempt the password three times without success, you can only view the hardware configuration.
3. If you changed the administrator password by using IBM Network Station Manager, you must boot the Network Station up to the Login window. This enables the new administrator password at the system unit.

Users who are granted limited access by the administrator in IBM Network Station Manager do not see the complete screen shown above. They see only the first option, which allows only for viewing the hardware configuration.

IBM Network Station Setup Utility Tasks

You can find information about Setup Utility tasks in Table 14 and Table 15 on page 103, in the text-based instructions which follow, or in both sources.

Table 14 and Table 15 on page 103 divide Setup Utility tasks into two categories: Tasks that deal with configuration settings and tasks that deal with appearances. The tables point you to the steps you need to take to perform each task. You can reach many of the required screens simply by pressing one key, and many of the tasks consist of a single keystroke. When the task is more complicated or bears explanation, the tables direct you to the text-based instructions in the remainder of the chapter.

Note: For specific instructions about configuring a Network Station to boot from NVRAM settings, refer to “Configuring an IBM Network Station to Boot from the NVRAM Setting” on page 108.

Table 14. Common Configuration Tasks in Setup Utility

Configuration Item	To View	To Set
Network Station IP Address	F3, select NVRAM.	F3, select NVRAM.
Subnet Mask	F3, select NVRAM.	F3, select NVRAM.

Table 14. Common Configuration Tasks in Setup Utility (continued)

Configuration Item	To View	To Set
Default MAC Address	See “Finding the Default MAC Address” on page 105.	N/A.
User-configurable MAC Address	See “Viewing the User-Configurable MAC Address” on page 106.	See “Specifying a User-Configurable MAC Address” on page 106.
Gateway IP Address	F3, select NVRAM.	F3, select NVRAM.
IP Addressed From (Is NVRAM or a Network setting being used to boot?)	F3.	F3.

Table 15. Common Appearance Tasks in Setup Utility

Appearance Item	To View	To Set
Keyboard Language	F7.	F7. See “Selecting a Keyboard Language” on page 104.
Monitor Resolution	F6.	F6. See “Setting Monitor Resolution”.
Verbose Diagnostic Messages (activity and messages displayed during boot)	F10.	F10. See “Using Verbose Diagnostic Messages” on page 105.
Blanking Pedestal	F6.	See “Working With the Blanking Pedestal”.

Setting Monitor Resolution

You can change the resolution of the monitor that is attached to a Network Station to improve a screen image that is not clear.

CAUTION:
Setting a resolution that is not supported by your monitor can permanently damage the monitor.

Note: For the best video image, you should power on the monitor before you start the logic unit.

__ 1. Enter the Setup Utility by powering on the Network Station and pressing the Escape key after the NS0500 *Search for Host System* message displays during system startup.
__ 2. Press the F6 key.
__ 3. Press the F2 key.
__ 4. Select a new monitor resolution by using the Up and Down arrow keys.
__ 5. After selecting your resolution, press Enter.
__ 6. Test the resolution by pressing Enter again. A properly resolved monitor clearly displays the resolution setting in the center of a full-screen grid.

Working With the Blanking Pedestal

The Blanking Pedestal allows you to increase the contrast between black and white on your monitor. To activate the Blanking Pedestal, carry out the following instructions:

__ 1. Enter the Setup Utility by pressing the Escape key after the NS0500 *Search for Host System* message displays during system startup.

__ 2. Press F6.

__ 3. Press the F9 key to enable or disable the Blanking Pedestal. The F9 key acts as a toggle switch.

Once you have enabled the Blanking Pedestal, your display changes immediately.

Selecting the Startup Language

The first time you start a Network Station, a screen prompts you to select a Startup Language. The Startup Language is the language that the Network Station uses in its own interface. For example, the screens that you see in the Setup Utility appear in the language that you select. The Startup Language is not the same as the keyboard language or the language that the IBM Network Station Manager interface uses. For information about setting the keyboard language for a Network Station, see “Selecting a Keyboard Language”.

To change the Startup Language after the first time the Network Station is started, complete the following steps:

__ 1. Enter the Setup Utility by pressing the Escape key after the NS0500 *Search for Host System* message displays during system startup.

__ 2. Press F7, *Set Language Parameters*.

__ 3. Press F3, *Select Startup Language*.

__ 4. Select the language of your choice.

__ 5. Press Enter. The language that you see on screen changes immediately.

Selecting a Keyboard Language

Warning: You should use the IBM Network Station Manager program to change keyboard languages. If you change the language in the Setup Utility, you might specify a different language than what is in the IBM Network Station Manager. The value in the IBM Network Station Manager overrides any value in the Setup Utility.

You can select a keyboard language to use with this Network Station. Selecting a different language changes the mapping of keys. By changing the mapping of keys, you could cause a different character to display when a certain key is pressed.

To select a keyboard language, carry out the following steps:

__ 1. Enter the Setup Utility by powering on the Network Station and pressing the Escape key after the NS0500 *Search for Host System* message displays during the startup process.

__ 2. In the main Setup Utility screen, press the F7 key.

__ 3. Press the F2 key to select a keyboard language.

__ 4. Use the Up and Down arrow keys to select a language from the options displayed.

__ 5. Press Enter to save your selection.

Using Verbose Diagnostic Messages

You have the choice of whether or not to monitor boot activity from the boot host on an individual Network Station. When you enable Verbose Diagnostic Messages in Setup Utility, messages appear on the monitor during the boot process as files are loaded.

__ 1. Enter the Setup Utility by powering on the Network Station and pressing the Escape key after the NS0500 *Search for Host System* message displays during the startup process.

__ 2. Press the F10 key to change the status of Verbose Diagnostic Messages. The F10 key acts as a toggle switch. Verbose Diagnostic Messages are currently disabled when the display reads ″F10 = Set Verbose Diagnostic Messages Disabled.″ When the display reads, ″F10 = Set Verbose Diagnostic Messages Enabled, it means that Verbose Diagnostic Messages are currently enabled.

Working With MAC Addresses

You use a MAC address (which is an alpha-numeric value) to identify a computer.

Network Stations can have two kinds of MAC addresses: Default MAC addresses, and user-configurable MAC addresses.

Default MAC Addresses

The default MAC address is a unique identifier that corresponds permanently to a particular Network Station. The Network Station receives its default MAC address in the factory where the machine is manufactured. The default MAC address does not change, even when you specify a user-configurable MAC address.

Finding the Default MAC Address: You can find the default MAC address by viewing the MAC address label in the Network Station packaging. See Figure 5 on page 7 for guidance.

On a new Network Station which has no user-configurable MAC address, you can view the default MAC address in the Setup Utility. To do so, carry out the following steps:

__ 1. Enter the Setup Utility by pressing the Escape key after the *Search for Host System* message displays during the startup process.

__ 2. Press the F2 key to view the MAC address.

Note: Remember, that the default MAC address will only appear here if no user-configurable MAC address is active. See “Recovering the Default MAC Address” for information about recovering the default MAC address once you have specified a user-configurable MAC address.

Recovering the Default MAC Address: Once you have entered a user-configurable MAC address, you can reset the MAC address to the default by carrying out the following steps:

__ 1. Enter the Setup Utility by restarting the Network Station and pressing the Escape key after the *Search for Host System* message displays during system startup.

__ 2. In the Setup Utility, press **Control+Alt+Shift+F1**.

__ 3. On the command line, type the following command: `ma default`.

__ 4. To return to the Setup Utility, type `SE` and press the Enter key or type `RS` to restart the Network Station.

User-Configurable MAC Addresses

You may wish to configure your own MAC addresses for Network Stations. By configuring your own MAC addresses, you can create a sequence of identifiers that has meaning to you as an administrator. Your own MAC addresses will be more memorable than the randomly produced default MAC addresses that reside in the Network Stations.

By configuring a MAC address, you do not permanently delete or overwrite the default MAC address. You can retrieve it from the memory of the Network Station at any time. For instructions about how to reset the default MAC address, see “Recovering the Default MAC Address” on page 105.

If you are using DHCP in your network to dynamically allocate IP addresses, you should not configure your own MAC addresses. User-configurable MAC addresses are most useful for the kind of tracking and close administrative scrutiny that are usually associated with small, static, stable networks.

The user-configurable MAC address must follow the conventions of the default MAC address. It must consist of 12 digits, in pairs that are sectioned off by colons. When you create a user-configurable address, you can use the numbers 0 through 9 and the letters A through F. The first digit in the MAC address must always be 4, 5, 6, 7, 8, C, D, E, or F. After the first digit, you may enter any values you wish, as long as they follow the conventions that have already been discussed.

Specifying a User-Configurable MAC Address:

__ 1. Enter the Setup Utility by restarting the Network Station and pressing the Escape key after the *Search for Host System* message displays during system startup.

__ 2. In the Setup Utility, press **Control+Alt+Shift+F1**.

__ 3. On a Network Station command line, type the following command: `ma XX:XX:XX:XX:XX:XX`, where `XX:XX:XX:XX:XX:XX` is your user-configurable MAC address.

__ 4. To return to the Setup Utility, type `SE` and press the Enter key or type `RS` to restart the Network Station.

Viewing the User-Configurable MAC Address: You can view the active MAC address on an IBM Network Station by carrying out the following steps:

__ 1. Enter the Setup Utility by restarting the Network Station and pressing the **Escape** key after the *Search for Host System* message displays during system startup.

__ 2. In the Setup Utility, press **Control+Alt+Shift+F1**.

__ 3. On a Network Station command line, type the following command: `ma`.

__ 4. Press Enter.

__ 5. To return to the Setup Utility, type `se` and press Enter.

Resetting an IBM Network Station to the Factory Defaults

Even if you have already configured your Network Station, you may wish to clear all of the settings and restore the factory defaults. To do this, carry out the following steps:

__ 1. Enter the Setup Utility by restarting the Network Station and pressing the Escape key after the *Search for Host System* message displays.

__ 2. In the Setup Utility, press **Ctrl+Alt+Shift+F1**.

__ 3. Type `nv` to enter the NVRAM utility. Press Enter.

__ 4. Type `l` to load the default values. Press Enter.

__ 5. Type `s` to save the new values. Press Enter.

__ 6. Type `y` to verify that you want to save the values. Press Enter.

__ 7. Type `q` to quit the NVRAM utility.

__ 8. To return to the Setup Utility, type `se` and press Enter.

Viewing the Boot PROM Version of an IBM Network Station

You may want to ensure that you have a certain version of boot PROM (also called the boot monitor) loaded on your Network Station. You can learn what version you have currently installed on your Network Station by carrying out the following steps:

__ 1. Enter the Setup Utility by powering on the Network Station and pressing the Escape key after the *Search for Host System* message displays.

__ 2. Press F2, *View Hardware Configuration*.

The Boot Monitor version appears as the third categorized item. The Boot Monitor version is the same thing as the boot PROM version.

Configuring an IBM Network Station to Boot from the Network Setting

For your Network Stations to boot using BOOTP or DHCP, you must set each logic unit to *Network* in the Setup Utility. *Network* is the factory default setting. You can also set this value in the IBM Network Station Manager. For more information about setting boot preferences in the IBM Network Station Manager, see “Overriding the Network Station Boot Setting” on page 72. To change or verify the Network Station’s boot setting, carry out the following steps:

__ 1. Enter the Setup Utility by powering on the Network Station and pressing the Escape key after the *Search for Host System* message displays during the startup process.

__ 2. Press F3, *Set Network Parameters*.

__ 3. On the line *IP Addressed from*, use the right and left arrow keys to highlight *Network*.

__ 4. Once you have highlighted *Network* on the *IP Addressed from* line, you must configure the following parameters:

- DHCP IP Addressing Order
- BOOTP IP Addressing Order

Choose whether you want DHCP or BOOTP to be the primary boot method of this Network Station. For guidance in making that decision, refer to “Boot Methods” on page 12. If you want to use both DHCP and BOOTP, type `1` next to your first choice and `2` next to your second choice. If you want to use only one boot method, type `1` beside your selection. Type `D` for ″Disabled″ beside the method that you do not want to use.

__ 5. If you have an Ethernet Network Station, choose the appropriate Ethernet standard for your network/

__ 6. Press Enter to save your changes.

__ 7. Your individual Network Station is now ready to boot using the Network setting. However, you must make sure that you have configured your server to process boot requests from BOOTP or DHCP clients. To configure your server to use BOOTP or DHCP, refer to your platform-specific installation chapter of this book.

Configuring an IBM Network Station to Boot from the NVRAM Setting

This section contains information about setting up a Network Station to boot from the NVRAM setting.

Note: If you make an error during the following procedure, recover the default information that you have overwritten by pressing F11.

__ 1. Enter the Setup Utility by powering on the Network Station and pressing the Escape key after the *Search for Host System* message displays during the startup process.

__ 2. Press F3, *Set Network Parameters*.

__ 3. On the line *IP Addressed from*, use the right and left arrow keys to highlight NVRAM.

__ 4. On the lines beneath *IP Addressed from*, fill in the requested information concerning your network's topology. Refer to your network topology diagram for your network's configuration information.

Notes:

a. To replace existing text, you must backspace to delete the text and then type your values. You cannot type over existing values.

b. Do not press Enter at the end of a line. Instead, use the arrow keys to move from one line to the next. Press Enter only when you are finished with the whole screen.

Table 16. Boot and Configuration Parameters for NVRAM Booting. Table 16 explains the configuration items and refers you to the sample values for Figure 3 on page 5.

Configuration Item	Description	Value for Network Examples
Network Station IP Address	The IP address for this individual IBM Network Station.	Network Example 2 = 192.168.1.2 or 192.168.1.3
First Boot Host IP Address	The IP address of the primary server that you will use to boot this Network Station.	Network Example 2 = 192.168.1.4
Second Boot Host IP Address	The server that you will use to boot this IBM Network Station should the first boot host fail. If you have no backup server, you may enter the value 0.0.0.0 or the same IP address as that of the first boot host.	Network Example 2 = 0.0.0.0
Third Boot Host IP Address	The server that you will use to boot this individual Network Station should the first and second boot hosts fail. If you have no third boot host, you may enter 0.0.0.0 or the same IP address as that of your first or second boot host.	Network Example 2 = 0.0.0.0

Table 16. Boot and Configuration Parameters for NVRAM Booting (continued). Table 16 on page 108 explains the configuration items and refers you to the sample values for Figure 3 on page 5.

Configuration Item	Description	Value for Network Examples
First Configuration Host IP Address	The IP address of the server from which the Network Station downloads its workstation configuration information. This may or may not be the same server as the boot host. See "Taking Advantage of Multiple Server Environments" on page 17, for information. If you do not specify a configuration host, the Network Station goes to the boot host as a default configuration server. If you do not want to specify a separate configuration host, you may enter 0.0.0.0 or the IP address of the boot host.	Network Example 2 = 0.0.0.0
Second Configuration Host IP Address	The IP address of the configuration host that you want the Network Station to use should the first configuration host fail. If you do not want to specify a second configuration host, you may enter 0.0.0.0 or the IP address of the first configuration host.	Network Example 2 = 0.0.0.0
Gateway IP Address	The IP address of the principle router of the Network Station's network.	Network Example 2 = 192.168.1.1
Subnet Mask	See "Subnets and Subnet Masks" on page 8 for a discussion of subnet masks. If the Network Station will never need to access anything that does not reside on its subnet, you can use the value 0.0.0.0.	Network Example 2 = 255.255.255.0
Broadcast IP Address	The broadcast IP address is the address that is used to communicate with every host on the network. For Class C networks whose subnet mask is 255.255.255.0, the broadcast address is the first three portions of the network address with 255 in the final portion.	Network Example 2 = 192.168.1.255

__ 5. Press Enter to save your changes.

__ 6. You must now specify the proper paths for the Network Station to follow to reach its boot and configuration files. From the Setup Utility main screen, press F4, *Set Boot Parameters*. Go to the next step for information about what parameters to enter.

__ 7. Specify the boot parameters that are explained in Table 17 on page 110. Make sure that you use forward slashes, as indicated in the table. If you use backslashes, the Network Station may not boot. Type in the values that are specified for your platform.

Notes

- Directory, file, and protocol values are case-sensitive.
- You can access the default values for the **OS/390** and **OS/400** platforms by deleting the ones that appear on the screen and then pressing Enter. The proper values take effect even though they do not appear on screen.

Table 17. Boot Parameters for NVRAM Booting

Boot Parameter	Description	Platform	Type this value
Boot File	The file that contains the operating system for the Network Station.	OS/2	kernel
		OS/390	kernel
		VM	kernel
		OS/400	kernel
		AIX	kernel
		NT	kernel
TFTP Boot Directory	The path that the Network Station uses to access the Boot File in the boot server when using TFTP to download the operating system.	OS/2	/nstation/prodbase/
		OS/390	/usr/lpp/nstation/standard/
		VM	/QIBM/ProdData/NetworkStation/
		OS/400	/QIBM/ProdData/NetworkStation/
		AIX	/usr/netstation/
		NT	/nstation/prodbase/
NFS Boot Directory	The path that the Network Station uses to access the Boot File from the boot server when using NFS to download the operating system.	OS/2	/netstation/prodbase/
		OS/390	/usr/lpp/nstation/standard/
		VM	/../VMBFS:VMSYSU:QIBM/ProdData/NetworkStation/
		OS/400	/QIBM/ProdData/NetworkStation/
		AIX	/usr/netstation/
		NT	/netstation/prodbase/

__ 8. Specify the Boot Host Protocol

In the *Set Boot Parameters* display, you can specify the order of the boot protocols for the Network Station. The supported protocols are:

- TFTP
- NFS
- Local

Use the numbers `1` through `3` for the boot host protocol order or use a `D` to disable the protocol. The Local boot host protocol is for booting from a flash card only. The Network Station will attempt to use the first protocol and if unsuccessful, it will attempt to use the next if specified.

__ 9. Press Enter to save your changes.

Note: If you have made a mistake and you want to recover the default boot parameter values, backspace over the current values and restart the Network Station.

__ 10. Press F5, *Set Configuration Parameters*.

__ 11. Enter your network's configuration information by using Table 18.

Table 18. Configuration Parameters for NVRAM Booting

Configuration Parameter	Description	Platform	Type this value
Configuration file	The name of the file that contains the Network Station's configuration information.	OS/2	standard.nsm
		OS/390	standard.nsm
		VM	standard.nsm
		OS/400	standard.nsm
		AIX	standard.nsm
		NT	standard.nsm
First Configuration Directory	The path name that the configuration host uses to locate the configuration file of the Network Station.	OS/2	/netstation/prodbase/configs/
		OS/390	/usr/lpp/nstation/standard/StationConfig/
		VM	/QIBM/ProdData/NetworkStation/configs/
		OS/400	/QIBM/ProdData/NetworkStation/configs/
		AIX	/usr/netstation/configs/
		NT (NFS)	/netstation/prodbase/configs/
Second Configuration Directory	The path name that the second configuration host uses to locate the configuration file of the Network Station. If you have not configured a second configuration host, you may leave this line blank.	OS/2	/netstation/prodbase/configs/
		OS/390	/usr/lpp/nstation/standard/StationConfig/
		VM	/QIBM/ProdData/NetworkStation/configs/
		OS/400	/QIBM/ProdData/NetworkStation/configs/
		AIX	/usr/netstation/configs/
		NT (NFS)	/netstation/prodbase/configs/
Configuration Host Protocol	The protocol that the Network Station uses to access its configuration files from the configuration host. Use the left and right arrow keys to change the host protocols. The available protocols are NFS, RFS/400, Local, Default, and TFTP. **Note:** You can also specify a second Configuration Host Protocol. The Network Station will use the second host protocol if the first host protocol fails.	OS/2	First: NFS
		OS/390	First: NFS
		VM	First: NFS
		OS/400	First: TFTP
		AIX	First: NFS
		NT	First: NFS

Note: It is recommended that you not enter a configuration file on the F5 Setup screen. The Network Station normally searches for its configuration file based on its TCP/IP hostname, IP address, or MAC address. If you enter a configuration file you prevent the Network Station from performing this search.

If you do not plan to configure a Network Station individually then you should type **standard.nsm** as the configuration file on the F5 screen. This causes the Network Station to read the standard configuration file without taking extra time to search for its individual file.

__ 12. Press Enter to save your changes.

__ 13. If you have not yet done so, you must install the IBM Network Station Manager software on the servers in your network. Refer to your platform's installation chapter of this book for instructions.

End of Procedure.

Appendix A. Problem Resolution

Problem Resolution Tables

This appendix contains information to help you resolve error situations. Error situations that are specified in Table 19 are common across all server platforms. Other error situations are specific to individual operating systems. If you do not find the error in Table 19, refer to the table of contents above for the operating system on your server.

If you are unable to solve the problem, request software service for your Network Station. Refer to your local telephone listings to contact your IBMhelpcenter. In the United States, call 1-800-237-5511 for software service. For hardware problems, refer to the IBM Network Station Setup and Use book (SA41-0036) that is shipped with individual Network Stations.

Common Error Situations

The following error situations are common across all Network Station platforms.

Table 19. Common Problem Resolution Table

Symptom	***What you should do***
BOOTP Problems	
BOOTP table cannot be read	This problem may occur if the information in your BOOTP table is incorrect. Verify the accuracy of your BOOTP settings in your BOOTP table. You may need to restore the BOOTP table from a backup copy.
Browser Problems	
Error message 404 - *file not found*	This error indicates a URL that is not entered correctly. Verify the spelling and case sensitivity of the URL you used to access the IBM Network Station Manager licensed program. If the spelling and case of the URL are correct, you can check the directives specified in the HTTP server configuration. Directives are statements in the HTTP server configuration that allow access to the HTTP server.
Color Problems	

Table 19. Common Problem Resolution Table (continued)

Symptom	***What you should do***
Colors appear incorrectly in applications	Color capabilities are fixed at 256 available colors. Some applications use as many colors as possible, thus leaving no colors for additional applications. Try to start other applications before starting an application that uses a large number of colors. Applications that do not use 256 colors may have to be changed to use 256 color support.
Cursor Problems	
Busy cursor (cursor seems busy trying to perform a task)	The first time you open an application from the Network Station menu bar, the cursor stays busy until the application finishes loading. Additional requests for another session of the same application show the cursor being busy for only 3 seconds. Depending on network traffic, the application may take longer than 3 seconds to appear. The application is loading; however, the cursor is not busy for more than 3 seconds.
Cursor in wrong position within an application	When you leave one application to go to another application using the mouse, the cursor may not be at the same position when you return. The cursor probably repositioned itself to the place where you clicked the mouse to restart the application. You can reposition the cursor using the directional arrow keys.
DHCP Problems	
Duplicate address conflict	You may have a duplicate address conflict when DHCP pings the network if a device (such as a printer, server, or other workstation) with a static Internet Protocol (IP) address is off. This occurs only if the static IP address is within the range of DHCP addresses in your DHCP configuration. Explicitly exclude the static IP address from your DHCP address range to resolve the duplicate address conflict.
Rogue DHCP server	If you have two DHCP servers in your network, ensure the ranges of IP addresses in the servers do not overlap.
Migration problems from BOOTP to DHCP	When you completely migrate from BOOTP to DHCP, disable BOOTP on the server.
DHCP broadcasts do not pass through entire network	Check the relay agent configuration in all of your routers and gateways.
Suspected class problem in DHCP configuration	DHCP needs correct class values in the DHCP configuration. If the classes are corrupt for any reason, you need to restore the classes from a backup.
Timing problems when BOOTP and DHCP run at the same time	BOOTP requires two packets for each transmission and DHCP requires four. This presents possible timing problems if both run at the same time. BOOTP and DHCP may begin communication simultaneously, but BOOTP establishes protocol before DHCP. BOOTP assigns a permanent IP address, which DHCP does not recognize due to the delay. DHCP tries to assign the BOOTP-allocated address which presents duplicate address conflicts. Disable BOOTP on the server.
Environment Variables - Java Applet Viewer	

Table 19. Common Problem Resolution Table (continued)

Symptom	***What you should do***
Environment variable not replaced	Environment variables cannot be used when you work with properties in the Java Applet Viewer section of the IBM Network Station Manager licensed program. The property value is not replaced with the Environment Variable value. For example, if you declared **name=${IP}** in the properties box, you might expect to get the Internet Protocol (IP) address of the Network Station user. Instead, you get **${IP}**.
Host Unknown or Unknown Host Message	
Host Unknown message appears on the Network Station	This message could appear for several reasons: • You specified a wrong system name or IP address in the program or menu functions of *Startup Tasks* in the IBM Network Station Manager program. • You specified a wrong system name or IP address in a 3270 or 5250 session. • Transmission Control Protocol/Internet Protocol (TCP/IP) names do not resolve in the menu functions of *Startup Tasks* in the IBM Network Station Manager program. • You specified the wrong server host name in the language panel or it cannot be resolved. • The hostnames in the *NC Navigator Options Network* preferences or *Network* panel are incorrect or they cannot be resolved. • The remote print server on the Printers panel is incorrect or it cannot be resolved. You should validate the system name or IP address. You should also access the *Hardware-Workstation Setup Task* and specify the correct Domain Name Server (DNS) to use. This configures the Network Station DNS so that the DNS resolves host names into IP addresses. You may configure a DNS using DHCP or have the Network Station Manager configure your DNS. If you choose DHCP, ensure that option 6 is correct for the Network Station. If you choose to let the Network Station Manager configure the DNS, Network Station Manager uses the server DNS information. Verify that the server DNS is correct for the Network Station and press **Update Network Station Manager DNS** file to refresh the DNS configuration. You must power down your Network Station and power on your Network Station for the name information to become available.
IBM Network Station Manager Program	
Changed hardware Network Station settings not being applied	Some changes require the Network Station to be restarted before they take effect. If you restart the Network Station and the changes are still not applied, use the IBM Setup Utility, Select F5 (*Set Network Parameters*) and make sure the **IP Addressed from** parameter value is Network. See “Chapter 6. Working With the IBM Network Station Setup Utility” on page 101 for more information.
Changed keyboard setting has not been applied	Restart your Network Station in order for the changed keyboard setting to take effect.

Table 19. Common Problem Resolution Table (continued)

Symptom	***What you should do***
Changes made to 5250, or 3270 have not been applied	Log out and log back in for changes to take effect.
Inactive navigational buttons in Help	In Help text, the navigational buttons (**Back** and **Next**) are not active until you have linked to other topics. Once you have moved, by linking other topics, you establish a history of that movement. The buttons use this history to determine whether the **Back** and **Next** buttons can be used.
Microsoft Internet Explorer windows are displayed behind the main window	In the IBM Network Station Manager program, if you request help or a list of users or terminals, a popup window contains the requested information. Internet Explorer may open the popup window behind the larger main window from which you made the request. To find the popup, you may need to move or minimize the larger window.
Pulldown box does not stay open to accept hardware setting changes	Try one of the following three options: • If you are running a browser in a Windows environment, change the screen size to something other than 640 X 480. • Try resizing your current window and then open the pulldown again. • Try scrolling the window to change the initial position of the pulldown. This may make room to display more of the pulldown list.
Resizing the NC Navigator window causes problems	When you run IBM Network Station Manager from NC Navigator on a Network Station and you resize the window, you go back to the main IBM Network Station Manager screen. After signing on, on your server, increase the memory cache setting for the NC Navigator browser to a value greater than the default 1K (1000).
Resizing the Netscape window causes problems	If you resize the Netscape window while the IBM Network Station Manager program is being loaded, Netscape may stop the load and you will not get a sign-on screen. You must close the IBM Network Station Manager browser window and restart the program; wait until after the logon screen is displayed before you resize the window. After signing on, resizing the Netscape window may cause the server name or name of the user whose defaults you are displaying to disappear. If cache is set to 0, resizing the window may cause unpredictable results.
Update of boot monitor has not been applied	Restart your Network Station in order for the updated boot monitor to take effect.
Java Problems	

Table 19. Common Problem Resolution Table (continued)

Symptom	***What you should do***
If the Java applet or application does not start, examine the messages that are displayed in the User Services console. These should give an indication of any problems that are found by the Java Virtual Machine (JVM) in running the program. In addition, you can determine whether the JVM is loaded by noting a change in the amount of memory currently being used, as found in *User Services Statistics*. See "Chapter 5. Working with User Services" on page 97, for more information. The following Java error messages describe the error and give problem resolution information.	
Cannot find class or Class not found	The JVM cannot find the class file requested by the Java applet or application. If the error is returned while you are running a Java application, inspect the class path that is specified in the startup programs or menus. Confirm that the directories with program class files are in the class path and that they have the correct format. Also ensure that the name in the Network Station Manager's *Application (Class) Name* field does not contain the .class file name extension. If the classes are provided in a zip file, the fully qualified zip file name must explicitly appear within the class path. In addition, due to differences in the file systems, the classes may not be found since they are referred to in a case-sensitive manner. It may be possible to rename the class to the name that is indicated in the console message. Some systems use mount points with different names than the actual directory structure leading to the class file. If you use a server with mount points, ensure the mount point name is correct in the class path specification. For an applet, the codebase portion of the applet tag within the HTML file lists the locations where classes are found. Also check the file access permissions on the directories and files to make sure that users are allowed to read the files.
IO exception while reading (a file name)	Ensure that you specified a valid HTML file name as the startup program or menu URL name in the IBM Network Station Manager licensed program. Also ensure that the file is readable by the user.
IO exception while reading (a remote server name)	An HTTP address rather than a file system location was passed to the applet viewer. *AppletViewer* is essentially a browser that needs to have a defined proxy server and port before it can load HTTP files. To do this, you need to set the HTTP proxy or Socks Host parameter by using the IBM Network Station Manager licensed program. Select the *Internet Setup Task* and then the *Network* section. If you are loading the applet from your host server, you do not need to use an HTTP address. Instead, you can simply fill in the local path and HTML file name.
Launcher Shutdown Monitor	If your applet does not start and the next message in the console is *Launcher Shutdown Monitor*, ensure that you specified a valid HTML file name as the startup program or menu URL name in the IBM Network Station Manager licensed program. Also ensure that the file is readable by the user.

Table 19. Common Problem Resolution Table (continued)

Symptom	***What you should do***
Out of memory	The Network Station may not have enough memory to run the application or applet. Possible causes include the following: • Other applications are using memory, and not enough memory is left for the Java application or applet to run. • The stack size and heap size parameters need to be adjusted. The stack and heap sizes can be set with the IBM Network Station Manager licensed program. For applications, the parameters are set in the *Startup Tasks* (programs or menus) section. For an applet, the parameters are set in the *Internet Tasks* (Applet Viewer section).
Unusable class name (name)	Check the name in the *Application (Class) Name* field in the startup program or menu section in the IBM Network Station Manager licensed program. Do not include a path or the .class file name extension in this field.
Other	If you do not see any messages in the *User Services Console* window that explain your problem, activate *Verbose Diagnostic Messages* by using the IBM Network Station Manager licensed program. For applications, Verbose messages can be set in the *Startup Tasks* (programs or menus) section. For an applet, Verbose messages can be set in the *Internet Tasks* (*AppletViewer* section). Additional messages are displayed when your application or applet is run.
The following Java error conditions are not related to specific Java error messages:	
Applet cannot read *Properties* or get a *Security Exception* while trying to read the *System Properties*	Applets may only read properties which are explicitly allowed by the system configuration. A property can be configured to be accessible by defining a new property of the form .applet and assigning it a value of true. This may be done through the Network Station Manager licensed program in the *AppletViewer* configuration section. The default properties that may be read by an applet are as follows: • java.vendor • java.version • java.vendor.url • java.class • os.name • os.version • os.arch • file.separator • path.separator • line.separator If the class sun.applet.AppletViewer is used to view applets, the accessible property list differs from above and depends on the property file defined within your home directory.
Cannot close Java error message box	Scroll to the end of the error message box and click **OK**.

Table 19. Common Problem Resolution Table (continued)

Symptom	***What you should do***
Cursor does not appear in text field or Window layout (for example, button positions) appears different from the way it appears when the applet is run on another platform	The *Java Abstract Window Toolkit* (AWT) is designed to create a development environment independent of the underlying windowing mechanisms. These classes use the native window calls to do the work, but provide a uniform interface to programmers. However, *Java Abstract Window Toolkit* cannot hide all the differences. Thus appearances may change from one Java Virtual Machine on one platform to another Java Virtual Machine on a different platform.
Data written to a file does not appear in the file	Make sure the Java applet or application closes the file to force all data to be written to the file.
Text does not appear or is a different style	Check the font sizes and styles. They may need to be changed to a different setting. Not all fonts are available on all Java Virtual Machines.
Keystrokes	
Unwanted keystrokes appear in applications	If the screen saver comes on while you are in an application and you press a key to end the screen saver, that keystroke appears in your application. Remove the unwanted keystroke.
Language Problems	
Wrong language appears on the Network Station when you power on the logic unit	You must reset the keyboard language to your language from the Setup Utility. • Power on the Network Station. • When the NS0500 *Search for Host System* message appears, press the Escape key to start the Setup Utility. • Press F1 (if necessary). • Enter your password (if necessary). • Press F7. • Press F3 to select language. • Choose one of the following options for the appropriate language: – 1 for English (US) – 2 for French – 3 for German – 4 for Italian – 5 for Japanese – 6 for Spanish • Press Enter three times to save your selection and restart the Network Station.
Login Problems	

Table 19. Common Problem Resolution Table (continued)

Symptom	***What you should do***
Network Station displays a light blue screen and the Network Station does not log in properly	This problem normally occurs when the required.nsm file could not be read during power on. If you boot from NVRAM check the following items to correct this problem: • Make sure that the Configuration line in the F5 screen is accurate. • On an AS/400, OS/390, and Virtual Machine (VM) server, the Network Station automatically looks for the required.nsm file if the Configuration File value is blank. **Note:** If you need to enter the required.nsm file manually, make sure that the path and the file name are entered correctly. • Ensure the accuracy of the Configuration Directory. • Select the correct Configuration Host Protocol. If you boot from DHCP, look for the correct configuration information in “Taking Advantage of Multiple Server Environments” on page 17.
Host xxx.xxx.xxx.xxx (IP address) not responding to ICMP Echo error message followed by NS0090 *Press a key to continue* message	This error message indicates that two devices in your network are trying to use the same IP address. Verify that the IP address you assigned to the Network Station is not used by a different device in your network. If all of your IP addresses are assigned to Network Stations (or other devices using a media access control (MAC) address, the error will be NS0600 *IP address xxx.xxx.xxx.xxx in use by (MAC address) xx:xx:xx:xx:xx:xx*. This error message also indicates a conflict in which two devices try to use the same IP address.

Table 19. Common Problem Resolution Table (continued)

Symptom	***What you should do***
Login stops at NS0500 *Search for Host System* message	There are several reasons this message appears: • Your server may not be running. • Your network cable connections may not be tight. If you are running IBM Operating System/400 Version 3 (OS/400), OS/390, or VM, you may need to reset the NVRAM to the factory defaults if you boot from NVRAM. Following the NVRAM reset, you must reenter the NVRAM values for the Network Station and power off and power on the Network Station. • When the NS0500 *Search for Host System* message appears, press the Escape key. • From the Setup Utility screen, press the following keys at the same time: (left)Ctrl - (left)Alt - (left)Shift - F1, to start the Boot Monitor command prompt. • Type NV to start the NVRAM Utility. • Type L to load factory defaults. • Type S to save factory defaults. • Type Y to confirm save. • Type Q to exit the NVRAM Utility. • Type SE to restart the Setup Utility. • Re-enter the correct NVRAM values in the Setup Utility. • Press Enter to restart your Network Station.
Monitor Problems	
Display image too large to fit on monitor	Your Network Station may be set to automatically detect which monitor you are using. For autodetect to work correctly, you must power on the monitor before you power on the Network Station.
Network Station Directory Problem	

Table 19. Common Problem Resolution Table (continued)

Symptom	***What you should do***
File not found	When the Network Station reads files, it sends information to the message area of the console. This information includes the path of the file being read. This is useful to figure out why the Network Station is not finding its files. The Network Station uses a local-remote file table to search for files. The Network Station looks for the file in the local area first, and then uses the table to map to the network directory. In the console message area, sometimes the path is the local path and sometimes it is the remote path. The local path is the path in the local directory structure on the Network Station. The remote path is the path exported by the server to the Network Station. For example, on an AS/400 server, /netstation/prodbase/ is a local Network Station client path. The corresponding remote server directory is /QIBM/ProdData/NetworkStation. Sometimes the console message log records /netstation/prodbase/ and sometimes it shows /QIBM/ProdData/NetworkStation when searching for a file. Each platform-specific problem resolution table contains a file structure for your server operating system. See *Local and Remote File Structure* on page 128 for NT. See *Local and Remote File Structure* on page130 for AS/400. Use these maps to determine where missing files are.
Out of Memory Problems	
'*Out of Memory*' message appears	When applications load in Network Station memory, they use a block of available free memory large enough to start the application. After an application closes, its memory frees up, but this freed block may not be large enough for an additional application. When you calculate memory requirements, you may find that you have enough memory to run a number of applications, but there may not be a large enough block of unallocated memory to start an additional application. Power off and power on your Network Station to clear all random access memory (RAM). Start your applications in order of largest to smallest memory requirement. If this process does not work, you may need to upgrade your Network Station RAM to run all of your applications.
PANIC Appears on Your Network Station	
P A N I C appears on your Network Station and you are given a **>** cursor or Screen turns reverse video (mostly black) and you are given a **>** cursor	The Network Station operating system stopped unexpectedly. See "PANIC Mode at an IBM Network Station" on page 123 for more information about recovering from a *PANIC* situation.
Resource File Does Not Exist Error	

Table 19. Common Problem Resolution Table (continued)

Symptom	***What you should do***
Error messages *Resource file does not exist* and *Unable to open resource* appear in the console log, but your Network Station network operates normally.	The Network Station Manager licensed program source code operates on multiple operating system platforms. Due to this complexity, the licensed program will occasionally make multiple searches throughout your network to find Network Station hardware and Network Station servers. The Network Station Manager licensed program does this to identify which type of server operating system you are using. Some of the searches succeed because they are designed for your operating system. Searches for other operating systems do not succeed. Every time the Network Station Manager licensed program unsuccessfully searches for a different operating system, it records a *Resource file does not exist* and *Unable to open resource* console log error message.
Screen Flashes	
Screen flashing or crackling sound	Screen flashes, along with some crackling sounds, can occur when you are logging out of the Network Station. The flashing does not harm hardware or applications.

PANIC Mode at an IBM Network Station

When the Network Station operating system stops unexpectedly, a *PANIC* error condition occurs. The *PANIC* situation sends you out of the normal graphical user interface to the boot monitor command prompt.

To recover from a *PANIC*, simply power off your Network Station and power it back on.

Occasionally, a *PANIC* error situation persists. If this occurs, contact IBM support for help in determining the cause of the recurring *PANIC* error condition.

Error Codes

This table lists error codes that are found while powering on your system.

Table 20. Network Station Error Codes

Message Number	***Message Description***	***Status and or Recovery***
NS0070	Boot Monitor Resolution	Shows the boot monitor screen resolution. Go to the IBM Network Station Setup Utility to change resolution settings.
NS0080	Server Resolution	Shows the server screen resolutions. Go to the IBM Network Station Setup Utility to change resolution settings.

Table 20. Network Station Error Codes (continued)

NS0090	Press a key to continue Note: Message is displayed with yellow text.	Look for other Network Station messages on the screen to assist in problem determination. Record the message number and refer to this table. Press a key to go to the IBM Network Station Setup Utility and take appropriate action to correct the problem.
NS0091	No input device detected. Startup will continue in 1 minute. Note: Message is displayed with yellow text.	If no keyboard or mouse is detected, the startup process will continue in one minute. If the message is displayed when keyboard and mouse are connected, you may need to replace the Network Station.
NS0200	NVRAM checksum error	Bad NVRAM settings. Use the NV utility Boot Monitor command prompt to return to the default settings. To reach the Boot Monitor command prompt (>), press the Escape key after the Network Station displays the NS0500 *Search for Host System* message during the startup sequence. Then, press (Left)Alt - (Left)Ctrl - (Left)Shift - F1 from the IBM Network Station Setup Utility. Type NV and press Enter. Then, in the order that they are listed, use NV command functions: L, S, Y (yes), and then Q. Type RS and press enter to reboot the system.
NS0240	Keyboard status timeout	Keyboard error. Ensure that your keyboard cable connections are tight.
NS0250	Keyboard BAT failure	Keyboard error. Ensure that your keyboard cable connection is tight.
NS0260	Keyboard initialization timeout	Keyboard error. Ensure that your keyboard cable connection is tight.
NS0270	Mouse status timeout	Mouse error. Ensure that your mouse cable connection is tight.
NS0280	Resolution is not supported on this hardware	Choose a different monitor resolution.
NS0500	Search for Host System...	
NS0503	Host IP addresses are all 0.0.0.0	Invalid IP address of 0.0.0.0 is configured. Correct the IP address and retry.

Table 20. Network Station Error Codes (continued)

NS0505	Host not responding to ICMP Echo	Server not found. Check the server IP address settings. Correct if necessary and retry.
NS0570	Connection cancelled by user	User pressed the Esc key to cancel the kernel download. Press Enter to reboot.
NS0580	File cyclic redundancy check (CRC) data error	A damaged kernel file was downloaded.
NS0590	Check network connection	Your token-ring or Ethernet cable is not connected, not functional, or not active.
NS0610	Searching for Subnet Mask	n/a
NS0620	Invalid IP address 0.0.0.0	An invalid IP address of 0.0.0.0 is configured. Correct the IP address and retry.
NS0630	Boot Server IP address = 0.0.0.0	An invalid boot server IP address of 0.0.0.0 is configured. Correct the boot server IP address and retry.
NS0660	Illegal Block Size	Server problem. The server is responding with an illegal block size less than 128 bytes or greater than 8192 bytes.
NS0670	Illegal Option	Server problem. The server is returning an option that is not valid.
NS0700	Twinax timeout, unable to contact host	To correct this problem try the following items: • Ensure the twinaxial cable connection is good. • Check the workstation controller. • Run Wrap test. If test fails, replace the Network Station.
NS0710	Twinax timeout, host connection lost	Try the following: • Ensure that the twinaxial cable connection is good. • Check the workstation controller.
NS0711	Station address in use	Select a different address that is not currently used by an active device on that port.
NS0720	No twinaxial activity detected	Check to see if the cable is properly connected to the Network Station and the workstation controller.
NS0850	Twinaxial hardware failed	Replace the Network Station.

PC Server Error Situations

The errors in this table are specific to a PC Server that runs the Microsoft Windows NT operating system.

Table 21. PC Server Problem Resolution Table

Symptom	***What you should do***
Boot Problems	
Extremely slow client boot times	If you use graphics-intensive Open GL three dimensional screen savers, you may experience extremely slow boot times. Select a different screen saver for your PC Server or disable the screen saver.
Unable to log in as administrator while roaming from an AS/400 server to a PC Server	If you are roaming from an AS/400 server to an PC Server, the PC Server only accepts 10 character administrator userids. An AS/400 server userid can be 12 characters. You need to select an AS/400 server userid of 10 characters or less.
DHCP Problems	
DHCP changes do not seem to take effect	You need to stop DHCP services and restart DHCP services for the changes to take effect.
DHCP Configuration Utility	
Error message: *Multiple instances of the Configuration Utility cannot be run while running the DHCP Configuration Utility*	If the DHCP Configuration Utility ends abnormally, it may leave some registry entries, which prevent you from starting the utility again. From a command line, type **tcpcfg -f**. This command clears the unwanted registry and allows you to start the configuration tool.
Installation Problems	
Generic error message: *An unrecoverable error occurred during setup.*	Several error conditions can occur during installation of the IBM Network Station Manager licensed program. They are: **Cannot find location of eNod install or Wedge install** You can install the licensed program using the NSM CD or perform the install from the Internet. (This may require you to reinstall your operating system.) **Required PTF not installed on AS/400 Integration with** **Windows NT Server product** The PTF SF49608 fixes a registry compatibility problem with the Wedge install. After apply the this PTF, try the installation again. **Not enough space on your Install disk** You need at least 500 MB of free space on your hard drive to install the Network Station Manager licensed program. **The install drive is not formatted for NTFS** You must select an install drive that is formatted for NTFS. You may start setup again and choose another NTFS formatted drive. You may also convert your drive to the NTFS file system. **Unable to rename NSMAdmin and NSMUser groups** Delete the groups NSMAdminTemp and NSMUserTemp. Then recreate all users to the NSMAdmin and NSMUser groups.

Table 21. PC Server Problem Resolution Table (continued)

Symptom	***What you should do***
Error message: *An error occurred while configuring eNetwork On-Demand Server.*	The install program could not configure the eNetwork On-Demand (eNOD) server. Perform the following steps and configure eNOD manually. You may also configure eNOD to run on a stand-alone DHCP server without installing the Network Station Manager licensed program code. If you need to manually install eNOD services, perform the following steps: 1. Insert your IBM Network Station Manager licensed program CD for PC Server into your CD-ROM drive. 2. Select the Start button. 3. Select Run. 4. Enter the following information in the data entry box where X is your CD-ROM drive letter. 5. **X:\ntnsm\en\products\enod\tcpip\setup.exe** 6. Select Ok. 7. Follow the steps in the Installation wizard.
Error Message: *An error occurred while installing the NC Navigator (North American).*	This error only pertains to the North American version of the Network Station Manager licensed program. The installation program could not install the NC Navigator. You need to manually install NC Navigator from a North American Network Station Manager licensed program CD.
Error message: *An error occured while trying to create the user directory for the IBM Network Station Manager.*	The installation program did not create some or all of the following directories: • \..\nstation\userbase • \..\nstation\userbase\groups • \..\nstation\userbase\sysdef • \..\nstation\userbase\home • \..\nstation\userbase\users • \..\nstation\AppBase The installation program did not create some or all of the following base permissions: • \nstation = NSMAdmin, Administrators, SYSTEM = Full Control, NSMUser = Change • \nstation\userbase\home = NSMAdmin, Administrators, SYSTEM = Full Control, NSMUser = Change • \nstation\userbase\users = NSMAdmin, Administrators, SYSTEM = Full Control, NSMUser = Change
Error message: *This machine does not have Windows NT Server 4.0 or Windows Terminal Server 1.0 installed.*	You must run Windows NT Server 4.0 or Windows Terminal Server 1.0 to operate the Network Station Manager licensed program. Install one of these operating systems and try the setup again.

Table 21. PC Server Problem Resolution Table (continued)

Symptom	***What you should do***
Error message: *This program requires a monitor with VGA or better resolution.*	The Network Station Manager licensed program installation requires screen resolution of 640 x 480 or greater. Reset your screen resolution to a minimum 640 x 480 resolution by performing the following steps: 1. Select the Start button. 2. Select Settings. 3. Select Control Panel. 4. Double click on Display in the control panel dialog box. 5. Select the Settings tab. 6. On Desktop Area slider bar, left click and hold the left button down. 7. Drag the slider bar to the right until the screen resolution is greater than 640 x 480. 8. Select Ok. After you make these changes, try your setup again.
Error message: *Unable to create one of the IBM Network Station Manager user groups.*	The installation program could not create one or more IBM Network Station Manager licensed program user groups. You will need to create these user groups manually.
Error message: *Unable to install the NDIS Intermediate Driver 3.0.*	The install shield setup could not properly install the NDIS Intermediate Driver 3.0. You need to manually install this driver to complete your Network Station Manager licensed program installation.
Error message: *Unable to load InServe.dll for installation and configuration of the Network Station Manager.*	Your installation requires the InServe.dll that could not be loaded into memory. Reboot your PC Server and try to run the installation again.
Error message: *Unable to obtain the Domain Controller name.*	The install shield could not find the Domain controller for your Windows NT server name. Ensure that your Windows NT server Domain name is correct. Try the setup again.
Internet Explorer Problem	
Microsoft Internet Explorer windows are displayed behind the main window	If you request help or a list of users and terminals in the IBM Network Station Manager program, a popup window opens that contains the requested information. Internet Explorer may open the popup window behind the larger main window from which you made the request. To find the popup, you may need to move or minimize the larger window.
Local and Remote File Structure	

Table 21. PC Server Problem Resolution Table (continued)

Symptom	***What you should do***
Missing file	You have to understand the path used to send files to the client (Network Station) to locate what seems to be a missing file. The *floating install root* ({float} in the examples below) is whatever directory you choose. For example, c:\nstation\prodbase\ or c:\nstation\userbase\ means the floating install root is c:. **Client path** is the path client applications use. **Remote NFS alias** is the path exported by the NFS server. Each NFS alias points to an NTFS directory on the server. **NTFS** directory is located on the server. The following information shows the path relationships between the client, remote (NFS alias), and the NTFS directory: **Client path = Remote NFS alias = NTFS directory on server** /netstation/prodbase/ = /netstation/prodbase/ = {float}\prodbase\ /netstation/prodbase/configs/ = /netstation/prodbase/configs/ = {float}\prodbase\configs\ /netstation/prodbase/SysDef/ = netstation/prodbase/SysDef/ = {float}\prodbase\SysDef\ /netstation/userbase/ = /netstation/userbase/ = {float}\userbase\ /netstation/homebase/users/userid/ = /netstation/userbase/home/userid/ = {float}\userbase\home/userid\
Network Interface Card Problem	
Incompatible network interface card drivers	If you install an older network interface card (NIC) and NIC driver in your PC Server, you may experience problems. Generally, the IBM Intermediate Support Driver works best with NIC drivers that use NDIS 3.0 or later. If you experience problems after you load the IBM Intermediate Support Driver, try to find a miniport NIC driver for your PC Server NIC. Install this new driver before you try to isolate other networking problems. The following drivers have known problems: • Replace the NIC driver AMDPCN.SYS with PCNTN4M.SYS from AMD on an IBM PC 325. Download Disk 2 for the updated driver from the AMD web site at the following URL: http://www.amd.com/ • Driver IBMENIIN.SYS will not work properly when controlling the Ethernet/A adapter for MCA. There is currently no updated driver.
Windows NT Associated Processor Problems	

Table 21. PC Server Problem Resolution Table (continued)

Symptom	***What you should do***
A generic error message appears when you try to run the IBM Network Station Manager on a Windows NT Associated Processor installed in an AS/400 server	Your Windows NT Associated Processor creates a virtual token-ring network with the AS/400 server. At the time of this writing, the IBM DHCP driver does not work with this virtual network in your AS/400 server. Contact IBM service to request a PTF to correct this IBM DHCP problem. You may also try using Microsoft DHCP to correct this problem. Uninstall IBM DHCP and install Microsoft DHCP.

OS/400 Error Situations

The errors in this table are specific to an AS/400 server that runs the IBM Operating System/400 (OS/400) operating system.

Table 22. OS/400 Problem Resolution Table

Symptom	***What you should do***
IBM Network Station Manager Program	
IBM Network Station Manager program will not start	This could be because the Retain Server Security Data `QRETSVRSEC`) system value was not set to 1. To verify, from any AS/400 system command line, type: `DSPSYSVAL QRETSVRSEC`. The value will be displayed. If the value is not 1, you can change it using the following command from any AS/400 command line: `CHGSYSVAL SYSVAL(QRETSVRSEC) VALUE('1')`.
User Defaults browse button does not work	To activate the browse button do the following: 1. Enter `WRKLIB QYTC` 2. In front of the `QYTC` library, enter option 12 to work with objects 3. Locate the `QYTCMCLS` object. 4. Enter option 2. 5. Press F6 to add new users. 6. Add a line where user=`QTMHHTP1` and object authority=`*USE`.
IBM Setup Assistant Problems	
Task 5000 of the IBM Setup Assistant does not complete successfully	In task 5000, if you selected to end TCP/IP, it is possible that all of the server jobs might not have ended before task 5000 starts TCP/IP. If this is the case, you will receive the message that task 5000 did not complete successfully. You can select task 5000 again, choose not to end TCP/IP, and press Enter to start the required servers. At this time all of the server jobs should have had time to end so that the start is successful.
Local and Remote File Structure	

Table 22. OS/400 Problem Resolution Table (continued)

Symptom	***What you should do***
Missing file	Use this local and remote file structure map and symbolic links used map to find missing files. **Client side = Server side** /netstation/prodbase/ = /QIBM/ProdData/NetworkStation/ /netstation/prodbase/configs = /QIBM/ProdData/NetworkStation/configs/ /netstation/prodbase/SysDef/ = /QIBM/ProdData/NetworkStation/SysDef/ /netstation/homebase/ = /QIBM/UserData/NetworkStation/users/'userid'/ 'userid' corresponds to the current User ID logged into the system. You may also want to check that the symbolic links on the AS/400 are correct. **Directory A links to Directory B** /QIBM/ProdData/NetworkStation/configs links to /QIBM/UserData/NetworkStation/StationConfig/ /QIBM/UserData/NetworkStation/StationConfig/standard.nsm links to /QIBM/ProdData/NetworkStation/StationConfig/standard.nsm /QIBM/UserData/NetworkStation/StationConfig/required.nsm links to /QIBM/ProdData/NetworkStation/StationConfig/required.nsm /QIBM/UserData/NetworkStation/StationConfig/control.nsm links to /QIBM/ProdData/NetworkStation/StationConfig/control.nsm
Login Problems	

Table 22. OS/400 Problem Resolution Table (continued)

Symptom	***What you should do***
Communication error in a Network Station dialog box and Network Station users cannot log in or *Catch-all for comm error* in a Network Station dialog box and Network Station users cannot log in	This error message indicates a variety of communication errors. If you receive this message, check the console. If you see Error 17, typically this indicates that your authentication server login daemon is down. Follow the corrective action below: Determine if the Network Station login daemon on your AS/400 authentication server is running by one of the following two methods: • From the AS/400 console, type `NETSTAT *CNN`. • Look for an active local port 256. If local port 256 is active, the Network Station login daemon is running. OR • For V3R7 to V4R2, type the command `CALL QYTCUSVR ('STRTCPSVR ')` on the console. • For V4R3 or higher, use Operations Navigator to `STRTCPSVR`.
Login is successful but no applications appear on the task bar	Restart the QServer subsystem on the AS/400 server. Enter the `QPWFSERVSD` command.
System hangs at NS0500 *Search for Host System* message	For twinaxial Network Stations, vary on the device or the workstation controller.
'**Unable to connect to Login Server, See System Administrator**' message appears at login.	There may be a problem with your network. The authentication server may be down or there is something wrong with the authentication server. You may need to restart the authentication server on your AS/400. Verify IP addresses and names in the authentication server.
Migration Problems	
Unable to determine list of files for migration	The list of files in the 'directory name' directory could not be determined. If this directory contains any files, the files have not been migrated as required by the current version of the IBM Network Station Manager licensed program. They may be unusable by the IBM Network Station Manager licensed program. Correct the error and run the migration again by issuing the command `CALL PGM(QYTCMIMP)`.
Unable to migrate file	The file 'old file name' could not be migrated to the file 'new file name'. This migration is required by the current version of the IBM Network Station Manager licensed program. These files may not be usable by the IBM Network Station Manager licensed program. The problem occurred either accessing the file 'old file name' or creating or updating the file 'new file name'. Correct the error and run the migration program again by issuing the command `CALL PGM(QYTC/QYTCMIMP)`.

Table 22. OS/400 Problem Resolution Table (continued)

Symptom	***What you should do***
Unable to retrieve list of users	The list of users with IBM Network Station Manager licensed program files could not be retrieved. The user level files have not been migrated and are not compatible with the current version of the IBM Network Station Manager licensed program. Correct the error and run the migration program again by issuing the command `CALL PGM(QYTC/QYTCMIMP)`.
Unable to delete file	The file 'file name' could not be deleted. This file has been successfully migrated or is no longer needed by the current version of the IBM Network Station Manager. The failure of the deletion will have no effect on the operation of the IBM Network Station Manager licensed program. Correct the error and delete the file using the Remove Link (DEL) command.
Migration problem did not complete successfully	The program to migrate the IBM Network Station Manager licensed program files as required by the current version of the IBM Network Station Manager licensed program did not complete successfully. One or more files may not be usable by the IBM Network Station Manager licensed program. Correct the error and run the migration program again by issuing the command `CALL PGM(QYTC/QYTCMIMP)`.
Error occurred while determining the national language ID and locale	The IBM Network Station Manager licensed program was determining the correct national language ID and locale when the error occurred. The feature code was 'feature code'. This was caused by a software problem. Use the Work with Problems `WRKPRB`) command to collect the appropriate information and contact IBM Support to report this error. This message and any previous messages have been written to the job log of 'job number'.
Unable to determine the national language version of the system	The IBM Network Station Manager licensed program was in the process of determining the national language version of the system when the error occurred. The national language version is determined by using the `QLANGID` system value. The IBM Network Station Manager licensed program uses the system national language version to establish the language used on the Network Station before a user logs in. The IBM Network Station Manager licensed program has defaulted to United States English as the language of the Network Stations. If you wish to reset this value, see "Selecting the Startup Language" on page 104.
No Login Window	

Table 22. OS/400 Problem Resolution Table (continued)

Symptom	***What you should do***
No Login window on monitor - User Services window appears instead	The most likely cause is an incorrect entry for this Network Station in the BOOTP table. Another possible cause is that the default configuration file on the server has been corrupted or deleted. The default configuration file, standard.nsm, is located in the /configs subdirectory of the directory indicated in the hd tag of the BOOTP table entry. You may need to reinstall the IBM Network Station Manager licensed program.
OS/400 Console Error and Log Messages	
While configuring and running IBM Network Station Manager licensed program on your server, several messages are sent to the console and to the log. These messages record several server events such as invalid passwords, Portable Operating System Interface for Computer Environments (POSIX) messages, and startup information. The error messages below help you resolve common IBM Network Station Manager errors.	
NSM9505, NSM9507, NSM9508, NSM9509, NSM9510, and NSM9511 File transfer and network errors	This series of errors indicates network transmission problems. Try some or all of the following to diagnose and correct these errors: • Ensure cable connections are tight. • Vary on all networking bridges, routers, gateways, switches, workstation controllers, and other hardware. • Ensure that Ethernet and token-ring lines are configured and operating properly. • Ensure that frame sizes are correct on all networking bridges, routers, gateways, switches, workstation controllers and other hardware.
NSM9530 Exiting abnormally, error code: xx	Refer to the error code 'xx' in your error message and take appropriate corrective action. • Error 3: Malloc failed. You may need to free up some server memory. • Error 5: Listen failed on socket. Check the preceding error message to correct the problem. • Error 6: Accept failed. Check the preceding error message to correct the problem. • Error 7: Server data error. The server could not read your configuration file. Verify the accuracy of the configuration file and retry. You may need to restart the network authentication server to correct the errors listed above.
NSM9537 Memory allocation failed	There is not enough free memory on your server for the Network Station Manager licensed program to operate. Check your storage pool allocations and allocate more memory for your server storage pool.

Table 22. OS/400 Problem Resolution Table (continued)

Symptom	***What you should do***
NSM9549 Error retrieving server data	The server needs a working Network Station configuration file. The configuration file is either corrupt, the configuration file is unusable, or the configuration file is not found. Verify that all configuration files are not corrupt. Verify accuracy of configuration file information and configuration file syntax. Look in the displayed path to figure out where the configuration file should be.
Printer Problems	
Printer not available to other applications	The AS/400 system locks the printer if someone started a printer writer to that printer. To release the printer and make it available, run the End Printer Writer (`ENDPRTWTR`) command for that printer on the AS/400 system.
Program Temporary Fix (PTF) Problems	
PTFs not working	If the PTFs being installed are for the IBM Network Station Manager for AS/400 product, you may have to restart the IBM Network Station Manager system unit. This causes a new software download to the system unit. The new downloaded software contains the program fixes for the Network Station.
Problem communicating using Host names	
Some Network Stations unable to communicate with some Hosts using the Host names table	The IBM Network Station Manager licensed program checks the authority level of the person making the Host Table updates. You need to make sure the person who adds names to the Host Table has all object authority (*ALLOBJ) . If you have authorities less than *ALLOBJ you can update the Host table but the changes are not passed to the Network Station.
Twinaxial Problems	
Network Station does not boot	If you are using BOOTP with twinaxial Network Stations, the twinaxial Network Station defines itself in the BOOTP table. If the twinaxial Network Station does not boot, you need to apply PTF SF47202.
No twinaxial activity detected	Ensure that the cable is plugged into the Network Station and the twinaxial workstation controller.

Table 22. OS/400 Problem Resolution Table (continued)

Symptom	***What you should do***
Twinaxial timeout or Unable to connect to host	Ensure that the twinaxial cable is plugged into the Network Station and the twinaxial workstation controller. Replace the cable if necessary. Ensure that the workstation controller is powered on and the workstation controller is varied on. If you suspect bad Network Station hardware, run the Wrap test to determine if your Network Station hardware is bad. To run the Wrap test, do the following: • Restart the Network Station. • At the NS0500 *Search for Host System* message, press the escape key. • Press (left)Alt - (left)Ctrl - (left)Shift - F1. • Enter EX. • Enter 1. • Enter 5. • Press the Enter key to test one iteration or type E to loop until error. If the message returned during the Wrap test says 'the wrap test was not successful', contact your local IBM your Network Station.
Station address in use	Change the twinaxial address to one not assigned to an active device on that port. To change the twinaxial address from the individual Network Station do the following: • Restart your Network Station. • At the NS0500 *Search for Host System* message, press the escape key. • Press F8. • Enter an address value between 0 and 6. • Press the Enter key. • Restart the Enter key to restart your logic unit.

AIX Error Situations

The errors in this table are specific to an RS/6000 server that runs the AIX operating system.

Table 23. AIX Problem Resolution Table

Symptom	***What you should do***
BOOTP in Debug Mode	

Table 23. AIX Problem Resolution Table (continued)

Symptom	***What you should do***
Logging errors in debug mode to diagnose BOOTP problems	If you start BOOTP from inetd, you will log the BOOTP startup events for your server and Network Station. This information is useful to debug BOOTP problems. Start debug mode by performing the following steps: 1. Enter **vi /etc/inetd.conf** 2. Place a # character in column one in front of bootps. 3. Save the changed file. 4. Enter **refresh -s inetd** 5. Enter **ps -ef | grep bootp** 6. Find the PID, and use **kill <pid_no>** 7. Start bootpd in debug mode by entering **bootpd -d -d -d -d -s /etc/bootptab** Power on the Network Station and look for errors on the RS/6000 screen where you started bootpd in debug mode from. After you finish debugging, turn off the bootpd program by entering pressing Ctrl - C. Remove the # character in front of bootpd in the /etc/inetd.conf file. Enter **refresh -s inetd** to refresh.
Fonts Missing	
Missing fonts	The fonts.dir file on your server font directories may not accurately reflect the correct number of fonts. To solve this problem perform the following tasks: 1. On the font server, change to the main font directory by typing **cd /usr/netstation/pcf** 2. Change into the 100dpi subdirectory by typing **cd 100dpi** 3. Look at the size of the fonts.dir file by typing **ls -l fonts.dir** 4. Run the mkfontdir command by typing **mkfontdir** 5. Look at the size of the new fonts directory by typing **ls -l fonts.dir** 6. Change to the /misc subdirectory by typing **cd ../misc** 7. Run the mkfontdir command by typing **mkfontdir** 8. Power down the Network Station 9. Power on the Network Station
Keyboard Mapping problem in XDM	

Table 23. AIX Problem Resolution Table (continued)

Symptom	***What you should do***
Keyboard map does not work under XDM	XDM assumes that the Network Station is a local graphics terminal because it is not an xstation. The keyboard is remapped for a graphic terminal. Set the XSTATION environment variable to the display name by adding the following lines in the /usr/lib/X11/xdm/Xsession file before any executable code: **if [-z ″$EXT_NCD_SETUP″]** Then enter this string: **export XSTATION=′echo $DISPLAY | cut -f1 - d\;′** **fi** **Note:** You need to use accent grave marks (′) in the export command above. The commands above check to see if your device is a Network Station and then the XSTATION variable displays the Network Station name. Power down your Network Station and power on your Network Station for the changes to take effect.
Network Traffic	
Network traffic when CDE dtterm is in focus	When a CDE tterm session is in focus, you will see network traffic. This is due to the default tterm cursor that blinks in your CDE tterm window. Each time it blinks, it sends a request to the RS/6000. You may change to aixterm as your standard window or change the default tterm cursor to reduce this network traffic by performing the following steps: 1. Select **Option**s from the dtterm menu bar. 2. Select **Global**. 3. In the Global window change the blinking cursor selection box to **Disabled**. **Note:** You may also wish to change the cursor blink rate from this window.
No DNS Entry	
No DNS Entry for server error message appears	Add the following line at the bottom of the /etc/httpd.conf file to solve this problem: **HostName host.full.domain.path**
No Login Window	
No Login window on monitor - User Services window appears instead	The most likely cause is an incorrect entry for this Network Station in the BOOTP table. Verify that you entered a forward slash '/' at the end of your boot directory entry. A corrupt default configuration file also may cause this problem. The default configuration file, standard.nsm, is located in the /configs subdirectory of the directory indicated in the hd tag of the BOOTP table entry. You may need to reinstall the IBM Network Station Manager licensed program.
NVRAM Setting Reverts to Network setting	

Table 23. AIX Problem Resolution Table (continued)

Symptom	***What you should do***
NVRAM setting only works for initial boot and NVRAM setting reverts to Network setting	When you set an individual Network Station to boot via NVRAM, the settings may only take effect for the first time you power on your Network Station. You need to modify required.nsm to repeatedly boot from NVRAM. Change the ip-use-address-discovery variable in your required.nsm file to one of the following values: • **true** for network setting • **false** for NVRAM setting Change the value to true to boot via the Network setting and change the value to false to boot via NVRAM.
PANIC situation in AIX	
PANIC caused by missing $HOME environment variable	If you are using IBM Network Station Browser code and your Network Station PANICs, you may not have the $HOME environment variable set on the Network Station. This variable should be set automatically when you run the /usr/netstation/bin/Xstartup.ibm8361 script through CDE. Verify the environment variable by performing the following steps: • Press the Pause key to start the **Console Monitor** • Select **Setup** • Select **User Setup** • Select **Environment Variables** • Verify your $HOME environment variable If the $HOME environment variable is not set, run the Xstartup.ibm8361 script again.
Printing Problems	
Stairstep, misaligned printouts	In the UNIX operating system, the lines in files end in line feeds without carriage returns. Some print queues add a carriage return to the end of each line feed. This is what causes the misaligned, stairstep printing. Format your print file locally and print remotely. OR Prepend a command to the print file to add the carriage returns if your printer requires them. For a PCL printer this command is ESC&k2G. Create the ESC character in vi by pressing Ctrl - V and then the ESC key.
Program Manager Problems	
Error message *403 error, access denied by rule* appears	Verify all of your permissions. Verify the accuracy of your name servers. Verify the spelling of the URL for the http://../NetworkStation/Admin

Table 23. AIX Problem Resolution Table (continued)

Symptom	***What you should do***
Resizing the Netscape window when using AIX causes loss of data input on IBM Network Station Manager program panels	Do not resize the window after you have entered data. Resizing the window resets the values.
Unable to find messages	Ensure that your locale values such as LANG, NLSPATH and so on are set correctly for the Network Station Manager licensed program and the HTTPD server.
Syslogd to Resolve AIX Network Station Manager Problems	
Use syslogd to record system events when debugging problems	Use the syslogd command to collect information on problem situations including booting, ftp, nfs, and so forth. Add the following line to the /etc/syslog.conf file: ***.debug /usr/spool/mqueue/syslog.out** This line collects system events and it records them in the file syslog.out. Read the syslog.out file messages to diagnose problems.

OS/390 Error Situations

The errors in this table are specific to the OS/390 operating system.

Table 24. OS/390 Problem Resolution Table

Symptom	***What you should do***
Browser problems	
The IBM Network Station Browser will not start	You may have deleted the IBM Network Station Manager for the OS/390 licensed program and then reinstalled it. In deleting the licensed program, some of the files that support the IBM Network Station Browser were also deleted. Reinstall the IBM Network Station Browser licensed program.
Program Manager Problems	
IBM Network Station Manager program will not start	Check to see if the ICS server is running and configured properly.

VM/ESA Error Situations

The errors in this table are specific to the VM/ESA operating system.

Table 25. VM/ESA Problem Resolution Table

Symptom	***What you should do***
No Login Window	

Table 25. VM/ESA Problem Resolution Table (continued)

Symptom	***What you should do***
No Login window on monitor - User Services window appears instead	The most likely cause is an incorrect entry for this Network Station in the BOOTP table. Another possible cause is that the default configuration file on the server has been corrupted or deleted. The default configuration file, standard.nsm, is located in the /configs subdirectory of the directory indicated in the hd tag of the BOOTP table entry. A reinstallation of the IBM Network Station Manager licensed program may be required.
Network Station Manager Debug Tool	
Any problem that occurs in the Network Station Manager.	After a problem occurs, specify a user ID on the DEBUG statement (DEBUG: *userid*) in the NSM SETUP file. Then, rerun the problem. Debug files will be sent to the user ID specified on the DEBUG statement. The debug files contain information that will help you solve the problem that occurred. See the *Program Directory for Network Station Manager Release 3 for VM/ESA* for information about the NSM SETUP file.

Appendix B. National Language Support

Locale Information

Table 26 lists all of the possible locales that are supported by the IBM Network Station Manager.

Table 26. Locale Information

Locale ID	Language / Locale
AR_AA	Arabic / Arabic Speaking
BE_BY	Byelorussia / Belarus
BG_BG	Bulgarian / Bulgaria
CA_ES	Catalan / Spain
CS_CZ	Czech / Czech Republic
DA_DK	Danish / Denmark
DE_CH	German / Switzerland
DE_DE	German / Germany
EL_GR	Greek / Greece
EN_GB	English / UK
EN_US	English / US
ES_ES	Spanish / Spain
ES_LA	Spanish / Latin America
ET_EE	Estonian / Estonia
FI_FI	Finnish / Finland
FR_BE	French / Belgium
FR_CA	French / Canada
FR_CH	French / Switzerland
FR_FR	French / France
IW_IL	Hebrew / Israel
HR_HR	Croatian / Croatia
HU_HU	Hungarian / Hungary
IS_IS	Icelandic / Iceland
IT_CH	Italian / Switzerland
IT_IT	Italian / Italy
JA_JP	Japanese / Japan
KO_KR	Korean / Korea
LT_LT	Lithuanian / Lithuania
LV_LV	Latvian / Latvia

Table 26. Locale Information (continued)

Locale ID	Language / Locale
MK_MK	Macedonian / Macedonia
NL_BE	Dutch / Belgium
NL_NL	Dutch / Netherlands
NO_NO	Norwegian / Norway
PL_PL	Polish / Poland
PT_BR	Portuguese / Brazil
PT_PT	Portuguese / Portugal
RO_RO	Romanian / Romania
RU_RU	Russian / Russia
SQ_AL	Albanian / Albania
SR_SP	Serbian Cyrillic / Serbia
SV_SE	Swedish / Sweden
TH_TH	Thai / Thailand
TR_TR	Turkish / Turkey
UK_UA	Ukranian / Ukraine
VI_VN	Vietnamese / Vietnam
ZH_CN	Chinese / PRC (Simplified)
ZH_TW	Chinese / ROC (Traditional)

DBCS Unique Support

Input Methods

The IBM Network Station supports the following double-byte input methods:

- Chinese (Simplified)
  - PinYin
  - English to Chinese
  - Intelligent ABC
- Chinese (Traditional)
  - Tsang-Jye
  - Phonetic Symbols
- Japanese
  - Kana to Kanji Conversion
  - Romanji to Kana Conversion
- Korean
  - ASCII
  - Hangul
  - Hanja

Printers

The following printer data streams can be printed to an IBM Network Station locally attached printer:

Printer Data Stream	Chinese (Simplified)	Chinese (Traditional)	Japanese	Korean
Adobe PostScript (PS) Level 2			x	
Epson ESC/P	x	x	x	x
IBM Pages	x	x	x	x
IBM PS55 (5575/5577)	x	x	x	x
HP PCL	x	x	x	x
Canon LIPS			x	
NEC PC-PR 201			x	

Appendix C. IBM Network Station Manager Program Shipped Default Settings

The following tables contain all of the IBM Network Station Manager default settings. The settings are in the same order as found in the Setup Tasks frame of the IBM Network Station Manager program.

Table 27. IBM Network Station Workstation Default Settings

Workstation Default Settings	
Item:	**Default Value:**
Mouse settings: • Mouse button configuration • Mouse pointer speed	 • Right-handed • Medium
Keyboard settings: • Keyboard Repeat rate • Keyboard Repeat delay • Keyboard mapping language	 • Medium • Medium delay • Default from terminal
Monitor settings: • Minutes before screen saver turns on • Screen saver • Minutes before monitor standby • Minutes before monitor suspend • Minutes before monitor power down • Desktop background	 • 10 • IBM bitmap • 20 • 40 • 60 • IBM bitmap
Local Services settings: • Allow remote X clients	 • No
Boot Parameters settings: • Language to be used during boot sequence • Number of times to try reloading operating system • Update to boot monitor installed on the boot server	 • English • 0 • No update except on Windows NT server
Miscellaneous settings: • Allocate memory to speed window refresh	 • No

Table 28. IBM Network Station Printer Default Settings

Printer Default Settings	
Item:	**Default Value:**
Print Client settings: • Maximum LPR buffer size	 • 10%
Print Server settings: • Maximum LPD buffer size • Stream jobs if buffer overflows • Remote systems allowed to print on this IBM Network Station	 • 10% • Yes • All systems

Table 29. IBM Network Station Startup Menu Contents Default Settings

Startup Menu Contents Default Settings	
Item:	**Default Value:**
Desktop and Menu Bar option settings: • Desktop style	 • Standard desktop with menu bar
Buttons to appear on standard desktop when menu bar is enabled: • Log out • Hide • Top/Bottom • Lock	 • Yes • Yes • Yes • Yes

Table 30. IBM Network Station Standard Desktop Setting Default Values

Standard Desktop Setting Default Values	
Item:	**Default Value:**
Screen colors: • Background color for window frame in focus • Background color for window frame not in focus • Foreground color for all window frames	 • Mint green • Gray • Black
Icon preferences: • Icons placed • Icon location	 • On desktop • Bottom left
Fonts: • Font size for icons and menus	 • 12
Window focus	Windows become active by clicking on the window

Table 31. 5250 Default Settings

5250 Default Settings	
Item:	**Default Value:**
Key remapping capability	Disabled
Default keyboard file for: • PC Keyboard (101 keys) • PC Keyboard (102 keys) • 5250 Keyboard (122 keys)	 • None • None • None
Color Settings: • Color customization capability • Default color scheme • Additional color schemes to make available	 • Basic • None • None
Record/Playback Settings: • Record/Playback capability • Playback sequences to make available	 • Enabled • None

Table 31. 5250 Default Settings (continued)

5250 Default Settings	
Item:	**Default Value:**
Allow Use of Settings: • Command menu • Option menu • Print menu • Miscellaneous preferences • New Session window • Edit menu • Control menu • Help menu • Font menu list • Pop-up keypad	 • Yes • Yes • Yes • Yes • Yes • Yes • Yes • Yes • Yes • Yes
Screen settings: • Screen size • Column separators • Image/Fax Display	 • 27 rows, 132 columns • Disabled • Disabled

Table 32. 3270 Default Settings

3270 Default Settings	
Item:	**Default Value:**
Key remapping capability	Disabled
Default keyboard file for: • PC Keyboard (101 keys) • PC Keyboard (102 keys)	 • None • None
Color Settings: • Color customization capability • Default color scheme • Additional color schemes to make available	 • Basic • None • None
Record/Playback Settings: • Record/Playback capability • Playback sequences to make available	 • Enabled • None
Allow Use of: • Command menu • Option menu • Help menu • Miscellaneous preferences • New Session window • Edit menu • Print menu • Graphics • Font Menu list • Pop-up keypad	 • Yes • Yes • Yes • Yes • Yes • Yes • Yes • No • Yes • Yes

Table 32. 3270 Default Settings (continued)

3270 Default Settings	
Item:	**Default Value:**
Miscellaneous settings: • Screen size • Key for Enter function • Telnet 3270 port to connect to	 • 32 X 80 • Control key • 23

Table 33. Internet Network Default Settings

Internet Network Default Settings	
Item:	**Default Value:**
Web server port on the boot host	80
Applet launcher port	5555

Table 34. NC Navigator Browser Defaults

NC Navigator Browser Defaults	
Item:	**Default Value:**
Proxy configuration	Manual proxies obtained from Internet Network panel
Security Settings: • Enable JavaScript • Enable Java Applets • Enable SSL 2 • Enable SSL 3	 • Yes • No • Yes • Yes
Network Settings: • Maximum memory cache • Maximum TCP/IP connections • Network buffer size	 • 1024 KB • 4 • 32 KB

Table 35. Java Applet Viewer Settings

Java Applet Viewer Settings	
Item:	**Default Value:**
Verbose mode	Off
Verify classes	Remote only
Maximum heap size	3 MB
JAVA stack size	256 KB
Native code stack size	32 KB
Garbage collection: • Verbose • Only when needed	 • Off • Off (garbage collection runs as an asynchronous thread in parallel with other threads)
NOTE: The Java Applet Viewer setting defaults are also the defaults for the Java Applications found on the Startup Programs and Menus screens.	

Table 36. Language Default Settings

Language Default Settings	
Item:	**Default Value:**
Format to use for dates, currency, numbers, and messages	Default from server

Appendix D. Serial Port Printer Connection

If you are connecting a serial port printer to a Network Station, you should use one of the following:

- A 9 (female) to 25 (male) pin cable (Cable AR or equivalent) through a db25-db25 null modem interposer (Cable E or equivalent).
- A 9 (female) to 25 (male) pin null modem cable (electrically equivalent to the description in Table 39 on page 154).

For additional information about cable characteristics, please see *Adapters, Devices, and Cable: Information for Micro Channel Bus Systems* (SA23-2764).

Using a 9 to 25 pin cable through a db25-db25 null modem interposer

Cable AR (recommended)

This Serial Port cable (Async Cable EIA-232) is for systems that have a nine pin serial port connector.

Table 37. Pin-out for Modem (Non-Interposer) Cable

Pin no. (9 Pin) Female	Signal Name (9 Pin)	Pin No. (25 Pin) Male	Signal Name (25 Pin)
1	Data Carrier Detect	8	Data Carrier Detect
2	Receive Data	3	Receive Data
3	Transmit Data	2	Transmit Data
4	Data Terminal Ready	20	Data Terminal Ready
5	Signal Ground	7	Signal Ground
6	Data Set Ready	6	Data Set Ready
7	Request to Send	4	Request to Send
8	Clear to Send	5	Clear to Send
9	Ring Indicator	22	Ring Indicator

Cable E Interposer (recommended)

Table 38. Pin-out for Cable E, Printer/Terminal Interposer-EIA-232

System End Connector Socket (Female)	Signal	Device End Connector Pin (Male)
1	Shield Ground	shell
2	TxD	3
3	RxD	2
4	RTS	5
5	CTS	4
6,8	DSR, CD	20
7	Signal Ground	7
20	DTR	6,8

Using a 9 to 25 Pin Null Modem Cable

The hardware interface uses the 9 pin D-shell female connector and pin assignments defined for RS-232-C. The voltage levels are EIA only. Current loop interface is not available. There are two identical connectors.

Table 39. Pin-out for Terminal (Interposer Cable)

Pin No. (9 Pin) Female	**Signal Name (9 Pin)**	**Pin No. (25 Pin) Male**	**Signal Name (25 Pin)**
1	Data Carrier Detect	20	Data Terminal Ready
2	Receive Data	2	Transmit Data
3	Transmit Data	3	Receive Data
4	Data Terminal Ready	6	Data Set Ready
5	Signal Ground	7	Signal Ground
6	Data Set Ready	20	Data Terminal Ready
7	Request to Send	5	Clear to Send
8	Clear to Send	4	Request to Send
9	Ring Indicator		

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