Troubleshooting Guide

HP Compaq t5000 Series Thin Client

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July 2004

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Troubleshooting Guide

HP Compaq t5000 Series Thin Client

Sixth Edition (July 2004)

First Edition (May 2003)

Document Part Number: 335795-006

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Product Description

The HP Compaq Thin Client t5000 Series are Windows-based terminals that connect over a network to a server where all processing and storage occurs. Because of the nature of the products, troubleshooting is significantly simpler than on a standard PC and previous thin clients.

The Windows Graphical User Interface (GUI) is English on all thin clients. If you are using a foreign language keyboard, you will need to set localized settings to perform the localization between a server-based application and the device, but interaction with the unit itself remains in English.

Network Firmware

PXE (Pre-boot Execution Environment) is supported on all HP Compaq Thin Client t5000 Series products.

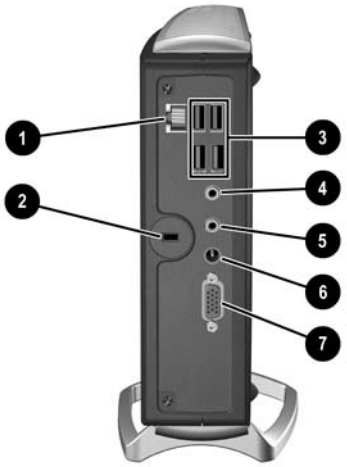
PXE allows a client to boot from a server on a network prior to booting the embedded Operating System (OS) from the local Flash module. As long as the system is connected to AC power, the Network Interface Controller (NIC) on a PXE-enabled client remains powered even when the system is turned off. This allows a network administrator to remotely wake up the unit and perform various management tasks, including loading the operating system and other software onto the device from a server over the network.

HP Compaq Thin Client t5000 Series

Front View of the t5000 Series Models

❶Power Button

For information on internal differences between the t5300, t5500, and t5700 series models, refer to the *Getting Started with the HP Compaq t5000 Series* manual in the Reference Library at http://h18004.www1.hp.com/products/thinclients/software.html



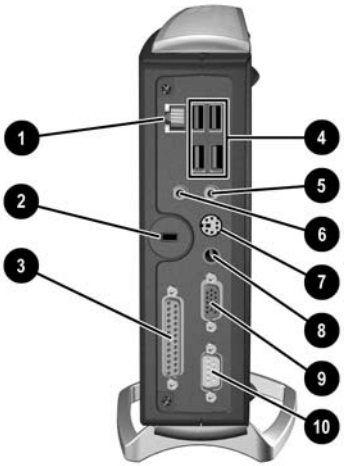
Rear View of the Legacy-Free t5300 Model

Legacy-Free t5300 Model Connectors

❶	Ethernet RJ-45 Connector	❺	Line-out Audio Connector (Headphone)
❷	Kensington Lock Connector	❻	Power Connector
❸	USB Connectors	❼	Monitor Connector
❹	Line-in Audio Connector (Microphone)		

The t5300 model does not include a PCI expansion option connector on the system board.

CAUTION: The t5000 Series' power cord connector is for use only with the supplied power adaptor. Replace only with the same or equivalent type as recommended by the manufacturer.



Rear View of the t5500 and t5700 Series Models

t5500/t5700 Series Model Connectors

❶	Ethernet RJ-45 Connector	❻	Line-out Audio Connector (Headphone)
❷	Kensington Lock Connector*	❼	PS/2 Connector**
❸	Parallel Connector***	❽	Power Connector
❹	USB Connectors (4)	❾	Monitor Connector
❺	Line-in Audio Connector (Microphone)	❿	Serial Connector***

*When the PCI Expansion module is installed, use the connector located at the bottom of the unit.

**Not available on all models

***Not available on t5300 series models

The t5500 and t5700 series models include a PCI expansion option connector on the system board.

CAUTION: The t5000 Series' power cord connector is for use only with the supplied power adaptor. Replace only with the same or equivalent type as recommended by the manufacturer.

Serial Number Location

The serial number is displayed on the side of the unit.

Connecting USB Equipment

USB mouse devices and keyboards do not require special drivers and are considered to be plug and play peripherals. Certain USB devices such as printers and modems, however, may require special drivers. For information on requirements for special drivers, refer to the documentation that is included with the USB device.

Locating Additional Information

The following documentation is available to support these products:

- *Quick Setup*
- *Hardware Reference Guide*
- *Terminal Emulation Quick Reference Guide (Extended Emulation)*
- *Terminal Emulation Quick Reference Guide*
- Customer and Service Notifications, Bulletins and Advisories
- Quickspecs

Documentation, white papers, and drivers are subject to change. For the latest HP thin client documentation, visit the following Web site:
http://h18004.www1.hp.com/products/thinclients/software.html

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Spare Parts Lists

t5000 Series Spare Parts List

The Spare Parts tables that follow provide a listing of the spare parts available for the Thin Client t5000 Series.

t5000 Series Spare Parts Table

Description	Spare Part Number
t5300\CE .NET/IE 533MHz 32F/64R Unit	325712-001
t5300 Diskless, 533 MHz 0/64 Unit	353340-001
t5500\CE .NET/IE 733MHz 32F/128R Unit	325698-001
t5500 Diskless, 733 MHz 0/128	353341-004
t5700\XP Embedded/IE 733MHz 192/256R Unit	350982-001
t5515 800MHz 32/64Unit	370450-001
t5515 800MHz 128/128 Unit	370450-002
t5700\XP Embedded/IE 1GHz 192F/256R Unit	325707-001
t5700\XP Embedded/IE 1GHz 256F/256R Unit	325708-001
t5700 Diskless, 1GHz 0/256	353338-001
t5700 Diskless, 733MHz 0/256	353339-001
t5700, 1 GHz 192/256, XPE, IE	325707-001
AC Adapter, 12V, 40W, AC to DC	325709-001

t5000 Series Spare Parts Table

Description	Spare Part Number
Mouse, USB, Carbon, 2 button scroll	323615-001
Foot Stand w/screws	336604-001
Foot, Rubber, t5000	348438-001
Battery, Internal, CR 2032, 3V	153099-001
Speaker w/screws	349326-001
Screw Kit, Miscellaneous	349327-001
Power Cords	
Power Cord, AC-Europe	198292-021
Power Cord, AC-Danish	198292-081
Power Cord, International	345751-002
Power Cord, AC-Italian	198292-061
Power Cord, AC	142766-001
Power Cord, AC-PRC	292657-AA1
Power Cord AC-Japanese	292643-291
Enhanced USB Keyboards	
Arabic, Carbon/Silver	326227-171
Belgian, Carbon/Silver	326227-181
Belgian, Carbonite/Silver	326228-181
Brazilian, Carbon/Silver	326227-201
Chinese (PRC), Carbon/Silver	326227-AA1
Czech, Carbon/Silver	326227-221
Danish, Carbon/Silver	326227-081
Danish, Carbonite/Silver	326228-081
Finnish, Carbon/Silver	326227-351
French, Carbon/Silver	326227-051

t5000 Series Spare Parts Table

Description	Spare Part Number
Enhanced USB Keyboards *(Continued)*	
French, Carbonite/Silver	326228-051
German, Carbon/Silver	326227-041
German, Carbonite/Silver	326228-041
Greek, Carbon/Silver	326227-151
Hebrew, Carbon/Silver	326227-BB1
Hungarian, Carbon/Silver	326227-211
International, Carbon/Silver	326227-B31
International, Carbonite/Silver	326228-B31
Italian, Carbon/Silver	326227-061
Italian, Carbonite/Silver	326228-061
Swiss, Carbon/Silver	326227-111
Japanese, Carbon/Silver	326227-291
Korean, Carbon/Silver	326227-AD1
LA Spanish, Carbon/Silver	326227-161
Norwegian, Carbon/Silver	326227-091
Portuguese, Carbon/Silver	326227-131
Russian, Carbon/Silver	326227-251
Slovakian, Carbon/Silver	326227-231
Spanish, Carbon/Silver	326227-071
Swedish, Carbonite/Silver	326228-101
Swiss, Carbonite/Silver	326228-111
Taiwan, Carbon/Silver	326227-AB1
Thailand, Carbon/Silver	326227-281
Turkey, Carbon/Silver	326227-141

t5000 Series Spare Parts Table

Description	Spare Part Number
Enhanced USB Keyboards *(Continued)*	
United Kingdom, Carbon/Silver	326227-031
United States, Carbon/Silver	326227-001
Basic USB Keyboards, Carbonite/Silver	
Arabic	355631-171
Belgian	355631-181
Brazilian Portuguese	355631-201
Czech	355631-221
Danish	355631-081
Finnish	355631-351
French	355631-051
French-Canadian	355631-121
German	355631-041
Greek	355631-151
Hebrew	355631-BB1
Hungarian	355631-211
International	355631-B31
Italian	355631-061
Japanese	355631-291
Korean (Hangul)	355631-KD1
LA Spanish	355631-161
Norwegian	355631-091
Portuguese	355631-131
Russian	355631-251
Simplified Chinese	355631-AA1

t5000 Series Spare Parts Table

Description	Spare Part Number
Basic USB Keyboards, Carbonite/Silver *(Continued)*	
Slovakian	355631-231
Spanish	355631-071
Swedish	355631-111
Swiss	355631-071
Taiwanese	355631-AB1
Thai	355631-281
Turkish	355631-141
UK	355631-031
U.S.	355631-001
If you are using a foreign language keyboard, an ICA or RDP connection will perform the localization between a server-based application and the device, but all interaction with the thin client itself is in English.	
All keyboards listed in this table may not be available at the time this document is first published.	
Options	
Cradle, USB MultiBay	280879-001
Cable, USB External MultiBay Cradle	287693-001
Adapter, AC External MultiBay Cradle	287694-001
Plugs, External MultiBay Cradle	287695-001
PCI Expansion Module	336603-001
Premier•Sound speakers	173980-001
Kensington cable lock	294359-001
SODIMM, 512MB, PC2100, 32Mx8CL2.5	338802-001

t5000 Series Spare Parts Table

Description	Spare Part Number
Options *(Continued)*	
Hard Drive, 30GB	217096-001
Diskette Drive, 1.44MB	241995-001
CD-ROM Drive, 24X	228746-001
USB Flash Drive (Drive Key), 32MB	305283-001
USB Flash Drive (Drive Key), 128MB (USB 1.1)	331466-001
USB Flash Drive (Drive Key), 128MB (USB 2.0)	349988-001
USB Flash Drive (Drive Key), 256MB (USB 2.0)	344249-001
For a full list of supported and leveraged Hewlett-Packard and third party options, go to http://h18004.www1.hp.com/products/thinclients/options/	

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HP t5000 Series Setup (F10) Utility

Using HP t5000 Series Setup (F10) Utility

The Setup utility can be accessed only by turning the computer on or restarting the system. To access the Setup Utility menu, complete the following steps:

1. Turn on or restart the computer.
   - ❏ If you are using Microsoft Windows XP Embedded, click **Start > Shut Down > Restart the Computer.**
   - ❏ If you are using Microsoft Windows CE .NET, click **Start > Shut Down > Shut Down and Restart > OK.**
2. When the **F10 = Setup** message displays in the task bar at the bottom of the screen, press the **F10** key.

If you do not press the **F10** key while the message is displayed, you must restart the computer again to access the utility. When the F10 Post Screen display is set to zero seconds, it may be necessary to press and hold **F10** on the keyboard, then power on the computer.

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3. A choice of five menu headings and five task headings appears in the Setup Utility menu:

   Menu Headings: System Information, Standard CMOS Features, Advanced BIOS Features, Integrated Peripherals, and Power Management Setup.

Task Headings: Load Factory Defaults, Set Administrative Password, Set User Password, Save & Exit Setup, and Exit without Saving.

4. Use the arrow (up and down, or left and right) keys to select the appropriate heading, then press the **Enter** key. To return to the Setup Utility menu, press the **Esc** key.
5. To apply and save changes, select **Save and Exit Setup.**
   - ❏ If you have made changes that you do not want applied, select **Exit without Saving.**
   - ❏ To reset to factory settings, select **Load Factory Defaults.** This option will restore the original factory system defaults.

CAUTION: Do NOT turn the computer power OFF while the ROM is saving your F10 Setup changes because the CMOS could become corrupted. It is safe to turn off power to the computer ONLY after you exit the F10 Setup screen.

t5000 Series Setup Utility

Heading	Option	Description
System Information		Lists: • Product name • Processor type • Processor Speed • CMS Version • OEM Config Table Version • Amount of Flash memory • Memory size • System ROM (includes family name and version) • Integrated MAC address for embedded, enabled NIC (if applicable) • UUID (Universal Unique ID) • Chassis serial number • Asset tracking number (Sets Asset tracking number) • Asset Tag Number
Standard CMOS Features		
	Date	Allows you to set the date
	Time	Allows you to set the time.
	xxxMB ATA Flash	Indicates ATA Flash settings
	Halt on	Allows you to select system response when POST Error has been detected.

Support for specific Setup options may vary depending on your hardware configuration.

t5000 Series Setup Utility *(Continued)*

Heading	Option	Description
Advanced BIOS Features		Allows you to:
	MBR Security	Choose the Virus warning feature.
	Quick Power On Self Test	Allows the system to skip certain tests while booting so the unit has a faster boot.
	First Boot Device	Select Boot Device Priority. The default is set to USB.
	Second Boot Device	Select Boot Device Priority
	Third Boot Device	Select Boot Device Priority
	Bootup NumLock Status	Select Power On state for NumLock.
	Security Option	Select whether the Password is required every time the system boots or only when you enter Setup.
	POST delay (secs)	Set a delay that is added to POST to allow more time to press F10 to enter the Setup Utility.
Integrated Peripherals		Allows you to:
	Integrated Audio	Enable/disable onboard AC97 audio controller
	Network Controller	Enable/disable onboard LAN device

Support for specific Setup options may vary depending on your hardware configuration.

t5000 Series Setup Utility *(Continued)*

Heading	Option	Description
Integrated Peripherals (Cont'd)	USB Controller	Enable/disable USB controller
	USB Keyboard Support	Use USB keyboard under DOS
	USB Mouse Support	Use USB Mouse under DOS
	Serial Port	Select serial port base IO port address and IRQ
	Parallel Port	Select parallel port base IO port address and IRQ
	Parallel Mode	Select parallel port transfer mode
	ECP Mode Use DMA	Select DMA channel if parallel is operated in ECP mode.
	Parallel Port EPP Type	Select EPP type
Power Management Setup		Allows you to:
	Wake on PME	Enable/disable system wakeup capability for onboard LAN device and PCI Card
	Wake on Alarm	Enable wakeup on RTC alarm
*Load Fact*ory Defaults		Select Yes or No (Y/N)

Support for specific Setup options may vary depending on your hardware configuration.

t5000 Series Setup Utility *(Continued)*

Heading	Option	Description
Set Administrative Password		Allows you to set and enable the administrative password. If the administrative password is set, it is required to change the Setup options, flash the ROM, and make changes to certain plug and play settings under Windows.
Set User Password		Allows you to set and enable the user password. When the user password is set, it prevents unauthorized access to the user's setup. User password provides read-only access to Setup options.
Save & Exit Setup		Saves data to CMOS
Exit without Saving		Exits the Setup Utility without saving any changes.

Support for specific Setup options may vary depending on your hardware configuration.

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Diagnostics and Troubleshooting

For information on using the Thin Client t5000 Series as an HP 9000 or HP Integrity server console, refer to the White Paper on http://docs.hp.com/hpux/onlinedocs/AB300-90001/AB300-90001.pdf

LEDs

Power-On LED

LED	Status
Off	When the unit is plugged into the wall socket and the Power LED is off, the unit is powered off. However, the network can trigger a Wake On LAN event in order to perform management functions.
Green	Displays during boot sequence and while the unit is on. During boot sequence, hardware initialization is processed and startup tests are performed on the following: • Processor initialization • Memory detection and initialization • Video detection and initialization If one of the tests fails, the unit will simply stop, but the LED will stay on. If the video test fails, the unit beeps. There are no messages sent to video for any of these failed tests. After the video is initialized, anything that fails will have an error message.

RJ-45 LEDs are located inside the RJ-45 connector on the top, rear panel of the thin client. The LEDs are visible when the connector is installed. Blinking green indicates network activity, and amber indicates a 100MB speed connection.

Power-On Sequence

At power-on, the flash boot block code initializes the hardware to a known state, then performs basic power-on diagnostic tests to determine the integrity of the hardware. Initialization performs the following functions:

1. Initializes CPU and memory controller.
2. Initializes VGA software.
3. Initializes and configures all PCI devices.
4. Initializes the video to a known state.
5. Initializes USB devices to a known state.
6. Performs power-on diagnostics. (See the following "Power-On Diagnostics" section.)
7. The unit boots the operating system.

Power-On Diagnostic Tests

The Power-on diagnostics performs basic integrity tests of the hardware to determine its functionality and configuration. If a diagnostic test fails during hardware initialization the unit simply stops. There are no messages sent to video.

You may try to restart the unit and run through the diagnostic tests a second time to confirm the first shutdown.

The following table lists the tests that are performed on the t5000 units.

Power-On Diagnostic Test

Test	Description
Boot Block Checksum	Tests boot block code for proper checksum value
DRAM	Simple write/read pattern test of the first 640k of memory
Parallel port	Initiates the port's driver and determines if the device is present
Serial port	Tests the serial port using simple port verification test to determine if ports are present
Timer	Tests timer interrupt by using polling method
RTC CMOS battery	Tests integrity of RTC CMOS battery
NAND Flash device	Tests for proper NAND flash device ID present

BIOS Error Messages

Beep Codes

A BIOS beep code indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by two short beeps. One long beep followed by three short beeps indicates the system is running in boot block recovery mode. If there are no video errors, the system goes directly to POST messages.

POST Messages	Procedures
BIOS ROM checksum error - System halted	The checksum of the BIOS code in the BIOS chip is incorrect, indicating the BIOS code may have become corrupt. To restore a corrupt BIOS, refer to Appendix D, "System BIOS" or call your local HP Call Center for a diagnosis. For phone numbers of an HP Call Center near you, visit the following Web site: http://www.hp.com/support.
CMOS battery failed	The CMOS battery is no longer functional. For information on replacing the battery, refer to Appendix E, "Replacing the CMOS Battery."
CMOS checksum error - Defaults loaded	Checksum of CMOS is incorrect, so the system loads the default equipment configuration. A checksum error may indicate that CMOS has become corrupt. A weak battery may have caused this error. Replace the battery if necessary. For more information, refer to Appendix E, "Replacing the CMOS Battery."

POST Messages	Procedures
CPU at nnnn	Displays the running speed of the CPU.
Press **ESC** to skip memory test	The user may press **Esc** to skip the full memory test.
Keyboard error or no keyboard present	Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are pressed during POST. To purposely configure the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. The BIOS then ignores the missing keyboard during POST.
Keyboard is locked out - Unlock the key	The message usually indicates that one or more keys have been pressed during the keyboard tests. Be sure no objects are resting on the keyboard.
Memory Test	This message displays during a full memory test, counting down the memory areas being tested.
Memory Test Fail	If POST detects an error during memory testing, additional information appears giving specifics about the type and location of the memory error.
Override enabled - Defaults loaded	If the system cannot boot using the current CMOS configuration, the BIOS can override the current configuration with a set of BIOS defaults designed for the most stable, minimal-performance system operations.

POST Messages	Procedures
Press **TAB** to show POST screen	Press the **TAB** key during POST to display messages hidden by the HP logo.
Error: Non-System disk or disk error	The BIOS was unable to find a suitable boot device. For the t5000 Series, this may mean an uninitialized or corrupt ATA Flash. Reflash the unit and press any key when ready. For more information, refer to Chapter 5, "Restoring the Flash Image."

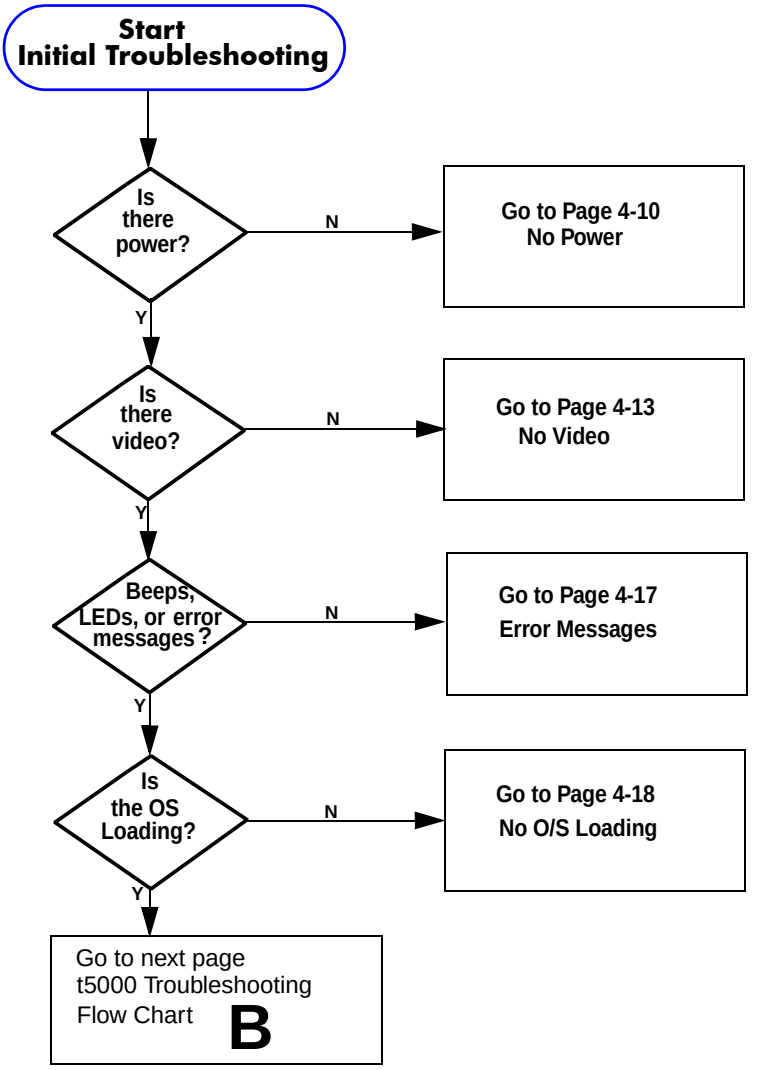
Boot Error Messages

Boot Error Messages	
Screen Messages	**Corrective Action**
Bad Block Test Error Message: "The internal diagnostics have detected a problem."	Too many bad flash memory blocks. This is a hardware problem. If the problem occurs every time the terminal is turned on, call your local HP Call Center for a diagnosis. For the phone numbers of an HP Call Center near you, visit the folowing Web site: http://www.hp.com/cgi-bin/hpsupport/index.pl

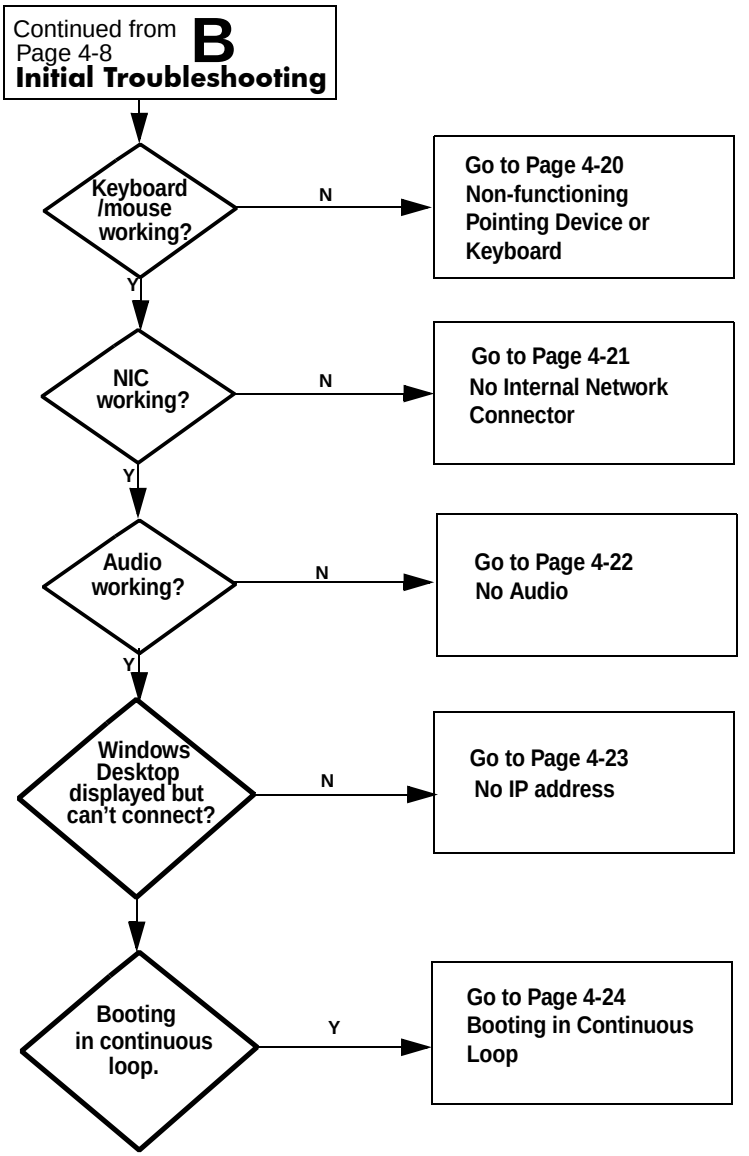
Boot Error Messages *(Continued)*

Screen Messages	Corrective Action
Flash Memory Error Message: "The terminal's flash file system has been corrupted. Normally, this problem can be corrected by reloading the terminal's firmware."	• Reflash the software image if you have already created a recovery device or file. • If you have not created a recovery diskette, you must download the appropriate image from http://h18004.www1.hp.com/products/thinclients/software.html and reflash the terminal's software. For information on reflashing software, see Chapter 5, "Restoring the Flash Image."

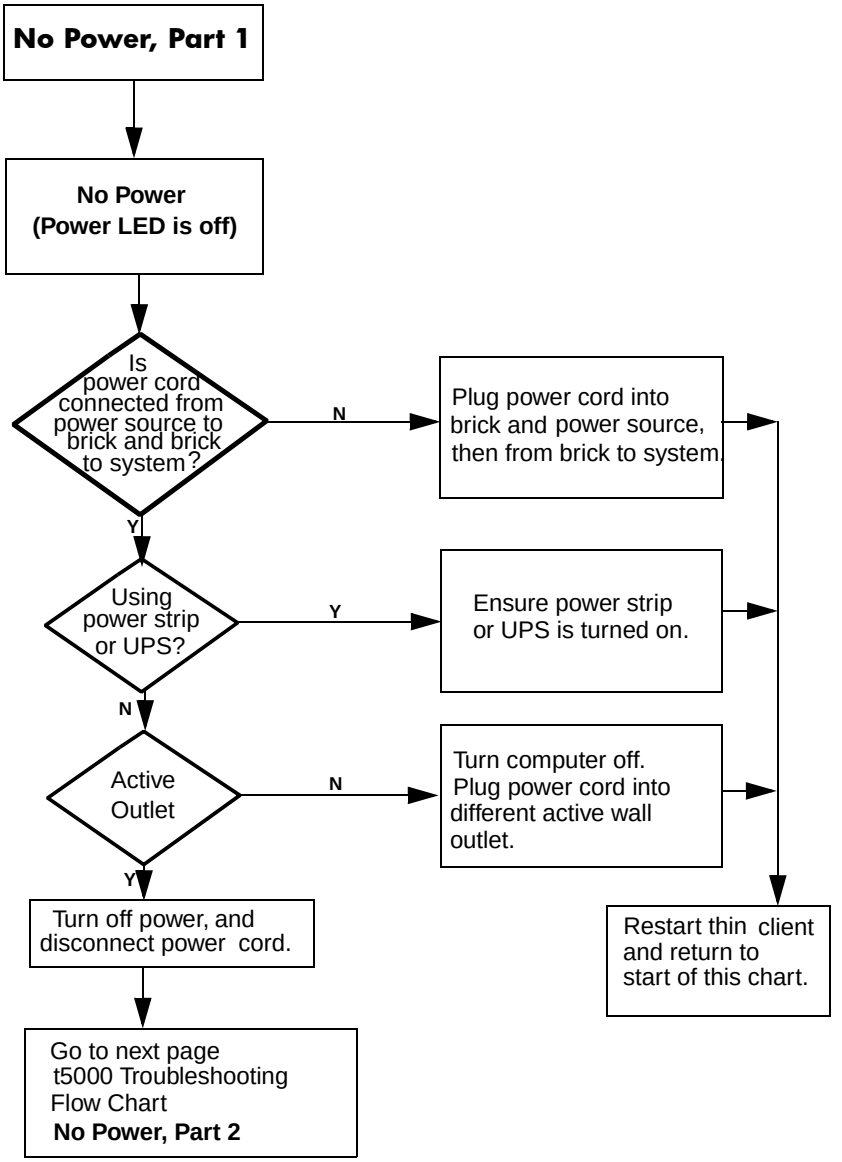
t5000 Troubleshooting Flow Chart



t5000 Troubleshooting Flow Chart (cont'd)



t5000 Troubleshooting Flow Chart (cont'd)



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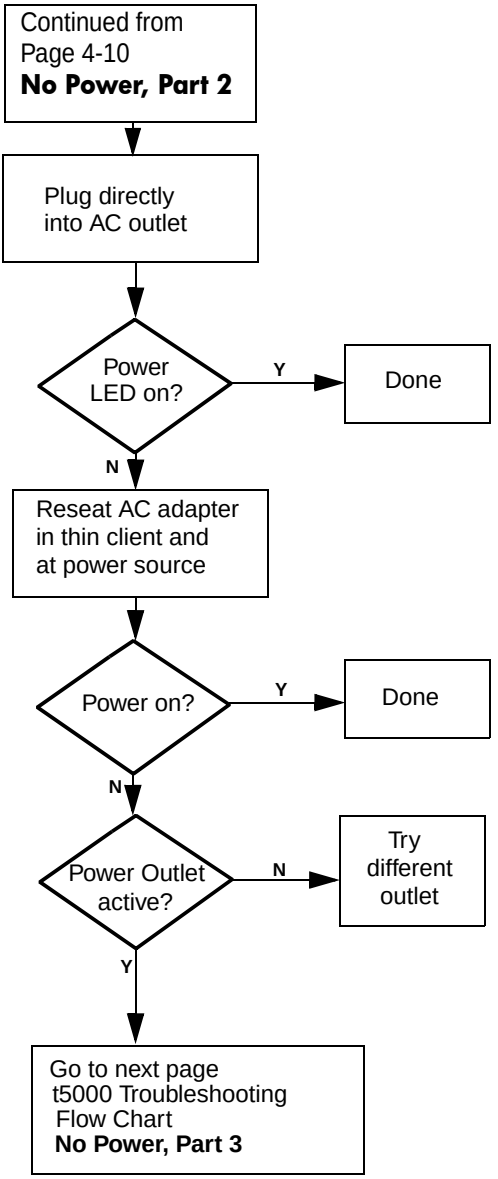

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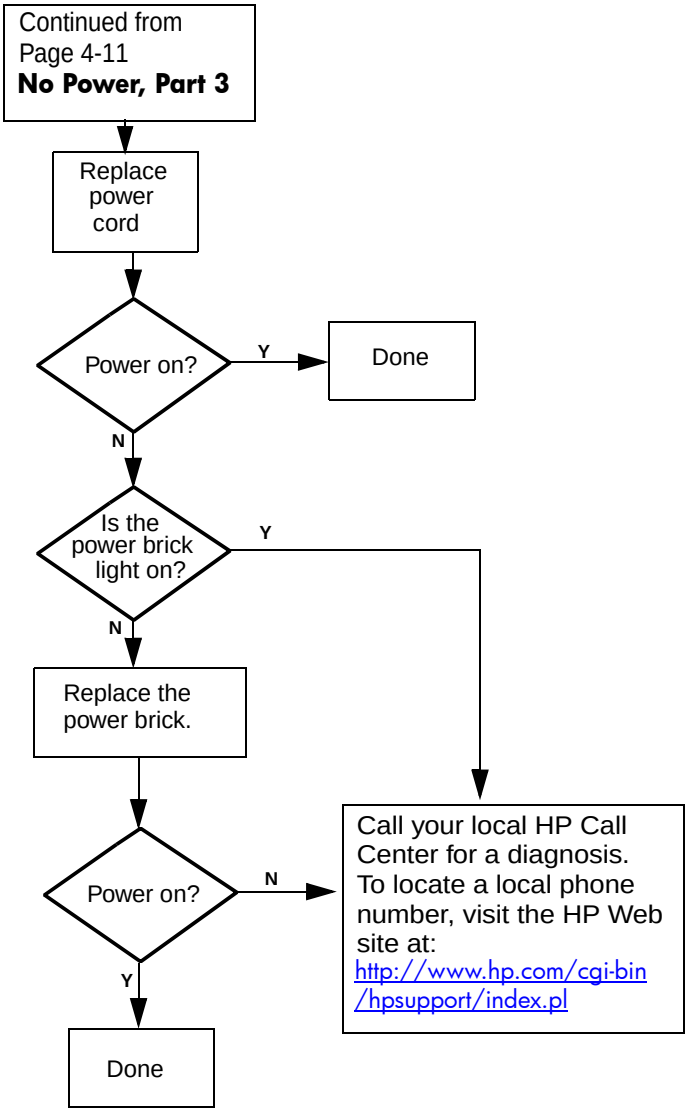

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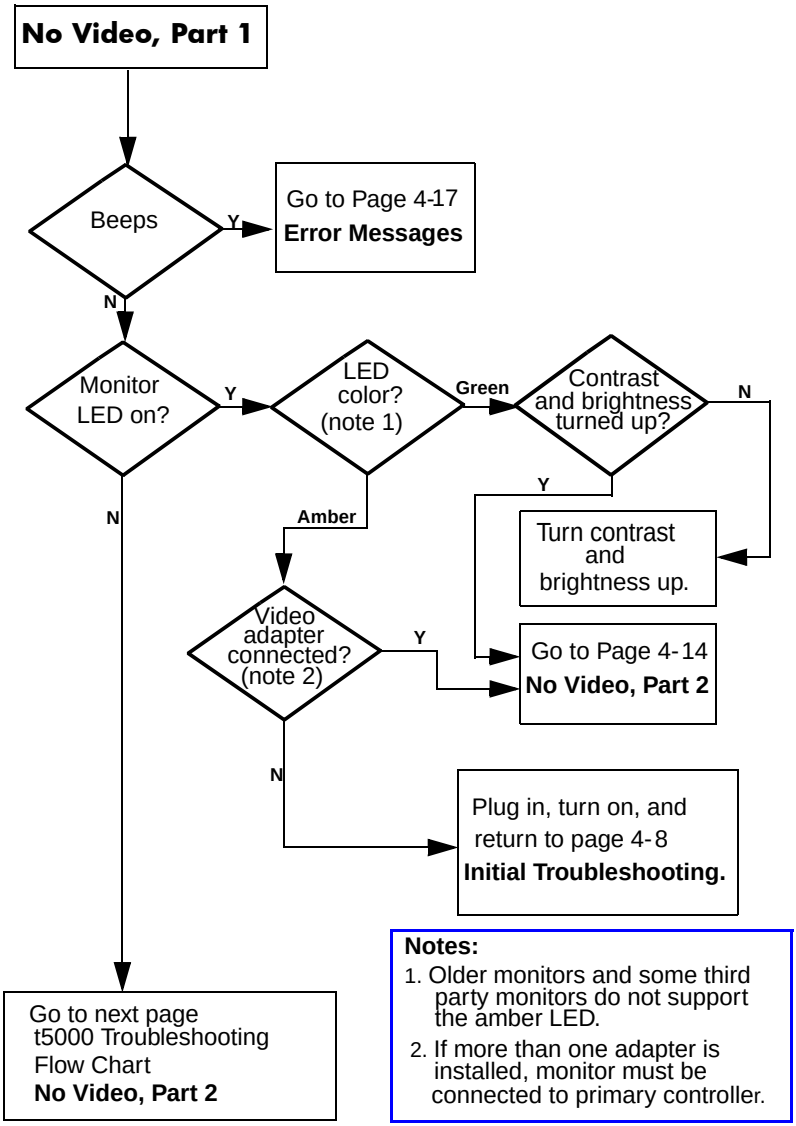

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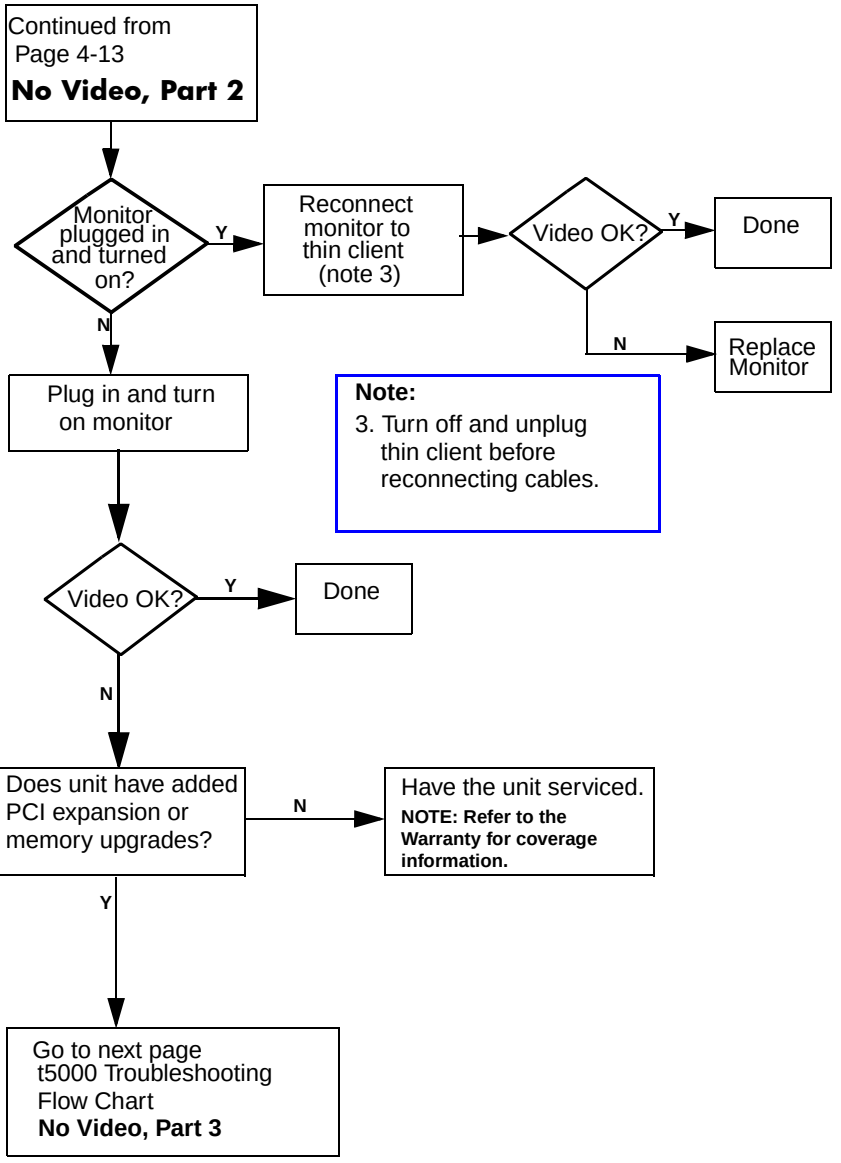

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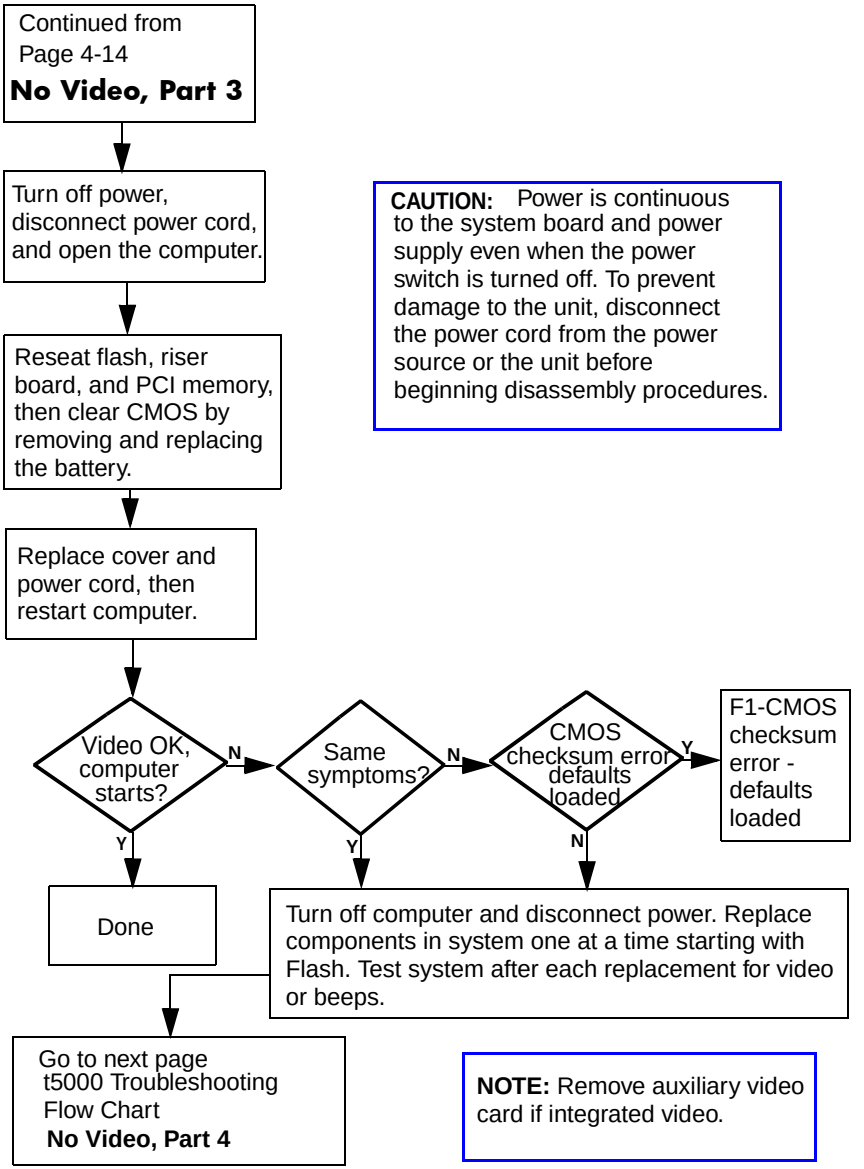

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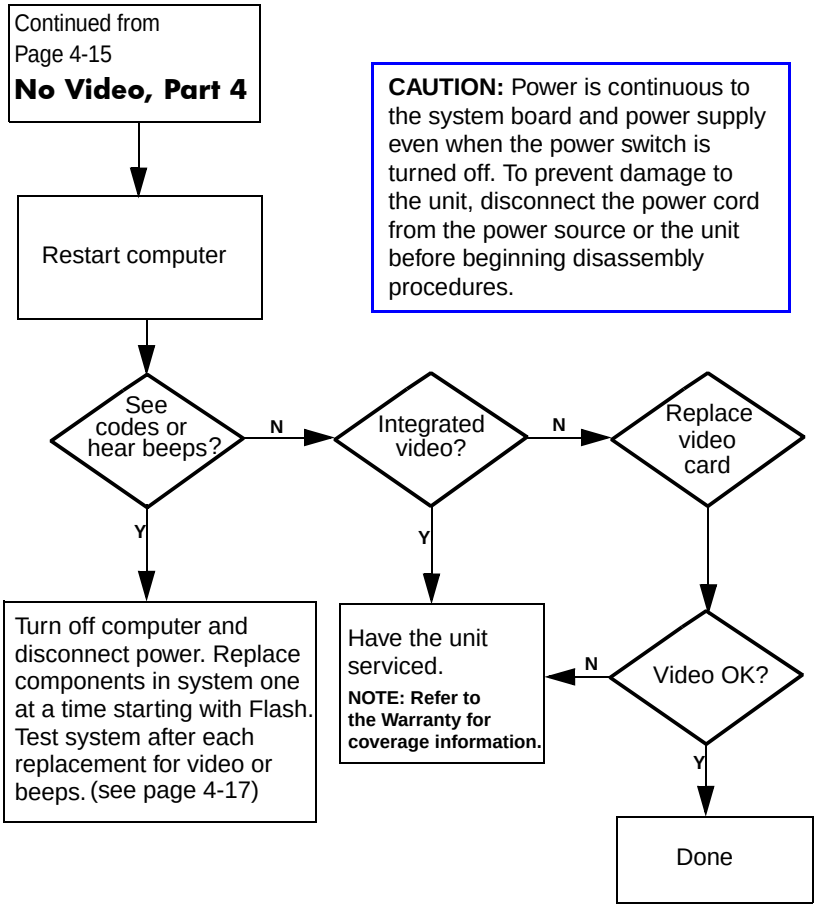

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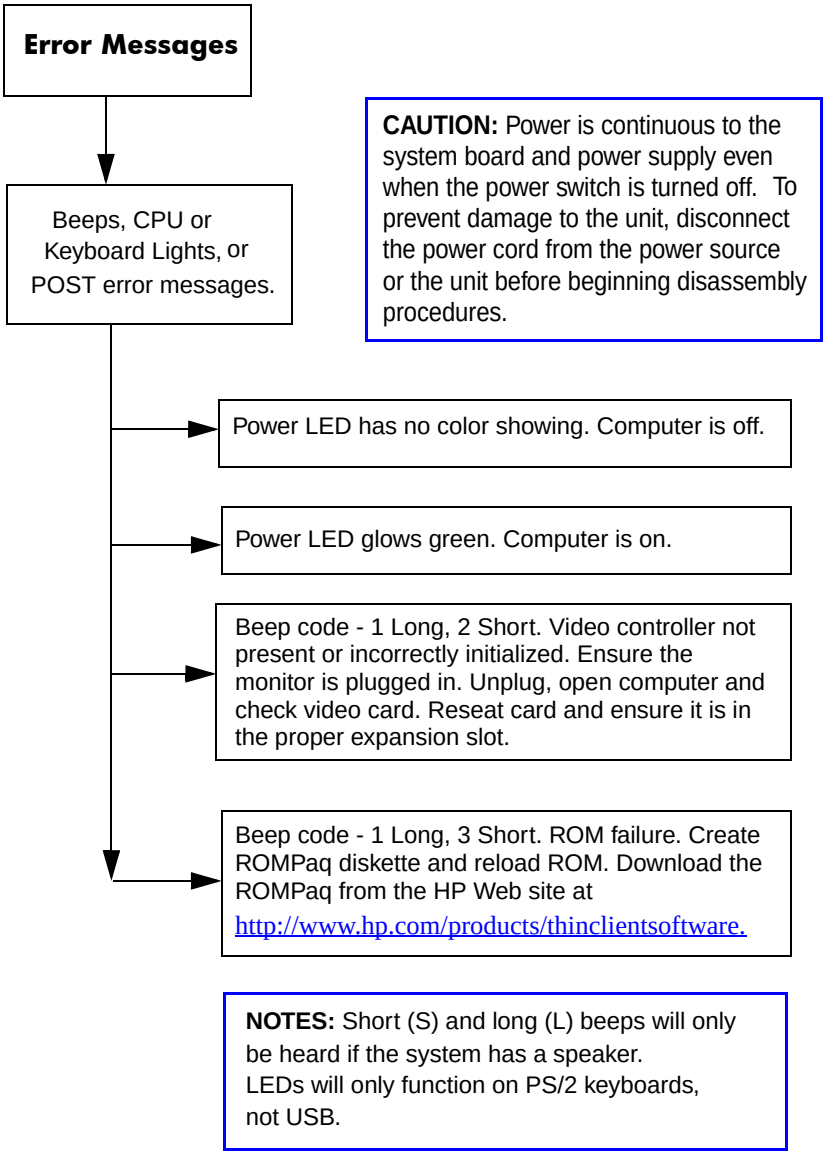

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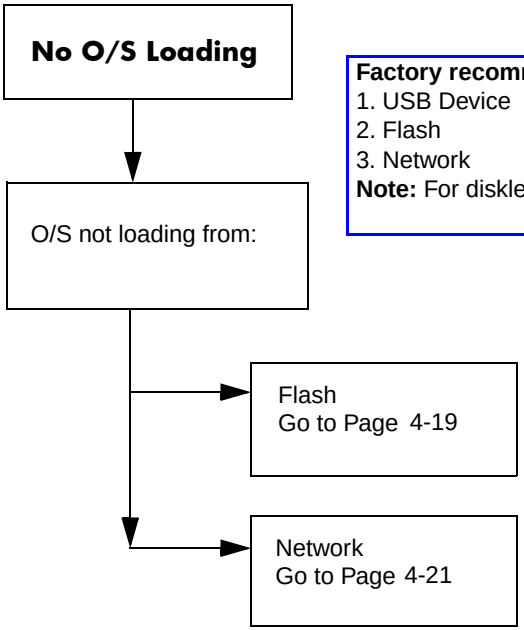
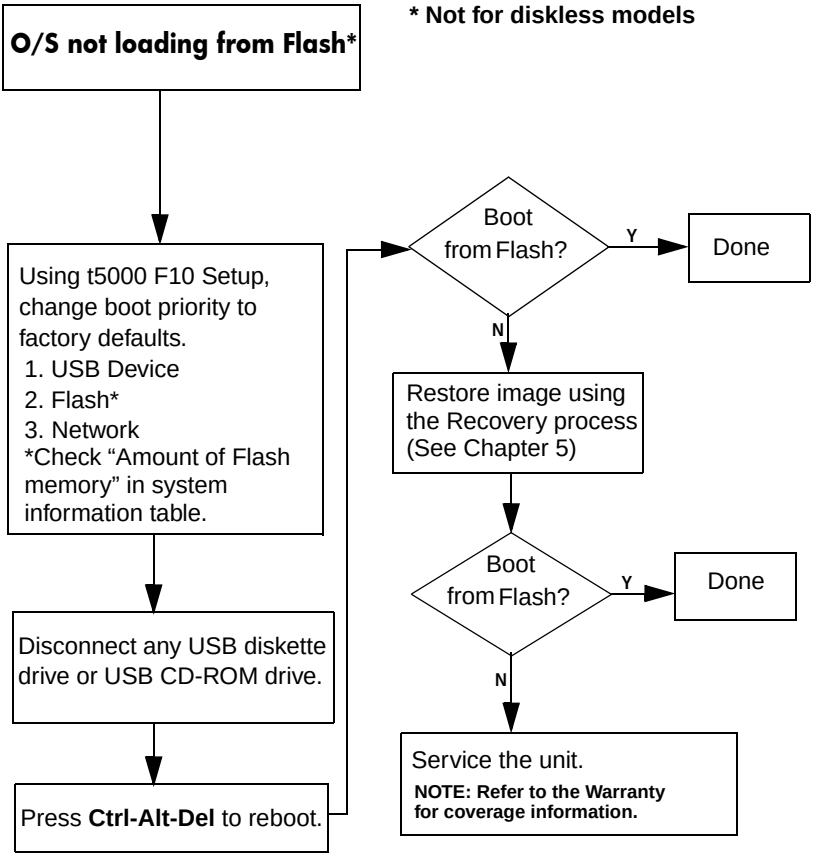


Factory recommended booting priority:
1. USB Device
2. Flash
3. Network

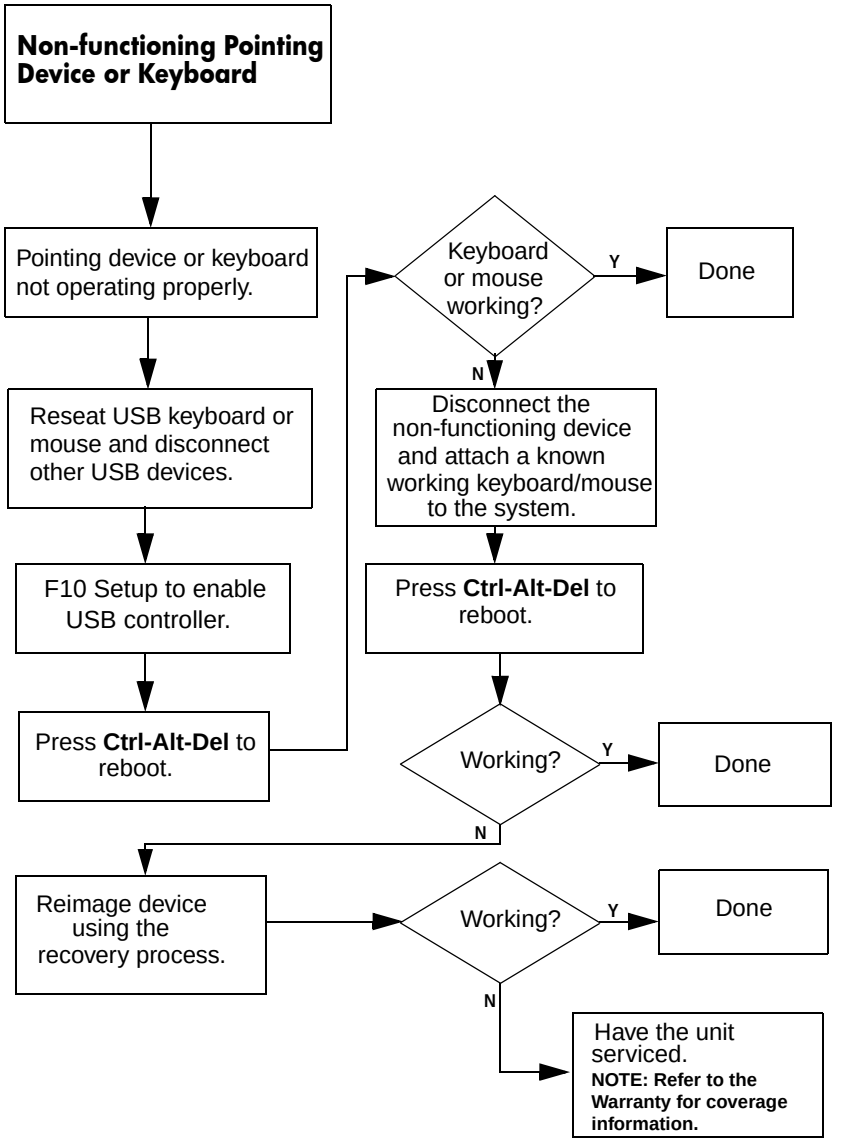
Note: For diskless models see page 4-29.

NOTE: If USB diskette drive present and diskette installed, system will not boot from other USB device.

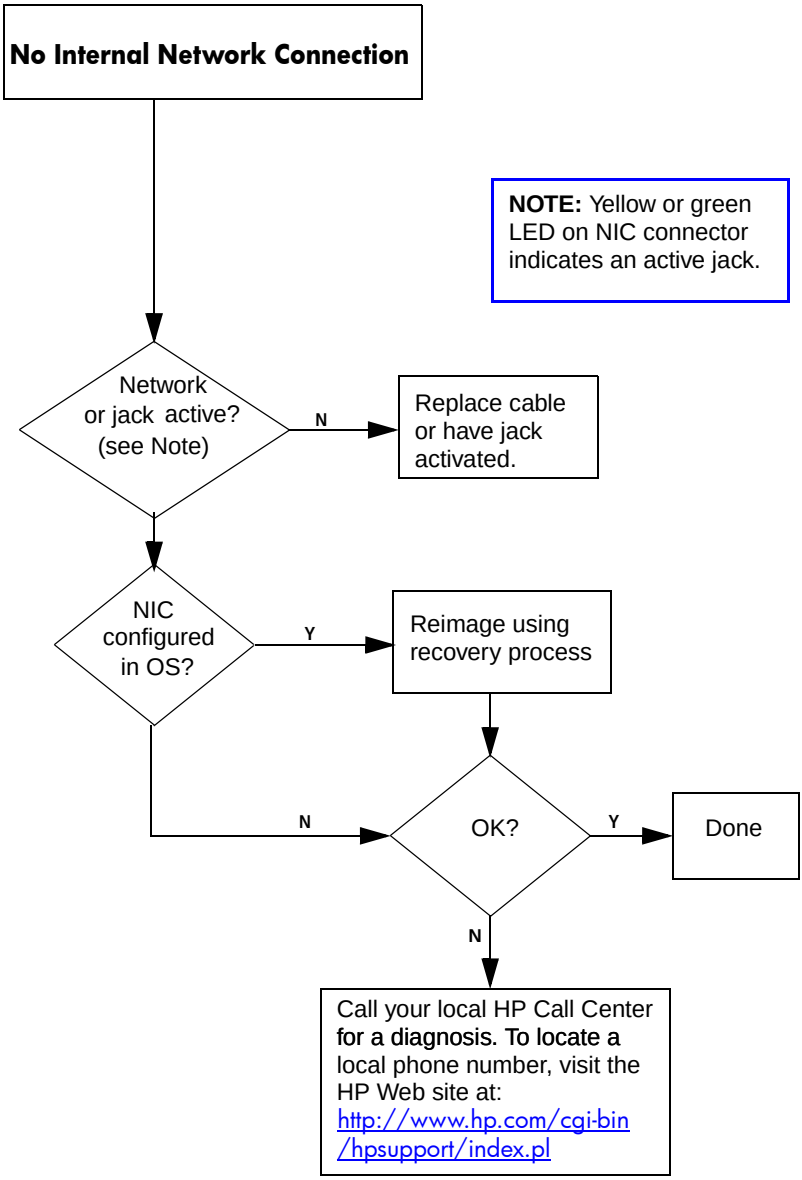
t5000 Troubleshooting Flow Chart (cont'd)



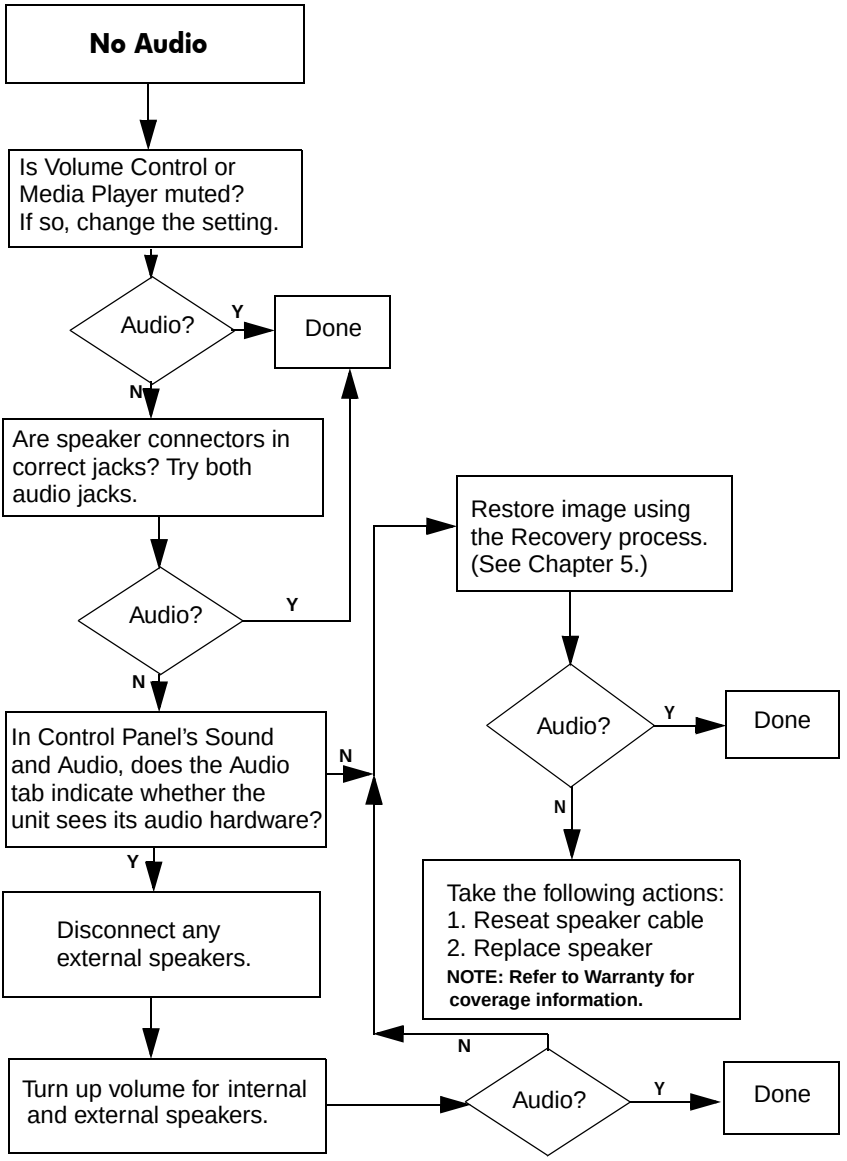
t5000 Troubleshooting Flow Chart (cont'd)



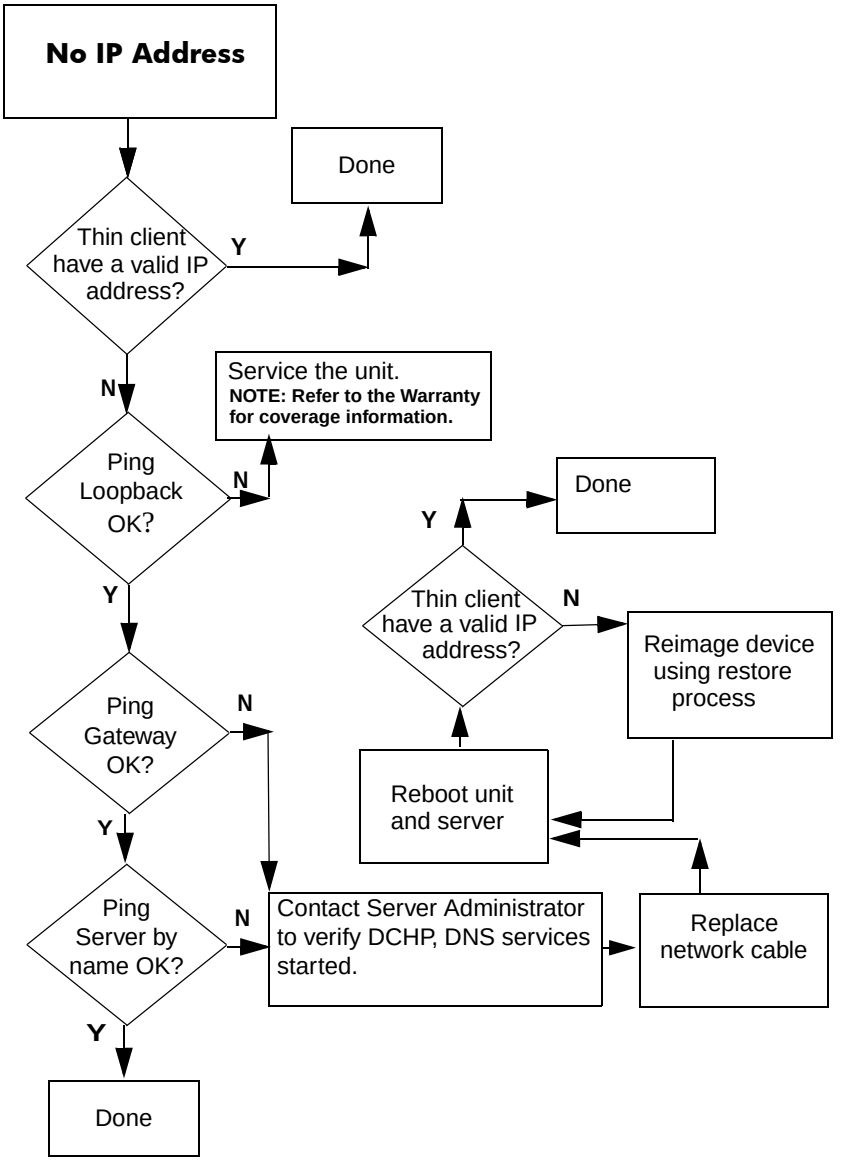
t5000 Troubleshooting Flow Chart (cont'd)



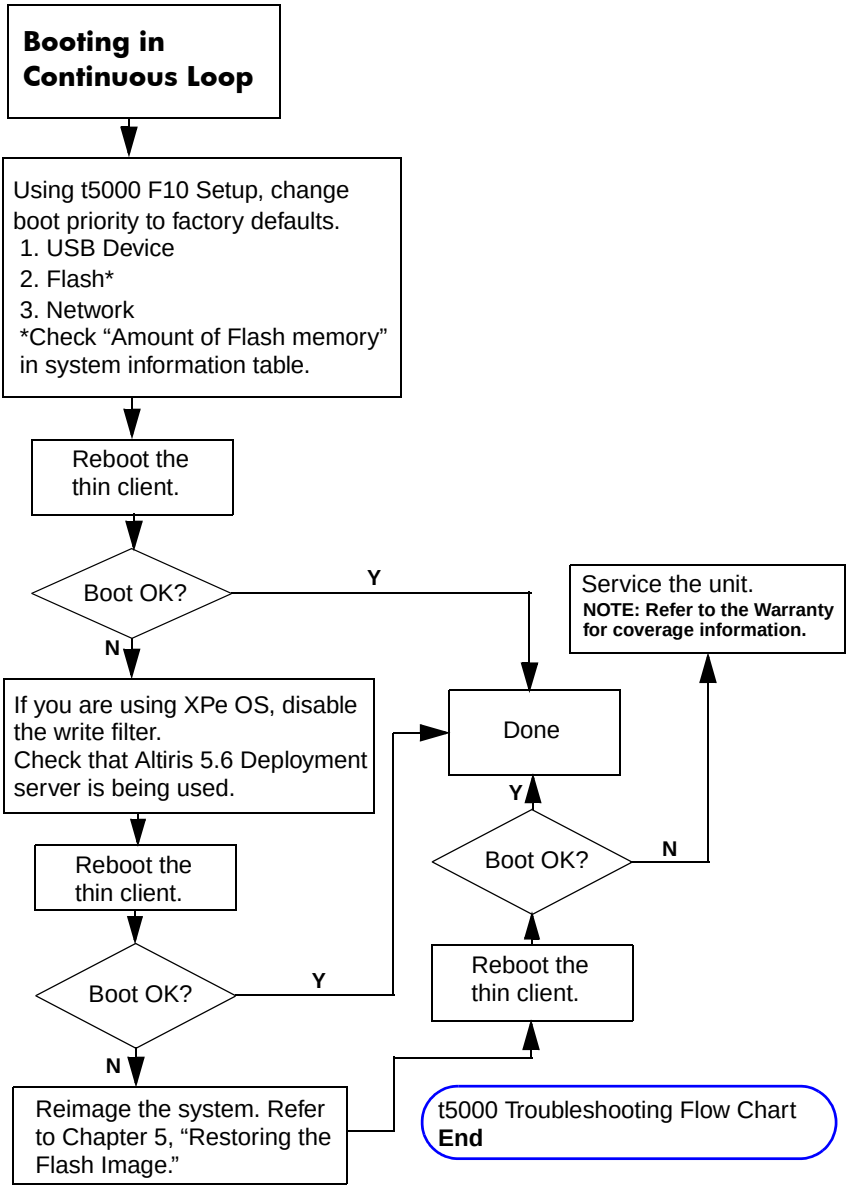
t5000 Troubleshooting Flow Chart (cont'd)



t5000 Troubleshooting Flow Chart (cont'd)



t5000 Troubleshooting Flow Chart (cont'd)



Basic Troubleshooting

If the Thin Client t5000 Series is experiencing operating problems or will not power on, review the following items.

Power-On Troubleshooting

Issue	Procedures
The thin client unit is experiencing operating problems.	Ensure that the following connectors are securely plugged into the thin client unit: • Power connector • Keyboard (USB) • Mouse (USB) • Network RJ-45 connector • Monitor
The thin client unit does not power on.	1. Verify that the power supply is good by installing it on a known working unit and testing it. If the power supply does not work on the test unit, replace the power supply. 2. If the unit does not work properly with the replaced power supply, have the unit serviced.

Power-On Troubleshooting *(Continued)*

Issue	Procedures
The thin client unit powers on and displays a splash screen, but does not connect to the server.	1. Verify that the network is operating and the network cable is working properly. 2. Verify that the unit is communicating with the server by having the System Administrator ping the unit from the server: • If the thin client pings back, then the signal was accepted and the unit is working. This indicates a configuration issue. • If the thin client does not ping back and the thin client does not connect to the server, reimage the unit.

Power-On Troubleshooting *(Continued)*

Issue	Procedures
No link or activity on the network RJ-45 LEDs or the LEDs do not illuminate blinking green after powering on the thin client unit. (The network LEDs are located inside the RJ-45 connector on the top, rear panel of the thin client. Indicator lights are visible when the connector is installed.)	1. Verify that the network is not down. 2. Make sure the RJ-45 cable is good by installing the RJ-45 cable onto a known working device—if a network signal is detected then the cable is good. 3. Verify the power supply is good by replacing the power cable to the unit with a known working power supply cable and testing it. 4. If network LED's still do not light and you know the power supply is good, then reimage the unit. 5. If network LED's still do not light, run the IP configuration procedure on page 4-23. 6. If network LED's still do not light, have the unit serviced.
A newly connected unknown USB peripheral does not respond or USB peripherals connected prior to the newly connected USB peripheral will not complete their device actions.	An unknown USB peripheral may be connected and disconnected to a running platform as long as you do not reboot the system. If problems occur, disconnect the unknown USB peripheral and reboot the platform.

Power-On Troubleshooting *(Continued)*

Issue	Procedures
Video does not display.	1. Verify that the monitor brightness is set to a readable level. 2. Verify the monitor is good by connecting it to a known working computer and ensure its front LED turns green (assuming the monitor is Energy Star compliant). If the monitor is defective, replace it with a working monitor and repeat testing. 3. Reimage the thin client unit and power on the monitor again. 4. Test the thin client unit on a known working monitor. If the monitor does not display video, replace the thin client unit.

Diskless (No-Flash) Unit Troubleshooting

This section is only for those units that do not have ATA Flash capability.

Because there is no ATA Flash in this model the boot priority sequence is:

- USB device
- PXE

1. When the unit boots, the monitor should display the following information:

- MAC Address — NIC portion of the system board is OK
- GUID—General system board information
- Client ID—Information from server
- MASK—Information from server
- DHCP IP—Information from server

  - If there is no MAC Address, the system board is at fault. Contact the Call Center for service.
  - If there is not GUID information, the system board is at fault and should be replaced.
  - If there is no Client ID, MASK, and DHCP IP information there is no network connection. This may be caused by a bad cable, the server is down, or a bad system board. Contact the Call Center for service for the bad system board.

  If you are running in an MS RIS PXE environment go to step 2.

  If you are running in a Linux environment go to step 3.

2. If you are running in an MS RIS PXE environment press the **F12** key to activate the network service boot as soon as the DHCP IP information appears on the screen.

   - ❏ If the unit does not boot to the network the server is not configured to PXE.
   - ❏ If you missed the F12 cue, the system will try to boot to the ATA flash that is not present. The message on the screen will read:

   ERROR: Non-system disk or disk error. Replace and press any key when ready.

   - ❏ Pressing any key will restart the boot cycle.

3. If you are running in a Linux environment an error message will appear on the screen if there is no Client IP.

   ERROR: Non-system disk or disk error. Replace and press any key when ready.

5

Restoring the Flash Image

System Requirements

To create a recovery device for the purpose of reflashing or restoring the software image on the ROM, you will need the following:

- A personal computer running Microsoft Windows 2000 Professional or Microsoft Windows XP Professional
- One or more HP Compaq t5000 Series Thin Clients
- CD-R or CD-RW drive (if using the ISO Image option)
- USB flash device 32MB for Microsoft Windows CE .NET or 256MB for Windows XP Embedded (if using the USB format). Compatible USB flash devices (drive keys) are available from www.diskonkey.com.

  This restore method will not work with all USB flash devices. USB flash devices with multiple partitions generally do not support this restore method. The range of USB flash devices available on the market is constantly changing. Not all USB flash devices (drive keys) have been tested with the HP Compaq Thin Client Imaging Tool.
- USB CD-ROM drive for thin client (if using the ISO Image option)

Before using the utility, you must download the appropriate image from http://www.hp.com/products/thinclientsoftware.

Getting Started

There are three deployment options supported by this utility. You can choose to do one or more of the following using your personal computer:

- Generate an ISO image to use with CD creation software to create a bootable CD for deployment using a USB CD-ROM drive.
- Create a bootable flash image on a USB flash device (such as a drive key)
- Unbundle the image to a directory for use in a custom deployment scenario or PXE image.

Download and run the Package-for-the-Web deliverable (an .exe file) that contains the original factory image for the thin client. The HP Compaq Thin Client Imaging Tool (CRStart.exe) runs automatically and will display the following dialog:

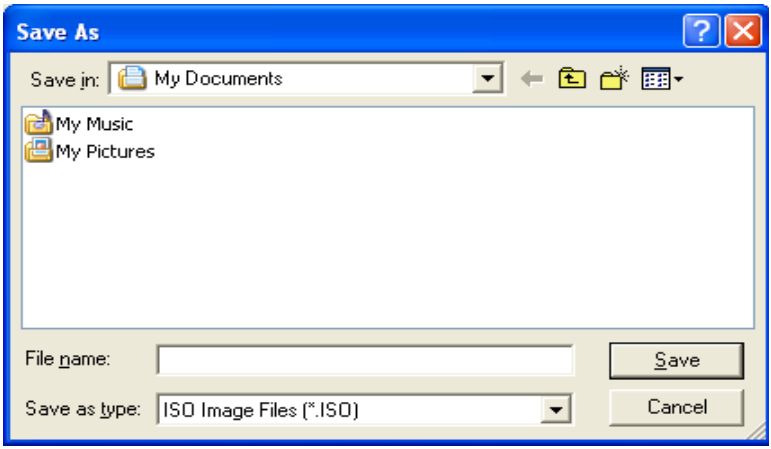
Choose one of the deployment options: ISO Image, USB Format, or Deployment. Each option is described in the following paragraphs.

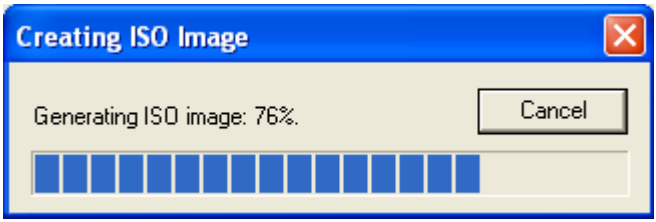
During the restore process, the thin client flash drive will be reformatted and all data on it will be erased before the system image is copied to it. To prevent loss of data, be sure that you have saved any user-created data from the flash drive.

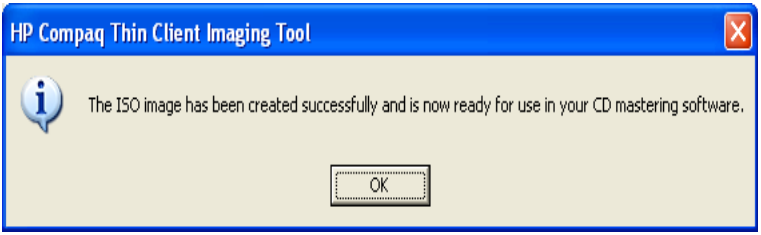
During the first restart of the thin client following the restore process, it may take approximately 15 minutes to unbundle the software before the Windows Desktop is displayed.

Creating an ISO Image

1. Click **ISO Image.**
2. When prompted, enter a file name for the generated ISO file.







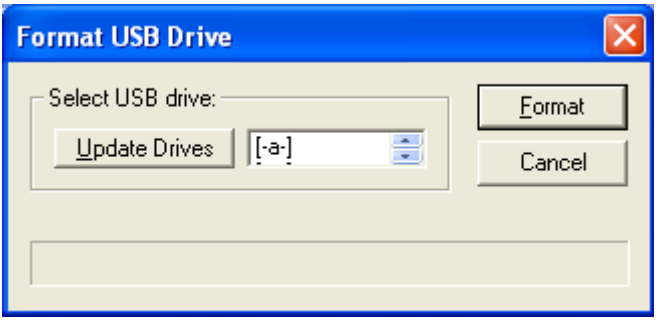
Once this process is complete, use the generated ISO file to create a bootable restore CD with your CD creation software.

3. Connect a USB CD-ROM drive to the thin client. **Only one bootable USB device may be attached to the thin client during this process.**
4. Insert the bootable restore CD into the CD-ROM drive.
5. Restart the thin client.
6. When prompted **Do you want to continue? [Y/N]** click **Y** to begin the image restore process on the thin client.

Formatting a USB Flash Drive

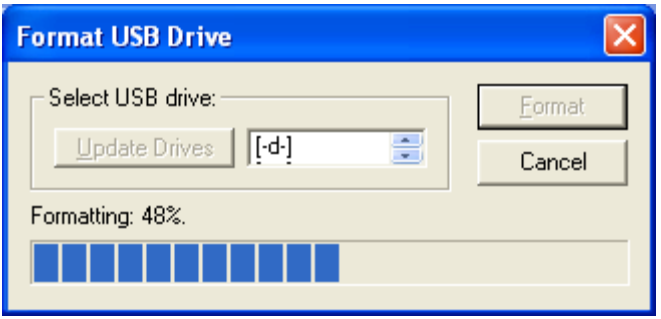
CAUTION: To prevent loss of data, be sure that you have saved any user-created data from the USB drive to another drive.

1. Connect your USB flash device (drive key) to your personal computer. Ensure that only **one** USB flash device is connected to the system.
2. Click **USB Format.**
3. Select the USB drive from the list, using the up and down arrows to display the correct drive letter. (If the USB drive does not appear in the list, click **Update Drives**, then scroll through the list again.)



During the next step, the USB drive will be reformatted and all data on it will be erased before the bootable image is copied to it. To prevent loss of data, be sure that you have saved any data from the USB drive to another drive.

4. Click **Format**.

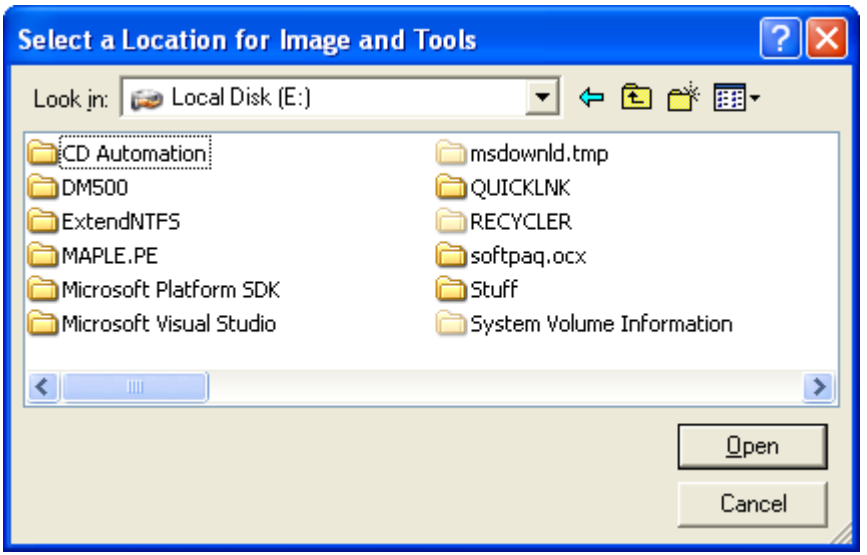


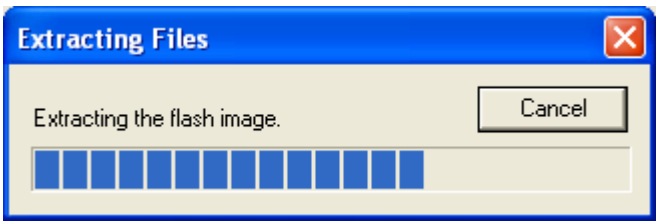
5. Connect the bootable USB flash device to the thin client. **Only one bootable USB device may be attached to the thin client during this process.**
6. Restart the thin client.
7. When prompted **Do you want to continue? [Y/N]** click **Y** to begin the image restore process on the thin client.

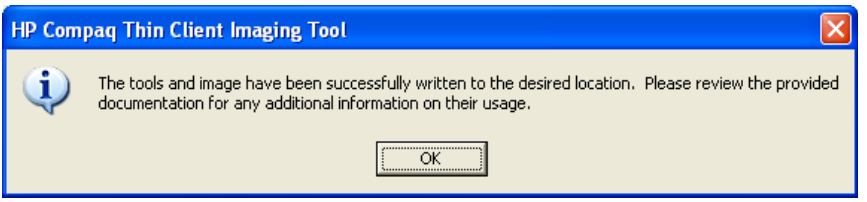
Unpacking the Image and Tools for Deployment

1. Click **Deployment.**
2. When prompted, select the destination directory for the imaging tools and image.

The components that comprise DSKIMG.BIN are then unbundled. When this process is complete, there will be three new files: **IBR.EXE** (the image restoration utility), **FLASH.IMG** (the OS image), and **README.TXT.**







Deploying with PXE

1. Ensure that IBR.exe and Flash.img are stored in the same directory on the server.
2. Add ***[full path]*\IBR.exe -y *[full path]*\Flash.img hd0** to the PXE command file, and run it.

To view the IBR command line options:

At the command prompt, type **IBR.EXE /?** and press **Enter.**

Refer to "Appendix C: Configuring a PXE Server" for instructions on setting up a PXE Server using Microsoft RIS. See your documentation if using a different PXE server, such as Altiris Deployment Solution.

6

Citrix MetaFrame

Citrix MetaFrame Troubleshooting

This Troubleshooting section is not intended to enable HP or Compaq Service to support Citrix software. All Citrix software is supported by Citrix or Citrix authorized service providers on a warranty or service contract basis. Customers that call the HP or Compaq Customer Service Center with Citrix issues and questions should be referred to Citrix for assistance.

A frequently encountered issue is the inability of the Thin Client to connect to the Citrix server. The problem is often caused by using the server name but not having a DNS server configured on the network or on the terminal. To correct the problem, do one of the following:

- Configure a DNS server on the network, then add the necessary DNS information at the terminal.
- Specify the server by its IP address rather than by its name.

Citrix Error Messages

Error Message	Meaning
The option *option* is not valid.	Missing argument for option *option*.
The option *option* has an invalid argument: *argument*.	The configuration file has been edited directly or is corrupt. Reconfigure Citrix MetaFrame.
Error in configuration file: *file* cannot find section *section*. Error in configuration file. *section* must contain an entry *entry*.	The configuration file has been edited directly or is corrupt. Reconfigure Citrix MetaFrame.
Invalid ICA Protocol data received.	This probably indicates a network error.
Cannot open visual: *ID number.*	This visual (ID =...) cannot support the required number of colors.
Cannot allocate sufficient colors. Continuing in 16-color mode.	A suitable visual has been found but it can only support 16 colors.
Cannot find a suitable visual on this display.	Unable to allocate a private color map on this display.
An error occurred in the graphics system.	This message indicates a problem with the display. Try exiting other applications, such as **Microsoft Internet Explorer**, to release the colors on your display.
Cannot find keyboard mapping file *file*.	The keyboard mapping file specified in the **Preferences** page of the **Settings** dialog box is invalid or cannot be located.
A server must be entered.	A server name must be entered on the **Network** page of the **Properties** dialog box.

Citrix Error Messages *(Continued)*

Error Message	Meaning
Window size must be between 300 and 2048.	The **Custom Width and Height** fields on the **Window** page of the **Properties** dialog box can take values between 300 and 2048 only.
Data has been changed. Are you sure you want to quit?	You are quitting from the ICA client without saving changes to the current connection entry.
Cannot write file: *file*.	This message indicates a problem with saving or creating a connection database (for example, no disk space).
Invalid Error: Cannot start Wfica with this connection.	The connection entry is invalid.
Cannot find selected connection, or cannot find specified connection.	The configuration file is corrupt. Create a new configuration file.
Error in configuration file: *file* Missing section: *section*	The configuration file is corrupt. Create a new configuration file.
Inconsistency in configuration file: *file* Missing section: *section*	The configuration file is corrupt. Create a new configuration file.
This description is already in use. The Description must be unique.	The **Description** field on the **Network** page of the **Properties** dialog box must be unique.
Cannot get address for server *server*.	The server name cannot be resolved.
Unable to perform update: client is not on local file system.	The client cannot update an installation on a non-local (for example, NFS-mounted) file system.
Unable to perform update: Not running $ICAROOT/wfica.	The client cannot update an installation other than its own.

7

Microsoft Remote Desktop Protocol

Microsoft Remote Desktop Protocol (RDP) is designed to provide remote display and input capabilities over network connections for Windows-based applications running on a server. RDP services are accessed by the Terminal Services client application on the thin client. RDP can be made available on the network using any of the following services:

- Microsoft Windows 2000 Server with Terminal Services installed:
- Microsoft Windows NT 4.0 Terminal Server Edition
- Microsoft Windows XP Professional
- Microsoft Windows .NET Server

For more information on RDP, visit the following Microsoft Web sites:

- http://www.microsoft.com/windowsxp/expertzone/columns/russel/02January28.asp
- http://www.microsoft.com/windows2000/technologies/terminal/default.asp#section1

A

Thin Client t5000 Specifications

Specifications

Item	Description
Processor	Transmeta Crusoe high-speed CPU with on-board SDRAM controller and PCI bus controller
Memory	Memory may be expandable. Refer to http://h18000.www1.hp.com/products/quickspecs/productbulletin.html for the latest information.
Protocol	Integrated Microsoft RDP and Citrix ICA protocols and terminal personalities standard
Display Support	VESA Monitor support; scalable video up to 1600 x 1200, 16-bit color, up to 85-Hz refresh rate.
Audio	Output: 1/8-inch mini-plug, full 16-bit stereo, 44-KHz sample rate Input: 1/8-inch mini-plug for microphone
Input Output Peripheral support	Keyboard: HP Enhanced USB with Microsoft Windows keys (104 keys) included Mouse: HP USB scroll mouse included Printer: Local and/or network printers on ICA (virtual port redirection ready) Video: VGA-type video output (DB-15)

Specifications

Item	Description
Networking	• TCP/IP with DNS and DHCP; Point-to-Point Protocol (PPP) • Multiple master browser support and Citrix load balancing on ICA • SNMP support allows configuration of terminal settings, reporting of terminal configuration and attached devices, and traps • DHCP support for automatic firmware upgrades and unit configuration
Administrative Software	• Altiris Deployment Solution 5.6 or greater
Communications	• Four USB ports • 10/100BaseT Fast Ethernet, twisted pair (RJ45) • ICA Remote dial-up via external modem
Terminal Personalities Supported	Refer to http://h18000.www1.hp.com/products/quickspecs/productbulletin.html for the latest information.
Resident Operating Systems	t5000 Series models may have one of the following operating systems: Microsoft Windows CE .NET/IE or XP Embedded/IE for Thin Clients
Server Compatibility	• Microsoft Windows NT Server 4.0 • Terminal Server Edition • Microsoft Windows 2000 Server with Terminal Services installed • Citrix WinFrame • Citrix MetaFrame

B

Adding an Image Restore Tool Using Altiris Deployment Solution

1. Ensure that IBR.exe (Image Restore) and Flash.img are stored in the same directory on the server (e.g., c:\program files\altiris\express\deployment server\tcimage).
2. From the Altiris Deployment Server Console, click **File > New > Job.**
3. Enter a unique name for the job that you will use to deploy the original thin client image.
4. Click the name of the new job.
5. Near the upper right side of the screen, click **Add>>.**
6. Select **Run Script…** from the pop-up menu.
7. Enter **[full path]\IBR.exe -y [full path]\Flash.img hd0**
8. Under **In which OS would you like to run this script?** Click **DOS.**
9. Click **Finish.**
10. You can now drag and drop the job onto the appropriate machine(s) or schedule it to run later, depending on your needs. Refer to the documentation for Altiris Deployment Solution (http://www.altiris.com/support/documentation) for more detailed information.

C

Configuring a PXE Server under Microsoft RIS

Prerequisites

The services listed below must be running, and they may be running on different servers:

1. Domain Name Service (DNS)
2. Active Directory
3. DHCP
4. Remote Installation Services (RIS) on Microsoft Windows 2000 Server

This documentation covers RIS setup, and assumes that servers 1, 2, and 3 (above) are already set up.

The RIS PXE Server must be equipped with two or more hard drives. Remote Installation Services and Windows 2000 Server cannot be installed on the same drive; nor will RIS work on a double partition of Windows 2000 Server. The drive on which RIS is installed must be first be formatted using NTFS.

Installing Remote Installation Services (RIS PXE Server)

1. From the Windows 2000 Server, log on to the domain using an account that has Administrator privileges on the server.

2. From the Windows Control Panel, double-click on **Add/Remove Programs.**
3. Double-click **Add/Remove Windows Components.**
4. Select **Remote Installation Services,** then click **Next.** (Insert Windows 2000 Server CD into the CD-ROM drive, if prompted.)
5. Restart the computer after the wizard has finished installing the service.

Authorizing Remote Installation Services (RIS PXE Server)

If you have installed RIS on a server **other than** the server running DHCP, authorize PXE with DHCP as follows:

1. Record the IP address of the RIS PXE Server.
2. Log on to the DHCP Server as administrator.
3. From the Control Panel, double-click **Administrative Tools.**
4. Double-click **DHCP.**
5. Right-click **DHCP** (just above the domain name) and select **Manage Authorized Servers.**
6. Click **Authorize.**
7. Type the IP address of your RIS PXE server and click **OK.**
8. Click **OK.**
9. Log off from the DHCP Server.

Configuring Remote Installation Services

Use the default option to have RIS install on second hard drive (D:\ or E:\).

1. Click **Start > Run.**

2. Type **Risetup.exe** and click **Next.**
3. Click **Next.**
4. Click the checkbox labeled **Respond to client computers requesting service.**
5. Click **Next.**
6. Insert the Windows 2000 Professional CD into the CD-ROM drive and enter the path to the CD-ROM drive (usually drive D:\ or E:\).
7. Click **Next.**
8. Click **Next.**
9. Click **Next.**
10. When installation is complete, click **Finish.**

Set User Permissions on the Active Directory Server

On the active directory server,

1. Click **Start > Programs > Administrative Tools.**
2. Click **Active Directory Users and Computers.**
3. Right-click on the appropriate domain name.
4. Click **Delegate Control.**
5. Click **Next.**
6. Click **Add** to add users.
7. Highlight **Everyone** and click **Add.**
8. Click **OK.**
9. Click **Next.**
10. Select **Join a Computer to the Domain.**

11. Click **Next.**
12. Click **Finish.**

RIS Menu

1. Install the RIS menu of your choice.
2. Configure the RIS menu.
3. Refer to the help file provided by the RIS menu for instructions on creating a network bootable diskette and RIS menu for PXE.

Creating Network Bootable Disk to Map Drives

Create a network boot disk to map drives. (Refer to Microsoft Web site for instructions on creating a network bootable diskette.)

For More Information

HP Compaq t5000 Series Documentation (including white papers discussing software deployment methods):

http://h18004.www1.hp.com/products/thinclients/software.html

Altiris Deployment Solution Documentation:

http://www.altiris.com/support/documentation/

D

System BIOS

Restoring a Corrupt BIOS

If the BIOS code on the thin client is corrupt (see the section on BIOS Error Messages in Chapter 4, “Diagnostics and Troubleshooting”), the BIOS must be restored before the thin client will boot to the operating system. To restore the BIOS on a thin client t5000 Series, you will need the following:

- An external USB diskette drive connected to the thin client
- HP Compaq Thin Client t5000 Series System BIOS Softpaq (SP23411 or the most current Softpaq) on diskette

A thin client with a corrupt BIOS will only boot from a USB diskette drive.

To restore a corrupt BIOS, complete the following instructions:

1. Insert an empty diskette into a diskette drive on a working computer, and navigate to the following HP Web site: http://h18004.www1.hp.com/products/thinclients/software.html
2. Select the Thin Client t5000 Series Softpaq (SP23411 or the most current Softpaq) and download to your hard drive. The file that is downloaded is an executable file.
3. From your hard drive, open the Softpaq, then open the Flash Diskette folder and double-click the 786w2.bat file.

The screen prompts: **Place Destination disk in drive A:, Press any key when you are ready.**

4. Be sure you have inserted an empty diskette in drive A: and press any key to copy the software to the diskette.
5. Power off the thin client with the corrupt BIOS.
6. Connect the external USB diskette drive to the thin client and insert the newly created Flash diskette into the diskette drive.

Before powering on the thin client, check to make sure there are no other USB devices connected to the thin client. If there are, disconnect them.

7. Power on the thin client.
8. At power on, the BIOS is automatically restored from the diskette.

WARNING: DO NOT TURN OFF POWER OR ATTEMPT TO REBOOT THE THIN CLIENT DURING THE RECOVERY PROCESS.

While this procedure is primarily used to recover systems with corrupt BIOS, it can also be used to locally update a system BIOS.

Updating a BIOS

To update the system BIOS on the Thin Client t5000 Series, download the Thin Client t5000 Series Softpaq (SP23411 or the most current Softpaq) from the HP Web site at: http://h18004.www1.hp.com/products/thinclients/software.html

The Softpaq contains utilities for restoring or updating the system BIOS on the Thin Client t5000 Series. Included in the Softpaq are several methods for changing or updating the BIOS version on your computer. The tools and appropriate BIOS images are contained in the following Softpaq directories:

- DOS Flash—DOS utility that can be used locally or with a Probate eXecution Environment (PXE) management application to update the system BIOS.
- WFlash—Windows-based utility used to locally update the system BIOS on individual PCs through the Windows environment.

To determine the BIOS family, version, and date on the thin client, press **F10** during system power-on to run the F10 Setup utility, then select **System Information**.

To update the system BIOS, complete the following instructions:

1. Download the Softpaq to a directory on your hard drive. The downloaded file is a self-extracting executable with a file name based on the thin client model.
2. From that drive and directory, execute the desired folder from the downloaded file and follow the on-screen instructions.
3. Copy the appropriate utility to a diskette to transfer to the thin client.

WARNING: DO NOT TURN OFF POWER OR ATTEMPT TO REBOOT THE COMPUTER DURING THE UPGRADE PROCESS.

E

Replacing the CMOS Battery

Removing and Replacing the Side Access Panel

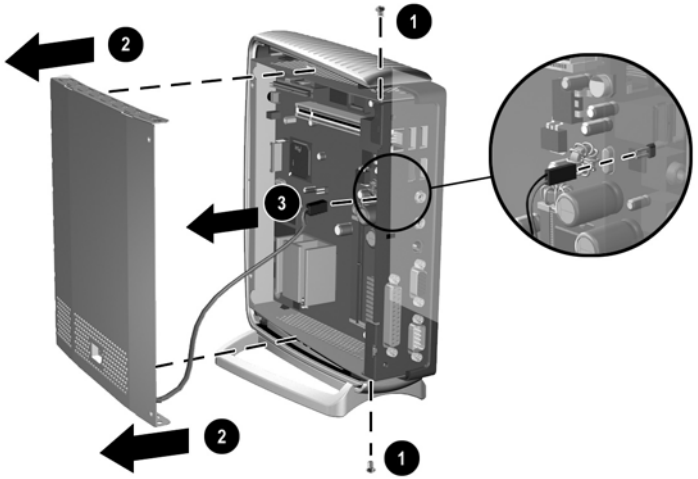
To replace the CMOS battery, you must remove the side access panel and chassis cover as shown below and on the next page.

WARNING: Before removing the side access panel, ensure that the thin client is turned off and that the power cord is disconnected from the electrical outlet.

1. Remove the two back panel screws ❶.
2. Pull the side panel off ❷.

Removing the Side Access Panel

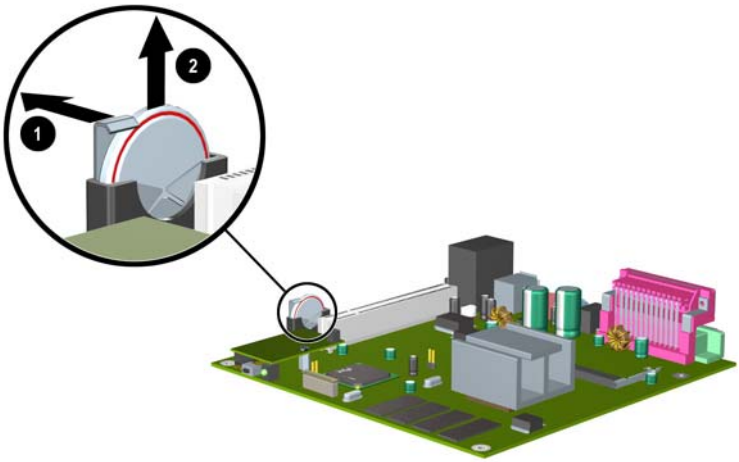
3. Remove the chassis cover by removing the two screws ❶ and pulling the chassis cover ❷ off.
4. Disconnect the speaker cable ❸ from the system board.



Removing the Chassis Cover and Disconnecting the Speaker

Replacing the Battery

1. Locate the battery on the system board.
2. Pull back on the clip ❶ that is holding the battery in place, and remove the battery ❷.
3. Insert the new battery and position the clip back into place.



Removing and Replacing the CMOS Battery

After replacing the battery, replace the side panel and chassis cover by reversing the previous steps.

F

Support Information

The following URLs point to thin client support information listed on the HP Web site.

- http://h18004.www1.hp.com/products/thinclients/ Links to information on the Support Home index, product documentation, Operating System upgrades and SoftPaqs, customer announcements and notifications, and self-help
- http://www.hp.com/products/thinclientsoftware/ - Links to thin client SoftPaqs and documentation

The following URLs point to embedded operating system information listed on the Microsoft Web site:

- http://www.microsoft.com/windows/embedded/default.asp - embedded home pointer
- http://www.microsoft.com/windows/embedded/ce.net/ - CE.NET pointer
- http://www.microsoft.com/windows/embedded/ce.net/default.asp - CE.NET Technical Resources pointer
- http://www.microsoft.com/windows/embedded/xp/default.asp- XPE pointer
- http://www.microsoft.com/windows/embedded/xp/techinfo/default.asp - XPE Technical Resources pointer

The following URLs point to Altiris software support:

- http://www.altiris.com/ - Lifecycle Management Software
- http://www.altiris.com/support/complimentary/ - Altiris Complimentary Support

The following URL points to Citrix support and services:

- http://www.citrix.com/site/SS/index.asp - Citrix Knowledge Center