

NetVista™



N2200e Thin Client Express Reference March 2001

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NetVista™



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Note

Before using this information and the product that it supports, be sure to read "Safety notices" on page v and "Notices" on page 57.

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Contents

Safety notices	v
Danger notices	v
Caution notices	vi
Handling static-sensitive devices	vi

About this book.	vii
Who should read this book	vii
Information available on the World Wide Web	vii
Related information	vii
How to send your comments	vii

Understanding your NetVista Thin Client Express. **1**

Learning about the hardware	3
Standard hardware	3
Hardware connectors	3
Communication hardware	3
Monitor specifications	4
Power consumption	4
Upgrading hardware features.	4

Setting up the hardware. **5**

Startup sequence **7**

Configuring the N2200e Thin Client Express.	9
Using the Setup Utility to configure the workstation	9
Using the Configuration Tool to configure the workstation	10

Installing the Thin Client Service Utility and the Operations Utilities.	13
Installing the utilities from the NetVista Thin Client Utilities CD	14
Downloading the utilities from the NetVista Thin Client web site	14

Managing your Thin Client Express remotely. **17**

PPP dialer for Thin Client Express workstations	19
Prerequisites for using PPP dial access	19
Configuring a workstation for PPP dialer	19
Preparing the workstation for PPP dialer configuration	19
Configuring initial modem settings for PPP dialer access	20
Starting the PPP dialer.	21
Learning about the NC dialer window	21

Maintaining and reconfiguring PPP dialer parameters	21
Using the PPP dialer to access flash images.	22
Troubleshooting PPP dialer problems.	22

Altering the flash image of a workstation.	23
Performing a software update on a workstation	23
Using the Configuration Tool to perform a software update on a workstation	23
Using the Thin Client Manager Operations Utility to perform a software update on a workstation	24
Recovering the flash image of a workstation	24
Using one workstation to recover the flash image of another workstation	25
Using the Setup Utility to recover the flash image of a workstation	27
Using the Thin Client Manager Operations Utility to recover the flash image of a workstation.	28

Resolving hardware problems.	29
Verifying hardware problems	29
Visible hardware failure	30
Audio beep sequences.	32
LED indications	33
Error codes and text messages	35

Appendix A. Replacing hardware parts	39
Replacing the logic unit	39
Replacing additional parts	40
Returning hardware parts	42

Appendix B. Upgrading memory. **43**

Appendix C. CompactFlash card. **45**

Appendix D. Recovering the boot block image **47**

Appendix E. Monitor specifications **51**

Appendix F. Connector pin information **53**

Appendix G. Choosing a flash file **55**

Notices	57
Environmental Design.	58
Product Recycling and Disposal	58
Trademarks	59
Electronic Emission Notices	59
Federal Communications Commission (FCC) Statement	59

Glossary of abbreviations 61 **Index 63**

Safety notices

Safety notices contain information that is related to using the IBM® NetVista thin client in a safe manner. These notices can be in the form of a danger, caution, or attention notice.

Danger notices

The following danger notices call attention to situations that are potentially lethal or extremely hazardous. These notices pertain throughout this book.

DANGER

To prevent a possible electrical shock during an electrical storm, do not connect or disconnect cables or station protectors for communications lines, display stations, printers, or telephones. (RSFTD003)

DANGER

To prevent a possible electrical shock from touching two surfaces with different electrical grounds, use one hand, when possible, to connect or disconnect signal cables. (RSFTD004)

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the products that attach to the system. It is the customer's responsibility to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (RSFTD201)

DANGER

To prevent a possible electrical shock when installing the system, ensure that the power cords for all devices are unplugged before installing signal cables. (RSFTD202)

DANGER

To prevent a possible electrical shock when adding the device to a system, disconnect all power cords, if possible, from the existing system before connecting the signal cable to that device. (RSFTD205)

DANGER

To prevent a possible electrical shock, disconnect the power cord from the electrical outlet before opening the unit. (RSFTD215)

DANGER

To reduce the risk of electrical shock use only AC power sources approved by IBM. (RSFTD216)

Caution notices

A caution notice applies to a situation that is potentially hazardous to people because of some existing condition.

Handling static-sensitive devices

When you handle components, take these precautions to avoid static electricity damage:

- Do *not* open static-protective packages until you are ready to install their contents.
- Limit your movements to avoid static electricity build-up around you.
- Handle components carefully, and never touch exposed circuitry.
- Prevent others from touching components.
- Place components on static-protective packages while performing hardware removal and installation procedures.
- Do not place components on metal surfaces.

About this book

IBM NetVista N2200e Thin Client Express Reference (SA23-2803) provides information for the Type 8363 (Model Cxx) IBM NetVista N2200e Thin Client Express (hereafter referred to as *workstation* or *thin client*).

This publication contains information on hardware setup, software configuration and update, hardware problem resolution, hardware upgrade options, parts replacement, and ordering.

Who should read this book

The following should find the information in this publication helpful:

- The person who administers the workstation
- The hardware service, and the support organizations for the workstation

Information available on the World Wide Web

You can obtain the latest version of this information at the following uniform resource locator (URL):

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

This is the same URL that is printed on the cover of this document.

Related information

The following publications ship with your hardware. Refer to these publications for information that relates to your workstation:

- See the *IBM NetVista Quick Setup for N2200e Thin Client Express, Type 8363 (Model Cxx)* (SA23-2800) pamphlet for quick hardware setup information and software configuration information.
- See the *IBM License Agreement For Machine Code* (Z125-5468) before using the workstation.
- See *IBM NetVista Thin Client Safety Information* (SA41-4143) for important safety notices.
- See *IBM NetVista Thin Client Hardware Warranty - Type 8363 and Type 8364* (SA23-2802) for important hardware warranty information.

Refer to *IBM NetVista Thin Client Manager Operations Utility* (SA23-2813) for information about managing your Thin Client Express. This information is available at the following URL:

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

How to send your comments

Your feedback is important in helping to provide the most accurate and high-quality information. You can submit comments about this, or other IBM information by mailing the readers' comment form, located at the end of this information.

- If you are mailing comments from a country other than the United States, you can give the form to the local IBM branch office or IBM representative for postage-paid mailing.
- If you prefer to send comments by FAX, use either of the following telephone numbers:
 - United States and Canada: 1-800-937-3430
 - Other countries: 1-507-253-5192
- If you prefer to send comments electronically, use the following network identification:
 - IBMMAIL, to IBMMAIL(USIB56RZ)
 - RCHCLERK@us.ibm.com

Be sure to include the following:

- The title, and order number of the information
- The page number or topic to which your comment applies

Understanding your NetVista Thin Client Express

The IBM NetVista N2200e Thin Client Express offers a fast and simple way to access applications on the following platforms:

- Windows NT[®] Server 4.0
- Windows NT Server 4.0, Terminal Server Edition (TSE)
- Windows NT Workstation 4.0
- Windows[®] 2000 Server
- Windows 2000 Professional
- Windows 2000 Advanced Server

As both a hardware and a software solution, Thin Client Express includes essential Network Station[™] Manager V2R1 functions on a pre-installed CompactFlash card.

Thin Client Express provides the usual thin-client benefits, such as a reduced total cost of ownership and the fast, flexible deployment of applications. Because it does not require a boot server, Thin Client Express also provides a quick start-up time.

Thin Client Express also includes a Setup Utility, and a Configuration Tool that provide the following:

- A streamlined configuration process
- Local boot capabilities from a CompactFlash card
- A Netscape browser
- 3270, 5250, and VTxx emulator sessions
- An Independent Computing Architecture (ICA) client and ICA Remote Application Manager
- Separate utility programs for flash update service and operations management
- A desktop with a Launch Bar or one or more full-screen applications
- Advanced diagnostics

The IBM NetVista Thin Client Express Service Utility and IBM NetVista Thin Client Manager Operations Utility are management utilities that you can use to manage your workstations. These utilities run on Windows 2000 and Windows NT workstations, and are available to you, free of charge. You can download these utilities either from a compact disc (CD) or from the World Wide Web. For information on obtaining the CD (at no cost to you), visit the following uniform resource locator (URL):

<http://www.pc.ibm.com/us/netvista/thinclient/xpress.html>

Click **Express Utilities**, located under the **More Info** heading.

If you are interested in downloading the utilities from the World Wide Web, refer to “Downloading the utilities from the NetVista Thin Client web site” on page 14 for more information.

Learning about the hardware

This section provides detailed hardware information about the N2200e Thin Client Express — Hardware Type 8363 (Model Cxx), hereafter referred to as N2200e Thin Client Express.

Standard hardware

The standard N2200e Thin Client Express hardware includes the following:

- 32 MB of permanent memory, which includes 3 MB dedicated to video memory
- Integrated Ethernet communication
- 16-bit internal and external sound
- One 32 MB CompactFlash card with preloaded software
- 2 USB ports for a keyboard and other USB devices

Note: The Netscape browser requires 64 MB of permanent memory. See “Appendix B. Upgrading memory” on page 43 for information about adding more memory to a workstation.

Hardware connectors

Your N2200e Thin Client Express hardware includes standard connectors, standard pin, signal, and signal direction configurations. See “Appendix F. Connector pin information” on page 53 for details.

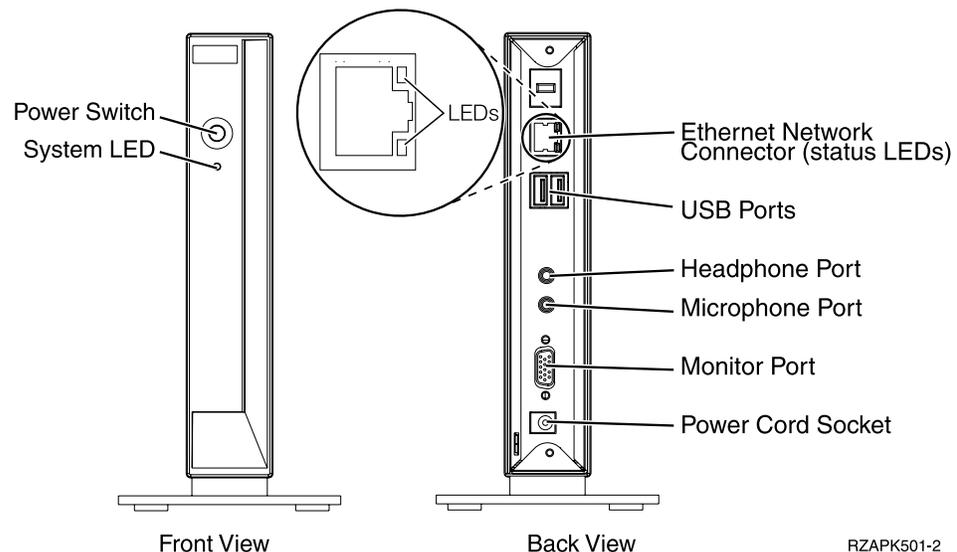


Figure 1. Hardware connectors

Communication hardware

Your N2200e Thin Client Express includes an integrated Ethernet connection.

For a 10 Megabit (Mb) line speed operation, you need a category 3 or higher Unshielded Twisted Pair (UTP) type of cable. For a 100 Mb line speed operation, you need a category 5 UTP type of cable.

Refer to “Appendix F. Connector pin information” on page 53 for communication cable specifications.

Monitor specifications

A basic video graphics adapter (VGA) class monitor that meets the Video Electronics Standards Association (VESA) standards of refresh rate and resolution functions with the N2200e Thin Client Express. The N2200e Thin Client Express can support VESA Display Power Management Signaling (DPMS) and VESA Display Data Channel (DDC2B).

Refer to “Appendix E. Monitor specifications” on page 51 for a list of resolutions and refresh rates that the N2200e Thin Client Express can support. Your monitor may not support all resolutions and refresh rates.

Power consumption

The normal power consumption for a N2200e Thin Client Express, while running applications, is approximately 14 watts. You may see power consumption of up to 18 watts in some applications or configurations. For more information, contact an IBM account representative.

Display monitor power reduction occurs when you use the N2200e Thin Client Express with a VESA DPMS Standard monitor.

Upgrading hardware features

You can perform the following hardware procedures:

- Connect USB devices

If you plan to use peripheral USB devices with your N2200e Thin Client Express, refer to the documentation for your peripheral USB devices for information.

- Upgrade your memory

The N2200e Thin Client Express has one random access memory (RAM) slot that accepts Synchronous Dynamic Random Access Memory (SDRAM) Dual Inline Memory Modules (DIMMs). The N2200e Thin Client Express includes 32 MB of permanent RAM on the system board, and supports memory expansions of up to 288 MB. You can expand the RAM of the N2200e by installing 32, 64, 128, or 256 MB DIMMs. “Appendix B. Upgrading memory” on page 43 provides information on how to upgrade your memory. Refer to “Replacing additional parts” on page 40 for detailed memory specifications and orderable N2200e Thin Client Express parts.

Note: Use of the Netscape browser requires 64 MB of permanent RAM.

Setting up the hardware

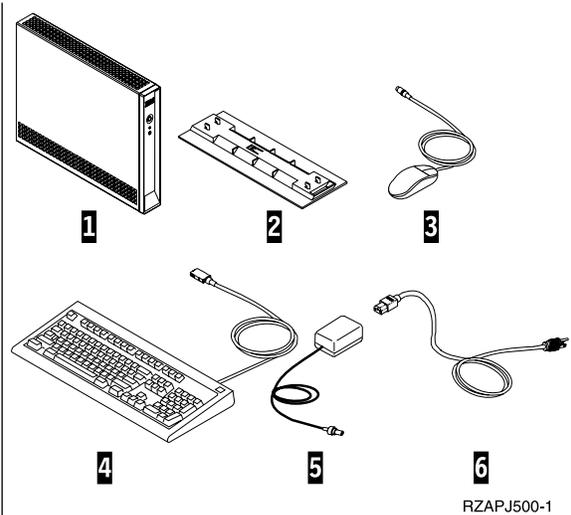
The *IBM NetVista Thin Client Express Quick Setup (SA23-2805)* pamphlet, which ships with your hardware, provides the following information. This section goes into more detail for your convenience.

Read "Safety notices" on page v before you continue with these instructions.

Unpacking the hardware

Unpack the hardware. Contact your reseller, or IBM, if you do not have these standard parts:

- 1** Logic unit
- 2** Base
- 3** Mouse
- 4** USB Keyboard
- 5** Power supply
- 6** Power cable



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Options:

- If you have additional memory cards, read "Appendix B. Upgrading memory" on page 43 first, and then continue with "Installing the support base".
- If you would like to restrict access to the logic unit, you can thread a security cable through tab **A**.

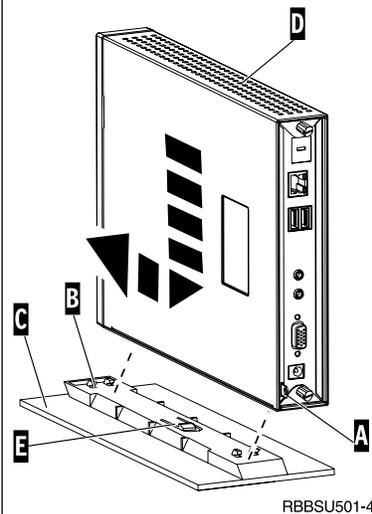
Installing the support base

Read "Safety notices" on page v before you continue with these instructions.

IBM recommends that you install the hardware in a vertical position.

1. Align the notches **B** on the support base **C** with the holes on the bottom of the logic unit **D**.
2. Slide the support base **C** onto the bottom of the logic unit **D**.

To remove the support base **C**, lift the latch **E** on the support base and slide the support base off the logic unit **D**.



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Connecting the hardware

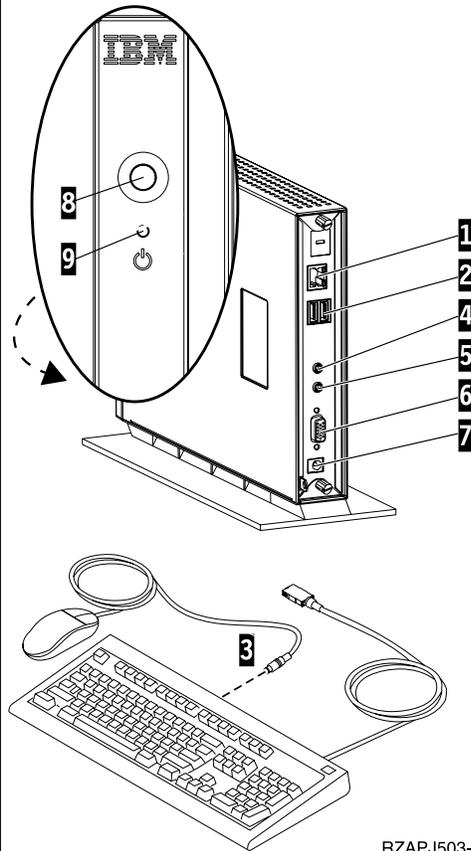
Read “Safety notices” on page v before you continue with these instructions.

1. Connect the devices listed below to the appropriate ports:
 - 1 Network cable
 - 2 USB keyboard and other USB devices (can be attached to either USB port)
 - 3 Mouse (connects to keyboard)
 - 4 Headphones
 - 5 Microphone
 - 6 Monitor
 - 7 Power supply and power cable
2. Ensure that the monitor cable is securely connected to the thin client.
3. Plug any power cables into properly grounded working electrical outlets.

Powering on the hardware

1. Power on the monitor and other devices that are attached to the thin client.
2. Press the white power button **8** to power on the thin client.

The thin client performs its startup sequence. See “Startup sequence” on page 7 for more information.
3. If this is the first time that you are powering on the thin client, proceed to “Configuring the N2200e Thin Client Express” on page 9. If this is not the first time that you are powering on the thin client, see the following sections for more information:
 - “Configuring the N2200e Thin Client Express” on page 9
 - “Managing your Thin Client Express remotely” on page 17
 - “Installing the Thin Client Service Utility and the Operations Utilities” on page 13



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Startup sequence

This is a typical startup sequence of events for the NetVista Thin Client Express. If any of these events do not occur, see “Resolving hardware problems” on page 29.

1. The following devices show light-emitting diode (LED) indications:
 - Logic unit (system LED and network status LED)
 - Power supply
 - Keyboard
 - Monitor¹
 - Any USB devices²
2. The following internal hardware components initialize:
 - Memory
 - L1 cache
 - Video memory
 - Keyboard controller
3. The IBM NetVista thin client screen appears on the monitor.
4. One of the following appears:
 - The Thin Client Express Setup Utility. The Setup Utility appears in either of the following situations:
 - You start the NetVista thin client for the first time.
 - You previously reset the NetVista thin client to the factory-default property settings.

The Configuration Tool launches after the Setup Utility in either situation.

Refer to “Configuring the N2200e Thin Client Express” on page 9 for more information about working with the Setup Utility.

- The NetVista Thin Client Express detects the CompactFlash card and loads the operating system into memory.
- The interface that you specified with the Configuration Tool appears. The interface can be either of the following:
 - One or more applications
 - A launch bar with one or more applications

Refer to the following sections for more information about configuring your NetVista Thin Client Express:

- “Configuring the N2200e Thin Client Express” on page 9
- “Installing the Thin Client Service Utility and the Operations Utilities” on page 13
- “Managing your Thin Client Express remotely” on page 17

1. Refer to the documentation for your monitor if there is no LED indication.

2. Refer to the documentation for your USB devices if there are no LED indications.

Configuring the N2200e Thin Client Express

Before you can use the N2200e Thin Client Express (also referred to as *workstation*) to access server applications, you need to configure your workstation. You can use the NSBoot Setup Utility (also referred to as *Setup Utility*) and the Thin Client Express Configuration Tool (or *Configuration Tool*) to configure workstations.

Note: You do not need access to an external server to set up and configure the workstation.

This section provides information on the following:

- “Using the Setup Utility to configure the workstation”
- “Using the Configuration Tool to configure the workstation” on page 10

Using the Setup Utility to configure the workstation

The Setup Utility allows you to perform the following tasks:

- Specify your keyboard language settings
- Set the resolution and frequency of your display
- Configure your Internet Protocol (IP) settings
- Perform advanced configurations, such as changing your boot file server settings

The first time you start the workstation, you must use the initial Setup Utility to configure the workstation. The following menu is an example of a Setup Utility menu:

```
MENU2x A                IBM NetVista Thin Client
                        CompactFlash boot - Configure IP settings B

Dial access ..... Disabled
DHCP ..... Disabled

Thin Client IP address ..... [0.0.0.0]
Subnet mask ..... [255.255.255.0]

Gateway IP address ..... [0.0.0.0]
Domain name server IP address ..... [0.0.0.0]
      C                                D

                        Press Enter to continue. E
                        Leave at 0.0.0.0 if a Domain Name Server is not used F
                        Thin Client IP address is required G

Enter=Continue   F5=Advanced configuration   F7=Back H
```

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Figure 2. Example menu

The menu number **A** makes it easy to navigate through the Setup Utility. Menu numbers that begin with **2** are unique to the initial Setup Utility. The menu title **B** tells you which menu you are using.

Use the arrow keys to select an option from the list of available options **C**. After you select an option, specify a value in the corresponding value field **D**. Certain fields allow you to select a value by using the **Page Up** and **Page Down** keys.

Instructions and other messages (**E** and **F**) provide additional information. Error messages **G** inform you when you need to complete a field or correct a value before continuing.

Use the active function keys **H** to navigate through the Setup Utility.

To access the Setup Utility during a subsequent boot, press **Esc** immediately after the following message disappears:

Hardware testing in progress . . .

If you worked only with the **Simple Configuration** menu during the initial boot, then the **Simple Configuration** menu appears. However, if you worked with the **Advanced Configuration** menu during the initial boot, then the **Advanced Configuration** menu appears.

You can also configure your workstation for Dial Access. This option is available if your client will use a modem for network connection instead of the Ethernet or Token-Ring connection. See “PPP dialer for Thin Client Express workstations” on page 19.

For information on using the Setup Utility to update CompactFlash cards, see “Using the Setup Utility to recover the flash image of a workstation” on page 27.

Using the Configuration Tool to configure the workstation

The Configuration Tool allows you to configure the following applications on your workstation:

- Independent Computing Architecture (ICA) Client
- ICA Remote Application Manager
- Netscape 4.5 browser (without Netscape JVM support)
- 3270 emulator to S/390® hosts
- 5250 emulator to Application System/400 (AS/400)® hosts
- VT emulator
- Advanced diagnostics

The Configuration Tool also allows you to configure the single user preferences that are independent of the applications, such as mouse orientation. It also provides a means to update the software on the CompactFlash card.

The first time you power on the workstation, the Configuration Tool displays automatically after you complete the Setup Utility configurations. You must complete the Configuration Tool configurations before you can access applications from network servers. However, you do not need to complete the advanced settings to create a basic, working configuration. After you have completed the Configuration Tool, click **Save and Restart** to save your settings and restart the workstation with your new configuration.

The Configuration Tool provides three Workstation Mode user interfaces:

1. A single application that starts automatically when you power on the workstation. This application fills the entire display screen.
2. One or more applications that start automatically when you power on the workstation.

Note: The N2200e's free memory determines how many applications you can run at one time. With 32 MB of RAM, you can specify up to either of the following applications:

- Four simultaneous 5250 or 3270 emulators
 - An ICA client and two simultaneous 5250 or 3270 emulators
3. A launch bar with one or more applications. The Configuration Tool can start these applications automatically, if desired.

Network administrators can use one of two possible methods to restrict access to the Configuration Tool:

1. Use the Configuration Tool itself to create an administrator password.
2. Use the Thin Client Manager Operations Utility. For more information on using the Thin Client Manager Operations Utility, see "Managing your Thin Client Express remotely" on page 17.

You can access additional, customized help at any time by clicking **Help** in the lower, right-hand corner of the display. The help viewer also has search capability.

To access the Configuration Tool anytime after the initial configuration, press and hold the following keys on the left side of the keyboard: **Shift + Ctrl + Alt**. Hold the keys down for several seconds until the Configuration Tool starts.

You can also place the Configuration Tool on the launch bar for simple, future access.

For information on using the Configuration Tool to update CompactFlash cards, see "Using the Configuration Tool to perform a software update on a workstation" on page 23.

Installing the Thin Client Service Utility and the Operations Utilities

The Thin Client Express Service and Thin Client Manager Operations Utilities are management utilities that run on the following workstations or server platforms:

- Windows NT Server 4.0
- Windows NT Server 4.0, Terminal Server Edition (TSE)
- Windows NT Workstation 4.0
- Windows 2000 Server
- Windows 2000 Professional
- Windows 2000 Advanced Server

Although these utilities are optional, IBM recommends that you install the Service Utility on if you want to rewrite the flash image of a workstation. The Service Utility consists of the following:

- NetVista Thin Client Express image files
- Network support services that provide Network File System (NFS) support for the client to access the image files

The Service Utility services start automatically after the installation is complete. The services also start automatically after the server reboots. If you experience problems while attempting to update or recover the flash of a workstation, verify the status of the Service Utility network support services. For information regarding how to verify the status of network support services, see the NetVista Thin Client Service and Operations Utilities Readme file. This file is available on the NetVista Thin Client Utilities CD, as well as the NetVista Thin Client website.

For information on using the Operations Utility, refer to *IBM NetVista Thin Client Manager Operations Utility (SA23-2813)*. This information is available at the following uniform resource locator (URL):

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

Table 1 shows the tools, and utilities that IBM recommends for the different methods of rewriting the flash image.

Table 1. Required tools and utilities to perform flash updates and recoveries

Type of update or recovery	NSBoot Setup Utility	Configuration Tool	Service Utility	Operations Utility
Configuration Tool update		X	X	
Operations Utility update			X	X
Operations Utility recovery			X	X
NS Boot Setup Utility recovery	X		X	
Peer flash recovery	X			

Only the Operations Utility methods of updating in Table 1 on page 13 allow you to update multiple workstations at a time. The other methods of flash recovery in Table 1 on page 13 allow you to perform flash recovery to one workstation at a time. For more information on recovering or updating CompactFlash cards with the TCM Operations Utility, refer to *IBM NetVista Thin Client Manager Operations Utility* (SA23-2813). This information is available at the following URL:

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

There are two ways to install the Service and Operations Utilities:

1. Installing the utilities from the NetVista Thin Client Utilities CD
2. Downloading the utilities from the NetVista Thin Client website

Installing the utilities from the NetVista Thin Client Utilities CD

To install the Service and Operations Utilities from the NetVista Thin Client Utilities CD, insert the CD into your server's CD-ROM drive. The IBM NetVista Thin Client Utilities menu starts automatically.

Note: If the Thin Client Utilities menu does not start automatically, you can run the `install.bat` file from the root directory of the CD.

To install the Operations Utility, click "Install NetVista Thin Client Manager Operations Utility."

To install the Service Utility, click "Install NetVista Thin Client Express Service Utility."

Downloading the utilities from the NetVista Thin Client web site

To download the Service and Operations Utilities from the IBM Thin Client web site, you need to set up an update server. This update server must meet the following requirements:

- Reliable access to the Internet
- Runs File Transfer Protocol (FTP) or Hypertext Transfer Protocol (HTTP)
- Accessible by workstations through a high-speed TCP/IP (Transmission Control Protocol/Internet Protocol) connection (for example, a LAN)
- Sufficient space for the download files

After you have set up an update server, follow these steps to download the Service and Operations Utilities from the IBM Thin Client web site:

Note: The Thin Client Express Service Utility, Thin Client Manager Operations Utility, and Readme files for each utility are available from this Internet site.

1. From the server that you want to install the utilities on, open an Internet browser and go to the following URL:

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

2. Click **NetVista**.
3. Click **NetVista *thin client***.
4. From the left column of links, click **Hot news**.
5. Click **NetVista Thin Client Express - Service and Operations Utilities**.

6. Click **download NetVista Thin Client Express Service and Operations Utilities**.
7. From the **Downloads** box, click the item that you want to download.

Managing your Thin Client Express remotely

You can use the IBM NetVista Thin Client Manager Operations Utility to remotely manage your N2200e Thin Client Express. You can use the Thin Client Manager Operations Utility to manage both individual workstations, and workstation groups. Before you can use the Operations Utility to perform a task on a workstation, you need to perform the following tasks:

- Install the Operations Utility on your computer. For information on installing the Operations Utility, see “Installing the Thin Client Service Utility and the Operations Utilities” on page 13.
- Power on the workstation on which you want to perform a task.

See *IBM NetVista Thin Client Manager Operations Utility (SA23-2813)* for more information on managing thin clients with the Thin Client Manager Operations Utility. This information is available on the World Wide Web at the following uniform resource locator (URL):

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

PPP dialer for Thin Client Express workstations

You can configure your Thin Client Express (hereafter referred to as *workstation*) for Point-to-Point Protocol (PPP) dial access. You can utilize this option if your workstation uses a modem to connect to a network. There are several prerequisites that you must meet before you can use PPP dialer.

Prerequisites for using PPP dial access

Before you can use PPP dial access with your workstation, you must have the following:

- A workstation, with a Service Update 1 BOM flash file installed on its CompactFlash card (see “Altering the flash image of a workstation” on page 23 for flash update information).
- USB modem or serial analog modem.

Note: If you are going to use a serial modem with a N2200e workstation, you need an USB-to-serial adapter.

- Analog telephone line.
- Internet Service Provider (ISP) that supports PPP connections, and Password Authentication Protocol (PAP) authentication.

Note: By default, the workstation does not recognize Domain Name System (DNS) information from ISPs. To enable DNS, perform the procedure, “Configuring initial modem settings for PPP dialer access” on page 20.

For a list of tested modems, visit the following uniform resource locator (URL):
<http://www.ibm.com/pc/support>

Click **NetVista**—>**NetVista thin client**—>**Advanced Search**, and then search for modems, under IBM NetVista Thin Client.

Configuring a workstation for PPP dialer

You need to perform the following procedures to configure a workstation for PPP dialer access:

1. “Preparing the workstation for PPP dialer configuration” on page 19
2. “Configuring initial modem settings for PPP dialer access” on page 20
3. “Starting the PPP dialer” on page 21

Preparing the workstation for PPP dialer configuration

Follow these steps to configure your workstation for PPP dialer access.

1. Power on the workstation.
2. If the workstation does not automatically display the **Setup Utility Simple configuration** menu, press **Esc** to enter the Setup Utility. If the workstation displays the **Advanced configuration** menu, select **Simple configuration**, and press **Enter**.
3. From the **Setup Utility Simple configuration** menu:
 - a. Choose a language setting.

- b. Choose a display resolution setting and a display frequency setting.
- c. Configure the workstation Internet Protocol (IP) settings:
 - 1) From the **CompactFlash Boot - Configure IP settings** menu, disable Dynamic Host Configuration Protocol (DHCP).
 - 2) Verify that all IP values are 0.0.0.0.
 - 3) From the **CompactFlash Boot - Configure IP settings** menu, enable **Dial Access**.
 - 4) Press **Enter**. The workstation restarts, and the Configuration Tool appears on the display. If the Configuration Tool does not display, Press and hold the following keys on the left side of the keyboard: **Shift + Ctrl + Alt**. Hold the keys down for several seconds until the Configuration Tool starts.

Note: If you are unable to enter the Configuration Tool, the workstation may not have access to the Configuration Tool. Refer to *IBM NetVista Thin Client Manager Operations Utility (SA23-2813)* for more information about granting and denying access to the Configuration Tool. This information is available at the following URL:

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

4. From the Configuration Tool, select a language.

You have completed the initial configurations of your workstation for PPP dialer access. Continue with "Configuring initial modem settings for PPP dialer access".

Configuring initial modem settings for PPP dialer access

Once you have prepared a workstation for PPP dialer access, you must configure the initial modem settings of the workstation. Perform the following steps from the **Communication Options** menu of the Configuration Tool to complete this task:

1. Select a type of modem. N2200e workstations use an USB modem, or a serial modem with an USB adapter.
2. Select DTE Baud rate. If you are using a 56K modem, you should select 57600 or higher.
3. Select a dialing method. You can choose **Tone** or **Pulse**.
4. This step is optional, depending on the modem that you are using:
 - a. Type the modem initialization string in the appropriate field. This can contain additional commands for the modem.
 - b. Type one command string and one response string into the appropriate fields. Refer to the documentation for the modem that you are using for specific commands. An example of a command string and a response string is atz&fL1 OK.
5. This step is optional, depending on the applications that you want to use:
 - a. If you need DNS support, from the **DNS active** pulldown list, select **Yes**.
 - b. Type up to two DNS server IP addresses in the **IP address 1** and **IP address 2** fields.
 - c. Type an optional domain name in the **Domain** field.
6. Type the telephone number of the ISP in the **Phone number** field. You can include commas in the telephone number for time delay, but you cannot include blank spaces. Commas indicate to the PPP dialer that it needs to wait for a dial tone before continuing to dial the telephone number of the ISP.

7. Type a userid and password in the appropriate fields. If you do not type a userid and password, the dialer prompts you for a userid and password each time that you connect to the network.

Once you have completed the initial modem setting configurations for PPP dialer access, you can start the PPP dialer. It is necessary for you to successfully start the PPP dialer at this time to complete the configuration of your workstation for PPP dialer access.

Starting the PPP dialer

You can start the PPP dialer once you have completed the initial modem setting configurations on the workstation. Starting the PPP dialer after you have completed the initial modem setting allows the workstation to test the modem settings that you have specified. Perform the following steps to start the PPP dialer:

1. In the last step of the procedure, “Configuring initial modem settings for PPP dialer access” on page 20, the workstation that you are configuring for PPP dialer access is displaying the **Communication Options** menu. From the **Communication Options** menu, click **OK** to start the dialer.
2. From the **NC Dialer** window, click **Connect**. The workstation may prompt you for a userid and password. After you click **Connect**, the **State** changes from **Offline**, to **Connecting**. Wait for the state to display **Online**. You can check the status log in the window for connection errors.

After the workstation has completed a successful dial connection, the **Configure a Workstation Mode** menu appears. You are now ready to configure the workstation desktop. See “Using the Configuration Tool to configure the workstation” on page 10 for more information about configuring the workstation desktop.

Learning about the NC dialer window

The **NC dialer** window displays information about the PPP connection of the workstation. The dialer window includes a log, which displays status information of the current dialer session. During a successful PPP dialer connection, the dialer window displays the following information:

- **Modem Speed** — displays the DTE Baud speed.
- **Local IP** — displays the local workstation’s IP address.
- **Remote IP**— displays the workstation’s gateway address.
- **Bytes in** — displays number of bytes received by the workstation.
- **Bytes out** — displays number of bytes transmitted by the workstation.
- **Time online** — displays the time online for the current connection.
- **Connect** — if enabled, allows the user to connect manually.
- **Disconnect** — if enabled, allows the user to disconnect manually.

Maintaining and reconfiguring PPP dialer parameters

You can change PPP dialer configuration parameters of a workstation from the Configuration Tool. Perform these steps to reconfigure the PPP dialer parameters for a workstation:

1. From the workstation that you want to update, enter the Configuration Tool:
 - a. Press and hold the following keys on the left side of the keyboard: **Shift + Ctrl + Alt**.

- b. Hold the keys down for several seconds until the Configuration Tool starts.

Note: If you are unable to enter the Configuration Tool, the workstation may not have access to the Configuration Tool. Refer to *IBM NetVista Thin Client Manager Operations Utility* (SA23-2813) for more information about granting and denying access to the Configuration Tool. This information is available at the following URL:

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

2. Click **Workstation Configuration**.
3. Select **Hardware—>Communications**. The **Dial Access Configuration** window appears.
4. Change the PPP dialer parameters according to your needs.

You do not need to restart the workstation for the changes to take effect. The next time you start a PPP dialer session, the PPP dialer will use the parameters that you have configured.

Using the PPP dialer to access flash images

You can use the workstation Configuration Tool to update the flash image of a workstation. If you have configured the workstation to use the PPP dialer, the workstation uses the dialer to access the update flash image. See “Using the Configuration Tool to perform a software update on a workstation” on page 23 for more information about using the Configuration Tool to perform software updates. Perform the procedure, “Configuring a workstation for PPP dialer” on page 19, to configure a workstation to use the PPP dialer.

Troubleshooting PPP dialer problems

The NC dialer window displays PPP connection information. The workstation saves this information in the following file: `/tmp/ncdialer/log`.

Note: The `/tmp/ncdialer/log` does not persist through workstation reboot. The workstation stores additional PPP connection information in the system log. You can access this information by performing the following steps:

1. Using the Configuration Tool, configure the workstation desktop to include an **Advanced Diagnostics** window (see “Using the Configuration Tool to configure the workstation” on page 10).
2. From the workstation desktop, open an Advanced Diagnostics window and type the command, `dmesg`. You can now see PPP connection information and messages for the current dialer session.

Altering the flash image of a workstation

There are two methods that you can use to alter the flash image of a workstation:

- “Performing a software update on a workstation” on page 23.
- “Recovering the flash image of a workstation” on page 24.

Notes:

1. When you perform a software *update* to the flash image of a workstation, you are only updating the software files. The workstation saves any configuration settings that you have made, during the software flash update process.
2. When you *recover* the flash image of a workstation, the recovery server reformats the CompactFlash card of the workstation, copying the recovery flash image to the workstation. Any configurations that you have made to the workstation are removed.

Performing a software update on a workstation

You should perform software updates on workstations only when a newer version of the software flash image exists. Files which contain configuration information are not rewritten by the workstation when you perform a software update on a workstation. Configuration files can include Internet Protocol (IP) configuration settings, emulator settings, keyboard remapping files, and Independent Computing Architecture (ICA) Client sessions that you have added.

You can perform a software update on a workstation, using the following two methods:

- “Using the Thin Client Manager Operations Utility to perform a software update on a workstation” on page 24
- “Using the Configuration Tool to perform a software update on a workstation”

Using the Configuration Tool to perform a software update on a workstation

You can use the Configuration Tool to perform a software update on a workstation. Using the Configuration Tool requires you to be at the workstation that you are updating. If you have installed the IBM NetVista Thin Client Express Service Utility (hereafter referred to as *Service Utility*), you can use it as a flash update source. To use the Configuration Tool to perform a software update on a workstation, follow these steps:

1. From the workstation that you want to update, enter the Configuration Tool:
 - a. Press and hold the following keys on the left side of the keyboard: **Shift + Ctrl + Alt**.
 - b. Hold the keys down for several seconds until the Configuration Tool starts.

Note: If you are unable to enter the Configuration Tool, the workstation may not have access to the Configuration Tool. Refer to *IBM NetVista Thin Client Manager Operations Utility (SA23-2813)* for more information about granting and denying workstations access to the Configuration Tool. This information is available at the following uniform resource locator (URL):

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

2. If you have installed the Service Utility on a network server, ensure that the Service Utility services are running. If you have not installed the Service Utility on a network server, you can use another workstation as your flash update source. Continue with the next step.
3. From the Configuration Tool, click **Remote Management / Software Update**.
4. Click **Configure Software Update Server Access**.
5. Specify the IP address of the Service Utility server. To use another workstation as your flash update source, enter the IP address of the workstation that you want to pull the software update from.
6. Verify that both the software update server, and the file system types are correct.
7. Set **Software update file list name** to the appropriate flash file, or BOM file. For information on selecting the correct flash file, see “Appendix G. Choosing a flash file” on page 55.
8. Click **OK**.
9. Click **Request Immediate Software Update**.
10. On the confirmation window, click **OK**.
Attention: After you click **OK**, the server might take as long as 10 minutes to update the CompactFlash card. Do **not** power off the workstation while it reboots.

If you are interested in learning more about the Configuration Tool, see “Using the Configuration Tool to configure the workstation” on page 10.

Using the Thin Client Manager Operations Utility to perform a software update on a workstation

You can use the Thin Client Manager Operations Utility to perform a software update on a workstation. To find out how to perform this, and other workstation management tasks, refer to *IBM NetVista Thin Client Manager Operations Utility (SA23-2813)* for information about managing your Thin Client Express. This information is available at the following URL:

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

Recovering the flash image of a workstation

You can recover the flash image of a workstation that has a damaged flash image. This process is also known as reflashing the workstation. When you *recover* the flash image of a workstation, the recovery server reformats the CompactFlash card, and copies the recovery flash image to the workstation. Any configurations that you have made to the workstation are removed.

Note: You should only perform flash recovery when you have a workstation with a corrupt flash image.

You can recover the flash image of a workstation by using one of the following methods:

- “Using one workstation to recover the flash image of another workstation” on page 25
- “Using the Setup Utility to recover the flash image of a workstation” on page 27
- “Using the Thin Client Manager Operations Utility to recover the flash image of a workstation” on page 28

You need to specify the flash file that you want to use in the process, regardless of the method that you choose. See “Appendix G. Choosing a flash file” on page 55 for more information.

Using one workstation to recover the flash image of another workstation

You can use a peer workstation to perform a *peer flash recovery* on another workstation. The term *peer flash recovery* means that you use one workstation to recover the flash image of another workstation.

Note: You should only perform flash recovery when you have a workstation with a corrupt flash image.

You can perform a peer flash recovery, provided that the following statements are true:

- Both workstations that you are working with are of the same hardware type (example, N2200e)
- Both workstations have CompactFlash cards installed
- The recovery workstation has a CompactFlash card that is compatible from a language and memory perspective with the CompactFlash card on the workstation whose flash image you are recovering.

A peer flash recovery requires you to perform the following procedures:

1. “Enabling peer flash recovery on a workstation”
2. “Recovering the image on the peer-booted workstation” on page 26
3. “Disabling peer flash recovery on a workstation” on page 27

Enabling peer flash recovery on a workstation

The first step of peer flash recovery is to enable peer flash recovery on the workstation that you want to provide the peer recovery service. From the workstation that you want to provide the peer flash recovery, perform the following steps:

1. Power on the workstation.
2. Access the Configuration Tool:
 - a. Press and hold the following keys on the left side of the keyboard: **Shift + Ctrl + Alt**.
 - b. Hold these keys down for several seconds, until the Configuration Tool starts.

Note: If you are unable to enter the Configuration Tool, the workstation may not have access to the Configuration Tool. Refer to *IBM NetVista Thin Client Manager Operations Utility* (SA23-2813) for more information about granting and denying access to the Configuration Tool. This information is available at the following URL:

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

3. In the Configuration Tool, click **Remote Management / Software Update**.
4. Click **Enable / Disable Peer Software Recovery**.
5. Select **Enable Peer Software Recovery**.
6. Click **OK**.

Do not exit the Configuration Tool at this time, as you will need to perform the procedure, “Disabling peer flash recovery on a workstation” on page 27 from this menu later.

7. Continue with the procedure, “Recovering the image on the peer-booted workstation”.

Recovering the image on the peer-booted workstation

The second step of peer flash recovery is recovering the image on the peer-booted workstation. The peer-booted workstation is the workstation whose flash image you are recovering. Follow these steps to recover the image:

1. Power on the *peer-booted* workstation.
2. Press **Esc** immediately after the following message disappears:
Hardware testing in progress . . .
3. Press a key to continue.
4. Follow the on-screen directions until you see the **Advanced configuration** menu (MENU03).
5. Select **Configure network settings**.
6. Press **Enter** to continue.
7. Set **Boot file source** to Network.
8. Verify that the following values are correct for your IP configuration:
 - Workstation IP Address
 - Gateway IP Address
 - Subnet Mask
9. Press **Enter** to continue.
10. Under **Boot file server IP address**, specify the IP address of the flash-booted workstation as the **First** option.
11. Under **Boot file server directory and file name**, specify the path and file name of the recovery kernel as the **First** option.
The following is an example of a probable path and file name:
/kernel.2200
12. Under **Boot file server protocol**, set **NFS** to **First**.
13. Press **F3** to save your settings and return to the **Advanced Configuration** menu.
14. Press **F10** to reboot the workstation.
After the flash-booted workstation successfully updates the flash image of the peer-booted workstation, the Configuration Tool appears on the display.

Note: The flash-booted workstation might take as long as 10 minutes to update the CompactFlash card of the peer-booted workstation. Do **not** power off either workstation during this time.
15. Use the **Simple configuration** menu of the Setup Utility to restore the workstation’s settings.
For information on using the Setup Utility, see “Using the Setup Utility to configure the workstation” on page 9.
16. Continue with the procedure, “Disabling peer flash recovery on a workstation” on page 27.

Disabling peer flash recovery on a workstation

The third step of peer flash recovery is to disable peer flash recovery on a workstation. Perform the following procedure from the workstation that you enabled to provide peer flash recovery:

1. From the **Remote Management / Software Update** menu, click **Enable / Disable Peer Software Recovery**.

The workstation should still display the **Remote Management / Software Update** menu from when you performed the procedure, “Enabling peer flash recovery on a workstation” on page 25.

2. Select **Disable Peer Software Recovery**.
3. Click **Ok**—>**Exit**.

Using the Setup Utility to recover the flash image of a workstation

You can use the NS Boot Setup Utility (hereafter referred to as Setup Utility) to recover the CompactFlash image of a workstation. If you have installed the IBM NetVista Thin Client Express Service Utility (hereafter referred to as Service Utility), you can use it as a source for recovery flash images.

Perform the following steps:

1. Power on the workstation whose flash image you want to recover.
2. Ensure that the Service Utility services have started on the Service Utility server. If you have not installed the Service Utility on a network server, you can use another workstation as your source for the recovery flash image. Continue with the next step.
3. Press **Esc** immediately after the following message disappears:
Hardware testing in progress . . .
4. Press a key to continue.
5. Follow the on-screen directions until you see the **Advanced Configuration** menu (MENU03).
6. Select **Configure Network Settings**.
7. Press **Enter** to continue.
8. Under **Network Priority**, specify the following:
 - Set **DHCP** to Disabled.
 - Set **BOOTP** to Disabled.
 - Set **Local (NVRAM)** to First.
9. Set **Boot file source** to Network.
10. Verify that the following values are correct for your IP configuration:
 - Workstation IP Address
 - Gateway IP Address
 - Subnet Mask
11. Press **Enter** to continue.
12. Under **Boot file server IP address**, specify the IP address of the Service Utility server as the **First** option. To use another workstation as your recovery flash source, enter the IP address of the recovery workstation.

Note: You need to perform the procedure, “Enabling peer flash recovery on a workstation” on page 25 before you can perform a peer flash recovery.

13. Under **Boot file server directory and file name**, specify this directory and file name as the **First** option:
/NS/flashbase/x86/kernel.2200
14. Under **Boot file server protocol**, set **NFS** to **First**.
15. Press **F3** to save your settings and return to the **Advanced Configuration** menu.
16. Press **F10** to reboot the workstation.
17. Specify the appropriate flash file, or BOM file, and press **Enter** to continue. For information on selecting the correct flash file, see “Appendix G. Choosing a flash file” on page 55.

Note: The workstation will not prompt you to specify a BOM file in the following instances:

- a. You are performing a peer flash recovery.
- b. The Service Utilities server administrator has already specified a BOM file to use for flash recovery.

Attention: Recovering the flash image of a workstation can take as long as 10 minutes. Do **not** power off the workstation until the flash recovery process is complete.

After the recovered workstation reboots, the Configuration Tool appears on the display.

18. Make any necessary changes to your configuration, and then click **Save and Restart**.

If you are interested in learning more about the Configuration Tool, see “Using the Configuration Tool to configure the workstation” on page 10.

Using the Thin Client Manager Operations Utility to recover the flash image of a workstation

You can use the Thin Client Manager Operations Utility to recover the flash image of a workstation. To find out how to perform this, and other workstation management tasks, refer to *IBM NetVista Thin Client Manager Operations Utility (SA23-2813)* for information about managing your Thin Client Express. This information is available at the following URL:

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

Resolving hardware problems

This section provides information on verifying and resolving hardware problems.

If you cannot identify a hardware problem, you can request technical service and support by contacting IBM. You need to provide the machine type, model, and serial number of your NetVista thin client.

You can obtain additional service and support information at the following URL:

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

Notes:

1. If your NetVista thin client is under warranty or a maintenance contract, contact IBM Service and Support to obtain a customer-replaceable unit (CRU). Refer to *IBM Network Station Hardware Warranty - Type 8363 and Type 8364 (SA23-2802)* for more information.
2. To resolve software errors, follow the instructions on the error message. For more information, contact IBM Service and Support.
3. Refer to the documentation for your monitor and USB devices for detailed information on resolving hardware problems that are associated with these devices.

Verifying hardware problems

Table 2 identifies possible hardware problem indications that can occur with the NetVista thin client during its startup sequence (see “Startup sequence” on page 7), or during normal operation.

Table 2. Hardware problem indications

Startup Checkpoints	Visible hardware failure	LED indications (system LED)	Audio beep sequences	Error codes and text messages (NSBxxxx)
Power on	X	X	X	
Monitor initialization	X			X
Keyboard initialization	X			X
Welcome screen	X			X

If you experience any hardware problem indications, you need to verify that an easily avoidable problem is not causing the hardware problem indication. Record any hardware problem indications and a description of the problem, and then proceed with the instructions below.

These instructions ensure that you start resolving any hardware problems by resetting the power to your hardware.

To determine the cause of NetVista thin client hardware problems, follow these steps to reset the power to your hardware:

- ___ 1. Power off the NetVista thin client.

- ___ 2. Unplug the power supply from the electrical outlet.
- ___ 3. Ensure that you properly connected all devices to the NetVista thin client. See “Connecting your hardware” on page 6 for more information.
- ___ 4. Plug the NetVista thin client power supply into a properly grounded, working electrical outlet.
- ___ 5. Power on the NetVista thin client.
- ___ 6. Wait for the IBM NetVista thin client screen to appear on your monitor.
 - If the IBM NetVista thin client screen appeared, and the NetVista thin client did not indicate any hardware problems during power-on, you do not have a hardware problem.
 - If the NetVista thin client indicates a hardware problem, record any problem indications and a description of the problem. Consult Table 3 with your hardware problem information.

Table 3. Hardware problem resolution information

Hardware problem indications	Where to find information
Visible hardware failure	“Visible hardware failure”
Audio beep sequences	“Audio beep sequences” on page 32
LED indications	“LED indications” on page 33
Error codes and text messages	“Error codes and text messages” on page 35

Visible hardware failure

You experience visible hardware failure during normal operation when a device that is attached to your logic unit fails to function properly. Visible hardware failure includes the following:

- A device that is attached to your logic unit fails to function at all.
For example:
 - Your mouse cursor stops moving.
 - Your monitor displays a blank screen.
 - Characters do not display on your monitor when you type.
- A device that is attached to your logic unit does not function properly.
For example:
 - Your monitor displays unreadable screens.
 - Your mouse cursor does not move smoothly.
 - Some keys on your keyboard do not respond correctly.

If your NetVista thin client hardware has a visible hardware failure, consult Table 4. Contact your technical support if these steps do not resolve the problem.

Table 4. Visible hardware failure

Symptom	What you should do
Logic Unit	

Table 4. Visible hardware failure (continued)

Symptom	What you should do
<p>The system LED does not light up when you press the white power button to power on the NetVista thin client.</p>	<ol style="list-style-type: none"> 1. Verify that you plugged the power supply into a working electrical outlet. 2. Verify that the power supply LED indicates a solid green color. 3. Reset power to the NetVista thin client by pressing the white power button. 4. If the system LED does not work, any of the following devices may be defective: <ul style="list-style-type: none"> • Power supply Verify that the power supply LED indicates a solid green color. • Power cable <p>Substitute a properly working device for a defective device. Repeat the previous steps. See “Appendix A. Replacing hardware parts” on page 39 for more information.</p> 5. If the system LED still does not work, you may need to replace the NetVista thin client logic unit. See “Appendix A. Replacing hardware parts” on page 39 for more information on replacing a defective mouse.
Monitor	
<ul style="list-style-type: none"> • The monitor displays a blank screen. • The monitor displays unreadable screens. 	<p>If the problem persists after you have verified the monitor cable connections, or after you have substituted a properly working monitor, refer to the documentation for your monitor for troubleshooting information.</p>
Keyboard	
<ul style="list-style-type: none"> • The arrow keys do not respond when you press them. • Characters do not display on the monitor when you type. 	<ol style="list-style-type: none"> 1. Verify that you connected the keyboard cable properly to the NetVista thin client. 2. If the problem persists, the keyboard may be defective. <ul style="list-style-type: none"> • Substitute a properly working keyboard, and repeat the previous steps. • See “Appendix A. Replacing hardware parts” on page 39 for more information on replacing a defective keyboard. 3. If the keyboard still does not work, you may need to replace the NetVista thin client logic unit. See “Appendix A. Replacing hardware parts” on page 39 for more information on replacing a defective logic unit.
Mouse	

Table 4. Visible hardware failure (continued)

Symptom	What you should do
<ul style="list-style-type: none"> • The mouse cursor stops moving; the mouse does not function at all. • The mouse cursor does not move smoothly. 	<ol style="list-style-type: none"> 1. Verify that you connected the mouse cable properly to the NetVista thin client keyboard. 2. If the mouse does not work, any of the following devices may be defective: <ul style="list-style-type: none"> • Mouse • Keyboard <p>Substitute a properly working device for a defective device. Repeat the previous steps. See “Appendix A. Replacing hardware parts” on page 39 for more information.</p> 3. If the mouse still does not work, you may need to replace the NetVista thin client logic unit. See “Appendix A. Replacing hardware parts” on page 39 for more information on replacing the defective logic unit.

Audio beep sequences

The NetVista thin client hardware utilizes both audio and visual alerts when reporting hardware problems. In the event of a hardware problem, the NetVista thin client emits audio beeps before your monitor initializes. After your monitor initializes, error codes and text messages appear on the screen (see “Error codes and text messages” on page 35).

Audio beep sequences can include short beeps, long beeps, and brief silent periods. Table 5 on page 33 defines the possible audio beep sequences that can occur when a hardware problem exists.

To verify that a NetVista thin client hardware problem exists, ensure that you complete the instructions in “Verifying hardware problems” on page 29.

If the NetVista thin client is not functioning properly, and it is emitting audio beep sequences, consult Table 5 on page 33. Contact your technical support if these steps do not resolve the problem.

Notes:

1. These beep sequences are in a numeric format which indicates the sequence of the audio output.
2. Audio beep sequences do not occur after the monitor initializes.

Table 5. Audio beep sequences

Symptom	What you should do
The NetVista thin client emits a 1-3-1 beep sequence, and the system LED is flashing amber.	<p>Memory error</p> <ol style="list-style-type: none"> 1. Check or replace the memory card. Refer to “Appendix B. Upgrading memory” on page 43 for instructions. 2. Verify that you properly connected the network cable to the NetVista thin client network connector. 3. Power on the NetVista thin client. 4. If the problem persists, you may need to replace the NetVista thin client logic unit. Refer to “Appendix A. Replacing hardware parts” on page 39 for information.
The NetVista thin client emits a 2-3-2 beep sequence, and the system LED is flashing amber.	<p>Video memory error</p> <ol style="list-style-type: none"> 1. Verify that you properly connected the network cable to the NetVista thin client network port. 2. Power on the NetVista thin client. 3. If the problem persists, you may need to replace the NetVista thin client logic unit. Refer to “Appendix A. Replacing hardware parts” on page 39 for information.

LED indications

The LED indicators of the following devices maintain a solid green color during normal operation:

- Logic unit (system LED and network status LED)
- Power supply
- Monitor
- Keyboard

The network status LED indicates a solid amber color during normal operation. The network status LED indicates a flashing green color during network activity.

The system LED quickly flashes from amber to green during a normal power-on. The system LED indicates hardware problems in the following ways:

- The flashing green indications
- The flashing amber indications
- Steady amber indications
- Failure to function

To verify that a NetVista thin client hardware problem exists, ensure that you complete the instructions in “Verifying hardware problems” on page 29.

If the NetVista thin client is not functioning properly, and the LED indicators indicate anything other than a solid green color, consult Table 6 on page 34. Contact your technical support if these steps do not resolve the problem.

Table 6. LED indications

Symptom	What you should do
System LED	
<p>The system LED fails to function after power on.</p>	<ol style="list-style-type: none"> 1. Verify that you plugged the power supply into a working electrical outlet. 2. Verify that the power supply LED indicates a solid green color. 3. Press the white power button to reset power to the NetVista thin client. 4. If the system LED does not work, any of the following devices may be defective: <ul style="list-style-type: none"> • Power supply Verify that the power supply LED indicates a solid green color. • Power cable Substitute a properly working device for a defective device. Repeat the previous steps. Contact your reseller, or IBM, to request a replacement part (see “Replacing additional parts” on page 40). 5. If the system LED still does not work, you may need to replace the NetVista thin client logic unit. Contact your reseller, or IBM, to request a replacement part (see “Replacing additional parts” on page 40).
<p>A power interruption during a software update occurs. When you power on the NetVista thin client, the system LED shows a solid green color, or a flashing amber color, and the monitor does not display any screens.</p>	<p>The software on the NetVista thin client may be damaged. Contact IBM Service and Support, and refer to “Appendix D. Recovering the boot block image” on page 47 for information on recovering the software on the NetVista thin client.</p>
<p>The system LED shows a solid amber color, or a flashing amber color.</p>	<ol style="list-style-type: none"> 1. Press the white power button to reset power to the NetVista thin client. 2. If the system LED still shows a solid amber color, or a flashing amber color, you may need to replace the NetVista thin client logic unit. Contact your reseller, or IBM, to request a replacement part (see “Replacing additional parts” on page 40).
<p>The system LED flashes amber once shortly after power off.</p>	<p>The NetVista thin client hardware automatically enables Wake-On-LAN (WOL). This is not an indication of a hardware problem.</p>
Power Supply LED	

Table 6. LED indications (continued)

Symptom	What you should do
The power supply LED fails to function after power on.	<ol style="list-style-type: none"> 1. Verify that you connected the power supply to the NetVista thin client. 2. Verify that you plugged the power supply into a working electrical outlet. 3. If the power supply LED does not indicate a solid green color, any of the following devices may be defective: <ul style="list-style-type: none"> • Power supply • Power cable <p>Substitute a properly working device for a defective device. Repeat the previous steps. Contact your reseller, or IBM, to request a replacement part (see “Replacing additional parts” on page 40).</p>
Monitor LED	
The monitor LED fails to function after power on.	If the problem still persists after you verified the monitor cable connections, or after you substituted a properly working monitor, refer to the documentation for your monitor for more information.
The monitor LED shows a solid amber color, or a flashing amber color.	If the problem still persists after you verified the monitor cable connections, or after you substituted a properly working monitor, refer to the documentation for your monitor for more information.

Error codes and text messages

Error codes and text messages can appear on the bottom of your screen during the startup sequence of the NetVista thin client. **NSBxxxx** error codes and text messages indicate only hardware problems.

To verify that a NetVista thin client hardware problem exists, ensure that you complete the instructions in “Verifying hardware problems” on page 29.

If the NetVista thin client is not functioning properly, and an error code or text message appears on your screen, consult Table 7. Contact your technical support, reseller, or IBM, if these steps do not resolve the problem.

Table 7. Error codes and text messages

Symptom	What you should do
An error code or text message appears on the screen.	<ol style="list-style-type: none"> 1. Record any error messages, audio beep sequences, or LED indications, and a description of the problem. 2. Perform any actions indicated within the error message. 3. Contact your technical support.
A boot interruption screen appears.	Press F10 to reboot the NetVista thin client.

Table 8 on page 36 defines the error messages that can appear when you power on the NetVista thin client. This table provides information that you must only follow

under the direction of the IBM Service and Support team.

Table 8. NSBxxxx error codes and text messages

Error code	Error message	What you should do
General messages (NSB0xxxx)		
NSB00020	Press a key to continue.	Power off the NetVista thin client. Ensure that the CompactFlash card is installed properly (see "Appendix C. CompactFlash card" on page 45). Power on the NetVista thin client. If the hardware problem persists, replace the NetVista thin client logic unit (see "Appendix A. Replacing hardware parts" on page 39).
NSB00030	Canceled by user.	Power off the NetVista thin client. Ensure that the CompactFlash card is installed properly (see "Appendix C. CompactFlash card" on page 45). Power on the NetVista thin client. If the hardware problem persists, replace the NetVista thin client logic unit (see "Appendix A. Replacing hardware parts" on page 39).
Main memory messages (NSB10xxx)		
NSB11500	On board memory failure.	Ensure that the memory is installed properly, or replace memory (see "Installing a memory card" on page 43).
NSB11510	Slot %d memory failure.	Ensure that the memory is installed properly, or replace the memory (see "Installing a memory card" on page 43).
Non-volatile memory messages (NVRAM) (NSB11xxx)		
NSB12500	Checksum failure for nonvolatile memory.	No action required.
NSB12510	Not able to access nonvolatile memory.	Replace the NetVista thin client logic unit (see "Appendix A. Replacing hardware parts" on page 39).
NSB12520	Setting nonvolatile memory to manufacturing defaults.	No action required.
NSB12530	Detected reset jumper.	No action required.
NSB12540	New nonvolatile memory structure detected.	No action required.
Audio messages (NSB21xxx)		
NSB21500	Audio failure.	Replace the NetVista thin client logic unit (see "Appendix A. Replacing hardware parts" on page 39).
Input messages (NSB3xxxx)		
Keyboard and mouse messages (NSB3xxxx, NSB31xxx, and NSB32xxx)		
NSB30500	No input device detected. NS Boot will continue in 10 seconds.	Check the keyboard and mouse cable connections.
NSB31500	Keyboard did not respond.	Check the keyboard cable connection.

Table 8. NSBxxxx error codes and text messages (continued)

Error code	Error message	What you should do
NSB31510	Keyboard controller did not respond.	Check the keyboard cable connection. If the symptom remains, replace the NetVista thin client logic unit (see “Appendix A. Replacing hardware parts” on page 39).
NSB31520	Keyboard was not recognized.	Check the keyboard cable connection.
NSB32500	Mouse did not respond.	Check the mouse cable connection.
USB messages (NSB4xxxx)		
NSB40500	USB failure.	Disconnect any USB devices from the NetVista thin client and restart the system. If the symptom remains, replace the NetVista thin client logic unit (see “Appendix A. Replacing hardware parts” on page 39).
NSB40510	USB initialization failure.	Disconnect any USB devices from the NetVista thin client and restart the system. If the symptom remains, replace the NetVista thin client logic unit (see “Appendix A. Replacing hardware parts” on page 39).
CompactFlash card messages (NSB51xxx)		
NSB51500	File not found on flash card.	Power off the NetVista thin client. Ensure that the CompactFlash card is installed properly (see “Appendix C. CompactFlash card” on page 45). Power on the NetVista thin client. If the hardware problem persists, replace the NetVista thin client logic unit (see “Appendix A. Replacing hardware parts” on page 39).
NSB51510	Cannot close file on flash card.	Power off the NetVista thin client. Ensure that the CompactFlash card is installed properly (see “Appendix C. CompactFlash card” on page 45). Power on the NetVista thin client. If the hardware problem persists, replace the NetVista thin client logic unit (see “Appendix A. Replacing hardware parts” on page 39).
Ethernet messages (NSB62xxx)		
NSB62500	Line speed automatic negotiation failed.	Verify that you connected the network cable to the NetVista thin client correctly.
NSB62510	No network device found.	Replace the NetVista thin client logic unit (see “Appendix A. Replacing hardware parts” on page 39).
Failure to boot message (NSB83xxx)		
NSB83589	Failed to boot after 3 attempts.	Power off the NetVista thin client. Ensure that the CompactFlash card is installed properly (see “Appendix C. CompactFlash card” on page 45). Power on the NetVista thin client. If the hardware problem persists, replace the NetVista thin client logic unit (see “Appendix A. Replacing hardware parts” on page 39).

Appendix A. Replacing hardware parts

You can order IBM replacement parts for the thin client. Contact IBM or your reseller to order warranty parts and non-warranty parts. IBM provides warranty service without charge for parts during the warranty period on an exchange basis only.

If you need to return a part, refer to “Returning hardware parts” on page 42 for more information.

Replacing the logic unit

IBM replaces a defective logic unit as a complete assembly. To replace a logic unit, the customer must transfer features, such as a memory DIMM, to the replacement unit. If customers do not transfer their features, the replacement units cannot operate properly. See “Safety notices” on page v for information about handling Customer Replaceable Unit (CRU) parts.

IBM delivers CRUs to the customers for exchange, and customers return defective parts to IBM under the basic service offering. Customers should return all defective logic units with the cover assembly, and without the support base or memory DIMMs. For upgraded service offerings, a service representative delivers replacement parts, transfers features, and returns defective parts to IBM.

See “Resolving hardware problems” on page 29 to determine whether or not it is necessary to replace the thin client logic unit or any other parts. If you need to replace the logic unit, you can find the correct part number on the right side of the thin client, near the back. The identification format is as follows, where ##X#### indicates the field replaceable unit (FRU) part number:

FRU P/N ##X####

If you cannot locate the part number for the logic unit, refer to Table 9 to determine the correct number. Warranty service terms and conditions by country apply.

Table 9. Thin Client Express logic units

Description	Model	Part number
Logic unit and associated parts		
Logic Unit for Model Cxx	CUS (US English), CAP (Asia Pacific), CLS (LA Spanish), CCF (Canadian French), CBP (Brazilian Portuguese)	34L4189
Logic Unit for Model Cxx	CUI (US English ISO 9995), CUK (UK English), CEU (European), CGE (German), CFR (French), CSW (Swedish/Finnish), CDK (Danish), CNO (Norwegian), CND (Dutch)	34L4187
Logic Unit for Model Cxx	CIL (Icelandic), CSG (Swiss German/French/Italian), CIT (Italian), CLE (Luxembourg), CSP (Spanish), CBE (Belgian Dutch/English), CPO (Portuguese)	34L4188

Replacing additional parts

Use the following tables to determine the correct part to replace. Warranty service terms and conditions by country apply.

Table 10. Type 8363 thin client replacement parts

Description	Country	Part number
Base (mounting stand)	All Countries	03N2725
Slotted thumbscrews	All Countries	03N3882
Memory		
Note: This thin client accepts 168 pin, 3.3 V, gold tab, unbuffered, non-parity, and 100MHz SDRAM DIMM memory.		
Memory (32 MB SDRAM DIMM)	All Countries	01K1146
Memory (64 MB SDRAM DIMM)	All Countries	01K1147
Memory (128 MB SDRAM DIMM)	All Countries	01K1148
Memory (256 MB SDRAM DIMM)	All Countries	01K1149
Power supply		
Power Supply (detachable power cable not included)	All Countries	03N2662
Mouse		
Mouse (two button)	All Countries	76H0889
Keyboards (USB)		
Keyboard	Belgian UK	37L2651
Keyboard	Brazilian Portuguese	37L2648
Keyboard	Canadian French	37L2646
Keyboard	Danish	37L2654
Keyboard	Dutch	37L2655
Keyboard	French	37L2656
Keyboard	French Canadian	37L2645
Keyboard	Finnish	37L2671
Keyboard	German	37L2657
Keyboard	Italian	37L2662
Keyboard	Japanese	37L2680
Keyboard	Latin America (Spanish)	37L2647
Keyboard	Norwegian	37L2663
Keyboard	Spanish	37L2670
Keyboard	Swedish	37L2671
Keyboard	Swiss (French and German)	37L2672
Keyboard	UK English	37L2675
Keyboard	US English ISO9995	37L2677
Keyboard	US English	37L2644

Table 11. Detachable power cables

Plug	Receptacle	Country	Part number
Detachable power cables			
		Argentina, Australia, New Zealand	13F9940
		Abu Dhabi, Austria, Belgium, Bulgaria, Botswana, Egypt, Finland, France, Germany, Greece, Iceland, Indonesia, Korea (South), Lebanon, Luxembourg, Netherlands, Norway, Portugal, Saudi Arabia, Spain, Sudan, Sweden, Turkey, Yugoslavia	13F9978
		Bahamas, Barbados, Bolivia, Brazil, Canada, Costa Rica, Dominican Republic, El Salvador, Ecuador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Netherlands Antilles, Panama, Peru, Philippines, Taiwan, Thailand, Trinidad, Tobago, U.S.A. (except Chicago), Venezuela	1838574
		Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Korea (South), Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Puerto Rico, Saudi Arabia, Suriname, Trinidad, Taiwan, U.S.A	6952301
		Bahrain, Bermuda, Brunei, Channel Islands, Cyprus, Ghana, Hong Kong, India, Iraq, Ireland, Jordan, Kenya, Kuwait, Malawi, Malaysia, Nigeria, Oman, People's Republic of China, Qatar, Singapore, Tanzania, Uganda, United Arab Emirates (Dubai), United Kingdom, Zambia	14F0032
		Bangladesh, Burma, Pakistan, South Africa, Sri Lanka	14F0014
		Denmark	13F9996
		Israel	14F0086
		Chile, Ethiopia, Italy	14F0068
		Liechtenstein, Switzerland	14F0050

Returning hardware parts

You may not need to return all defective items to IBM. Always check the replacement part packaging for any instructions regarding the return of defective parts.

To return a defective part to IBM, pack the defective part in the packaging container of the replacement part.

Note: Customers must not ship features, such as memory DIMMs, with defective logic units that they are returning to IBM. It is not possible for IBM to return these features back to customers.

If customers do not follow IBM shipping instructions, they may get charges for any damage to a defective part. IBM covers shipping costs on all warranted hardware and maintenance agreement hardware. Replacement parts become the customer's property in exchange for the defective parts, which become the property of IBM.

For information on ordering thin client parts, refer to "Replacing additional parts" on page 40.

Appendix B. Upgrading memory

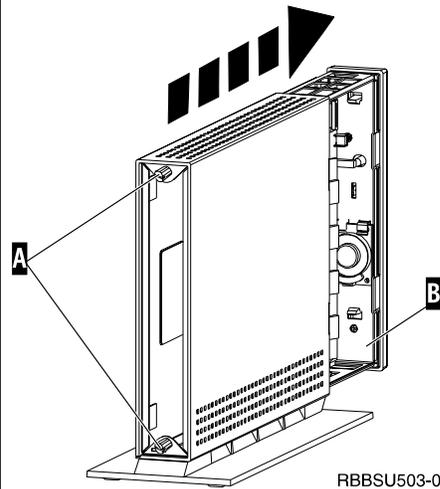
See “Resolving hardware problems” on page 29 to determine whether or not it is necessary to replace the logic unit, or any other parts. For information on ordering thin client hardware parts, refer to “Replacing additional parts” on page 40.

Read “Safety notices” on page v before you continue with these instructions.

Removing the logic unit

Read “Safety notices” on page v before you continue with these instructions.

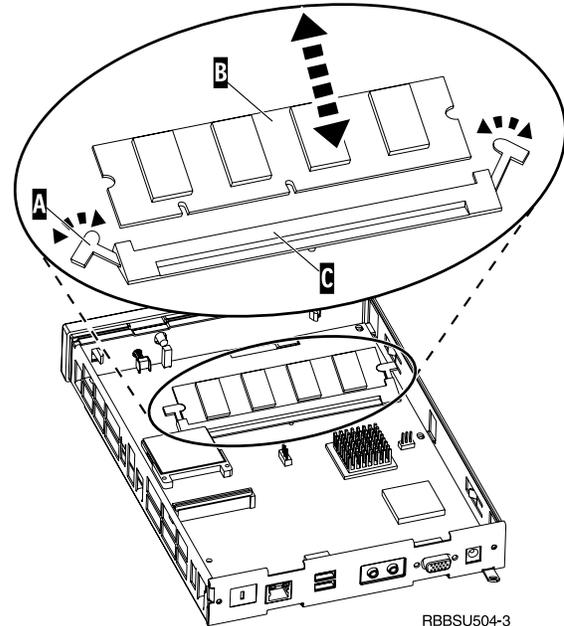
1. Power off the thin client, and disconnect all cables to the thin client.
2. Remove the two thumbscrews **A** at the back of the logic unit.
3. Push the logic unit **B** out of the cover.
4. Lay the logic unit on a flat surface.
5. Continue with “Installing a memory card” to install a memory card.



Installing a memory card

Complete the instructions in “Removing the logic unit”, and read “Safety notices” on page v before you continue with these instructions.

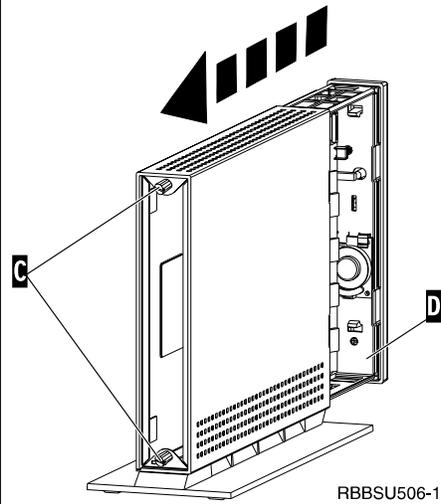
1. To remove a previously installed memory card, press the tabs **A**, that are located at each end of the memory card **B**, out until the memory card **B** comes out of the memory socket **C**.
2. To install a memory card, align the notches on the bottom of the memory card **B** with the matching notches on the memory socket **C**.
3. Press the memory card down into the memory socket **C**. The tabs **A** should swing in, holding the memory card in place.
4. Continue with “Reassembling the thin client” on page 44.



Reassembling the thin client

Read “Safety notices” on page v before you continue with these instructions.

1. To reassemble the thin client, carefully slide the logic unit **D** back into the cover, connectors first.
2. Install and tighten the two thumbscrews **C** at the back of the thin client.
3. Continue with “Installing the support base” on page 5 and “Connecting your hardware” on page 6.

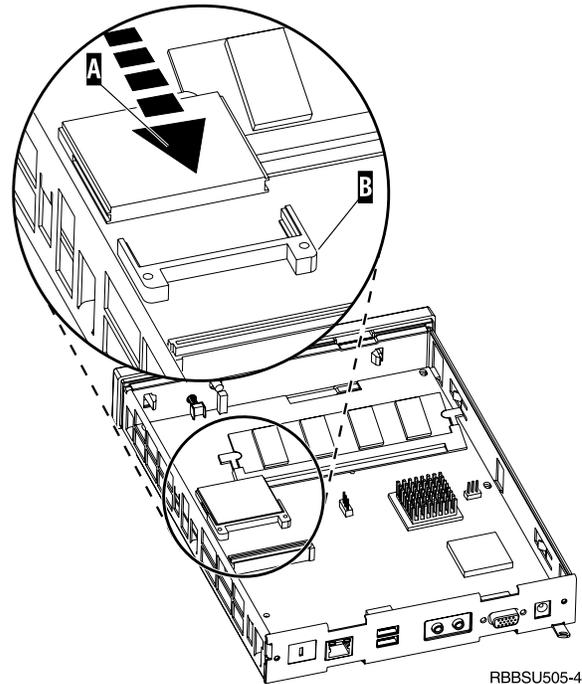


Appendix C. CompactFlash card

Follow these steps to verify if the CompactFlash card is installed properly.

Read “Safety notices” on page v before you continue with these instructions.

1. Perform Steps 1 to 4 in “Removing the logic unit” on page 43.
2. Align the grooves on the sides of the CompactFlash card **A** to the grooves of the flash card slot **B**. Make sure to align the grooves properly, as you can insert the CompactFlash card only one way.
3. Carefully press the CompactFlash card into the flash card slot. To avoid hardware damage, do not force the card into the flash card slot.
4. Perform “Reassembling the thin client” on page 44.



Appendix D. Recovering the boot block image

This section provides instructions that should be followed only under the direction of the IBM Service and Support team. Use these instructions only if you encountered a power interruption during a software update.

Creating the boot block recovery CompactFlash card

Refer to the appropriate diagram (Diagram 1 or Diagram 2) that matches your NetVista System.

Read “Safety notices” on page v before you continue with these instructions.

Perform these instructions **from a properly working thin client**:

1. Perform Steps 1 to 4 in “Removing the logic unit” on page 43.
2. If a CompactFlash card is already installed, remove it by carefully pulling out of the flash card slot. If a CompactFlash card is not installed, go to step 3.
3. Carefully insert a blank CompactFlash card into the flash card slot. This CompactFlash card is your recovery CompactFlash card.

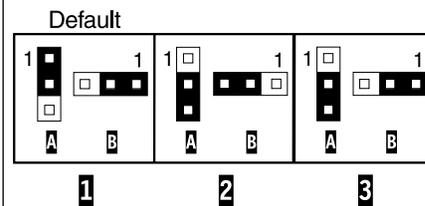
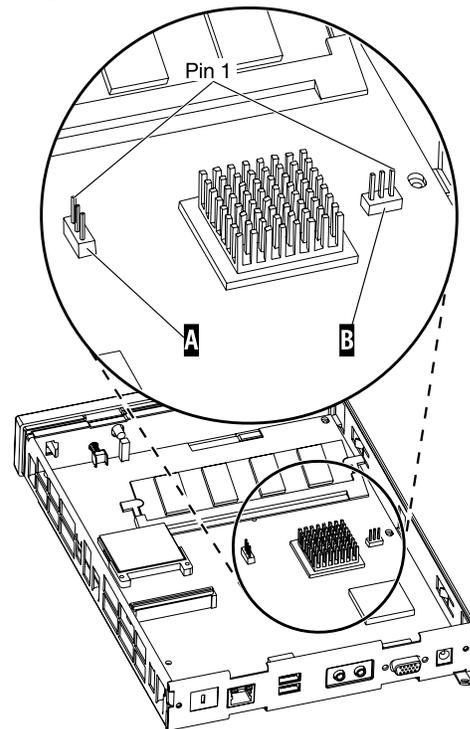
For more information on CompactFlash cards, see “Appendix C. CompactFlash card” on page 45.

4. Move the jumpers on headers **A** and **B** into configuration **2**.
5. Reconnect the power cable to the logic unit.
6. Power on the thin client, and wait for the system LED to flash green.

If the system LED flashes amber, the image was not created. Repeat the procedure with another CompactFlash card.

7. Power off the thin client.
8. Remove the recovery CompactFlash card.
9. Move the jumpers back into the default configuration **1**.
10. If you removed an original CompactFlash card in step 2, reinsert it into the flash card slot. If you did not remove an original CompactFlash card in step 2, go to step 11.
11. Perform “Reassembling the thin client” on page 44.
12. Continue with “Reflashing the boot block from the recovery CompactFlash card” on page 49.

Diagram 1



RZAPJ505-2

Creating the boot block recovery CompactFlash card

Read “Safety notices” on page v before you continue with these instructions.

Perform these instructions **from a properly working thin client**:

1. Perform Steps 1 to 4 in “Removing the logic unit” on page 43.
2. If a CompactFlash card is already installed, remove it by carefully pulling out of the flash card slot. If a CompactFlash card is not installed, go to step 3.
3. Carefully insert a blank CompactFlash card into the flash card slot. This CompactFlash card is your recovery CompactFlash card.

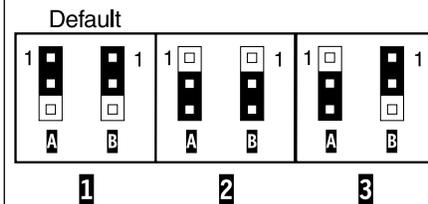
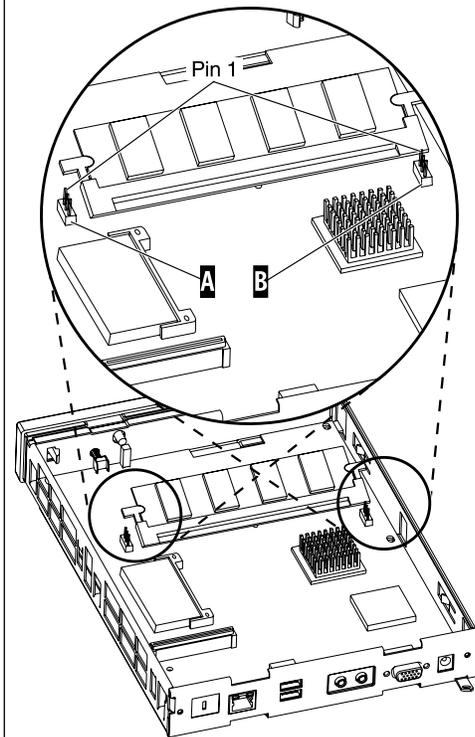
For more information on CompactFlash cards, see “Appendix C. CompactFlash card” on page 45.

4. Move the jumpers on headers **A** and **B** into configuration **2**.
5. Reconnect the power cable to the logic unit.
6. Power on the thin client, and wait for the system LED to flash green.

If the system LED flashes amber, the image was not created. Repeat the procedure with another CompactFlash card.

7. Power off the thin client.
8. Remove the recovery CompactFlash card.
9. Move the jumpers back into the default configuration **1**.
10. If you removed an original CompactFlash card in step 2, reinsert it into the flash card slot. If you did not remove an original CompactFlash card in step 2, go to step 11.
11. Perform “Reassembling the thin client” on page 44.
12. Continue with “Reflashing the boot block from the recovery CompactFlash card” on page 49.

Diagram 2



RZAPJ506-0

Recovering the boot block from the recovery CompactFlash card

Refer to the appropriate diagram (Diagram 1 or Diagram 2) that matches your NetVista system.

Read “Safety notices” on page v before you continue with these instructions.

Perform these instructions **using the thin client that requires the new boot block**:

1. Perform Steps 1 to 4 in “Removing the logic unit” on page 43.
2. If a CompactFlash card is already installed, remove it by carefully pulling out of the flash card slot. If a CompactFlash card is not installed, go to step 3.
3. Carefully insert the recovery CompactFlash card into the flash card slot.

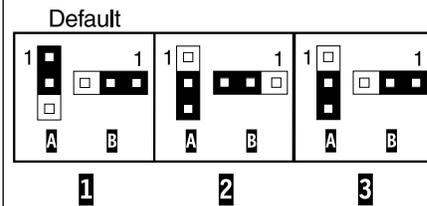
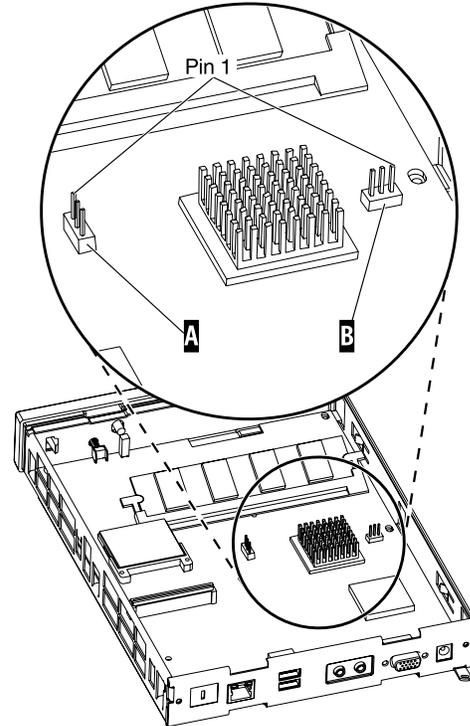
For more information on CompactFlash cards, see “Appendix C. CompactFlash card” on page 45.

4. Move the jumpers on headers **A** and **B** into configuration **3**.
5. Reconnect the power cable to the logic unit.
6. Power on the thin client, and wait for the system LED to flash green.

If the system LED flashes amber, the image was not copied correctly. Replace the logic unit (see “Appendix A. Replacing hardware parts” on page 39).

7. Power off the thin client.
8. Remove the recovery CompactFlash card.
9. Move the jumpers back into the default configuration **1**.
10. If you removed an original CompactFlash card in step 2, reinsert it into the flash card slot. If you did not remove an original CompactFlash card in step 2, go to step 11.
11. Perform “Reassembling the thin client” on page 44.

Diagram 1



RZAPJ505-2

Recovering the boot block from the recovery CompactFlash card

Read “Safety notices” on page v before you continue with these instructions.

Perform these instructions **using the thin client that requires the new boot block:**

1. Perform Steps 1 to 4 in “Removing the logic unit” on page 43.
2. If a CompactFlash card is already installed, remove it by carefully pulling out of the flash card slot. If a CompactFlash card is not installed, go to step 3.
3. Carefully insert the recovery CompactFlash card into the flash card slot.

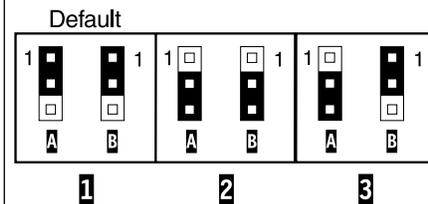
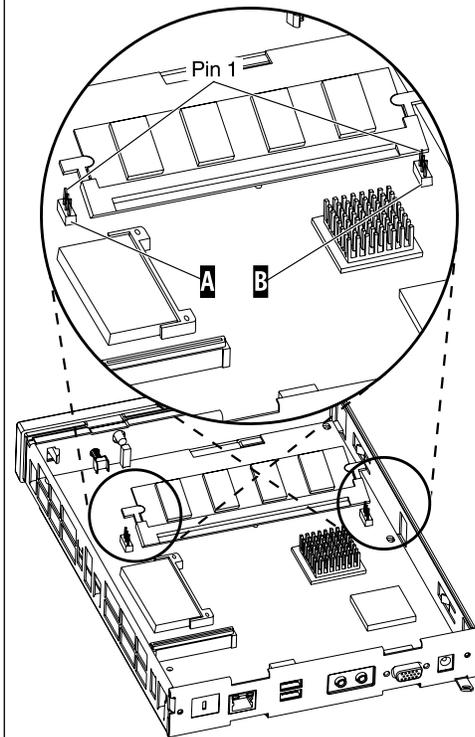
For more information on CompactFlash cards, see “Appendix C. CompactFlash card” on page 45.

4. Move the jumpers on headers **A** and **B** into configuration **3**.
5. Reconnect the power cable to the logic unit.
6. Power on the thin client, and wait for the system LED to flash green.

If the system LED flashes amber, the image was not copied correctly. Replace the logic unit (see “Appendix A. Replacing hardware parts” on page 39).

7. Power off the thin client.
8. Remove the recovery CompactFlash card.
9. Move the jumpers back into the default configuration **1**.
10. If you removed an original CompactFlash card in step 2, reinsert it into the flash card slot. If you did not remove an original CompactFlash card in step 2, go to step 11.
11. Perform “Reassembling the thin client” on page 44.

Diagram 2



RZAPJ506-0

Appendix E. Monitor specifications

A basic video graphics adapter (VGA) class monitor that meets the VESA standards of refresh rate and resolution can function with the thin client. The thin client supports VESA Display Power Management Signaling (DPMS) and VESA Display Data Channel (DDC2B). A monitor that is attached to the thin client does not require either standard. You configure the resolution in each case at the client operating system (OS) level.

Your monitor may not support all resolutions and refresh rates.

Table 12. Monitor support

High color (16 bit) and 256 color (8 bit)	
Resolution (pixels)	Refresh Rate (Hz)
640x480	60, 72, 75
800x600	60, 72, 75
1024x768	60, 75
256 color (8 bit)	
640x480	60, 72, 75
800x600	60, 72, 75
1024x768	60, 75
1280x1024	60

Appendix F. Connector pin information

The following tables define the connector pins that are used with the thin client.

Table 13. Monitor Connector

Pin	Signal	Signal Direction
1	Red Video	Out
2	Green Video	Out
3	Blue Video	Out
4	Monitor Detect 2	In
5	Ground	---
6	Red Video Ground	---
7	Green Video Ground	---
8	Blue Video Ground	---
9	Not connected	---
10	Ground	---
11	Monitor Detect 0	In
12	Monitor Detect 1 / DDCSDA	In / Out
13	Horizontal Sync	Out
14	Vertical Sync	Out
15	Monitor Detect 3 / DDCSCL	In / Out
Connector shell	Protective Ground	---

Table 14. RJ-45 Twisted Pair Connector

Pin	Name	Function
1	TPOP	Transmit +
2	TPON	Transmit -
3	TPIP	Receive +
4/5	Not used	---
6	TPIN	Receive -
7/8	Not used	---

Table 15. USB connector

Pin #	Direction	Description
1	Power	Power (5V) for USB0
2	Bidir	Data positive for USB0
3	Bidir	Data negative for USB0
4	Power	Ground for USB0
5	Power	Power (5V) for USB1
6	Bidir	Data positive for USB1
7	Bidir	Data negative for USB1
8	Power	Ground for USB1

Table 16. Power supply connector

Pin #	Voltage+12V dc input
1	+12V dc
2	Ground
3	Ground

Appendix G. Choosing a flash file

Regardless of which method you use to update the flash image of a workstation, you may need to specify the flash file to use. These files, which are sometimes called Bill of Material (BOM) files, contain a list of files that make up a flash image.

When reflashing your flash card, you must specify which image you want.

Note: The first three images listed below include Netscape browser and PPP Dialer support.

Table 17. Flash files (also referred to as BOM files)

BOM file	Languages supported
NS-x86-0000-e-032-020-01.BOM	US English, LA Spanish, Canadian French, Brazilian Portuguese, UK English, French, Swiss French, Belgian French
NS-x86-0000-e-032-020-02.BOM	US English, German, French, Swedish, Finnish, Danish, Norwegian, Dutch, UK English, Swiss German, Belgian Dutch, Canadian French, Swiss French, Belgian French
NS-x86-0000-e-032-020-03.BOM	US English, Swiss German, Spanish, Belgian French, Swiss French, Swiss Italian, Italian, Belgian Dutch, Portuguese, UK English, German, Dutch, French, Canadian French
NS-x86-2200-e-032-010-01.BOM	US English, LA Spanish, Canadian French, Brazilian Portuguese, UK English, French, Swiss French, Belgian French
NS-x86-2200-e-032-010-02.BOM	US English, German, French, Swedish, Finnish, Danish, Norwegian, Dutch, UK English, Swiss German, Belgian Dutch, Canadian French, Swiss French, Belgian French
NS-x86-2200-e-032-010-03.BOM	US English, Swiss German, Spanish, Belgian French, Swiss French, Swiss Italian, Italian, Belgian Dutch, Portuguese, UK English, German, Dutch, French, Canadian French

The following are available regardless of the flash file that you choose:

- Basic keyboard language support
- Messages that are translated into US English

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Glossary of abbreviations

A

AC. Alternating Current

ARP. Address Resolution Protocol

B

BOM. Bill of Material

BOOTP. Bootstrap Protocol

C

CD. Compact Disc

CRU. Customer-Replaceable Unit

Cxx. Thin Client Express model

D

DBCS. Double Byte Character Set

d.d.d.d. IP address format

DC. Direct Current

DCE. Data Communications Equipment

DDC. Display Data Channel

DDC2B. Display Data Channel (version 2B)

DHCP. Dynamic Host Configuration Protocol

DIMM. Dual In-line Memory Module

DMA. Direct Memory Access

DNS. Domain Name Server

DPMS. Display Power Management Signaling

DTE. Data Terminal Equipment

F

FAX. Facsimile

FCC. Federal Communications Commission

FTP. File Transfer Protocol

FRU. Field Replaceable Unit

H

HTTP. Hypertext Transfer Protocol

Hz. Hertz or cycles per second

I

IBM. International Business Machines

ICA. Independent Computing Architecture

ICMP. Internet Control Message Protocol

ISO. International Organization for Standardization

ID. Identification

IEEE. Institute of Electrical and Electronics Engineers

IP. Internet Protocol

IRQ. Interrupt Request

L

LA. Latin American

LAN. Local Area Network

LED. Light Emitting Diode

LLC. Logical Link Control

M

MAC. Medium Access Control

Mb. Megabit

MB. Megabyte

MHz. Megahertz

MTU. Maximum Transmission Unit

N

N2200e. IBM NetVista Thin Client Express

NFS. Network File Server

NS. Network Station

NSB. Network Station Boot

NSBXXXXX. Network Station Boot message with identification number (XXXXX)

NSM. Network Station Manager

NVRAM. Nonvolatile Random Access Memory (also referred to as local settings)

O

OS. Operating System

P

PC. Personal Computer

POST. Power On Self Test

PPP. Point-to-Point Protocol

R

RAM. Random Access Memory

RAP. Remote Authentication Protocol

RIE. Routing Information Field

RFS. Remote File System

S

SDRAM. Synchronous Dynamic Random Access Memory

SNMP. Simple Network Management Protocol

T

TCM. Thin Client Manager

TCP/IP. Transmission Control Protocol / Internet Protocol

TFTP. Trivial File Transfer Protocol

TSE. Windows NT Server 4.0, Terminal Server Edition

U

UDP. User Datagram Protocol

UK. United Kingdom

URL. Uniform Resource Locator

US. United States

USB. Universal Serial Bus

UTP. Unshielded Twisted Pair

V

V. Volts

VESA. Video Electronics Standards Association

VGA. Video Graphics Array

VM. Virtual Machine

VT. Virtual Terminal

W

WAN. Wide Area Network

WBT. Windows-Based Terminal

WOL. Wake On LAN

WWW. World Wide Web

Index

A

- access
 - configuring initial modem settings for PPP dialer 20
 - prerequisites for using PPP 19

B

- BOM file, choosing a 55
- boot block image 47
 - recovering 47

C

- CD
 - installing the utilities from the NetVista Thin Client Utilities CD 14
- CompactFlash card 45
- configuration
 - preparing the workstation for PPP dialer 19
- Configuration Tool 10
 - accessing 11
 - using the configuration tool to perform a software update on a workstation 23
- configuring
 - N2200e 9
 - using the Configuration Tool 10
 - using the Setup Utility 9
- configuring a workstation for PPP dialer 19
- configuring initial modem settings for PPP dialer access 20
- connector pins 3, 53
- connectors
 - hardware 3

D

- dial access
 - prerequisites for using PPP 19
- dialer
 - configuring a workstation for PPP 19
 - configuring initial modem settings for PPP access 20
 - maintaining and reconfiguring PPP dialer parameters 21
 - PPP 19
 - preparing a workstation for PPP 19
 - starting the PPP 21
 - troubleshooting PPP problems 22
 - using the PPP dialer to access flash images 22
- dialer window, learning about the 21
- disabling peer flash recovery on a workstation 27

- downloading the utilities from the NetVista Thin Client website 14

F

- flash
 - choosing a flash file 55
- flash file, choosing a 55
- flash image
 - altering the flash image of a workstation 23
 - recovering 24
 - using peer recovery to recover the flash image 25
 - using TCM to recover the flash image 28
 - using the Setup Utility to recover the flash image 27
- flash images
 - using the PPP dialer to access 22
- flash recovery 24
 - disabling peer flash recovery 27
 - enabling peer flash recovery 25

H

- hardware
 - boot block image 47
 - communication cables 3
 - CompactFlash card 45
 - connectors 3
 - detailed information 3
 - display resolutions 4
 - ethernet 3
 - hardware procedures 4
 - memory 43
 - monitor specifications 4
 - ordering replacement parts 40
 - parts 39
 - ports 3
 - power consumption 4
 - power reduction 4
 - problem indications 29
 - refresh frequency 4
 - replacing parts 39
 - replacing the logic unit 39
 - resolving problems 29
 - returning parts 42
 - setting up 5
 - standard 3
 - type and model 3
 - upgrading memory 4, 43
 - USB devices 4
 - verifying problems 29
- hardware features
 - memory upgrade 4
 - USB devices 4
- hardware parts 39, 40, 42
- hardware problems
 - audio beep sequences 32
 - error codes and text messages 35

- hardware problems (*continued*)
 - LED indications 33
 - visible hardware failure 30

I

- image
 - altering the flash image of a workstation 23
 - using peer recovery to recover the flash 25
- images
 - using the PPP dialer to access flash images 22
- initial modem settings for PPP dialer access, configuring 20
- installing
 - management utilities 13
 - utilities from the NetVista Thin Client Utilities CD 14
- installing NetVista Thin Client management utilities from website 14
- introduction 1

M

- maintaining and reconfiguring PPP dialer parameters 21
- managing your Thin Client Express remotely 17
- memory upgrade 43
- modem settings for PPP dialer access 20
- monitor
 - display resolutions 4
 - refresh frequency 4
 - specifications 4
- monitor specifications 51

N

- N2200e
 - boot block image 47
 - CompactFlash card 45
 - configuring 9
 - hardware 3
 - hardware parts 39, 40, 42
 - hardware problems 29
 - installing management utilities 13
 - memory 43
 - ordering replacement parts 40
 - remote management 17
 - replacing hardware parts 39
 - returning parts 42
 - setting up 5
 - startup sequence 7
 - understanding 1
- NC dialer window, learning about the 21
- NetVista Thin Client website 14

network cables 3

O

Operations Utility

installing 13

using TCM to perform a software

update on a workstation 24

using TCM to recover the flash image
of a workstation 28

ordering replacement parts 40

P

parameters

maintaining and reconfiguring PPP

dialer parameters 21

peer-booted workstation

recovering the image 26

peer flash recovery 25

disabling 27

enabling 25

power consumption 4

power on 7

startup sequence 7

PPP

prerequisites for using 19

PPP dial access, prerequisites for

using 19

PPP dialer

configuring a workstation for 19

configuring initial modem settings
for 20

for Thin Client Express

workstations 19

preparing a workstation for 19

starting the 21

troubleshooting 22

using to access flash images 22

PPP dialer parameters

maintaining and reconfiguring 21

prerequisites

for using PPP dial access 19

problems

troubleshooting PPP dialer 22

R

reconfiguring PPP dialer parameters 21

recovering the flash image of a
workstation 24

recovery

disabling peer flash recovery 27

enabling peer flash recovery 25

peer flash 25

recovering the flash image 26

using TCM to recover the flash image
of a workstation 28

using the Setup Utility to recover the
flash image of a workstation 27

remote

Managing your Thin Client Express

remotely 17

replacing hardware parts 39

resolving problems 29

returning hardware parts 42

S

Service Utility 13

settings

configuring initial modem for PPP

dialer access 20

Setup Utility 9

example menu 9

navigation 10

recovering the flash image of a

workstation 27

software update

on a workstation 23

using TCM to perform a software

update 24

using the Configuration Tool to

perform a software update 23

startup sequence 7

T

Thin Client Express

boot block image 47

CompactFlash card 45

configuring 9

hardware 3

hardware parts 39, 40, 42

hardware problems 29

installing management utilities 13

memory 43

ordering replacement parts 40

PPP dialer for 19

remote management 17

replacing hardware parts 39

returning parts 42

setting up 5

startup sequence 7

understanding 1

Thin Client Manager Operations Utility

using TCM to perform a software

update on a workstation 24

using TCM to recover the flash image

of a workstation 28

troubleshooting 29

PPP dialer problems 22

U

update

software update of a workstation 23

using TCM to perform a software

update 24

using the Configuration Tool to

perform a software update 23

utilities

installing from the NetVista Thin
Client Utilities CD 14

utility

operations 13

service 13

setup 9

V

verifying problems 29

W

website

NetVista Thin Client 14

website for NetVista Thin Client

Utilities 14

Windows 2000 Advanced Server 13

Windows 2000 Professional 13

Windows 2000 Server 13

Windows NT Server 4.0 13

Windows NT Server 4.0 Terminal Server

Edition (TSE) 13

Windows NT Workstation 4.0 13

workstation

altering the flash image 23

configuring for PPP dialer 19

disabling peer flash recovery 27

enabling peer flash recovery 25

peer flash recovery 25

performing a software update 23

PPP dialer for Thin Client Express 19

preparing for PPP configuration 19

recovering the flash image 24

recovering the image on a peer-booted
workstation 26

remote management 17

using TCM to perform a software
update 24

using TCM to recover the flash
image 28

using the Configuration Tool to
perform a software update 23

using the Setup Utility to recover the
flash image 27

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