IBM Network Station Runtime Environment for RS/6000 System Administrator's Guide

Fourth Edition (October 1997)

Contents

About This Book

The *IBM Network Station Runtime Environment for RS/6000 System Administrator's Guide* provides instructions for installing, configuring, and administering IBM Network Stations in the RS/6000 environment. It has been revised to integrate the information for the Network Station Manager support on RS/6000.

New in This Release

- Instructions for printing from an IBM Network Station have been added. See "Attached Printer Installation and Configuration" on page 56 and Appendix D, "More About Printing" on page 75.
- "Setting up the XDM environment" on page 17 has been clarified.
- "Configuring IBM Network Stations locally—NVRAM configuration" on page 12 has been clarified.
- Appendix C, "IBM Network Station Memory Management" on page 73 has been revised.
- Chapter 5, "Advanced IBM Network Station configuration (optional)" on page 51 has been revised to include additional examples of parameters that may be set in the **local.nsm** file.
- Network Station Manager support is available on AIX 4.2 and 4.3. With the Network Station Manager, the Common Login Environment is supported as the standard login environment, instead of the XDM or CDE.

Who Should Use This Book

This book is intended to be used by system administrators installing, configuring, and administering IBM Network Stations in the RS/6000 environment. A working knowledge of AIX and the principles of networking is assumed. Some experience with TCP/IP, the Common Desktop Environment (CDE), and X Windows system administration will help in the successful use of this product.

How To Use This Book

These chapters and appendixes are included:

- Chapter 1, "Installation" on page 1 outlines system requirements and installation procedures.

- Chapter 2, "Configuration" on page 5 offers instructions on both basic, essential configuration tasks and advanced configuration capabilities.

- Chapter 3, "The Common Login Environment vs. the CDE/XDM Environment" on page 25 provides information for migrating the CDE and XDM login environments to the Common Login Environment.

- Chapter 4, "Using the IBM Network Station Manager Program" on page 27 describes the setup and management tasks associated with one or all of your IBM Network Stations and IBM Network Station users. It gives an overview of Network Station Manager and explains how to start the program, work with the program, and view the error messages.

- Chapter 5, "Advanced IBM Network Station configuration (optional)" on page 51 discusses modifying basic configuration information for IBM Network Stations.

- Chapter 6, "Miscellaneous Administration Tasks" on page 55 describes AIX server routing, BootP relay configuration, and print setup from IBM Network Stations.

- Chapter 7, "Configuring the ICS Webserver for RS/6000" on page 61 provides reference material for the Internet Connection Server (Domino GO Server).

- Chapter 8, "Troubleshooting" on page 67 includes instructions for diagnosing and resolving problems.

- Appendix A, "More about CDE" on page 69 offers additional information about the CDE.

- Appendix B, "Local Clients" on page 71 lists local client commands and utilities.

- Appendix C, "IBM Network Station Memory Management" on page 73 lists IBM Network Station memory requirements for downloaded software.

- Appendix D, "More About Printing" on page 75 offers additional information about print topics described in Chapter 6, "Miscellaneous Administration Tasks" on page 55.

- Appendix E, "IBM Network Station Manager Program Shipped Default Settings" on page 79 shows the hardware default settings, desktop manager default settings, 5250 default settings, 3270 default settings, internet network default settings, Network Station browser defaults, and the Java Applet viewer settings.

- Appendix F, "IBM Network Station Manager Program Shipped Environment Variables" on page 85 includes the environment variables whose values cannot be altered for RS/6000.

Highlighting Conventions

These highlighting conventions are used in this book.

Bold	Identifies commands, subroutines, files, structures, directories, and other items whose names are predefined by the system. Also identifies graphical objects such as buttons, labels, and icons that the user selects.
Italics	Identifies parameters whose actual names or values are to be supplied by the user.
`Monospace`	Identifies examples of specific data values, examples of text similar to what you might see displayed, examples of portions of program code similar to what you might write as a programmer, messages from the system, or information you should actually type.

ISO 9000

ISO 9000 registered quality systems were used in the development and manufacturing of this product.

Related Publications

The *IBM Network Station Runtime Environment for RS/6000 System Administrator's Guide* is provided in PostScript and HTML format. We recommend that if you want to print the *System Administrator's Guide*, print the **/usr/netstation/doc/SysAdminGuide.ps** file. If you want to read the documentation online, view the **/usr/netstation/doc/SysAdminGuide.html** file.

The documentation for IBM Network Station Runtime Environment for RS/6000 also includes the *IBM Network Station Runtime Environment for RS/6000 User's Guide*.

The IBM Network Station Runtime Environment for RS/6000 documentation is available only on the installation media and from the following World Wide Web page :

http://www.as400.ibm.com/networkstation/rs6000

The documentation is not separately orderable.

You may also find these books useful:

For additional information about the IBM Network Station:

- *IBM Network Station Use* (SA41-0036). Information about the IBM Network Station hardware, valid for all platforms.

- IBM Network Station documentation for the AS/400 platform:

  - *IBM Network Station Manager for AS/400* (SC41-0632)

- IBM Network Station documentation for the S/900 platform:

  - *IBM Network Station Manager for S/390* (SC31-8546)
  - *IBM Network Station—Getting Started* (SG24-4954). While this book was written for IBM Network Station in the S/390 environment, much of the information applies to all platforms.

For information about installing and managing the AIX operating system and TCP/IP:

- *AIX Version 4.2 Installation Guide* (SC23-1924)

- *AIX Version 4 System Management Guide: Operating System and Devices* (SC23-2525)

- *AIX Version 4 System Management Guide: Communications and Networks* (SC23-2526)

For information about printing in the AIX environment:

- *AIX Version 4 Guide to Printers and Printing* (SC23-2783)

- *Adapters, Device, and Cable Information for Micro Channel Bus Systems* (SC23-2764)

For information about X Windows:

- *AIXWindows Desktop Advanced User's and System Administrator's Guide* (SC23-2671)
- *Volume 8: X Window System Administrator's Guide* (Sebastopol, CA: O'Reilly & Associates, Inc.)

For information about the CDE:

- *AIX V4.1 CDE: User's Guide* (SC23-2793)
- *AIX V4.1 CDE: Advanced User's and System Administrator's Guide* (SC23-2795)
- *AIX V4.1 CDE: Application Builder User's Guide.* (SC23-2785)
- *AIX V4.1 CDE: Desktop Kornshell User's Guide* (SC23-2786)
- *AIX V4.1 CDE: Help System Author's and Programmer's Guide* (SC23-2787)
- *AIX V4.1 CDE: Programmer's Overview* (SC23-2789)
- *AIX V4.1 CDE: Programmer's Guide* (SC23-2790)
- *AIX V4.1 CDE: Style Guide & Certification Checklist* (SC23-2791)
- *AIX V4.1 CDE: Internationalization Programmer's Guide* (SC23-2788)
- *AIX V4.1 CDE: ToolTalk Messaging Overview* (SC23-2792)
- *AIX V4.X CDE: ToolTalk and Open Protocols* (SR23-7352)

For information about the ICS Webserver (Domino GO):

- *Webmaster's Guide* (GC31-8287)

Books identified with an order number (for example, SC23-2526) may be ordered as described below.

Ordering Publications

You can order publications from your sales representative or from your point of sale.

Use *AIX and Related Products Documentation Overview* for information on related publications and how to obtain them. The *AIX and Related Products Documentation Overview* is available:

- On the World Wide Web. Using your web browser, go to the IBM Home Page by opening the following URL:

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

  On the IBM Home page, search on "AIX and Related Products Documentation Overview" to access the publication.

- In the Hyptertext Information Base Library Version 1 for AIX. This online documentation is designed for use with the InfoExplorer Hypertext retrieval system.

- As a hardcopy publication; use order number SC23-2456.

Chapter 1. Installation

System requirements

Hardware

These are the hardware requirements to run IBM Network Stations in the RS/6000 environment:

- RS/6000 capable of running AIX 4.1.5 or better

- For Network Station Manager, AIX 4.2.1 or better is required

- One or more IBM Network Station desktop units. These models are available:

  Base IBM Network Station unit:

    - 8361-100 (for Ethernet connectivity)
    - 8361-200 (for token-ring connectivity)

  403GCX 66MHz IBM Network Station unit:

    - 8361-110 (for Ethernet connectivity)
    - 8361-210 (for token-ring connectivity)

The *IBM Network Station Use* publication (SA41-0036) provides details about the IBM Network Station hardware.

Software

These are the software requirements to run IBM Network Stations in the RS/6000 environment:

- The RS/6000 needs AIX Versions 4.1.5 or 4.2.1 for servers. A system with AIX Version 4.1.5 also needs APAR IX64800. For Network Station Manager, AIX 4.2.1 or better is required.

  These are the specific required filesets:

    - **bos.rte** 4.1 or higher

    - If your server will use DHCP, **bos.net.tcp.server** 4.1 or higher. A system with **bos.rte** 4.1 also needs APAR IX64800 (**bos.net.tcp.server** 4.1.5.5 or higher).

- Depending on the environment you plan to run on your IBM Network Stations, ONE of the following filesets is required:

    - For the Common Desktop Environment (CDE)— **X11.Dt.rte** 4.1.0.0 or higher
    - For the X Display Manager (XDM) environment— **X11.apps.xdm** 4.1.0.0 or higher

- We recommend that you also install the **X11.fnt.fontServer** fileset to allow the use of a font server.

- For Network Station Manager, the Internet Connection Server (Domino GO Webserver) fileset **internet_server.base.httpd** version 4.1.1.0 or higher is required.

- We recommended that you also install the **bos.net.nfs.server** fileset. NFS is required to support most of the Network Station applications, such as the IBM Browser.

Network

- LAN connectivity via Ethernet or token-ring

Hardware installation

Hardware installation instructions are provided in the *IBM Network Station Use* publication (SA41-0036).

Software installation

This is the procedure to install the IBM Network Station Runtime Environment for RS/6000 server code on the RS/6000 server:

Note: Before you run the software installation program, be aware that installing the software enables BootP, TFTP, and NFS on your RS/6000 server by running the **nsconf** script. See "Configuring your AIX RS/6000 server" on page 5 for more details.

1. Use the FastPath shortcut to open the System Management Interface Tool (SMIT) Install/Update From All Available Software menu:

   ```
   smitty install_selectable_all
   ```

   OR if you prefer to work in the graphical SMIT interface, type:

   ```
   smit install_selectable_all
   ```

2. Select an input device or directory by choosing from the selections displayed when you use the List function.

3. To select the software you need to install, use the List function to display a list of all available software on the input device or directory. Use the Find function to search on netstation, then highlight the fileset. For example, highlight **netstation.base.rte** and select to install.

4. Since no Network Station application is actually running on the RS/6000, a reboot of the RS/6000 is *not* necessary at this point if only the netstation filesets have been installed.

5. Verify that you have the latest Network Station APARs installed. As a system administrator, you may need to install APAR IX68615 and IX69567 on your system.

6. The following is a list of Network Station package names:

   netstation.base

   netstation.ibmlogin

   netstation.3270

   netstation.5250

   netstation.java

   netstation.msg.*xx_xx*

The package names for the Network Station Manager support are:

netstation.nsm

netstation.msg.*xx_xx*.nsm.

Chapter 2. Configuration

Configuration involves several tasks:

- Gathering information about your network environment and your IBM Network Stations
- Configuring your server
- Configuring your IBM network stations to be recognized by the server
- Configuring the login environment

Optionally, you may also want to change the default configuration of the IBM Network Stations on your system.

Before you begin—gathering information

You'll need the following information to configure your server and your IBM Network Stations:

- Internet Protocol (IP) address for the RS/6000 server

- MAC address (hardware address) for each IBM Network Station (Refer to the *IBM Network Station Use* book for information about locating MAC addresses. An alternative process to find MAC addresses is described in "Configuring IBM Network Stations centrally—BootP" on page 7.)

- IP address for each IBM Network Station (not needed in DHCP environments if IP addresses are being assigned dynamically; see "DHCP" on page 14)

- Subnet mask

- IP address for the Gateway (if one exists in your network)

- IP address for the Domain Nameserver (if one exists for your network)

Configuring your AIX RS/6000 server

The software installation process automatically configures the server by running the **/usr/netstation/bin/nsconf** script, which sets up and enables these pieces on the RS/6000 server:

- RS/6000 host specific configuration
- BootP
- TFTP
- NFS
- X Font services

More about nsconf

These are the tasks that the **nsconf** script performs for you at software installation time; *you do not need to perform these tasks*.

- The **nsconf** script enables TFTP access from the IBM Network Stations by performing these tasks on the server:

  - In the **/etc/inetd.conf** file, removes the '#' (pound sign) in the leftmost column for the 'tftp' entry.

  - Runs **/usr/bin/refresh -s inetd**.

– Adds these lines to the **/etc/tftpaccess.ctl** file:

```
allow:/usr/netstation
allow:/usr/netstation/configs
allow:/usr/netstation/mods
allow:/usr/netstation/fonts/pcf/misc
allow:/usr/netstation/fonts/pcf/dw100dpi
allow:/usr/netstation/fonts/pcf/java
```

Note: The existence of the **/etc/tftpaccess.ctl** file limits TFTP access to only the directories explicitly listed in this file. You may want to add additional 'allow' statements to support other TFTP activity on the server, or you might want to remove the **/etc/tftpaccess.ctl** file if you want to allow unlimited TFTP access to the server. See the **tftp** man page for additional information.

– Adds the entry '/usr/netstation -ro' to the **/etc/exports** file.

– Runs **/usr/sbin/exportfs -a**, which exports all the directories listed in the **/etc/exports** file for NFS client access.

– Runs **/usr/sbin/mknfs -B**. The **mknfs** command configures the system to run the Network File System (NFS) daemons. The **mknfs** command adds an entry to the **inittab** file so that the **/etc/rc.nfs** file is executed on system restart. The **mknfs** command also executes the **/etc/rc.nfs** file immediately to start the NFS daemons.

• The **nsconf** script enables NFS access from the IBM Network Stations by changing the IP entry in the 'file-service-table' stanza of the **/usr/netstation/configs/local.nsm** file to the IP address of your AIX server.

• The **nsconf** script enables the IBM Network Stations to dynamically load X11 fonts from an AIX font server. The script changes the IP entry in the 'xserver-default-font-path' stanza of the **/usr/netstation/configs/local.nsm** file to the IP address of your AIX font server. The script checks for the existence of the **X11.fnt.fontServer** fileset and if it finds the fileset, runs **/usr/lpp/X11/bin/fsconf**.

If you need further information about any of the subsystems described above (for example, manually stopping or starting them), please reference the man pages or InfoExplorer.

You ***must*** perform the action described in the section that follows before IBM Network Station users attempt to boot from the RS/6000 server.

Accepting the terms and conditions

As system administrator, you must accept the IBM Network Station Runtime Environment for RS/6000 terms and conditions before IBM Network Station users can boot from the RS/6000 server. Type at the command line:

```
/usr/netstation/bin/agree
```

The terms and conditions will be displayed, and you will be prompted to enter *y* to accept them.

If you do not agree to the terms and conditions, when users attempt to boot, the following error message will be displayed:

```
request file: '/usr/netstation/kernel'
Incorrect file type
```

Disabling the server code

If at any time you need to disable ("deconfigure") the server code, type at the command line:

```
/usr/netstation/bin/nsconf -d
```

Running the **nsconf** script with the **-d** flag comments out the references to the IBM Network Stations in the **/etc/bootptab** file, which keeps them from booting using the BootP protocol. Configuration information is not erased from the system, and the server code can be reactivated by running the **nsconf** script again with no flags.

Note: Running **nsconf -d** does *not* turn off BootP, TFTP, and NFS. These processes must be shut down manually.

Configuring IBM Network Stations to be recognized by the server

Each IBM Network Station must be configured to be recognized by the server when it attempts to connect during the boot process. You can configure the stations centrally (using BootP from the server) or locally (using NVRAM on each unit). The DHCP and RARP options are also discussed briefly at the end of this chapter.

Configuring IBM Network Stations centrally—BootP

Setting the "IP Addressed From" parameter and finding the MAC address

For you to be able to configure the IBM Network Stations from the server, the "IP addressed from" parameter on each unit must be set to Network.

Note: This is the default setting when IBM Network Stations are shipped; however, if you're reusing units that may have been configured previously, you'll need to check each unit and, if necessary, reset the "IP Addressed From" parameter.

Also, if you haven't previously recorded the MAC address (hardware address) for each unit, you'll need to find that information now.

For each unit, this is the procedure to set the "IP Addressed From" parameter (and find the MAC address, if necessary):

1. After powering on the IBM Network Station and going through memory check and device checks, press the Escape key to open the IBM Network Station Setup Utility.

```
                        IBM Network Station
                          Setup Utility


   F2 = View Network Parameters
   F3 = View Boot Parameters
   F4 = View Hardware Configuration

   F5 = Set Network Parameters
   F6 = Set Boot Parameters
   F7 = Set Monitor Resolution
   F8 = Set Keyboard Language
   F9 = Verbose Diagnostic Messages (Disabled or Enabled)




   Enter=Reboot
```

2. If you haven't already located and recorded the MAC address, press the
   F4 = View Hardware Configuration key.

```
                        IBM Network Station
                     View Hardware Configuration

   Video Memory ..................... 1 MB
   Base Memory ...................... 8 MB
   Boot Monitor Version ............. Boot Monitor V2.8.q
   Keyboard Controller .............. V1.37
   Keyboard ID ...................... AB83
   Processor Version ................ 00200011
   Boot Resolution .................. 640x480  60Hz
   Server Resolution ................ 1024x768  70Hz
   Monitor ID ....................... 1 0 1 0
   Ethernet
     MAC Address .................... 00:00:A7:00:9E:00

   Enter=Exit
```

The MAC address is displayed as a string of 12 numbers and letters with :
(colon) separators. You won't need to record the : (colon) separators, just the
12 character string.

3. Press the F5 = Set Network Parameters key. You set the "IP Addressed From"
   parameter from this menu.

```
                          IBM Network Station
                            Setup Utility


   IP Addressed From ................. Network  NVRAM

   BOOTP IP Addressing Order ........... 2
   DHCP IP Addressing Order ............ 1
   RARP IP Addressing Order ............ Disabled

   Ethernet Standard .................. Version 2 IEEE 802.3




   Enter=Save    F12=Cancel   Esc=Restore Parameter

```

4. Set the "IP Addressed from" field to Network, then press the Enter key.

5. Press the Enter key again to reboot the IBM Network Station.

Repeat this procedure for each IBM Network Station.

Note: For information about the other options offered through the IBM Network Station Setup Utility, see Appendix B in *IBM Network Station Use*.

Adding your IBM Network Stations to the BootP table

In order for your IBM Network Stations to boot using BootP, a line for each station must be added to the server's **/etc/bootptab** file. Choose ONE of the three options described below to add your IBM Network Stations to the BootP table.

Option 1—Use the System Management Interface Tool (SMIT)

This is the procedure to configure an IBM Network Station from the server using SMIT:

1. Use the FastPath to open the SMIT BootP Device screen:

   smitty bootp

   OR if you prefer to work in the graphical SMIT interface, type:

   smit bootp

```
                          BootP Device

   Move cursor to desired item and press Enter.


   List All BootP Devices
   Add a new BootP Device
   Change / Show Characteristics of a BootP Device
   Duplicate a new BootP Device from an existing Device
   Remove a BootP Device




   F1=Help              F2=Refresh          F3=Cancel           F8=Image
   F9=Shell             F10=Exit            Enter=Do

```

2. Select **Add a new BootP Device**

```
                          Add a new BootP Device

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                              [Entry Fields]

* Hostname                                    [ ]
* Hardware Type                               [ ]            +
  Hardware Address                            [ ]
* IP Address                                  [ ]
* TFTP Server IP                              [ ]
* Boot File                                   [ ]
* Boot Directory                              [ ]
  Domain Name Server                          [ ]
  Gateway                                     [ ]
* Subnet Mask                                 [ ]




F1=Help              F2=Refresh          F3=Cancel          F4=List
F5=Reset             F6=Command          F7=Edit            F8=Image
F9=Shell             F10=Exit            Enter=Do
```

3. In the Add a new BootP Device screen, enter the following information. (Enter
   each piece of information in its corresponding Entry Field):

   • Hostname of the IBM Network Station
   • Hardware Type of the IBM Network Station (Choose from the list)
   • Hardware Address (the MAC address for the IBM Network Station being
     configured)—entered without the : (colon) separators. Either enter the string
     with no separators or with . (period) separators.
   • IP Address of the IBM Network Station
   • TFTP Server IP—typically the IP address of the RS/6000 being configured
   • Boot File (type kernel in this field)
   • Boot Directory (type /usr/netstation/ in this field)
   • Subnet Mask

   The following fields are optional and depend on your network environment. If
   they exist in your environment, please enter the appropriate information;
   otherwise, leave them blank:

   • Domain Name Server
   • Gateway

4. Press the Enter key or the **Do** button.

Repeat these steps for each IBM Network Station.

Note: You can also perform other BootP management tasks from the SMIT BootP
Device menu. For example, if you are doing configuration for more than one IBM
Network Station, select **Duplicate a new BootP Device from any existing Device**
as a starting point to configure the next unit, since many fields will contain the
same information for all units.

Once you've configured your IBM Network Stations using SMIT, go to "Configuring
X Display Manager Control Protocol (XDMCP)" on page 16.

Option 2—Use the chbootptab script:

This is the procedure to configure an IBM Network Station from the server using the **chbootptab** script.

1. Type at the command line (enter on one line):

   ```
   /usr/netstation/bin/chbootptab -A -h hostname -t hardware_type
   -s tftp_server_ip -a hardware_address -b boot_file -i ip_address
   -d boot_directory
   ```

   These optional flags may also be used:

   -n *domain_name_server*
   -g *gateway_ip*,
   -m *subnet_mask*

2. Repeat for each IBM Network Station.

For information about more advanced flags that are available with the **chbootptab** script, type at the command line:

```
/usr/netstation/bin/chbootptab -?
```

Once you've configured your IBM Network Stations using **chbootptab**, go to "Configuring X Display Manager Control Protocol (XDMCP)" on page 16.

Option 3—Manually edit the /etc/bootptab file

This is the procedure to configure an IBM Network Station from the server by manually editing the **/etc/bootptab** file:

1. In the **/etc/bootptab** file, ***for each IBM Network Station that you want your server to boot***, copy the template below and replace the labels in upper case with the appropriate values. Enter on one line:

   ```
   NC_HOST_NAME:ht=NETWORK_TYPE:ha=MAC_ADDRESS:ip=IP_ADDRESS:bf=kernel:
   hd=/usr/netstation/:sm=SUBNET_MASK:gw=GATEWAY_IP:ds=NAMESERVER_IP:
   ```

   Note: When you edit the **/etc/bootptab** file manually, be aware that each entry is longer than one line of text can display in your editor. Don't put a manual return (line feed) in the entry or the entry will fail. (Your editor may be set up to wrap lines automatically; this isn't a problem—just don't manually press the Enter key to force a return.)

Replace...	with...
NC_HOST_NAME	network name of your Network Station (for example, hostname)
NETWORK_TYPE	`ethernet`, `ieee802`, or `tokenring`
MAC_ADDRESS	hardware address of the IBM Network Station
IP_ADDRESS	IP address of your Network Station

The following fields are optional and can be left blank (for example, `:sm=:gw=:`) if they do not exist in your network.

SUBNET_MASK	subnet mask of your network
GATEWAY	gateway IP of your network
NAMESERVER_IP	domain name server IP of your network

Once you've configured your IBM Network Stations by editing the **/etc/bootptab** file, go to "Configuring X Display Manager Control Protocol (XDMCP)" on page 16.

Note: There must be an entry in the **/etc/bootptab** file for each IBM Network Station that you want your AIX system to boot using BootP.

Configuring IBM Network Stations locally—NVRAM configuration

If you prefer to configure your IBM Network Stations individually (at each unit), rather than centrally (from the server), use this procedure. (This approach is practical only if you're configuring a very small number of IBM Network Stations.)

For each unit, this is the procedure:

1. After powering on the IBM Network Station and going through memory check and device checks, press the Escape key to open the IBM Network Station Setup Utility.

```
                          IBM Network Station
                            Setup Utility

     F2 = View Network Parameters
     F3 = View Boot Parameters
     F4 = View Hardware Configuration

     F5 = Set Network Parameters
     F6 = Set Boot Parameters
     F7 = Set Monitor Resolution
     F8 = Set Keyboard Language
     F9 = Verbose Diagnostic Messages (Disabled or Enabled)




     Enter=Reboot
```

2. If you haven't previously recorded the MAC Address, press the F4 = View Hardware Configuration key.

```
                          IBM Network Station
                        View Hardware Configuration


     Video Memory ..................... 1 MB
     Base Memory ...................... 8 MB
     Boot Monitor Version ............. Boot Monitor V2.8.q
     Keyboard Controller .............. V1.37
     Keyboard ID ...................... AB83
     Processor Version ................ 00200011
     Boot Resolution .................. 640x480  60Hz
     Server Resolution ................ 1024x768  70Hz
     Monitor ID ....................... 1 0 1 0
     Ethernet
       MAC Address ....................  00:00:A7:00:9E:00


     Enter=Exit
```

The MAC address is displayed as a string of 12 numbers and letters with : (colon) separators. You won't need to record the : (colon) separators, just the 12 character string.

3. Press the F5 = Set Network Parameters key.

```
                        IBM Network Station
                          Setup Utility


IP Addressed From ................... Network  NVRAM

Network Station IP Address........... 0.0.0.0
First Boot Host IP Address........... 0.0.0.0
Second Boot Host IP Address ......... 0.0.0.0
Third Boot Host IP Address .......... 0.0.0.0
Gateway IP Address .................. 0.0.0.0
Subnet Mask ......................... 255.255.255.0
Broadcast IP Address ................ 255.255.255.255

Ethernet Standard ................... Version 2 IEEE 802.3




Enter=Save   F12=Cancel   Esc=Restore Parameter
```

From the Set Network Parameters screen, press the right arrow key (->) to select the **NVRAM option**. Using the arrow keys to move from field to field and the Backspace key to delete the existing characters, enter information in the following fields to set your IBM Network Station's network parameters:

Network Station IP Address
First Boot Host IP Address
Second Boot Host IP Address
Gateway IP Address
Subnet Mask

When all settings have been entered, press the Enter key.

4. Press the F6 = Set Boot Parameters key.

```
                        IBM Network Station
                        Set Boot Parameters


Boot File ........................ kernel
TFTP Boot Directory .............. /usr/netstation/
NFS Boot Directory ............... /usr/netstation/
Configuration File ..............
Configuration Directory .......... /usr/netstation/configs/

TFTP Order ....................... 2
NFS Order ........................ 1
MOP Order ........................ Disabled
Local Order ...................... Disabled




Enter=Save   F12=Cancel   Esc=Restore Parameter
```

Enter information as indicated in the screen graphic above.

Note: The Configuration File field in the Set Boot Parameters screen should be left blank for the terminal specific configuration to work.

When all settings have been entered, press the Enter key.

5. Press the Enter key after setup is completed to reboot the IBM Network Station.

Repeat this procedure for each IBM Network Station.

The procedure described above allows the configured IBM Network Station to boot from a specific server. You may also need to modify the **/usr/netstation/configs/local.nsm** file to prevent the boot server from switching the IBM Network Station from NVRAM back to bootp. If all IBM Network Stations that boot from this server have the `IP Addressed From` field set to `NVRAM`, add the following line to the **local.nsm** file in the **/usr/netstation/configs** directory:

```
set ip-use-address-discovery = false
```

This forces all IBM Network Stations to use NVRAM.

If some IBM Network Stations that boot from this server have the `IP Addressed From` field set to `NVRAM` and other IBM Network Stations have the `IP Addressed From` field set to `network`, remove or comment out the following line from the **required.nsm** file in the **/usr/netstation/configs** directory:

```
set ip-use-address-discovery = true
```

This allows the setting on the IBM Network Stations to remain unchanged; therefore, it allows a scenario in which some IBM Network Stations are set to `NVRAM` and some to `network`.

DHCP

The RS/6000 server can also be configured to use Dynamic Host Configuration Protocol (DHCP) in the IBM Network Station Runtime Environment for RS/6000.

It's important to note that the RS/6000 can function as only one of the following:

- BootP server (**bootpd** enabled)
- DHCP server (**dhcpsd** enabled)
- BootP/DHCP Relay (**dhcprd** enabled)

Since all of these share one port number (**bootps/67**), only one function can bind to that port number at any given time; therefore, it is only possible to run one.

To configure your RS/6000 as a DHCP server:

1. Disable **bootp** in the **/etc/inetd.conf** file by placing a '#' (pound sign) in the first column of the 'bootps' line. Save the file and refresh the **inetd** subsystem by typing:

   ```
   refresh -s inetd
   ```

2. Check for any active BootP daemons by typing:

   ```
   ps -ef | grep bootp
   ```

   If any bootp processes are running, stop them by typing:

   ```
   kill -9 PID
   ```

   where *PID* is the process ID of the **bootpd** command listed in the previous **ps** command output.

3. Make sure that **dhcprd** is not running by typing:

   ```
   ps -ef | grep dhcprd
   ```

   If it is running, stop it by typing:

   ```
   smit spdhcprd
   ```

and choosing NOW or BOTH to disable **dhcprd**.

4. Add the IBM Network Stations into the BootP table (See "Adding your IBM Network Stations to the BootP table" on page 9) if they have not already been added.

5. Run **/usr/sbin/bootptodhcp**, which is a script to convert the entries in **/etc/bootptab**, the BootP table, into DHCP format.

6. At this point, depending upon your particular environment, the **/etc/dhcpsd.cnf** file may need further configuration. For example, if the IBM Network Station's IP was 9.3.6.7 and the TFTP server IP was 9.3.6.60 with a subnet mask of 255.255.255.192, the following stanza would need to be placed in the **/etc/dhcpsd.cnf** file for the IBM Network Station in question.

   Note: DHCP can work by dynamically assigning an IP address from a pool or by assigning a particular IP address to a particular IBM Network Station each time, as in the example that follows.

```
supportBOOTP yes
network 9.0.0.0 255.255.255.192
{
 subnet 9.3.6.0 9.3.6.1-9.3.6.7
 {
  client 1 0x0000a716a43b 9.3.6.7
  {
     option 1 255.255.255.192
     option 3 9.3.6.60
     option 6 129.35.17.2
     option hd "/usr/netstation"
     option bf "kernel"
     option sa 9.3.6.60
   }
  }
 }
```

   Notes about the above example and syntax of the **/etc/dhcpsd.cnf** file:

   - There **cannot** be any blank lines after the network directive or the subnet directive. Open braces **must** follow those directives on the next available line.

   - The 'supportBOOTP yes' line must also be added to enable the **dhcpsd** (DHCP server daemon) to respond to BootP requests.

   - The client stanza is added by the **bootptodhcp** script (described in step 5).

7. Finally you need to start the **dhcpsd** daemon by typing:

   ```
   smit stdhcpsd
   ```

For more information about DHCP, check these resources:

- the **dhcpsd** man page
- "Internet Naming and Address Management" (*AIXpert*, November 1996), also available at this URL:

  ```
  http://www.developer.ibm.com/sdp/library/aixpert
  ```

RARP

Reverse Address Resolution Protocol (RARP) is listed as a choice in the IBM Network Stations NVRAM boot choices; however, RARP is not supported for booting IBM Network Stations on the RS/6000 platform.

Configuring the Login Environment

AIX provides three environments for the Network Station users to log in:

- XDM
- CDE
- Common Login Environment

Configuring X Display Manager Control Protocol (XDMCP)

Once the IBM Network Stations are configured on the network, you must enable XDMCP compliant software on each AIX system that someone might log in to. You need to decide whether you'll be configuring the X Display Manager (XDM) environment or the Common Desktop Environment (CDE) as the desktop environment in which IBM Network Station users will work.

The X Display Manager (XDM) is used to graphically prompt and authenticate the user to gain access to the server and to launch X applications from that platform. Generally, the Motif Window Manager (MWM) and other X clients like a terminal emulator are started at login time.

The Common Desktop Environment (CDE) Desktop Login (DtLogin) uses the XDMCP protocol to prompt and authenticate the user, but the CDE also includes session management and other desktop services. Additional information about the CDE is available in Appendix A, "More about CDE" on page 69.

You cannot run both desktop environments at the same time from one server. If one environment is running and you try to start the other environment, the system console may lock and you'll be forced to reboot in order to regain access to the console.

Note: You can check whether CDE or XDM is already running on your RS/6000 using the **ps** command. Type at the command line:

```
ps -ef |grep dtlogin
```

to look for the **dtlogin** process, which indicates the CDE is configured on this RS/6000 as the desktop environment, or

```
ps -ef |grep xdm
```

to look for the **xdm** process, which indicates that XDM is configured on this RS/6000 as the desktop environment.

Setting up the CDE

If you'll be configuring the IBM Network Stations to run the CDE **but are not currently running XDM**, this is the procedure:

Note: The **X11.Dt.rte** fileset must be installed on the server.

1. Use the FastPath to open the SMIT Select System User Interface menu:

```
smitty dtconfig
```

OR if you prefer to work in the graphical SMIT interface, type:

```
smit dtconfig
```

2. Use the List function to display available selections for the Select System Login User Interface field. If the AIX host console and IBM Network Stations are to log in to the system using the CDE interface, select the first option, **CDE 1.0** (or **AIXwindows Desktop Environment** in AIX Version 4.1) or the second option, **CDE 1.0 (without graphical boot)** (or **AIXwindows Desktop Environment (without graphical boot)** in AIX Version 4.1).

   Note: The only difference between these two options is that the first option displays a graphical progress indicator on the console of the RS/6000 during boot.

   If you do not have a bitmap capable display as your RS/6000 console and you are configuring your system for CDE for the first time, you will need to follow these steps to keep CDE from trying to run on the console:

   a. Type at the command line, pressing the Enter key after each line:

   ```
   cp /usr/dt/config/Xservers /etc/dt/config/Xservers
   cd /etc/dt/config
   chmod 755 Xservers
   vi Xservers
   ```

   b. Comment out the last line in the file by placing a '#' (pound sign) in the first column. The last line should look like this when you're finished:

   ```
   #    :0   Local local@console /usr/lpp/X11/defaults/xserverrc -T
   -force  :0
   ```

3. Reboot the RS/6000 server for the configuration change to take effect.

Setting up the XDM environment

If you'll be configuring your IBM Network Stations to run XDM **but are not currently running CDE**, this is the procedure:

Note: The **X11.apps.xdm** fileset must be installed on the server.

1. Type at the command line:

   ```
   /usr/lib/X11/xdm/xdmconf
   ```

   If you do **not** have a bitmap capable display as your RS/6000 console OR you do not wish to run XDM on your console in place of the current X11 or other windowing environment, you will need to follow these steps to keep XDM from trying to run on the console:

   a. Type at the command line, pressing the Enter key after each line:

   ```
   cd /usr/lib/X11/xdm
   vi Xservers
   ```

   b. Comment out the last line in the file by placing a '#' (pound sign) in the first column. The last line should look like this when you're finished:

   ```
   #    :0  local /usr/bin/X11/X -T -force
   ```

2. Run **startsrc** as directed below, but please read the note before invoking the command.

Note: If you are currently running an X environment on the console, running the following command will restart the current session as an XDM session. If you do not want to run XDM on the console, follow the steps outlined above to prevent XDM from starting on the console.

Type at the command line:

```
startsrc -s xdm
```

You do not have to reboot if you're installing XDM for the first time (**not** changing from CDE to XDM).

Changing from CDE to XDM

If CDE is running on your system and you want to change so that XDM is the desktop environment for the IBM Network Stations, this is the procedure.

Note: The **X11.apps.xdm** fileset must be installed on the server.

1. Type at the command line:

   ```
   /usr/lib/X11/xdm/xdmconf
   ```

   If you do **not** have a bitmap capable display as your RS/6000 console and you are configuring your system for XDM for the first time, you will need to follow these steps to keep XDM from trying to run on the console:

   a. Type at the command line, pressing the Enter key after each line:

      ```
      cd /usr/lib/X11/xdm
      vi Xservers
      ```

   b. Comment out the last line in the file by placing a '#' (pound sign) in the first column. The last line should look like this when you're finished:

      ```
      #    :0  local /usr/bin/X11/X -T -force
      ```

2. Reboot the RS/6000 server.

   Note: The CDE is still running in the background until you reboot.

Changing from XDM to CDE

If XDM is running on your system and you want to change so that CDE is the desktop environment for the IBM Network Stations in your system, this is the procedure.

Note: The **X11.Dt.rte** fileset must be installed on the server.

1. Use the FastPath to open the SMIT Select System User Interface menu:

   ```
   smitty dtconfig
   ```

   OR if you prefer to work in the graphical SMIT interface, type:

   ```
   smit dtconfig
   ```

2. Use the List function to display available selections for the Select System Login User Interface field.

3. If the AIX host console and IBM Network Stations are to log in to the system using the CDE interface, select the first option, **CDE 1.0** (or **AIXwindows Desktop Environment 1.0** for AIX Version 4.1) or the second option, **CDE 1.0 (without graphical boot)** (or **AIXwindows Desktop Environment (without graphical boot)** for AIX Version 4.1).

> **Note:** The only difference between these two options is that the first option displays a graphical progress indicator on the console during boot.

> If you do not have a bitmap capable display as your RS/6000 console and you are configuring your system for CDE for the first time, you will need to follow these steps to keep CDE from trying to run on the console:

> a. Type at the command line, pressing the Enter key after each line:

```
cp /usr/dt/config/Xservers /etc/dt/config/Xservers
cd /etc/dt/config
chmod 755 Xservers
vi Xservers
```

> b. Comment out the last line in the file by placing a '#' (pound sign) in the first column. The last line should look like this when you're finished:

```
#    :0    Local local@console /usr/lpp/X11/defaults/xserverrc -T
-force  :0
```

4. Reboot the RS/6000 server for the configuration change to take effect.

What's next?

Once you've completed these tasks:

- Configuring your AIX RS/6000 server (See "Configuring your AIX RS/6000 server" on page 5)
- Configuring your IBM Network Stations to be recognized by the server (See "Configuring IBM Network Stations to be recognized by the server" on page 7)
- Configuring XDMCP (See "Configuring X Display Manager Control Protocol (XDMCP)" on page 16)

you should be able to boot your IBM Network Stations. If you have problems booting now, check Chapter 8, "Troubleshooting" on page 67.

Your IBM Network Stations should now be up and running, but you have some optional configuration opportunities available. Some optional tasks are described in the sections that follow:

- "Advanced XDMCP Configuration (optional)" on page 21
- Chapter 5, "Advanced IBM Network Station configuration (optional)" on page 51

Additional optional configuration is discussed in the Windows Manager section of the *User's Guide*.

Common Login Environment

The Common Login Environment is a standard login environment that is supported on all server platforms that serve the IBM Network Stations, such as AS/400 and OS/390. It is provided and enabled on AIX through the Network Station Manager package; i.e., you have to install **netstation.nsm** and **netstation.msg.en_US.nsm** on your AIX system.

Note: Once you have installed the Network Station Manager packages, the Common Login Environment is in effect the next time the IBM Network Station is rebooted. There is no particular set up or configuration needed.

The Common Login Environment is supported across multiple platforms to provide a common look and feel for the Network Station users. It is also the strategic

environment for Network Station management by using the Network Station Manager. It is highly recommended to use the Common Login Environment for all the Network Stations running off AIX, instead of XDM/CDE. If there are hardware configuration and application preferences previously set up in the XDM/CDE environment, refer to Chapter 4, "Using the IBM Network Station Manager Program" on page 27 on how to use Network Station Manager to set them for the Common Login Environment.

After you power-on your IBM Network Station, the following login screen appears:
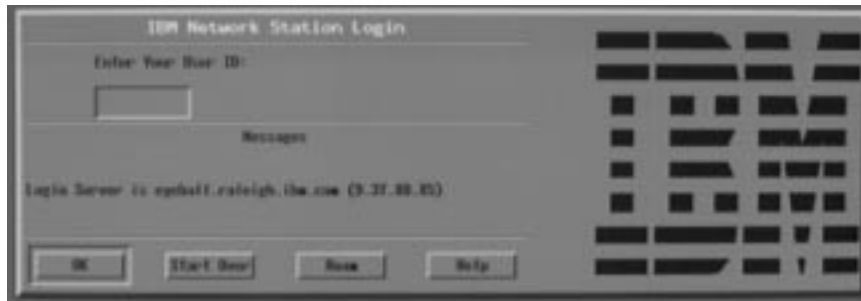

Figure 1. IBM Network Station Login Screen

Figure 1 shows the initial IBM Network Station login screen. Type your user name and press Enter. Type your password and press Enter.

The buttons within the menu bar are:

- Ok

  Clicking Ok sends request to server for processing.

- Start Over

  Clicking Start Over prompts for userid and password.

- Roam

  Clicking Roam allows you to specify the network server to log into.

- Help

  Clicking Help allows you to access Help for the IBM Network Station Manager program.

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

Figure 2 shows the IBM Network Station menu bar, which contains the available applications to select. If any applications were specified to autostart by the IBM Network Station Manager (see Chapter 4, "Using the IBM Network Station Manager Program" on page 27 for more information), they will appear on your screen. If no applications were set to autostart, select any applications that appear in your menu bar. Additional available application buttons are: 5250, the Navio Browser, and NSterm.

Figure 2. IBM Network Station Menu Bar

The buttons within the menu bar are:

- Log Out

  Clicking Logout logs you off the IBM Network Station.

- Hide

  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). This is useful if the menu bar covers part of an application window. Clicking the Hide button changes the button to Show and keeps the menu bar displayed on the screen.

- Move to Top

  Clicking Move to Top moves the menu bar to the top of the screen. The button will read Move to Bottom after the menu bar moves to the top. Clicking the Move to Bottom button, once the menu bar is located at the top, moves the menu bar back to the bottom.

- Other buttons

  Other buttons on the menu bar will be applications available to select and use.

- Lock Screen

  The Lock Screen button allows you to lock the screen when you leave the Network Station. You will be prompted for a lock screen password.

NSLD for RS/6000

In the Common Login Environment, there is a Network Station Login Daemon (NSLD) server running on the RS/6000 to respond to Network Station Login client requests for login information about the user ID logging into an IBM Network Station. The NSLD server first determines if the user ID and password combination passed is valid on this system. If it is not valid, an error response is sent to the client. If it is valid, the information passed back to the IBM Network Station includes the user's user ID and group ID, home directory, and Network Station Manager preference directory. The NSLD server is a daemon process started during the installation of **netstation.nsm**. An entry is also added into the **/etc/inittab** for starting the NSLD server daemon on the next AIX boot.

NSLD is installed in the **/usr/netstation/bin** directory. If the NSLD server is not running, start the NSLD server by typing the following on the command line:

```
/usr/netstation/bin/nsld
```

To terminate the NSLD server, send a SIGTERM signal to the oldest existing NSLD process. This is the process that has a parent process ID of 1. Termination of this process causes all of its children to terminate.

Advanced XDMCP Configuration (optional)

Disallowing specific logins

Using Xaccess

By default, all IBM Network Stations are allowed to access the RS/6000 server via XDMCP; however, XDMCP enables you to control access to the server using the **Xaccess** configuration file. Both CDE and XDM support this type of file.

In CDE, the **Xaccess** file is located in the **/usr/dt/config** directory by default. Copy the **/usr/dt/config/Xaccess** file to the **/etc/dt/config** directory and edit the **/etc/dt/config/Xaccess** file to control access.

In an XDM environment, the **Xaccess** file is located in the **/usr/lib/X11/xdm** directory. To enable XDMCP access control in an XDM environment, edit the **/usr/lib/X11/xdm/Xaccess** file.

By editing the **Xaccess** file, you'll either be allowing or disallowing access to the RS/6000 server from specific IBM Network Stations.

This line in the **Xaccess** file allows access to all IBM Network Stations:

```
*          #grant service to all remote displays.
```

If you want to limit access, start by commenting out that line.

If you would like to allow access only from a specific domain or from specific IBM Network Stations, list those domain names or host names in the file.

If you would like to exclude specific hosts or domains, place an '!' (exclamation point) in front of the names or domains to be excluded.

For example, to allow access from all IBM Network Stations in the `austin.ibm.com` and `dallas.ibm.com` domains except `badhost.austin.ibm.com` and `badhost.dallas.ibm.com`, comment out the 'grant service to all remote displays' line and add the following lines to the **Xaccess** file:

```
*.austin.ibm.com
*.dallas.ibm.com
!badhost.austin.ibm.com
!badhost.dallas.ibm.com
```

Chooser List access control

Probably of more interest to system administrators in an IBM Network Station environment is chooser list access control. If your IBM Network Stations have been configured to automatically send indirect XDMCP requests to the RS/6000 server at boot time, editing the **Xaccess** file allows you to define the list of hosts that is returned. (See Chapter 5, "Advanced IBM Network Station configuration (optional)" on page 51 for more information on configuring IBM Network Stations to automatically send an XDMCP indirect request at boot time.).

This is an example of an indirect CHOOSER list:

```
%hostlist       good-server1 good-server2
*               CHOOSER %hostlist
```

where *good-server1* and *good-server2* are the names of the hosts you want to specify.

With the above lines in the **Xaccess** file and the default CHOOSER line commented out, like this:

```
#         CHOOSER BROADCAST       #any indirect host can get a chooser
```

you can present a restricted host list to your XDMCP indirect users.

Using IBM Network Station configuration files

It's important to note that the default login window that comes up at boot time on the IBM Network Station is not the chooser that is referred to above. The initial chooser window is a local client that does not have access to any sort of **Xaccess** file. However, the following parameters can be used in the IBM Network Station's default configuration file, **/usr/netstation/configs/required.nsm** (See Chapter 5, "Advanced IBM Network Station configuration (optional)" on page 51 for more information on this file) to give the same functionality with the local chooser window:

```
set login-xdm-broadcasts = ignore
set login-restrict-host-choices = true
set login-default-hosts = {
     { tcp good-server1 "Good Server #1" }
     { tcp good-server2 "Good Server #2" }
}
```

where *good-server1* and *good-server2* are the names of the hosts you want to specify.

IBM Network Station display class

The IBM Network Station's display classes IBM-8361-100 (for Ethernet) and IBM-8361-200 (for token-ring) allow you to fine tune AIX's XDMCP configuration.

In the CDE environment, copy your system's **/usr/dt/config/Xconfig** setup file to **/etc/dt/config/Xconfig**, then edit the **/etc/dt/config/Xconfig** file to invoke a session method specifically for the IBM Network Stations. For XDM, edit the **/usr/lib/X11/xdm-config** file to invoke a session method specifically for the IBM Network Stations.

For example, the following lines cause the **Xstartup.ibm8361** script to be run instead of the default **Xstartup** file. The new file can be modified to start up clients (for example, a browser) for all IBM Network Station users when they log in.

```
Dtlogin*startup:                    Xstartup  #default line
Dtlogin.IBM-8361-100.startup:    /usr/netstation/bin/Xstartup.ibm8361
```

More information about using the display class option to fine tune AIX's XDMCP configuration is available in *AIXWindows Desktop Advanced User's and System Administrator's Guide* (SC23-2671) and in *Volume 8: X Window System Administrator's Guide* (Sebastopol, CA: O'Reilly & Associates, Inc.).

Additional information about advanced configuration topics is available in InfoExplorer. Search on xdm and configure the login manager.

NFS

It is highly recommended to enable NFS on the RS/6000 and configure the Network Stations to use NFS for remote file access on servers. More and more Network Station applications rely on NFS access to the server to function properly. Make sure that fileset **bos.net.nfs.server** is installed on your RS/6000 before you install the Network Station packages. During the Network Station installation, the **/usr/netstation** directory is configured to be exported. When Network Stations are booted, the **/usr/netstation** is mounted on the Network Station for subsequent file access.

Note: It is essential for most Network Station applications to have NFS access (read/write) to the user's home directory, such as the IBM Browser and the NC Navio Navigator. To ensure that these applications function correctly, the system administrator needs to properly export the user's home directory. This can be done through the **smitty nfs** command. Take appropriate security precautions when exporting the user's home directory.

Chapter 3. The Common Login Environment vs. the CDE/XDM Environment

What is the Common Login Environment

The Common Login Environment is a desktop environment that provides a common look-and-feel client runtime environment for users of the IBM Network Station when served by IBM servers, such as AS/400, System/390, RS/6000, and so on.

The Common Login Environment is designed to be an integral part of the Network Station Manager. The Network Station Manager program is a Web-based management tool for configuring and managing the IBM Network Stations across multiple server platforms. By running with the Common Login Environment, the Network Station Manager provides multi-level (system-wide, user-specific, terminal-specific) hardware/software configuration control, easy-to-use graphical interface, and consistencies among the IBM Network Stations in a heterogeneous environment.

On AIX, the CDE/XDM environment is the default runtime environment for the associated IBM Network Stations after the Network Station base software (**netstation.base**) is installed. The Common Login Environment and the Network Station Manager are currently supported by a separate package (**netstation.nsm**). After **netstation.nsm** is installed on the server, re-boot the IBM Network Stations, and the Common Login Environment will become effective as the runtime environment on the Network Station.

Please note that most of the Network Station applications will run on any one of the desktop environments (CDE, XDM, or Common Login). The X Server access on the Network Station remains the same as well. However, it is highly recommended to use the Network Station Manager along with the Common Login Environment to manage your IBM Network Stations as well as any future Network Station applications.

Migration from the CDE/XDM environment to the Common Login Environment

As indicated above, to migrate the IBM Network Stations from the CDE/XDM environment to the Common Login Environment, all it takes is to install the fileset **netstation.nsm.rte** and **netstation.msg.xx_xx.nsm.rte**. After the installation is successfully done, simply reboot the IBM Network Stations. Please note that the Network Station Manager is the primary configuration tool in the Common Login Environment. It manages a set of configuration and preferences files that may or may not apply to the CDE/XDM environment prior to the migration. If there are any hardware/software preferences that were setup before, you need to invoke the Network Station manager program to set them again.

Example 1:

If you have the Navio Browser (**netstation.navio** or **netstation.navio-us**) product installed and running with the CDE/XDM environment and you have set up the proxy host configuration by using the **/usr/netstation/bin/NAVconf** command, such as *HTTP PROXY HOST name* to *proxy1*, and *HTTP PROXY HOST TCP/IP PORT Number* to *80*, you can invoke the Network Station Manager program as a system administrator (i.e., root), click on the *Internet* Setup Task, and choose the sub-item *Network*. If the proxy host configuration was done for all users on the system, you can choose to work on the *System defaults* and click the **Next** button. Follow the prompts on the screen and enter *proxy1* for the *HTTP proxy* and *80* for the corresponding *Port*. Click the **Finish** button when you are done.

Example 2:

If a user has changed the mouse settings from default *right-handed* to *left-handed* by creating a **$HOME/.netstationrc** file with entry *set pref-mouse-arrangement = left-handed*, either the system administrator or the user can invoke the Network Station Manager program, choose the *Hardware* Setup Task, choose *User defaults*, enter the username, and click the **Next** button. Follow the prompts on the screen, select *Right handed* for the *Button configuration* under *Mouse Settings*, and click the **Finish** button when you are done.

Refer to Chapter 4, "Using the IBM Network Station Manager Program" on page 27 for more details on how to use the Network Station Manager.

Switching back to the CDE/XDM environment

Please note that the CDE/XDM environment and the Common Login Environment are mutually exclusive. After the **netstation.nsm** package is installed on your RS/6000, if you decide that the CDE/XDM environment is best for your IBM Network Stations to run with, there are two ways to switch back to the CDE/XDM environment:

1. Simply de-install fileset **netstation.nsm.rte** and **netstation.msg.xx_xx.nsm.** Re-boot the IBM Network Stations.

2. Edit the **/usr/netstation/configs/local.nsm** file. Find the following line in the file:

```
set exec-startup-commands = { actlogin }
```

Comment it out by putting a *#* at the beginning of this line. Re-boot the IBM Network Stations.

Chapter 4. Using the IBM Network Station Manager Program

The IBM Network Station Manager program is a browser-based application program. This application program allows you to perform the setup and management tasks that are associated with one or all of your IBM Network Stations and IBM Network Station users. Setup Tasks are:

- Hardware configuration:

  Examples of configurable Hardware settings are: specifying primary mouse buttons (left or right-handed), mouse pointer speeds, screen savers, desktop background, and more.

- Startup application and program selection

  - Programs and menus

    Examples of configurable Startup settings are 5250 sessions, 3270 sessions, remote program sessions, Java application or applets, and IBM Network Station Browser sessions.

  - Environment variables

    Environment variable settings are also configured under Startup. Environment variables can be used with Startup programs, menus, or any applications that are running on the IBM Network Station.

- Desktop Management

  Examples of configurable Desktop settings are screen colors for window frames, Icon placement, Font selection, and specifying how windows on the Network Station are made active.

- 3270 Session configuration

  Examples of configurable settings for 3270 sessions are screen size, key remapping capability, color customization, and 3270 sessions with graphics support.

- 5250 Session configuration

  Examples of configurable settings for 5250 sessions are screen size, key remapping capability, color customization (basic and advanced), record/playback, and edit/copy/paste functions.

- Internet configuration

  - Network

    Examples of configurable Network settings are E-Mail address, default home page, proxy settings, and encrypted or non-encrypted version of the IBM Network Station Browser.

  - IBM Browser

    Examples of configurable IBM Browser settings are disk caching, auto loading of images, print headers and footers, and print margins.

  - Navio NC Browser

    Examples of configurable Navio NC Browser settings are caching, auto loading of images, and network buffer size.

  - Java Applet Viewer

Examples of configurable Java applet viewer settings are message style, heap and stack size settings, and defining properties.

This application also allows you to view the error messages generated by the Network Station Manager program. This facility is limited to the Network Station Manager administrator only.
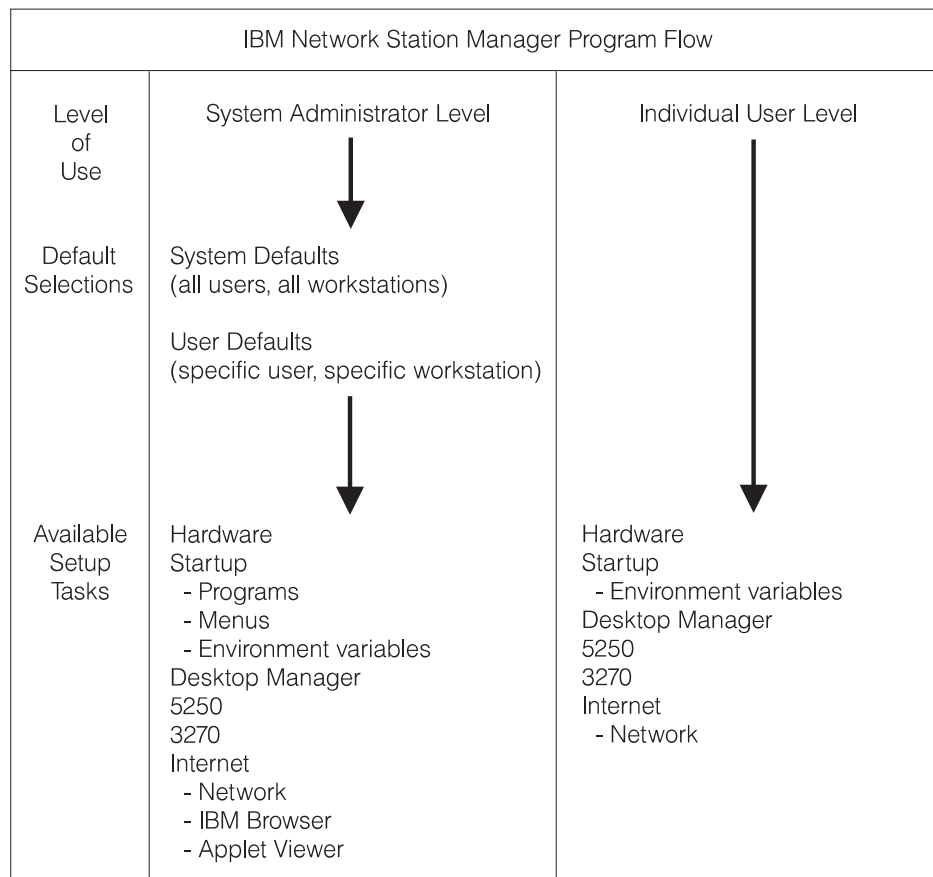
This chapter discusses the following IBM Network Station Manager program topics:

- IBM Network Station Manager program overview
  - Who can use the IBM Network Station Manager program
  - Working with IBM Network Station Manager defaults
  - Working with settings
- Starting the IBM Network Station Manager program. This section discusses:
  - Starting the IBM Network Station Manager program from a web browser
  - Signing onto the IBM Network Station Manager program
- Working with the IBM Network Station Manager program - Examples
- Viewing Network Station Manager Error Messages

IBM Network Station Manager Program - an Overview

Figure 3 on page 29 provides a graphical view of how the IBM Network Station Manager program flows. Take a moment to study Figure 3 on page 29; it highlights the differences between the defaults and setup tasks that a system administrator and end user can work with.

```
┌─────────────────────────────────────────────────────────────────────────────┐
│                    IBM Network Station Manager Program Flow                     │
├──────────────┬────────────────────────────────┬──────────────────────────────┤
│  Level       │  System Administrator Level      │      Individual User Level     │
│  of          │              │                   │              │                │
│  Use         │              ▼                   │              │                │
│              │                                  │              │                │
│  Default     │  System Defaults                 │              │                │
│  Selections  │  (all users, all workstations)   │              │                │
│              │                                  │              │                │
│              │  User Defaults                   │              │                │
│              │  (specific user, specific        │              │                │
│              │   workstation)                   │              │                │
│              │              │                   │              │                │
│              │              ▼                   │              ▼                │
│  Available   │  Hardware                        │  Hardware                     │
│  Setup       │  Startup                         │  Startup                      │
│  Tasks       │    - Programs                    │    - Environment variables    │
│              │    - Menus                       │  Desktop Manager              │
│              │    - Environment variables       │  5250                         │
│              │  Desktop Manager                 │  3270                         │
│              │  5250                            │  Internet                     │
│              │  3270                            │    - Network                  │
│              │  Internet                        │                               │
│              │    - Network                     │                               │
│              │    - IBM Browser                 │                               │
│              │    - Applet Viewer               │                               │
└──────────────┴────────────────────────────────┴──────────────────────────────┘
                                                                        RV4V005-3
```

Figure 3. IBM Network Station Manager Program Flow

Who can use the IBM Network Station Manager Program?

As shown in Figure 3, both system administrators and individual end users can access and use the program.

System Administrators

System administrators are users having root authority and can work at a level that is either system-wide or specifically for one user or one Network Station. For example, an administrator could specify that all IBM Network Station users will have one 3270 emulation session available and that one particular user could have an additional 3270 emulation session.

For information on how to sign on to the IBM Network Station Manager program, see "Starting the IBM Network Station Manager Program using a Browser" on page 34.

Figure 4 on page 30 shows the screen a system administrator sees after signing onto the IBM Network Station Manager program. Notice the range of functions presented in the Setup Tasks frame.

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

Figure 4. System Administrator Level

Compare these functions to the range of functions that are available to individual
end users as shown in Figure 5 on page 31.

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 to settings that
pertain only to themselves.

The following diagram shows the screen that an end user would see after signing
onto the IBM Network Station Manager program. Notice the range of functions
presented in the Setup Tasks frame.
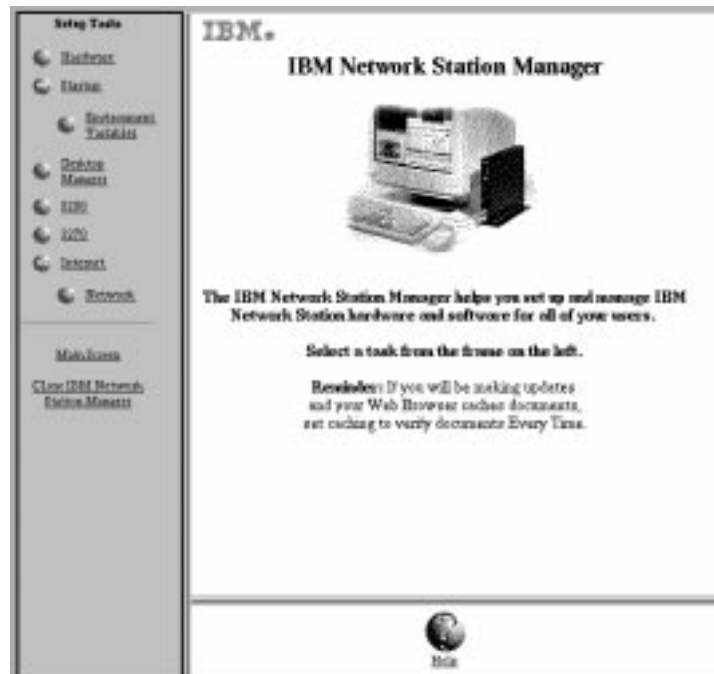
Figure 5. End-user Level

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 three levels of defaults. They are:

- IBM-supplied defaults

  IBM-supplied defaults are provided for all settings that are supported by the IBM Network Station Manager program.

  The IBM-supplied defaults cannot be changed. They can be overridden by using the IBM Network Station Manager program feature of System defaults or User level defaults.

  See Appendix E, "IBM Network Station Manager Program Shipped Default Settings" on page 79 for a complete list of all IBM-supplied default values for the IBM Network Station Manager program.

- System defaults

  System defaults are used to change settings for all users or all Network Stations.

  System defaults take precedence over IBM-supplied defaults.

- User defaults

  User defaults are used to change settings for an individual user or individual Network Station.

  User 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. (That is, 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.

IBM Network Station Manager Program Defaults - Example

This example uses the Desktop background setting that is in the Hardware function of Setup Tasks.

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

At this point, the administrator determines that all Desktop backgrounds will be set 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 new desktop background color of dark red, a user determines it is too difficult to look at for long periods of time and 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, User defaults and specify the user name of the person who is requesting the change. Scroll to the Desktop background field and specify green. 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 the user changed the Desktop setting, they would go directly to the Hardware settings panel, bypassing the Default selection panel.

2. To view this change in Desktop settings you would have to log off and then log on to the Network Station.

Working with System-Wide Defaults

Figure 6 on page 33 is representative of the panel that appears when a selection is made from the Setup Tasks frame. In this example, the Hardware Defaults panel is used.
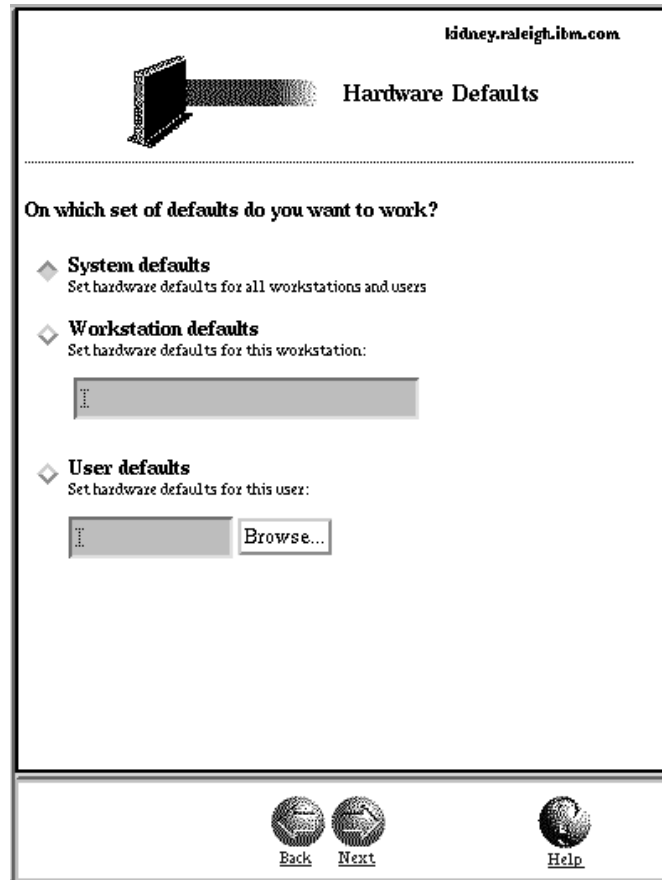
Figure 6. Hardware Defaults

As you can see, the Hardware Defaults panel allows you to work with System defaults for all Network Stations and users, Network Station defaults for a particular Network Station, or User defaults for a particular user. The Hardware Defaults panel is unique in that it allows you to specify settings for Network Stations in addition to specific users. If you want to specify defaults for a particular user, you can click the Browse button and get a list of users on the system.

System defaults have settings that are not available when working with an individual user or Network Station.

Working with Individual User Defaults
User defaults are designed to change settings on a user-by-user basis, one user at a time. This gives you flexibility in custom tailoring individual sessions.

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

Working with Settings
Settings are fields that you see after you have selected which defaults (System or User) you want to work with. For example, Figure 7 on page 34 shows the Desktop Manager Settings fields for Screen colors, Icon preferences, Fonts, and Window focus.

Figure 7. Desktop Manager Settings Fields

In this example, Figure 7 represents Desktop settings that are being worked with from the System Defaults level. That means that any changes to the settings would be applied to **ALL** users.

Note: Settings in the Startup function of Setup Tasks work differently than the settings in other Setup Tasks. The difference is that any changes that are made at the system default level and user default level are added to the settings that are shipped with the IBM-supplied default settings.

For example, the IBM-supplied default is that all users have one 5250 session. Then, in Setup Tasks, the administrator selects Startup, Menus, System defaults, 5250 and applies this setting. The result is that all users would now have two 5250 sessions available to them.

Starting the IBM Network Station Manager Program using a Browser

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

To start working with the IBM Network Station Manager program, power-on your IBM Network Station, login, and click **IBM Browser** from the Menu bar on your IBM Network Station as shown in Figure 8.

Figure 8. IBM Network Station Menu Bar

Note: If you do not have, or have not installed, the IBM Network Station Browser licensed program, you can use the following web browsers to sign on to the IBM Network Station Manager program from your Network Station:

- Netscape** 3.01
- Microsoft Internet Explorer** 3.01

The IBM Network Station Browser appears as shown in Figure 9:

Figure 9. IBM Network Station Browser Sign on Screen

Click the Edit pulldown and select IBM Network Station Manager Preferences as shown in Figure 10 on page 36:
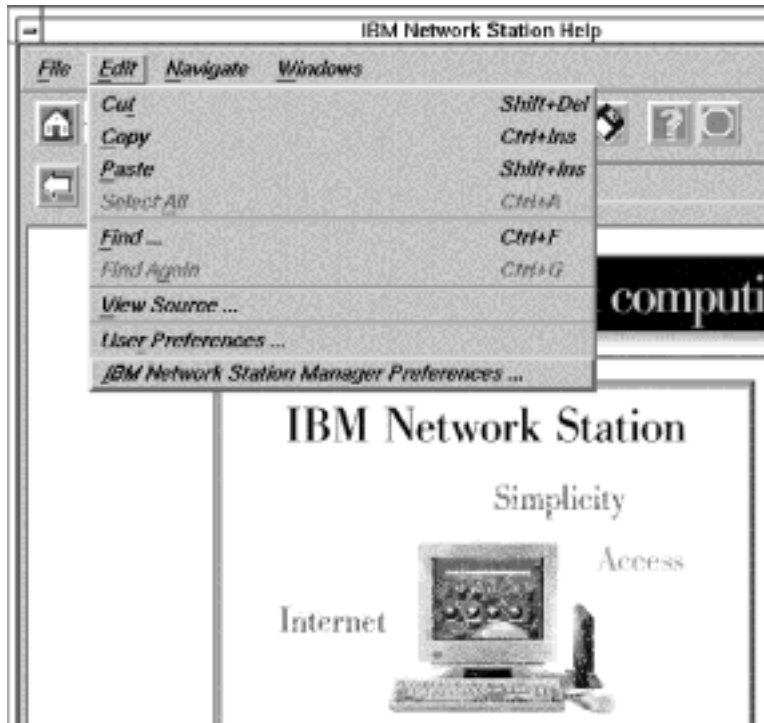
Figure 10. IBM Network Station Browser Sign on Screen with Edit Pulldown

The IBM Network Station Manager program sign-on screen appears:

Figure 11. Sign on Screen

Note: An alternative way to reach the IBM Network Station Manager program sign-on screen is to enter the following case-sensitive URL in the IBM Browser's URL field:

http://yourservername:portnumber/NetworkStation/Admin

where:

- ***yourservername*** is the host name or TCP/IP address.
- ***portnumber*** is the port that is configured for use with the IBM Network Station program.

If you have not changed the default port number for the ICS Webserver (80), you do not need to specify *portnumber*.

Type your username and password, then click **Ok**

The Main Screen of the IBM Network Station Manager appears:

Figure 12. 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.

As shown in Figure 12, setup tasks are represented by icons in the left-most frame of the screen.

Clicking on any icon presents a panel where you select which set of Defaults you want to work with.

When working with these examples, select User defaults and use your own user name. Then, when you are done going through the examples, you will be able to see the results on your Network Station.

In order to see the changes you make using the IBM Network Station Manager program, you will have to log off and then log on to your Network Station. Do not do this until we have gone through all of the examples that are presented here.

Notes:

1. When going through the examples, the Main panel and the Default selection panel will not be presented in this document every time.

2. See "Additional IBM Network Station Manager Program Examples" on page 46 for information on working with remote programs such as AIX sessions and WinCenter Pro for PC applications.

Hardware Settings - User Example

From the Setup Tasks frame, click Hardware.

Select User defaults, and type in your user name (user001 in this example) as shown in Figure 13.
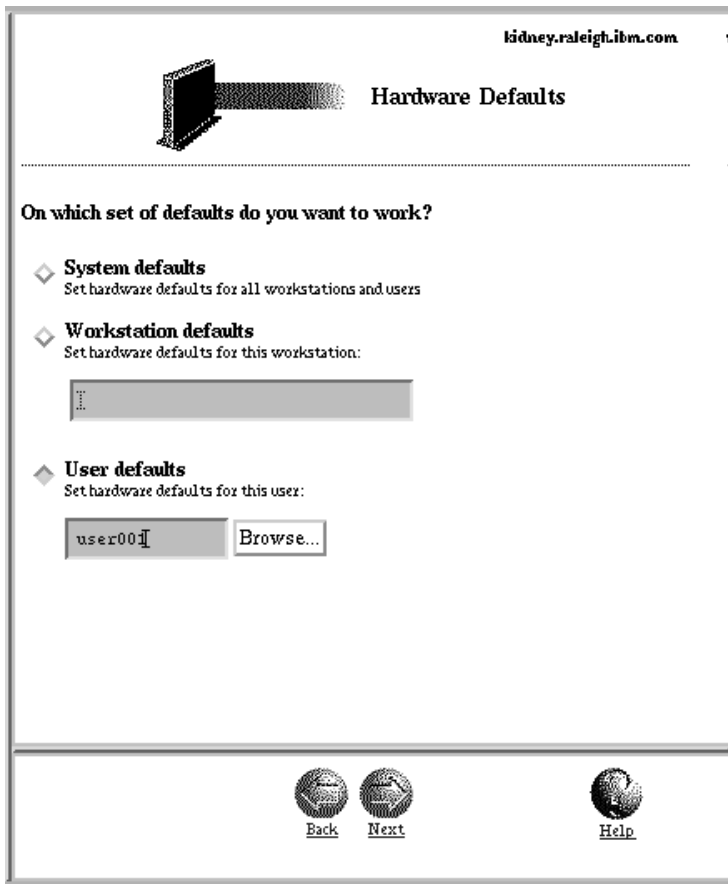
Figure 13. Hardware Defaults Panel with User Defaults Specified

In the bottom frame, click Next to continue.

The Hardware Settings frame appears as shown (scrolled-down) in Figure 14 on page 39.

Note: The "Update host table and DNS configuration from server" option in the system-wide hardware settings is disabled in the current release.

Figure 14. Hardware Settings User Example

Scroll to Desktop background and select the Tiles bitmap.

Click Finish to apply the change. Go to the next example.

Startup Settings Example

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

The Programs Settings frame appears as shown in Figure 15 on page 40.
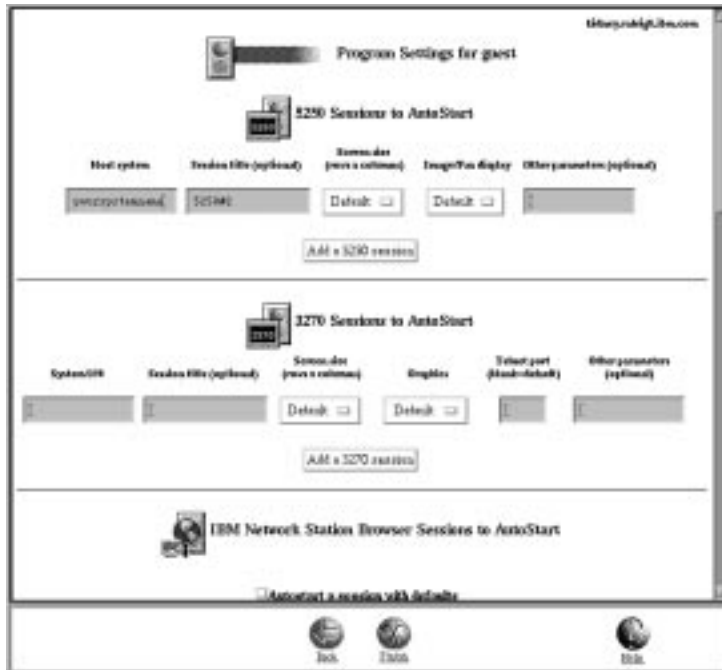
Figure 15. Startup Settings Example

Scroll to 3270 Sessions to Autostart. This setting, when completed, will automatically start a 3270 session for you when you sign on to your Network Station. Complete the following fields:

- S/390 system - Type the name or TCP/IP address of the S/390 your 3270 session will be established with.

- Session title - Type in a text string that represents your 3270 session. For example, 3270#2. This text string will appear in the Title bar of your 3270 session. This field is optional and you do not need a value. However, in this example you might want to try a name (3270#2) so you can see it when we verify the examples.

- For the other settings fields, use the defaults.

  Click Finish to apply the change. Go to the next example.

Desktop Manager Example

From the Setup Tasks frame, click Desktop Manager and select User defaults. In the bottom frame, click Next to continue.

The Desktop Manager Settings frame appears as shown in Figure 16 on page 41.

Figure 16. Desktop Manager Settings Example

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

Click Finish to apply the change. Go to the next example.

5250 Example

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

The 5250 Settings appear as shown in Figure 17 on page 42.
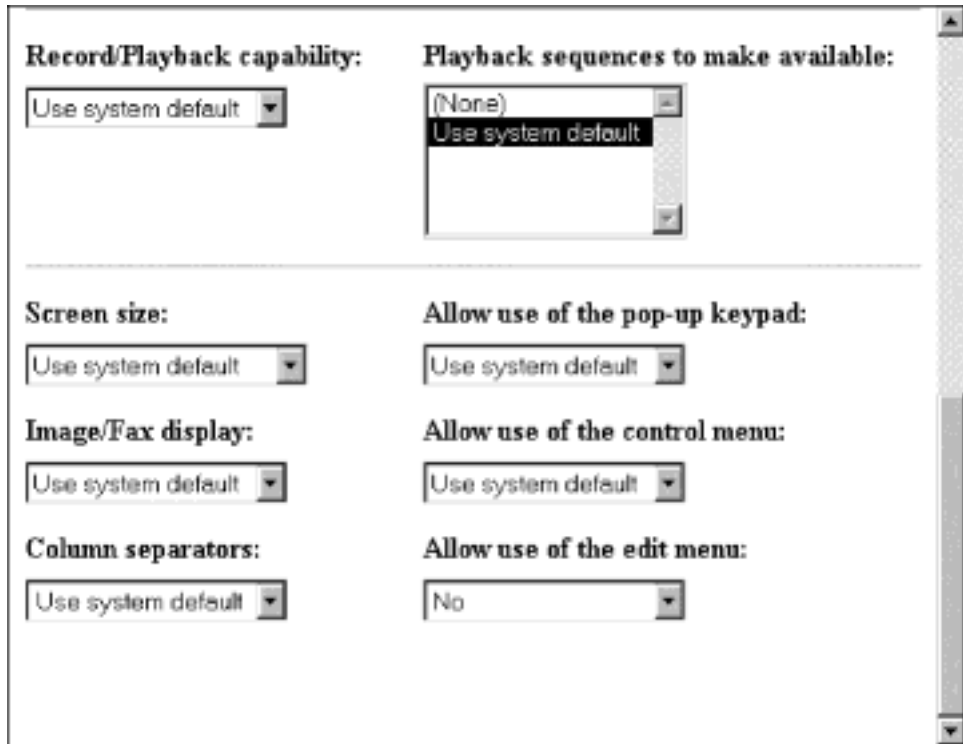
Figure 17. 5250 Setting Example

Scroll to the Allow use of the edit menu field and select No to disable the edit menu. (The default is Yes, meaning that you can use the edit menu).

By disabling Allow use of the edit menu, your 5250 sessions will not have the Edit pulldown displayed for use.

Click Finish to apply the change. Go to the next example.

3270 Example

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

The 3270 Settings panel appears as shown in Figure 18 on page 43.
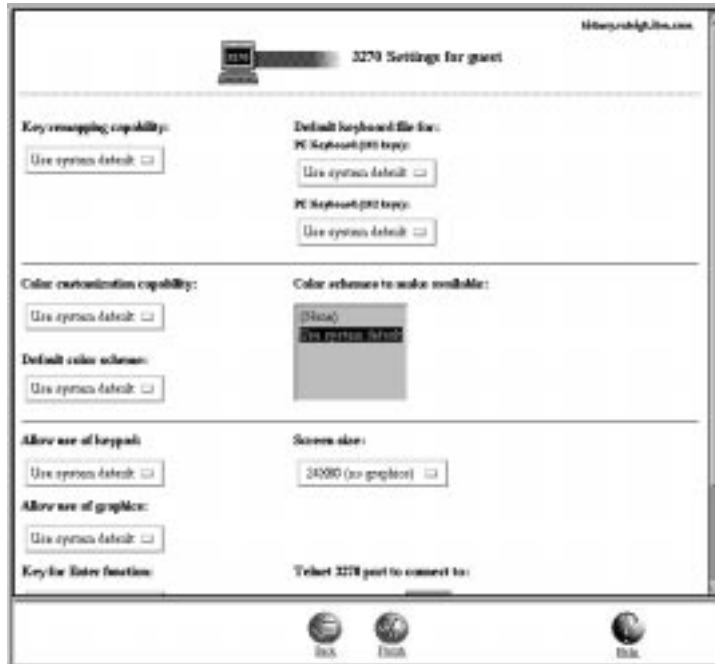
Figure 18. 3270 Settings Example

Scroll to the Screen size field. Select 24 x 80.

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

Click Finish to apply the change. Go to the next example.

Internet

Changing the IBM Network Station Default Port Number

The default ICS Webserver number is port 80. This port number is also the default port number used by the IBM Network Station browsers to access the IBM Network Station Manager program. If the ICS Webserver configured for use with IBM Network Station Manager program does not use the default port 80, do the following steps to configure the IBM Network Station browsers to select the appropriate port.

1. Invoke the IBM Network Station Manager program

```
http://yourservername:portnumber/NetworkStation/Admin
```

where:

- *yourservername* is the host name or TCP/IP address of the ICS Webserver

- *portnumber* is the port that is configured for use with the IBM Network Station Manager program

If you have not changed the default port number for the ICS Webserver (80), you do not need to specify *portnumber*

Enter the URL and log as a system administrator.

2. Access the Internet Network System default panel. The Internet Network System panel appears as shown in Figure 19 on page 44.

   From the 'Setup Tasks' frame on the left, click Internet, click Network, and select System defaults. In the bottom frame, click Next to continue.

3. Update the port number.

   Scroll to the 'Proxy Section'. At the end of this section, see the following:

   Web server port on the boot host:

   To the right is a box that indicates 'Use default' or key in the new port number.

   Enter the new port number (for example 8080).

   Select Finish.
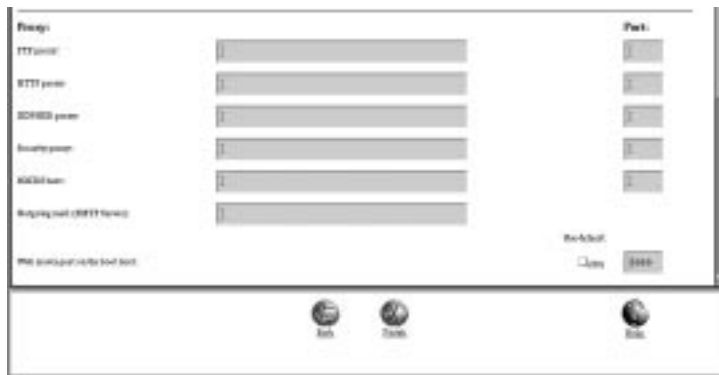
Figure 19. IBM Network Station Manager program Internet Network System Defaults

Reboot the IBM Network Station. Do the following to verify the change.

1. Select Edit

2. Select Network Station Manager Program Preferences.

The updated port number appears in the URL.

Changing Other Internet Settings

From the Setup Tasks frame on the left , click Internet, click Network, and select System defaults. In the bottom frame, click Next to continue.

The IBM Network Station Browser Settings frame appears as shown in Figure 20 on page 45.

Figure 20. IBM Network Station Browser Settings Example

Scroll to the Proxy Section heading and select No in the Auto load images field.

Note: Remember that if you apply this change, no images will display when you are using a browser. After a page loads the text, you can use the browser's Navigate pulldown menu to load the images. Select the Navigate pulldown, and then select Load Missing Images.

Click Finish to apply the change. Click Main Screen in the Setup Tasks frame.

Verifying your Setting Changes

After completing the examples, you can verify the settings you specified.You will need to log off and then log on for the settings to be applied.

Do not forget: If you do not want any of the settings specified in the example exercises to remain, you will have to use the IBM Network Station Manager program to return them to the original settings or some other settings of your choice.

IBM Network Station Manager Program Education

It is recommended that you provide some hands-on education, similar to what you just experienced going through the above examples, for your users of the IBM Network Stations.

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

Additional IBM Network Station Manager Program Examples

Following is a list of additional 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 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 setup an AIX session by using the IBM Network Station Manager program:

1. Verify that the user name and password on the host system match the user name and password on the AIX server.

2. You must create a **.rhosts** file on the AIX server. This file must contain the IBM 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 userid of user001:

```
                    Contents of File

Directory Structure:              /home/user001
File name:                        .rhosts
IBM Network Station name          MYNWS.mycompany.ABC.com
Name user signs on with:          user001
```

   This file can contain multiple lines. Each line should have one IBM Network Station name and one user name on it. If a user will be working from more than one IBM Network Station, create an entry for each IBM Network Station.

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

4. From Setup Tasks, click Startup.

5. Under Startup, click Menu.

6. From Program Defaults, click User defaults.

   If you are setting this up for someone else, type their user name or click Browse to select their user name if you do not know it.

7. Click Next to continue.

8. Scroll ahead to Remote Programs. Type in the information as shown in Figure 21 on page 47.

Figure 21. Remote Program Example for AIX

Where:

Menu item label
This text string will appear in the Menu bar on the IBM 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 IBM Network Station rather than on the remote host. ${IP} is an IBM-supplied environment variable that gets replaced with the IP address of the IBM 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 and ${IP}:0.

9. Click Finish to apply the AIX remote program setting.

10. Log off and then log on your IBM Network Station. In the Menu bar there will be a button that is labeled AIX-Session, as shown in Figure 22.

Figure 22. Menu Button for Remote Program Example for AIX

11. Click AIX-Session and a window will open with your X-station session.

From the Aixterm window, you can run additional programs.

Setting up a Windows NT Session using the IBM Network Station Manager Program

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

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

2. Verify that the user has a valid user name and password on the Windows NT server. When the session from the Windows NT server is requested on the IBM Network Station, the user will have to sign on.

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

4. From Setup Tasks, click Startup.

5. Under Startup, click Menu.

6. From Program Defaults, click User defaults.

   If you are setting this up for someone else, type their user name or click Browse to select their user name if you do not know it.

7. Click Next to continue.

8. Scroll ahead to Remote Programs. Type in the information as shown in Figure 23.

Figure 23. Remote Program Example for Windows NT

Where:

Menu item label
    This text string will appear in the Menu bar on the IBM Network Station.

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

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

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

    The required parameters for WinCenter Pro are: -display and ${IP}:0.

9. Click Finish to apply the WinCenter Pro remote program setting.

10. Log off and then log on your IBM Network Station. In the Menu bar there will be a button that is labeled WinCenter Pro, as shown in Figure 24.

Figure 24. Menu Button for Remote Program Example for NT - EDBAR

11. Click WinCenter Pro and a window will open with your WinCenter session.

Viewing Network Station Manager Error Messages

Only system administrators can view network station manager error message descriptions online From the Setup Task frame, click Network Station Manager Error Messages. This will open the window as shown in Figure 25.

Enter the error message number you want to view and click on Submit. You can enter an error number with or without message prefix, such as 7350.

The corresponding error message will be displayed as shown in Figure 26 on page 50. Variable tokens, which are substituted in the messages, are highlighted within brackets ([]).

Use the back button to go to the previous screen if you want to see another error message. The Close button will close this new window.

Figure 25. Network Station Manager's Error Messages

Figure 26. Network Station Manager's Error Message Displayed

Chapter 5. Advanced IBM Network Station configuration (optional)

The installation program sets up basic configuration information for the IBM Network Stations. If you want to make changes to these configuration specifications, you can modify the **local.nsm** file in the **/usr/netstation/configs** directory.

There are four files in the **/usr/netstation/configs** directory; the files are read in the following order, and the latest read takes precedence:

1. standard.nsm
2. required.nsm
3. control.nsm
4. local.nsm

Therefore, the changes you make in the **local.nsm** file take precedence over entries in **required.nsm** and **control.nsm**.

This is a typical entry in **local.nsm** (or **required.nsm** or **control.nsm**):

```
set login-xdm-action-on-disconnect = logout
```

The entry defines what happens when a user logs out of a desktop session.

To understand the meaning of a parameter listed in any of the configuration files in **/usr/netstation/configs**, refer to the **/usr/netstation/configs/configd.doc** file, which contains descriptive information about each parameter.

Note: Since the **configd.doc** file contains entries for hundreds of parameters, a useful way to find the one you need is to open the file in a text editor (for example, vi), then search for the parameter you want to change.

This is the **configd.doc** entry for the logout parameter:

NAME	login-xdm-action-on-disconnect
HIDEBOX	Console=>Setup=>Change Setup
	Parameters=>Login=>What to do when XDM disconnects
SNMP NAME	ncdXdmcpWhenFirstClientExits
SNMP PATH	ncdXdmcp 8
TYPE	CHOICE
CHOICES	{ logout prompt ignore }
DEFAULT	prompt
PERMISSION	READ-WRITE
EFFECT	IMMEDIATE
NVRAM	NO
DESCRIPTION	Specifies what to do when the host XDM program disconnects from the display.

In this case, by default the IBM Network Station prompts the user for confirmation that he or she wants to end the desktop session and return to the initial login window. The logout parameter can be configured to automatically logout without the extra prompt, or to ignore the logout request.

The parameters that are most likely to be of interest to system administrators are listed in the **/usr/netstation/configs/required.nsm** file and the

/usr/netstation/configs/control.nsm file. By becoming familiar with these options, you can configure the IBM Network Station environment to match users' needs.

These are additional examples of how you can use the parameters listed in the **configd.doc** file to fine tune the IBM Network Station environment:

- To have the IBM Network Stations boot directly to an XDMCP login window from a particular host machine, use the following line in the **local.nsm** file:

```
set exec-startup-commands = { {"login RSserver"} }
```

  where *RSserver* is the name or IP address of the host from which you would like a login window.

- The IBM Network Station can also boot directly to an XDMCP Indirect Chooser window from a host on the network. Insert the following line in the **local.nsm** file:

```
set exec-startup-commands = { {"login @RSserver"} }
```

  where *RSserver* is the name or IP address of the host. The '@' symbol tells the IBM Network Station to request an indirect login window from the *RSserver* host machine. See "Chooser List access control" on page 22 for more information about XDMCP Indirect Chooser.

- To have the IBM Network Station automatically disable or enable X server access control at boot time, use the following parameter:

```
set xserver-access-control-enabled = false
```

  or

```
set xserver-access-control-enabled = true
```

  Setting this parameter to false is equivalent to invoking **xhost+**; it allows any host to send a window to the IBM Network Station.

  The parameter **xserver-access-control-list** contains a list of host names for granting X server access. For example, to allow X applications on host1 and host2 to access the Network Stations, specify the following to the **local.nsm**:

```
set xserver-access-control-list = {
    { host1 tcpip }
    { host2 tcpip }
    }
```

- To change the DNS name server entry, edit the following four lines in the **local.nsm** file (these lines are written to your **required.nsm** file by the **nsconf** script if the server has an **/etc/resolv.conf** file, pointing to a nameserver):

```
set tcpip-name-server-protocol = dns
set tcpip-name-servers = {
        { 129.35.17.2 }
        }
```

- If you would like to disable the console window or any other local client utilities, add the following parameters to the **local.nsm** file:

```
set exec-disabled-commands = {
  { console }
      }
```

- You may want to disable some parts of the console, but not the entire console menu. This can be accomplished on a client-by-client basis. For example, the

following will still allow access to the console window, but will gray out the setup menu options and disallow access to those client utilities:

```
set exec-disabled-commands = {
        { setup }
        { quicksetup }
        { pref }
    }
```

- To set a default DNS domain on the IBM Network Station, add the following line to the **/usr/netstation/configs/local.nsm** file:

```
set tcpip-dns-default-domain=austin.ibm.com
```

- To do NFS mounts, add this line to the **/usr/netstation/configs/local.nsm** file (enter all on one line):

```
set file-service-table[-1" = {"local_mount_point" nil "NFS_server_IPaddress" nfs "NFS_exported_directory" unix 3 30 8192 8192}
```

These variables are supplied by you:

local_mount_point
NFS_server_IPaddress
NFS_exported_directory

These pieces are defined as follows:

nil   vms mount point (set to nil)

3   retransmission timeout

30   transaction timeout

8192   read size

8192   write size

These pieces must be entered as shown:

nfs
unix

You can append lists in the **required.nsm** or **control.nsm** file (for example, `tcpip-name-servers`) by adding a line to the **local.nsm** file. This is the syntax:

parameter[-1] = *additional_list_entry*

For example, to add to the list of name servers (`tcpip-name-servers` parameter) in the **required.nsm** file, add the following line to the **local.nsm** file:

```
set tcpip-name-servers[-1] = {129.35.17.2}
```

Note: For a complete list of local clients commands and utilities, please see Appendix B, "Local Clients" on page 71.

Chapter 6. Miscellaneous Administration Tasks

AIX server routing

If you set up your RS/6000 server as a gateway between your IBM Network Stations and other networks, you must configure the **/etc/rc.net** file to do IP forwarding. Add the following line to the end of the **/etc/rc.net** file:

```
/usr/sbin/no -o ipforwarding=1
```

Note: If you would like your RS/6000 to begin forwarding IP packets immediately, execute this command manually at the command prompt.

BootP Relay Configuration

If you set up your RS/6000 server to be a gateway between your IBM Network Stations and the IBM Network Stations' boot server and you wish to use BootP or DHCP, you must configure AIX's **/etc/dhcprd.cnf** file to do direct broadcast forwarding. Once configured, the RS/6000 will forward the IBM Network Station's BootP or DHCP broadcast message to a specific boot server on another network.

It's important to note that the RS/6000 can function as only one of the following:

- BootP server (**bootpd** enabled)
- DHCP server (**dhcpsd** enabled)
- BootP/DHCP Relay (**dhcprd** enabled)

Since all of these share one port number (**bootps/67**), only one can bind to that port number at any given time; therefore, it is only possible to run one.

This is the procedure to configure BootP relay:

1. Disable **bootp** in the **/etc/inetd.conf** file by placing a '#' (pound sign) in the first column of the 'bootps' line. Save the file and refresh the **inetd** subsystem by typing:

   ```
   refresh -s inetd
   ```

2. Check for any active BootP daemons by typing:

   ```
   ps -ef | grep bootp
   ```

   If any **bootp** processes are running, stop them by typing:

   ```
   kill -9 PID
   ```

   where *PID* is the process ID of the **bootpd** command listed in the previous **ps** command output.

3. Make sure that **dhcpsd** is not running by typing:

   ```
   ps -ef | grep dhcpsd
   ```

   If it is running, disable it by typing:

   ```
   smit spdhcpsd
   ```

   and selecting NOW or BOTH to disable **dhcpsd**.

4. Edit the **/etc/dhcprd.cnf** file to specify the IP address of each server to which the IBM Network Stations' BootP/DHCP broadcast should be forwarded. Entries are in this form:

```
server  IP_address
```

where *IP_address* is the IP address of the destination server. To have the IBM Network Station BootP or DHCP broadcast forwarded to multiple BootP or DHCP servers, add additional 'server' lines.

5. Start the **dhcprd** daemon by typing at the command line:

```
smit stdhcprd
```

and select NOW or BOTH to start **dhcprd**.

Attached Printer Installation and Configuration

In the RS/6000 environment, printing from an RS/6000 Xwindow or application on an IBM Network Station to an attached printer is done through the AIX print spooler subsystem. You define a queue for each printer attached to the IBM Network Station. Jobs to be printed are submitted using standard AIX print commands—for example, **qprt** and **enq**.

Local IBM Network Station clients do not use the spooler subsystem for printing.

Please see *AIX Version 4 Guide to Printers and Printing* (SC23-2783) or later for general AIX printer installation and configuration information.

Installation

Install the latest Hewlett-Packard JetDirect Network Printer Attachment software from the **hpJetDirect.attach** fileset, found in the **printers.hp** bundle delivered with the AIX system media. A system running AIX 4.1.5 also requires APAR IX68615.

If you need additional printer support information, please see *AIX Version 4 Guide to Printers and Printing* (SC23-2783) or later.

Configuration

Configuring AIX printing from an IBM Network Station to an attached printer includes these tasks, described further in the sections that follow:

1. Define AIX printer queue(s) for IBM Network Station-attached printers.

2. Update the **/etc/qconfig** file to correctly reference the serial or parallel ports.

3. For serial port printers only (not necessary for parallel port printers), configure serial port access.

4. Connect a printer to the IBM Network Station.

1. Define AIX printer queue(s) for IBM Network Station-attached printers

This is the procedure to define the printer queue(s):

1. As root, use the FastPath shortcut to open the SMIT Add a Print Queue menu:

```
smitty mkpq
```

OR if you prefer to work in the graphical SMIT interface, type:

```
smit mkpq
```

2. Select **hpJetDirect ATTACHMENT TYPE** from the Add a Print Queue menu.

3. Select your printer type from the Printer Type list.

4. Select your printer model from the Printer Type list that displays. If your printer is not listed, select **Other** to use a generic printer definition.

5. Select option 2, **Do NOT make this system a BOOTP/TFTP server**, in the BOOTP/TFTP Server dialog box.

6. In the Add a Print Queue dialog box, enter the names of new print queues to add and the hostnames of the IBM Network Stations. Depending on the AIX system level, the PORT option field may be displayed; leave it set to the default.

7. Press the Enter key to create the queue(s).

2. Update the /etc/qconfig file to correctly reference the serial or parallel ports

This is the procedure to update the **/etc/qconfig** file:

1. Open the **/etc/qconfig** file in a text editor (for example, vi).

2. Search for the printer queue name you defined using the procedure described previously.

   The entry found should be similar to this:

   ```
   PostScriptPrinterQ:
    device = hp@NetStationHostname

   NetStationHostname:

    file = /var/spool/lpd/pio/@local/dev/hp@NetStationHostname#hpJetDirect
    header = never
    trailer = never
    access = both
    backend = /usr/lib/lpd/pio/etc/piojetd NetStationHostname
   ```

3. If you're using an AIX 4.1.5 system, change the following line:

   ```
   backend = /usr/lib/lpd/pio/etc/piojetd NetStationHostname
   ```

   to this:

   ```
   backend = /usr/lib/lpd/pio/etc/piojetd NetStationHostname portNumber
   ```

   If you're using an AIX 4.2.1 system, a port number will already be included in the backend line.

   The port number argument must be the one defined for the IBM Network Station serial or parallel port. The defaults are 87 for serial port and 5964 for parallel port. These values are variable, but must be those defined to the IBM Network Station.

   If you are attaching printers to both parallel and serial ports, you must define separate queues and modify the **/etc/qconfig** file for each queue to reflect the correct port number.

3. Configure serial port access

Note: This is required only if you are configuring serial ports; if you are configuring parallel ports, skip this step.

The procedure to configure serial port access depends on your environment.

- For all printers attached to IBM Network Stations that have the same serial interface attributes, you can configure port access globally. (In some environments, all printers will be configured globally, and this is the only action you'll need to take to configure port access.)

  Open the **/usr/netstation/configs/local.nsm** file in a text editor (for example, vi) and find the following line:

  ```
  set serial-interfaces-table={
  {1 printer printer 9600 8 1 none xon/xoff none}
  }
  ```

  If necessary, modify the nine values required to reflect the global serial attributes in your environment.

  - port number — at this time, port number 1 is supported; do not change this value.
  - port use at boot time — use keyword `printer`; do not change this value.
  - port use now — use keyword `printer`; do not change this value.
  - port speed — set to same setting as printer. Default is `9600`; modify if necessary.
  - byte size — set to same setting as printer. Default is `8` bits; modify if necessary.
  - stop bits — set to same setting as printer. Default is `1` bit; modify if necessary.
  - parity — set to same setting as printer. Default is `none`; modify if necessary.
  - flow control — set to same setting as printer. Default is `xon/xoff`; modify if necessary.
  - hangup — set to `none`; do not change this value.

  For additional information about the values that you may need to modify, see Appendix D, "More About Printing" on page 75.

- For any serial printers attached to IBM Network Stations that have attributes different than those defined in the global **/usr/netstation/configs/local.nsm** file, you must create for each IBM Network Station a unique configuration file (for example, **/usr/netstation/configs/**_hostname_).

  where _hostname_ is the host name of the IBM Network Station.

  The **/usr/netstation/configs/**_hostname_ file will consist of two lines:

  ```
  read /usr/netstation/configs/standard.nsm
  set serial-interfaces-table={ {1 printer printer 9600 8 1 none xon/xoff none}
  }
  ```

  Modify the `set serial-interfaces-table` line to reflect the serial attributes of the attached printer. Parameters are described above and in Appendix D, "More About Printing" on page 75.

Depending on how your boot environment has been defined on AIX, it **may** also be necessary to perform a configuration task on the desktop IBM Network Station units if you've created unique **/usr/netstation/configs/**_hostname_ files. We suggest that

you omit this task initially and continue to "4. Connect a printer to the IBM Network Station" on page 59, then follow the verification instructions. If the results are not what you anticipate, return to this section for instructions about configuring port access on the IBM Network Stations.

1. Reboot the IBM Network Station. After the unit goes through memory check and device checks, press the Escape key to open the IBM Network Station Setup Utility.

2. Press the F6=Set Boot Parameters key.

```
                        IBM Network Station
                        Set Boot Parameters

Boot File ........................ kernel
TFTP Boot Directory .............. /usr/netstation/
NFS Boot Directory ............... /usr/netstation/
Configuration File ...............
Configuration Directory .......... /usr/netstation/configs/

TFTP Order ....................... 2
NFS Order ........................ 1
MOP Order ........................ Disabled
Local Order ...................... Disabled


Enter=Save    F12=Cancel    Esc=Restore Parameter

```

3. If the Configuration File fields contains the information standard.nsm, remove the entry to leave the Configuration File field blank; by default the system will look for a file by the name of the IBM Network Station's hostname in the defined configuration directory (for example, **/usr/netstation/configs/**hostname).

4. Press the Enter key to save the change.

5. Reboot the IBM Network Station by pressing the Enter key.

4. Connect a printer to the IBM Network Station
1. If you are connecting a serial port printer, power off the printer and connect it to a serial port using a 9 (female) to 25 (male) pin cable through a db25-db25 null modem interposer or a 9 (female) to 25 (male) pin null modem cable. See Appendix D, "More About Printing" on page 75 for additional information about cable requirements for serial port printers.

   If you are connecting a parallel port printer, power off the printer and connect it to a parallel port using standard parallel port cabling.

2. Power on the printer.

Verification

To verify printer operation, type the following command to submit a job to a printer queue:

enq -P*name_of_print_queue* /etc/motd

If you need additional printer support information, please see *AIX Version 4 Guide to Printers and Printing* (SC23-2783) or later.

Chapter 7. Configuring the ICS Webserver for RS/6000

This chapter explains how to configure the ICS Webserver to support the IBM Network Station.

Note: During Network Station Manager installation, the ICS Webserver is already configured for Network Station Manager. There is no need to do anything additional. The information in this chapter is provided for your reference.

Specifically, this chapter describes how to:

- Set up the ICS Webserver configuration file
- Access the IBM Network Station Manager program

If you use the IBM Network Browser or the Navio NC Browser on the IBM Network Station Manager and your server has a port number other than the default (80), refer to "Changing the IBM Network Station Default Port Number" on page 43 for details for enabling the new port.

Setting the ICS Webserver Configuration File

Before you can use the IBM Network Station Manager program, ensure that the following tasks have been completed:

1. The ICS Webserver is installed.

2. The ICS Webserver is started with root authority.

3. The URL maps to where the IBM Network Station Manager program has been installed.

4. The ICS Webserver is configured to perform Basic Authentication before the IBM Network Station Manager program is invoked.

Refer to the ICS Webserver program documentation for detailed instructions on how to update the ICS Webserver configuration file (**/etc/httpd.conf**) and the syntax of the appropriate statements. During Network Station Manager installation/deinstallation, a backup of the original ICS configuration file is created as **/etc/httpd.conf.sav** for your reference.

Specifying the ICS Webserver User ID

To use the IBM Network Station Manager program, the userid directive in the ICS Webserver configuration file must specify a valid user ID that has root authority. The server must be invoked with root authority to validate users requesting services and to maintain a data base of user preferences (read/write) that can be accessed by all (read only).

Mapping to the URL

Add the following sample request routing statements to the ICS Webserver configuration file (**/etc/httpd.conf**):

```
Exec  /NetworkStation/Admin/*   /usr/netstation/nsm/cgi-bin/QYTCMAIN.PGM
Exec  /NetworkStation/Dump/*    /usr/netstation/nsm/cgi-bin/QYTCMDMP.PGM
Exec  /NetworkStation/cgi-bin/  /usr/netstation/nsm/cgi-bin/*
Pass  /NetworkStation/*         /usr/netstation/nsm/*
```

Figure 27. URL mapping

Notes:

1. The /NetworkStation/Admin/ statement converts the URL which initially invokes the IBM Network Station Manager program into the specific program which will be invoked.

   The initial URL sets up the initial dialogue with the IBM Network Station Manager and is specified by users on their browsers as:

   ```
   http://yourservername:portnumber/NetworkStation/Admin
   ```

   where:

   - *yourservername* is the host name or TCP/IP address of the ICS Webserver
   - *portnumber* is the port that is configured for use with the IBM Network Station program

   If you have not changed the default port number for the ICS Webserver (80), you do not need to specify *portnumber*.

2. The /NetworkStation/Dump/ statement converts the URL which invokes the dump formatter.

3. The /NetworkStation/cgi-bin/ statement converts the call to the program contained in the HTML file to the library where the program is stored.

   The cgi-bin must be implemented with Basic Authentication which is used to verify that users are authorized to use the IBM Network Station Manager program.

4. The /NetworkStation/ statement enables the proper HTML and Image (GIFs) files to be displayed.

Setting up Basic Authentication

Use Basic Authentication to protect the programs for the IBM Network Station Manager program. During the Network Station Manager installation, an ICS Webserver Application Programming Interface (ICAPI) is set up to perform the user authentication on the AIX system for the Network Station Manager program. Every time the Network Station Manager program is brought up, the Basic Authentication will prompt for userid and password. Users have to enter a userid and password that is valid on the AIX server system.

An ICAPI is a user-written exit that provides a program to verify that the user ID and password are authorized to use the system. Refer to ICS Webserver documentation for more information.

Updating the NLSPATH variable

The NLSPATH variable for ICS Webserver applications is defined in the file:
/etc/httpd.envvars and may contain the following statements:

```
 NLSPATH=
/usr/lpp/internet/%N.cat:/usr/lib/nls/msg/%L/%N:/usr/lib/nls/msg/%L/%N.cat
 LANG= en_US
 LIBPATH=/usr/lpp/internet/bin
```

Figure 28. Sample /etc/httpd.envvars

In the preceding example, the name associated with the Network Station Manager
program catalog is:

```
/usr/lib/nls/msg/%L/%N.cat
```

The results returned for LANG= are substituted for the %L in the NLSPATH
returned string and the %N is replaced with the file name of the file being
requested. This will result in the following file being opened for message catalog
processing:

```
/usr/lib/nls/msg/en_US/nsmmsg.cat
```

Note: In the list of files defined for NLSPATH= do not code the real name of the
IBM Network Station Manager program catalog (nsmmsg.cat). The file name
should be represented by %N. Specifying the real file name for the IBM
Network Station Manager message catalog (or any other catalog) may
result in a failure by the application to access the catalog.

Accessing the IBM Network Station Server

You can take the following steps to validate that the IBM Network Station Manager
program has been configured properly:

1. Display images of GIF files to verify accessibility to HTML and GIF files.

2. Start the IBM Network Station Manager program to verify Basic Authentication
   is active and programs can be executed.

3. Verify Message Catalog Accessible to verify that the IBM Network Station
   Manager program can access the message catalog.

Displaying Images of GIF Files

Invoke the following URL listed to access the HTML directory and the directory
where the GIF images are stored. A display of all application GIF files will be
presented. No authentication should take place as the IBM Network Station
Manager program does not require these directories to be protected.

```
http://yourservername:portnumber/NetworkStation/en_US/gifs.htm
```

where:

- *yourservername* is the host name or TCP/IP address of the ICS Webserver

- *portnumber* is the port that is configured for use with the IBM Network Station program

If you have not changed the default port number for the ICS Webserver (80), you do not need to specify *portnumber*.

Starting the IBM Network Station Manager Program

From a frames-capable browser, start the IBM Network Station Manager program with the following URL:

```
http://yourservername:portnumber/NetworkStation/Admin
```

where:

- *yourservername* is the host name or TCP/IP address of the ICS Webserver

- *portnumber* is the port that is configured for use with the IBM Network Station program

If you have not changed the default port number for the ICS Webserver (80), you do not need to specify *portnumber*.

Log on with a user ID and password that have root authority. This ID will be treated as a system administrator. You must invoke authentication to ensure that the IBM Network Station Manager program functions properly.

Possible Failure Conditions

Following are possible failure conditions which may occur if the IBM Network Station Manager program has not been configured properly:

- Browser problems

- Authentication error

- Authentication error and catalog interface error

Browser Problems: If a request for an executable is made to an object which cannot be executed, some browsers may hang or present a message, for example, "Document contains no data". Following are potential causes:

- ICS Webserver Directive is not mapped to the proper executable.

- Executable does not exist.

- Executable is not readable by the ICS Webserver.

- Browser is not Java-script enabled.

- Browser is not frames-capable.

Correct the problem and retry the application.

Verifying Message Catalog Accessible for RS/6000

From the Setup Tasks listed in the frame on the left, select the Network Station Manager Error Messages task at the bottom.

This task enables the Administrator to key in a message number and obtain a message description.

Key in a valid IBM Network Station Manager message number, such as 7350, and select the Submit key.

You will receive a response indicating if the message was successfully retrieved. Figure 29 shows a successful retrieval.

```
EZZ7350

(User: <User_name>) Unable to access HTML file <File_Name>
```

Note: Message has been successfully retrieved.

Figure 29. Retrieval successful for the message

Message Failure

The message in Figure 30 indicates that the IBM Network Station Manager program could not access the message catalog.

```
Retrieval failed for the message
PSA_0_NSM_NO_TEMPLATE_MSG:{1,1} ...
```
Note: Message catalog is not properly configured.

Figure 30. Retrieval failed for the message

Verify that the message catalog has been placed in a directory which is accessible by the ICS Webserver and contained in the NLSPATH variable and validate user preferences (read/write) that can be accessed by all (read only) for this file See "Updating the NLSPATH variable" on page 63 information on setting the NLSPATH variable.

Chapter 8. Troubleshooting

Boot problems

- **If you are having TCP/IP problems booting an IBM Network Station**

  Run the following when booting the Network Station:

  ```
  tcpdump -x -s 576 -I -i tr0 port bootps
  ```

  to trace **bootp** from the IBM Network Station, or

  ```
  tcpdump -x -s 576 -I -i tr0 port tftp
  ```

  to trace **tftp** from the IBM Network Station.

- **If you are having problems booting an IBM Network Station**

  Booting in verbose mode can help diagnose the problem. To enable verbose mode during boot:

  1. After powering on the IBM Network Station and going through memory check and device checks, press the Escape key to open the IBM Network Station Setup Utility.

  2. Press the F9 key to enable verbose diagnostics messages.

  3. Press the Enter key to reboot the IBM Network Station.

  4. Pay close attention to the boot screens on the IBM Network Station and make note of any error messages displayed. If the messages scroll too quickly and you are able to get into Xwindows, you can bring up the console window by pressing the Pause/Break key. Click the messages button from the console window that appears; all of the boot messages should be listed in the messages window.

- **If you need to reset the IBM Network Station to its factory defaults**

  At some point, it may become necessary to set the IBM Network Station back to its factory default settings. This is the procedure:

  1. After powering on the IBM Network Station and going through memory check and device checks, press the Escape key to open the IBM Network Station Setup Utility.

  2. Press the ALT-CTL-Shift-F1 keys at the same time to bring up the boot monitor prompt > (greater than sign).

  3. At the boot monitor prompt, type these lines, pressing the Enter key after each line:

     ```
     nv
     l
     s
     y
     q
     ```

     Be very careful when you are in the NVRAM utility. At this point, the IBM Network Station has been returned to its factory defaults and you can type rs to reboot. Please follow the basic boot configuration instructions discussed earlier to reconfigure the IBM Network Station to boot (see "Configuring IBM Network Stations centrally—BootP" on page 7 and

"Configuring IBM Network Stations locally—NVRAM configuration" on page 12).

- **If users are unable to boot and see this message:**

```
request file: '/usr/netstation/kernel'
Incorrect file type
```

As system administrator, you are required to accept the terms and conditions before IBM Network Station users can boot from the RS/6000 server. If users see the message listed above, you have not accepted the terms and conditions. Type at the command line:

```
/usr/netstation/bin/agree
```

The terms and conditions will be displayed, and you will be prompted to enter y to accept them.

Runtime problems

- **If you need to access the Runtime Message Log**

If X Windows is up and running on an IBM Network Station but you are having some sort of trouble (for example, problems with filesystem mounting or font loading), press the Pause/Break key to bring up the IBM Network Station console window, then click the messages button from the console window that appears. The messages displayed may help identify the problem.

- **If the words** `PANIC DUMP` **display on the screen**

  1. At the > (greater than sign) prompt at the bottom of the screen, type:

     ```
     st
     ```

     (for stack trace) and record the last line of the output.

  2. Type:

     ```
     up
     ```

     to upload a picture of the IBM Network Station's memory to the RS/6000 using TFTP.

  This may help software services to diagnose the problem.

  For help with the **up** command, you can type ? (the question mark) at the > (greater than sign) prompt for a list of available commands and their formats.

- Monitor the usage of the **/usr** filesystem. The Network Station software is installed under **/usr/netstation**. Make sure the file system is not full.

- Some applications need to access the user's home directory. Make sure that the user's home directory is exported properly for the Network Station.

- On AIX 4.1.5, there is a known problem with the keyboard mapping in the XDM environment. Refer to the README file in **/usr/lib/X11/xdm** for a fix of this problem. Modify file **/usr/lib/X11/xdm/Xsession** accordingly.

For a list of known problems and limitations, please refer to the README in the **/usr/netstation/doc** directory.

Appendix A. More about CDE

What is CDE?

The Common Desktop Environment (CDE) desktop is an interactive graphical user interface jointly developed by IBM, HP, Sun, and Novell for open systems. The desktop is a rich and intuitive user interface based on X11 release 5 and OSF/Motif 1.2. It is designed for enterprise computing and scales across a variety of platforms, appealing to a wide range of users from novice to expert.

CDE targets three key audiences: the end user, the system administrator, and the application developer.

End users are presented with an easy-to-use interface, with emphasis on common look, feel, and behavior. The desktop is both visually appealing and highly customizable. Extensive online help has been provided to aid users in familiarizing themselves with the desktop in minimal time.

System administrators will appreciate CDE's integrated approach to accessing applications, whether they reside locally or on a remote host. CDE is also easy to set up and configure, with most of the setup handled by tools which come packaged with the desktop. Applications can be served from systems that do not have CDE installed.

Application developers will find application integration to be straightforward and painless. An application developer's toolkit comes standard with CDE 1.0 on AIX. The toolkit includes libraries, custom widgets, header files, and application building tools. The desktop also supports existing X Windows, and OSF/Motif applications. See "CDE Infrastructure," *AIXpert*, November 1996.

The scope of the desktop is broad, and encompasses core services, as well as productivity tools and applications. The base support covers areas such as window management, file management, customization, and online help. Advanced programming services for interapplication communication include messaging, drag/drop, data interchange, and session and workspace management. See "Plug-and-Play," *AIXpert*, April 1997.

Why CDE?

Broad industry acceptance
AIX is X/Open CDE compliant.

Extensive online help system
The standard online help system is both system-wide and application-specific. With the click of a mouse button, information about every feature of the desktop is available. Applications can also be easily integrated with online help.

Rich set of productivity tools

Many tools are provided standard with the desktop. Among these are a calendar, text editor, mailer, print manager, terminal emulator, and icon editor.

Multiple workspaces

One of the more popular features of the desktop is its multiple workspace capability. Workspaces multiply the amount of display area available for windows. Each workspace occupies the entire display, as though the display has multiple screens.

Designed for enterprise computing

The desktop is designed to help you take advantage of distributed computing. For example a user can add an appointment to another user's calendar or run an application that resides on a remote machine.

Standards Based

CDE is based on industry standards X/OPEN, X11 release 5, OSF/Motif 1.2, and Spec 1170. Also a CDE Sample Implementation standard was established with the release of CDE 1.0.

Usability

CDE is based on a consistent user interface for appearance and behavior of the desktop components. The design uses a graphical user interface and direct manipulation approach. A cross-corporate team of usability professionals were involved in the design of the CDE desktop. Additionally, extensive usability testing was performed to verify the usability of the desktop.

Open Systems Based

Because CDE is X/Open-compliant, applications written for CDE can be easily ported to run on all manufacturers' machines running the CDE desktop. This means that developers don't have to create multiple versions of an application.

Check this URL for additional information about the CDE:

`http://www.rs6000.ibm.com/software/OS/CDE/`

Appendix B. Local Clients

Local clients (or local commands) are X programs that run on the IBM Network Station's processor, not on the RS/6000 server.

Available Local Clients

The following table lists the local clients currently available on the IBM Network Station for AIX, and the corresponding command name to use when running the command from a remote shell, starting the client at boot time, or integrating the CDE desktop to start the local client.

Table 1. Local Client Commands	
Local Client	**Command**
Window Manager	wm
Telnet	term -ctype telnet [*host*]
5250 terminal emulator	ns5250 [-port *portnumber*] [*host*]
3270 terminal emulator	ns3270 [-port *portnumber*] *host*
Java applications	java -classpath *path* *java_application*
Java applets	appletviewer *html*

To start a local client by invoking a remote shell command, type:

rsh *hostname command*

where *hostname* is the IBM Network Station where the local client is to run and *command* is the local client command.

Available Local Utilities

The following table lists the local utilities currently available on the IBM Network Station for AIX, and the corresponding command name to use when running the utility from a remote shell, starting the utility at boot time, or integrating the CDE desktop to start the utility.

Table 2. Local Utilities	
Local Utility	**Command**
Console	console
NSterm Host Chooser	term
Statistics	stats
Common Login (AS/400, MVS, NT, AIX)	actlogin
Memory	show memory
Version	show version
Connections	show connections
Logout	logout

Appendix C. IBM Network Station Memory Management

Applications downloaded to IBM Network Stations require memory. The table below is a guide to how much memory each IBM Network Station should have, given the applications that users in your environment expect to run simultaneously.

Note: Subsequent releases may have increased memory requirements.

Table 3. Network Station memory requirements for downloaded software	
Software	**Memory Requirement**
Base Operating System	5.35MB
5250 Session (1st session) Additional session	1.4MB 0.3MB
3270 Session (non-graphic) Additional session (non-graphic)	0.7MB 0.25MB
3270 Session (graphics) Additional session (graphics)	1.4MB 0.55MB
Java VM Session	5.0MB default or 1.3MB in minimal configuration. Code size of each Java Applet must be added to either number. **Note:** If you want to run large Java applications, you should calculate memory requirements from the default size of 5.0MB.
IBM Network Station Browser (available separately)	5.6MB

Appendix D. More About Printing

The serial-interfaces-table Parameter

As described in "3. Configure serial port access" on page 58, you'll be adding this line either to the **local.nsm** file or to unique configuration files (for example, **/usr/netstation/configs/**_netStationHostname_**.nsm**) for each IBM Network Station:

```
serial-interfaces-table={ {1 printer printer 9600 8 1 none xon/xoff none} }
```

The values listed in the table that follows may be modified from the default to reflect the settings of your attached printer.

Table 4. The serial-interfaces-table parameter		
Table Entries	**Possible Values**	**Results**
baud-rate	default	9600
	baud-rate	Serial ports run at the specified baud rate. Acceptable values for the Auxiliary Serial Port (number 1) are 50, 75, 110, 134.5, 150, 200, 300, 600, 1050, 1200, 1800, 2000, 2400, 4800, 7200, 9600, 14400, 19200, 38400, 57600.
data-bits	default	8
	8	The serial port transmits characters with eight data bits.
	7	The serial port transmits characters with seven data bits.
stop-bits	default	1
	1	The serial port uses one stop bit per character.
	2	The serial port uses two stop bits per character.
parity	default	none
	none	No parity is generated.
	even	The serial port requires an even number of 1s (ones) for each byte.
	mark	The serial port uses a 1 (one) for each parity bit.
	odd	The serial port requires an odd number of 1s (ones) for each byte.
	space	The serial port uses a 0 (zero) for each parity bit.
handshake	default	none
	none	Flow control is disabled.
	dtr/dsr	The terminal raises the DTR (Data Terminal Ready) signal when input buffers are available and lowers DTR when input buffers are nearly full. In addition, the DCE (Data Communication Equipment, the device with which the terminal communicates) raises the DSR (Data Set Ready) signal when it can receive data from the terminal. The terminal stops sending data when the DCE lowers the DSR signal.
	rts/cts	The terminal raises the RTS (Ready to Send) signal when input buffers are available and lowers RTS when input buffers are nearly full.
	xon/xoff	The terminal sends an XON (Ctl-Q) signal when input buffers are available and an XOFFF (Ctl-S) signal when input buffers are nearly full.

Serial Port Connectors

As described in "4. Connect a printer to the IBM Network Station" on page 59, if you are connecting a serial port printer to an IBM Network Station, you'll use either a 9 (female) to 25 (male) pin cable (Cable AR or equivalent) through a db25-db25 null modem interposer (Cable E or equivalent), or a 9 (female) to 25 (male) pin null modem cable (electrically equivalent to the description in Table 7 on page 78).

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 5. 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 6. Pin-out for Cable E, Printer/Terminal Interposer-EIA-232		
System End Connector	**Signal**	**Device End Connector**
Socket (Female)		**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 supported. There are two identical connectors.

Table 7. 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		

Appendix E. IBM Network Station Manager Program Shipped Default Settings

The following table contains all the IBM Network Station Manager Program shipped default settings. The settings are presented in the same order that is found in the Setup Tasks frame when you open the IBM Network Station Manager program.

Table 8. IBM Network Station Hardware Default Settings

Hardware 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
Miscellaneous settings: • Parallel printer port • Allocate memory to speed window refresh • Update boot monitor from the hardware settings file	 • On • No • No update

Table 9. IBM Network Station Desktop Manager Default Settings	
Desktop Manager Default Settings	
Item:	**Default Value:**
Screen colors: • Background color for window frame in focus • Background color for window frame not in focus • Foreground color for window frame not in focus	 • 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 10. 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
Miscellaneous Settings: • Screen size • Image/Fax display • Column separators • Allow use of the pop-up keypad • Allow use of the control menu • Allow use of the edit menu	 • 27 rows, 132 columns • Disabled • Disabled • No • Yes • Yes

Table 11. 3270 Default Settings	
3270 Default Settings	
Item:	**Default Value:**
Key remapping capability	Disabled
Default keyboard file for:	
• PC Keyboard (101 keys)	• None
• PC Keyboard (102 keys)	• None
Color Settings:	
• Color customization capability	• Basic
• Default color scheme	• None
• Additional color schemes to make available	• None
Miscellaneous Settings:	
• Screen size	• 32 rows, 80 columns
• Allow use of keypad	• No
• Allow use of graphics	• No
• Key for Enter function	• Control key
• Use Auto Action	• No
• Telnet 3270 port to connect to	• 23

Table 12. Internet Network Default Settings	
Internet Network Default Settings	
Item:	**Default Value:**
Web server port on the boot host	80
Applet launcher port	5555
IBM Network Station browser version	Non-encrypted

Table 13. IBM Network Station Browser Defaults	
IBM Network Station Browser Defaults	
Item:	**Default Value:**
Allow user to override settings	No
Security Settings:	
• Enable JavaScript	• Yes
• Enable Java Applets	• Yes
Network Settings:	
• Disk cache	• 0 KB
• TCP/IP maximum connections	• 5
Print headers and footers:	
• Left header	• &w
• Right header	• &p
• Left footer	• &D
• Right footer	• &t
Print margins:	
• Top margin	• .5 inches
• Bottom margin	• .5 inches
• Left margin	• .5 inches
• Right margin	• .5 inches
• Paper size	• Letter
Miscellaneous:	
• Auto load images	• Yes
• Show toolbar	• Yes

Table 14. Navio NC Navigator Default Settings	
NC Navio Navigator Default Settings	
Item:	**Default Value:**
Proxy Configuration	Manual proxies obtained from Internet Network panel
Security:	
• Enable Java Script	• Yes
• Enable Java Applets	• No
• Enable SSL2	• Yes
• Enable SSL3	• Yes
Network:	
• Maximum memory cache	• 1024 KB
• Maximum TCP/IP connection	• 4
• Network buffer size	• 32 KB

Table 15. 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.	

Appendix F. IBM Network Station Manager Program Shipped Environment Variables

The following sections include the environment variables whose values cannot be altered for RS/6000. These values are set when a user logs onto the IBM Network Station.

Environment Variables for RS/6000

PATH
/usr/netstation/mods

HOME
user's home directory; such as, /u/*username*

DISPLAY
:0.0

HOSTNAME
Name of the IBM Network Station

BOOTHOST
The host from which the IBM Network Station was booted

BOOTPATH
/usr/netstation/

NSM_PROD_SYSDEFAULTS
/usr/netstation/SysDefaults/

NSM_ADMIN_SYSDEFAULTS
/usr/netstation/nsm/SysDefaults/

NSM_USER_PREFS
/usr/netstation/nsm/*usrname*/nsm

> **Note:** *username* is the userid of the person that is signed onto the IBM Network Station.

NSM_HTTP_PORT
80

MRI_PATH
MRI 2924

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Special Characters