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Prepared by OS Integration

Compaq Computer Corporation

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Upgrading to Microsoft Windows 2000 on Compaq ProLiant Servers

Abstract: This document provides system engineers and network administrators with tested information to upgrade successfully from Microsoft Windows NT to Microsoft Windows 2000 on Compaq ProLiant Servers. This document includes information on planning, preparation, and installation of the operating system for Windows 2000. It also includes four upgrade scenarios and a troubleshooting section, as well as three appendices. Appendix A lists the Compaq-supported platforms; Appendix B provides an upgrade flow chart; and Appendix C lists resources on the Compaq website.

Microsoft Windows 2000 Release Candidate 2 was used in our upgrade process.

IMPORTANT: We suggest you read and thoroughly understand this document before attempting an upgrade to Windows 2000.

Other documents with information regarding Compaq servers and Windows 2000 include [Microsoft Windows 2000 Release Candidate 2 with Compaq Server Products](#) and [Compaq Tips on Evaluating, Planning, Preparing, and Piloting Your Windows 2000 Environment](#). The Compaq ActiveAnswers Resource Paq 6.0 for Microsoft Windows 2000 and Windows NT also contains white papers, as well as ROMPaqs and other information regarding Windows 2000. You can obtain the Resource Paq through our website at <http://www.compaq.com/partners/microsoft/resourcepaq.html>.

Visit the Compaq website for the latest information about Compaq products, options, customer support, and documentation regarding Microsoft Windows 2000 products. The Compaq Frontline Partnership website, <http://www.compaq.com/partners/Microsoft>, contains [Windows 2000 information](#) including beta support, white papers, questions and answers, features, test labs, and a survey questionnaire.

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Integration Note prepared by OS Integration

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Planning for Windows 2000

Windows 2000 does not provide just an upgrade; it is a radical new design that changes the way you manage your network. To effectively plan for the change, you need to understand the differences between your current configuration and your Windows 2000 configuration. DNS becomes the primary method of name resolution and your network administration becomes much more granular and localized. It may seem extremely complex at first, but good planning eliminates much of the difficulty.

In order to effectively plan for these changes, find and update your network map to determine how and why your network looks as it does. What domains do you have and why? Does the structure work internally? What changes could be made to make network use easier? Will certain changes make your network administrators more efficient? What are your security needs? What are your bandwidth needs? How do you use or plan to use the Internet within your organization?

Look at the entire network infrastructure to establish what improvements should be made before the upgrade begins. Look at your current applications and determine if they will operate in a Windows 2000 environment or if you need an upgrade or replacement. How are the applications

Windows 2000 provides an Upgrade Compatibility Verification Tool. Enter D:/I386>WINNT32.EXE/CHECKUPGRADE ONLY to start the batch file.

used? Which groups use them? Will this make a difference in your network structure? Are there similar applications more likely to be Windows 2000 compatible in use elsewhere in your organization? Take time to investigate Windows 2000, your hardware, and your applications.

Establish functional teams with experts in directory services, administration and management, core OS, networking, applications, and hardware compatibility. Have these teams evaluate Windows 2000. Plan on four to six months to correctly plan your upgrade strategy. Make clear assignments and verify progress along the way. The planning process for a project of this scope is a critical piece in its success.

Fix any problems in your Windows NT environment and verify that your Windows Internet Naming Service (WINS) works properly. WINS will be necessary on your system until all clients are Active Directory aware. Collapse unneeded resource domains and check for duplicate names across the entire network. Audit your security environment and determine how global groups can help with the upgrade process.

Table 1 provides the Microsoft supported upgrade paths for Windows 2000.

IMPORTANT: Attempts to upgrade Windows NT 3.51 or 4.0 to Advanced Server results in a dual booting system and your users and groups will not transfer to Windows 2000.

Table 1. Supported upgrade paths

| Current Server Operating System | Upgraded Server Operating System |
|--|--------------------------------------|
| Microsoft Windows NT 3.51 Server | Windows 2000 Server Edition |
| Microsoft Windows NT 4.0 Server | Windows 2000 Server Edition |
| Microsoft Windows NT 4.0 Enterprise Server | Windows 2000 Advanced Server Edition |

If you need hardware documentation for your Compaq equipment, it's available at <http://www.compaq.com/products/servers/platforms/index.html>.

Once you decide where you are, how you got there, and what is available, determine where you want to be and how to get there. Who will upgrade first? How will you determine when the next group is ready to upgrade? What security issues are most important? How long can you allow for the full upgrade?

Develop a roadmap with clearly defined action programs to

make sure you have a strategy that can work. Your strategy should include checking the [Compaq Windows 2000 website](#) for new information on a regular basis. [Compaq Services](#) can help you plan your upgrade to Windows 2000.

Upgrade Checklist

Make a checklist to make certain each step is completed once you are ready to begin the actual process of upgrading. Table 2 provides a sample upgrade checklist.

Table 2. Upgrade checklist

| ✓ | Description | Comments | Location |
|---|---|--|---|
| ✓ | Minimum requirements met | | See Table of Contents. |
| ✓ | Platforms support | | See Table of Contents. |
| ✓ | Sufficient backup media | Verify that you have enough for a full backup and that the media itself is in excellent condition. | |
| ✓ | Six (6) to 30 disks | This depends on what options you have on your server and the last update you performed on them. | |
| ✓ | Windows 2000 Server or Advanced Server CD ROM | Be sure you meet the upgrade path requirements before trying to upgrade to Windows 2000 Advanced Server. | |
| ✓ | SmartStart CD | Version 4.60. | To be determined (expected availability with Windows 2000 release). |
| ✓ | Internet access | For system updates. | |
| ✓ | Firmware ROMPaq | By server. | http://www.compaq.com/partners/Microsoft/Windows2000/BetaSupport/servers.html |
| ✓ | Options ROMPaq | By option. | http://www.compaq.com/support/files/server/softpaqs/Rompaq/index.html |
| ✓ | Compaq SSD for Windows NT | Update via SoftPaq. | http://www.compaq.com/support/files/server/WINNT/index.html |
| ✓ | Compaq SSD for Windows 2000 | Update via SoftPaq. | http://www.compaq.com/partners/Microsoft/Windows2000/BetaSupport/servers.html |
| ✓ | Compaq Management Agents for Servers | Update via SoftPaq. | http://www.compaq.com/partners/Microsoft/Windows2000/BetaSupport/servers.html |
| ✓ | System Configuration Utility | Update via SoftPaq. | http://www.compaq.com/partners/Microsoft/Windows2000/BetaSupport/servers.html |
| ✓ | Windows 2000 Primer Utility from Compaq | This erases non-compatible Compaq utilities. | http://www.compaq.com/partners/Microsoft/Windows2000/BetaSupport/servers.html |
| ✓ | Windows 2000 support on third-party hardware | Make sure all hardware is supported. | http://www.microsoft.com/hcl/default.asp |
| ✓ | Compaq website | Get the latest information. | http://www.compaq.com/partners/Microsoft/Windows2000/index.html |

Minimum Requirements

The minimum requirements listed here pertain to the Windows 2000 network operating system only and do not include the requirements for software applications that run on your system. Please check your application requirements to make certain your system can run both the operating system and your software. Most software vendors have this information posted to their website.

IMPORTANT: Compaq does not support use of Windows 2000 Professional Edition on Compaq Server platforms.

To use Microsoft Windows 2000 Server, your equipment must meet the following requirements:

- 166-MHz or higher Pentium-compatible CPU
- One to four CPUs on one machine
- 256 MB of RAM recommended (64 MB supported as a minimum; 4 GB supported as a maximum)
- 1.0 GB of free space on the hard disk

To use Microsoft Windows 2000 Advanced Server, your equipment must meet the following requirements:

- 166-MHz or higher Pentium-compatible CPU
- One to eight CPUs on one machine
- 256 MB of RAM recommended (128 MB supported as a minimum; 8 GB supported as a maximum)
- 1.0 GB of free space on the hard disk

Note: Available disk space refers to free disk space on the partition to contain the system files. Additional space is required if you copy the Windows 2000 CD contents to the hard disk during installation.

Software Fault Tolerance Preparation

Check the [Compaq Windows 2000 website](#) to locate the most recent information on Windows 2000 preparation.

Appendix A lists the Compaq-supported server platforms. Make sure you have a Compaq-supported system platform and inspect the system to confirm that it conforms to the platform-specific configuration listed. The system will be updated and the necessary ROMPaqs installed during the preparation process.

Preparation for the upgrade to Windows 2000 includes backing up the system, preparing for system recovery, saving configuration information, updating the system software, documenting settings, updating the firmware, and updating the system partition. After these items are completed, you are ready to upgrade. Appendix B provides a flow chart of the upgrade process.

CAUTION: Verify any mixed-processor steppings before installing Windows 2000 through our website at <http://www.compaq.com/products/servers/processor-mixing/>. See Appendix A.

Backup the System

Compaq Insight Manager allows you to copy the database files it generated if you want copies separate from your backup file.

You must first perform a complete backup of your system and verify it. Use the same backup program (Compaq Enterprise Backup Solution, BackupExec, ArcServe, or other program) you normally use on your system. Follow the instructions included with your backup software to enable the Verify After Backup option. This ensures that you can return to the starting point with all of your data if a problem arises. Test your backup to make certain it can be restored if necessary.

Prepare for System Recovery

To prepare for problems that could arise during the upgrade and to make certain that you can recover your system, create an emergency repair disk (ERD) and a Windows NT boot disk.

Create an Emergency Repair Disk

After the backup completes, update your emergency repair disk (ERD) or create a new one. You need this if you have to restore your complete system. The Repair Disk Utility accomplishes this task. The steps to complete the procedure follow.

- Type **RDISK** from a command prompt, then press **Enter**.
- Select Create Repair Disk to create a new repair disk or select Update Repair Info to update an existing repair disk.
- Follow the onscreen instructions to complete the task.

Create a Windows NT Boot Disk

The boot disk allows access to a drive with a faulty boot sequence, such as a corrupted boot sector, corrupted master boot record, or corrupted boot files. The boot disk can restart your system under almost any circumstance.

Note: Make sure the disk is formatted under Windows NT. You can copy files to a DOS-formatted disk but you cannot boot from it.

- Create a Windows NT boot disk by using the format command in Windows NT.
- Copy the *NTLDR*, *NTDETECT.COM*, and *BOOT.INI* files from the server boot drive to the formatted disk.
- Make certain you verify the boot disk before proceeding by inserting it into the disk drive and restarting the system.

If you are unsure which device is your boot device, unable to find the correct driver, or using different types of controllers, use the [Compaq Boot Partition and Boot Driver Detection Utility](#) available through our website and on the Compaq ActiveAnswers Resource Paq 6.0 for Microsoft Windows 2000 and Windows NT.

Update the System Software

The system software must be updated prior to upgrading your operating system to Windows 2000. These steps ensure that Windows 2000 adapts to your desired configuration after the upgrade. During the installation process, several utilities and drivers will be removed by the Windows 2000 Primer Utility from Compaq. If the files are not updated during this stage, they might not be properly removed from the Windows Registry when the Windows 2000 Primer Utility from Compaq runs.

Compaq Server Software for Microsoft Windows NT (Compaq SSD for Windows NT)

Upgrade to the latest Compaq Server Software for Microsoft Windows NT (Compaq SSD for Windows NT) before attempting to upgrade to Windows 2000. The Compaq SSD for Windows NT contains the latest updates for the drivers included in your system for use with Windows NT. Check our website [Compaq SSD for Windows NT](#) for the latest version.

To install the Compaq SSD for Windows NT, complete the following steps:

- Obtain four formatted 1.44-MB diskettes.
- Verify the name of the SoftPaq to execute it later (SP followed by a number).

Note: We used SP10445, version 2.14 for Windows NT 4.0, and SP9896, version 1.35 for Windows NT 3.51. These were the latest available versions at the time of this document.

- Download the SoftPaq to a directory on your hard drive and change to that directory.
- Execute the SoftPaq file.
- Follow the onscreen instructions.

After the disks are created, you may delete the downloaded file and the other files it created from your hard drive.

Compaq Management Agents for Servers

Update your [Management Agents](#) through our website before attempting to upgrade to Windows 2000. To complete the update, perform the following steps:

- Verify the name of the SoftPaq to execute it later (SP followed by a number).

Note: We used version 4.40a consisting of SP10593 for Foundation Agents, SP10594 for Server Agents, SP10595 for Storage Agents, and SP10596 for NIC Agents. These were the latest available versions at the time of this document.

- Download the SoftPaq to a directory on your hard drive and change to that directory.
- Execute the SoftPaq file.
- Follow the onscreen instructions.

The screen displays the number of files to be created and the total file size. You can specify the target directory for the files or default to the download directory. After the files unpack, you may delete the self-extracting file. For installation instructions, refer to the *README.TXT* in the created directory. After a successful installation, you may delete the unpacked files.

Document Operating System Settings

You should carefully document all the operating system network settings before preparing the system. These settings would include IP addresses, NIC information, protocols used, and so forth.

- Select Start → Settings → Control Panel → Network to start the Network Settings dialog box.
- Highlight each protocol and service from the Protocol and Services tabs.
- Select Properties.
- Write down all configuration details.
- Document all protocols and services used by your system.
- Record all the system configuration settings. Press the **F10** key when restarting the system to locate these settings.
- Close the Network Settings dialog box.

Update Firmware

The latest Windows 2000 compatible firmware for your Compaq server can be located through our website at <http://www.compaq.com/partners/Microsoft/Windows2000/BetaSupport/rc2-ServerRomPaqs.html>. This site provides special firmware upgrades for Compaq ProLiant and Prosignia servers and server options. Update your system firmware according to the instructions included with the firmware.

Update System Partition

In order to run Windows 2000, your system requires an updated version of the System Configuration Utility and other utilities stored in the system partition of your hard disk. If your hard drive does not contain a partition, omit this step.

CAUTION: Your system partition must be at least 36 MB to contain the utilities upgraded during this operation. **Do not perform this step if your system partition is under 36 MB.**

To ensure that the correct versions are installed, follow the instructions below. You can obtain the SoftPaq through our website at <http://www.compaq.com/support/files/server/softpaqs/Rompaq/sysconfig.html>.

- Follow the instructions provided with the SoftPaq.

IMPORTANT: Do not run the Compaq System Erase Utility. **Running this utility erases all of your hard disks and configuration memory.**

- Select Upgrade System Partition from the Compaq Systems Utility menu.
- Select Next → Continue.
- Select System Configuration, Diagnostics, and Drive Array Configuration.
- Select Exit.
- Remove any diskettes.
- Restart the server.

Windows 2000 Installation

To produce a Windows 2000 Server installation supported by Compaq, follow these steps when setting up the system.

IMPORTANT: Before beginning the installation process, check the [Compaq Windows 2000](http://www.compaq.com/support/files/index.html) website for the most recent information concerning Windows 2000 and Compaq products.

The SoftPaq files mentioned are available through the Compaq website at <http://www.compaq.com/support/files/index.html>.

Step One: Change the operating system selection to Windows 2000.

- Boot the server and press the **F10** key in order to launch the Compaq System Configuration Utility.

Note: The Prosignia Server 720 and ProLiant 400 do not need the Compaq System Configuration Utility because they have a ROM-based setup. There is no option nor need to specify the operating system on these servers.

- Select System Configuration from the Main Menu dialog box.
- Select Configure Hardware from the System Configuration dialog box.
- Select Review or Modify Hardware Settings from the Configuration Complete dialog box.
- Select Step 3: View or Edit Details from the Steps in Configuring Your Computer dialog box.

Changing your OS selection to Windows 2000 in the System Configuration Utility enables the following settings:

APIC Mode = Full Table

Hot Plug Reservation Mode = Extensive (for SMART-2 Array Controllers) or = Normal (for all types of PCI Controllers)

- Press **Enter** at the Primary Operating System prompt, and select Windows NT at the Primary Operating System menu (selecting Windows NT displays a submenu that includes Windows 2000.)
- Select Windows 2000.

- Exit the System Configuration Utility.
- Save your changes.

The server reboots.

IMPORTANT: If Windows 2000 does not appear as one of the operating system selections, you may not have upgraded your server's system partition properly. See "Update System Partition" for more information.

Step Two: Run the [Windows 2000 Primer Utility](#) from Compaq available through our website. This utility removes the Compaq drivers that are not Windows 2000 compliant and may have been installed with prior Compaq SSD for Windows NT packages. The components removed include the following:

- Compaq Advanced Network Control Utility
- Compaq Array Configuration Utility

- Compaq Cluster Verification Utility (if Windows NT SSD Version 2.12C or earlier)
- Compaq Insight Management Foundation Agents
- Compaq Insight Management Server Agents
- Compaq Insight Management Storage Agents
- Compaq Insight Management Survey Utility
- Compaq Integrated Management Display Utility
- Compaq Integrated Management Log Viewer Utility
- Compaq Integration Maintenance Utility
- Compaq Network Teaming and Configuration Utility
- Compaq Online Storage Controller Recovery Utility
- Compaq PCI Hot Plug Utility
- Compaq Power Down Manager
- Compaq Power Supply Viewer
- Compaq Remote Monitor Service
- Compaq System Management Services
- Compaq System Partition Upgrade Utility

IMPORTANT: The Windows 2000 Primer Utility from Compaq does not remove non-compliant drivers for third-party options, such as Adaptec controllers or EMC storage devices. Contact the manufacturer directly for information on driver compatibility with Windows 2000.

Figure 1 illustrates the initial popup screen of this utility.

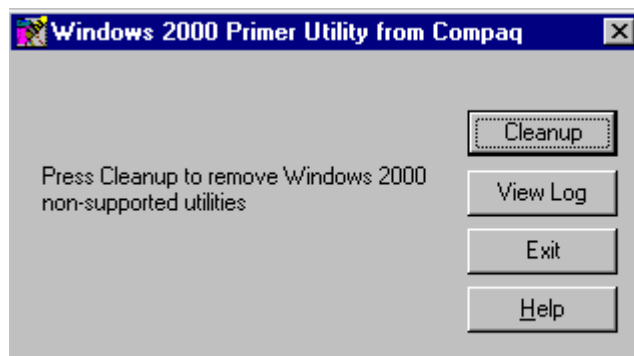


Figure 1. Windows 2000 Primer Utility cleanup screen

Select Cleanup to start the utility. The process runs in the background and notifies you when it has successfully completed.

After you run this utility, the associated applets are removed from the Control Panel and the program group prior to the reboot. This means that the affected utilities are not operational after this utility runs. In our testing, we actually started some of the utilities slated for removal, and they were still removed, although the files were in use.

The generated log provides information on which drivers the utility found and removed. It can be viewed with any text reader and printed in hard copy. Figure 2 illustrates the log file format and the data provided.

```

-----
Product Name:   Compaq Integration Maintenance Utility
Action:        This utility is not installed, so the Windows 2000 Primer
               Utility from Compaq is not attempting to remove it.
Warning:       N/A
-----
Product Name:   Netflex3 control panel applet
Action:        This component has been detected.
               Attempting to remove...
               This component has been removed.
Warning:       N/A
-----
Product Name:   Compaq Array Configuration Utility
Action:        This utility has been detected.
               Attempting to remove...
               This utility has been removed.
Warning:       N/A
-----
Product Name:   Compaq Integrated Management Display Utility
Action:        This utility has been detected.
               Attempting to remove...
               This utility has been removed.
Warning:       N/A
-----
Product Name:   Compaq IML Viewer Utility
Action:        This utility has been detected.

```

Figure 2. Windows 2000 Primer Utility log file

You could receive a warning message if the utility could not be removed because of a registry problem. In that case, manually remove the utility. You can accomplish this by using Uninstall from the Control Panel or, in the case of Insight Management Agents, run Compaq Insight Manager and go to its Uninstall file.

IMPORTANT: Third-party drivers and hardware are not necessarily Windows 2000 compatible. Check with the manufacturer of these devices. The Windows 2000 Primer Utility from Compaq is only guaranteed to remove Compaq drivers that are not Windows 2000 compatible.

1. Restart the system from the Windows 2000 CD and install the operating system or insert the CD and it will auto run with a pop-up screen asking if you want to upgrade. Help files are available on the Windows 2000 CD.

In our testing, we received the screen shown in Figure 3 after Windows 2000 Advanced Server checked our system compatibility.

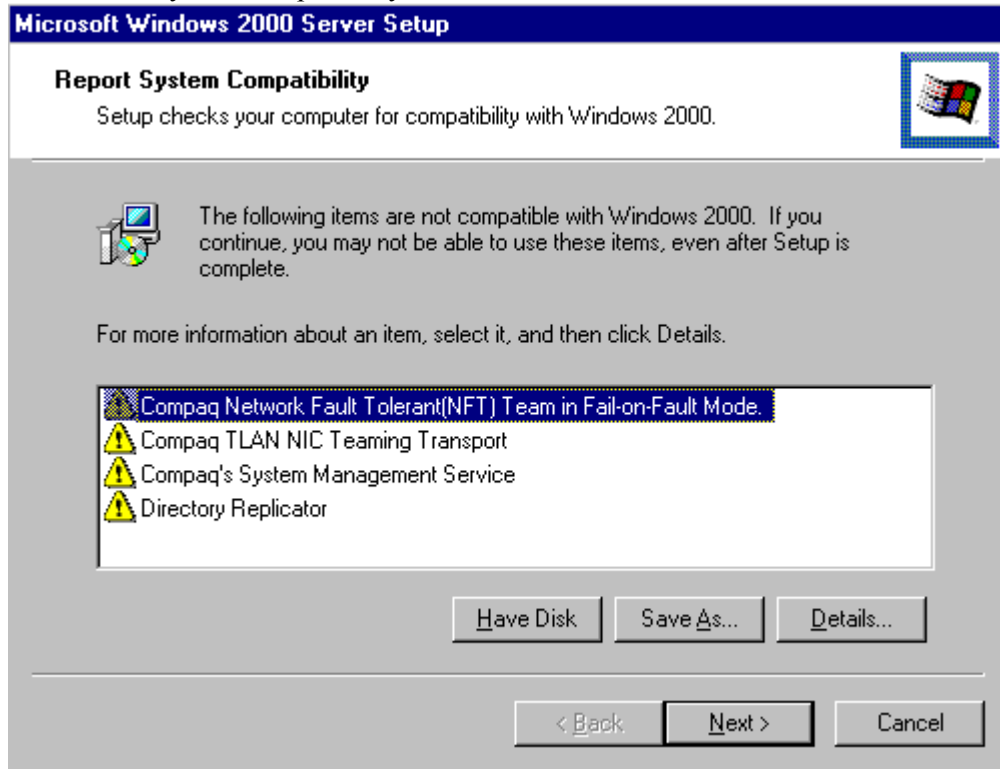


Figure 3. System Compatibility Report

Clicking on the Details button brought up a screen that stated Windows 2000 was disabling the software during setup. We also knew that we needed to dissolve the NIC teaming (See “Teamed NICs” under “Troubleshooting”) and we needed to remove some management agents. You could receive a similar screen if you opt to run the Windows 2000 Primer Utility from Compaq after the installation of Windows 2000. The File Replication System in Windows 2000 replaces Directory Replicator after installation.

2. Apply the latest Compaq SSD for Windows 2000 available from <http://www.compaq.com/partners/microsoft/windows2000/betasupport/servers.html>. Review the Help File included with this software. You can now select which drivers you want to install. The Help File and your configuration data determine which drivers must be loaded to make your system operate correctly.

Drivers do not install as a package in Windows 2000 as they did in Windows NT. You must manually load the drivers in this version of the Compaq SSD for Windows 2000. Certain drivers must be added through Add/Remove Hardware and not through Device Manager. Drivers loaded through Add/Remove Hardware include the following:

- Compaq Event Notification Driver
- Compaq Fibre Channel Array Class Driver
- Compaq ProLiant Storage System Driver

- Compaq StorageWorks Fibre Channel Filter Driver
- Compaq StorageWorks Fibre Channel Host Controller SCIS Miniport Driver
- Compaq System Management Driver

Drivers loaded through the Device Manager include the following:

- Compaq Advanced System Management Driver
- Compaq Netelligent/NetFlex-3 Controller Driver
- Compaq PCI Hot Plug Filter Driver
- Compaq SCSI Controller Driver
- Compaq SMART/SMART-2 Array Controller Driver

Check the Help file included with the Compaq SSD for Windows 2000 and read the upgrade scenarios below for more information.

If you copy the Compaq SSD for Windows 2000 onto your hard drive instead of creating diskettes, do not copy it to the boot partition or you will copy over the Windows 2000 default drivers.

Upgrade Scenarios

Several upgrade scenarios were tested in the Compaq Integration Test Lab using Windows 2000 Release Candidate 2 and the Compaq Server Support Software for Windows 2000 Release Candidate 2. To illustrate the broadest range of possible upgrade scenarios, four upgrade scenarios from the ProLiant Server family were selected for this document. Although your exact configuration might not be included, the information provided applies to all supported Compaq ProLiant Servers and addresses all known issues with upgrading to Windows 2000. Our scenarios included equipment operating with Windows NT 3.51 Server, Windows NT 4.0 Server, and Windows NT 4.0 Enterprise Server Edition. The equipment included a ProLiant 850R, a ProLiant 4500, and a ProLiant 7000 in various configurations. We used single and teamed NICs, as well as single and multiple array controllers. We tested various Compaq software settings and used equipment that was hot-plug capable and equipment that was not.

Upgrade Scenario 1 – PCI Hot Plug

Compaq PCI Hot Plug functionality operates differently in Windows 2000 than in Windows NT 4.0. For Windows 2000, the Compaq implementation now enables hot add, hot replace, and hot remove in all PCI Hot Plug-capable slots.

The Compaq PCI Hot Plug Filter Driver (*CPQPHP.SYS*) provides PCI Hot Plug functionality for Windows 2000. Both the PCI Hot Plug Filter Driver and the Compaq System Management Driver must be installed properly to obtain maximum functionality from the PCI Hot Plug bus. When installing these drivers, please read the associated help files.

When properly installed, the PCI Hot Plug functionality for Windows 2000 does include hot add, hot replace, and hot remove capabilities but not surprise-style hot removal. A device must be powered down before removing it from the PCI Hot Plug slot either via the GUI interface in Windows 2000 or the Compaq PCI power buttons. The screen interface for PCI Hot Plug changed in Windows 2000. See Figure 4.

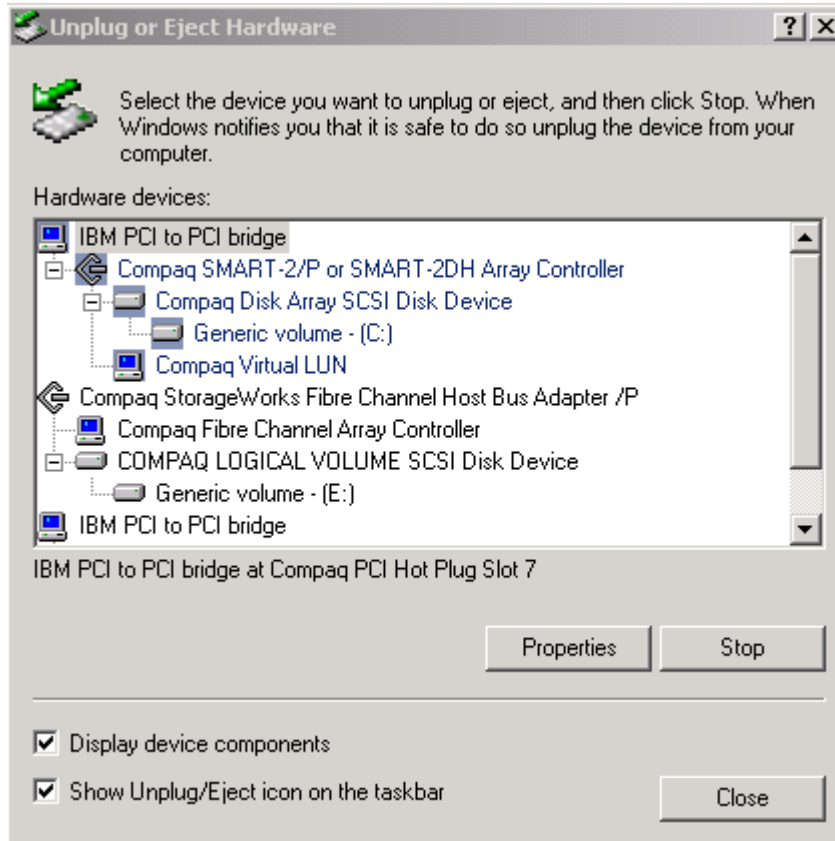


Figure 4. PCI Hot Plug interface

Note: PCI Hot Plug may not appear under Compaq System Tools on the Program Menu. You can access it by the shortcut on your task bar system tray or through Add/Remove Hardware by selecting Uninstall/Unplug Device.

For a detailed discussion of PCI Hot Plug technology in the Windows 2000 environment, see the white paper [PCI Hot Plug Technology with Microsoft Windows Architecture](#).

Upgrade Scenario 2 – Mixed Processor Steppings

Compaq supports mixed stepping processors with different cache sizes for Windows 2000, although Microsoft, Intel, and other hardware vendors do not. As part of the Compaq internal testing program, ProLiant Servers pass the same WHQL certification test under combinations of mixed cache sizes as they pass on non-mixed processor steppings. Compaq provides this additional level of testing as added value for customers eager for the cost benefits of successfully mixing processors.

The ProLiant servers with mixed-stepping support include the ProLiant 5500 Xeon, ProLiant 6000 Xeon, ProLiant 6400R Xeon, ProLiant 6500 Xeon, ProLiant 7000 Xeon, ProLiant 8000, and ProLiant 8500. The following general conditions apply to this support:

- All processors of the same processor family and model
- Core frequency of all processors set to frequency of slowest processor

- No processor core frequency set to a higher frequency than its rating allows
- Cache sizes installed in pairs if different cache sizes used
- Lowest step processor is the bootstrap processor

CAUTION: Detailed information and warnings are available through our website at <http://www.compaq.com/products/servers/processor-mixing/>. Please review this information carefully before upgrading to Windows 2000.

A multiprocessor system can contain processors with mixed steppings or processors with mixed L2 cache sizes but they must all be the same speed. At startup, Windows 2000 writes an information message in the event log regarding mixed processors. See Figure 5 for the location of the message in the Event Viewer and Figure 6 to see the message. This is not an error message. It is provided for information purposes only.

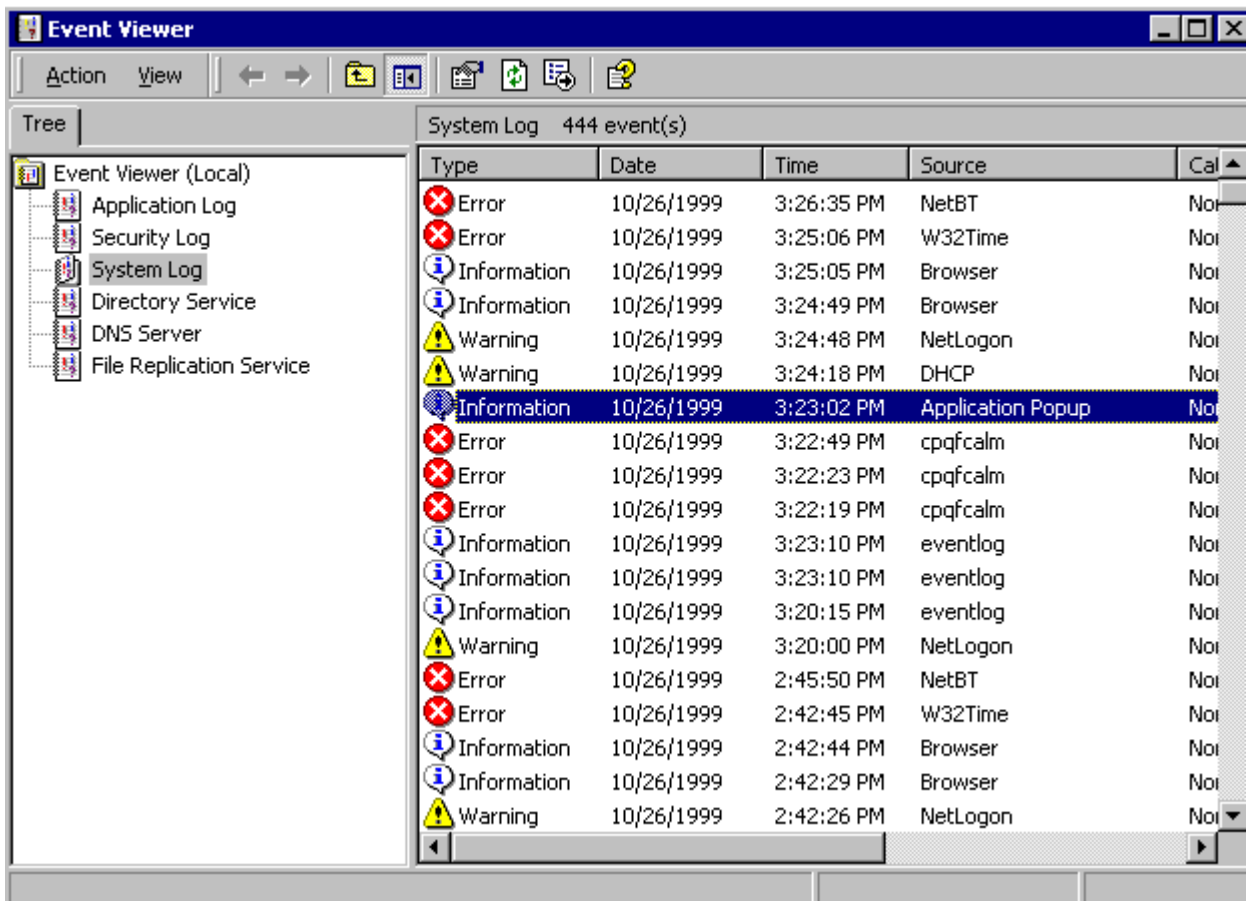


Figure 5. Event Viewer screen

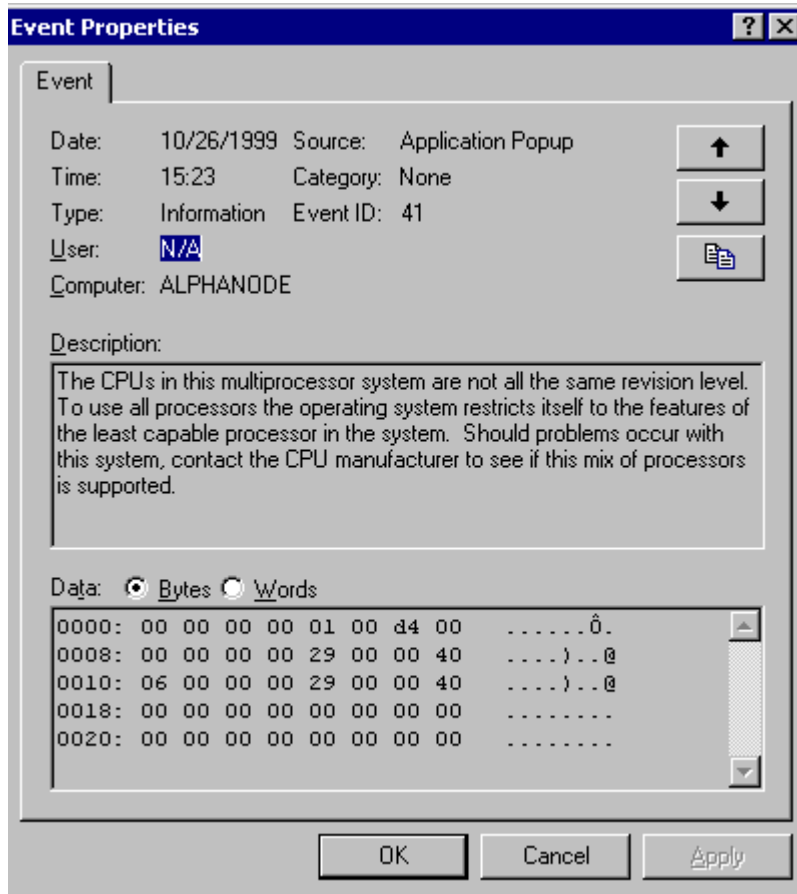


Figure 6. Mixed stepping informational message

Make certain that the first processor slot is the Bootstrap Processor (BSP). If the BSP is not the lowest stepping processor in the mix, problems can result as Windows 2000 initializes the processors.

Some mixed processor configurations can cause the system to hang during installation of Windows 2000. This issue has been corrected with new BIOS on systems with programmable slot ordering. For legacy systems without programmable slot ordering, locate the lowest stepping processor and place it in the first processor slot. For additional information, please see the document entitled [Support for Mixing Intel 6 Processors in Compaq Servers Running Windows NT or Windows 2000](#) through our website.

Upgrade Scenario 3 – Multiple Array Controllers

We tested a number of different scenarios with multiple array controllers. Our combinations included SMART controllers combined with Fibre Array Controllers, SMART controllers paired with each other, SMART controllers with Wide-Ultra SCSI controllers, and configurations with integrated controllers. None of the combinations tested showed any problems after installing drivers. Drivers should be reinstalled using the drivers from the Compaq SSD for Windows 2000 and not from the Windows 2000 CD default drivers. The Array Configuration Utility installation screen looks somewhat different in Windows 2000. See Figure 7.

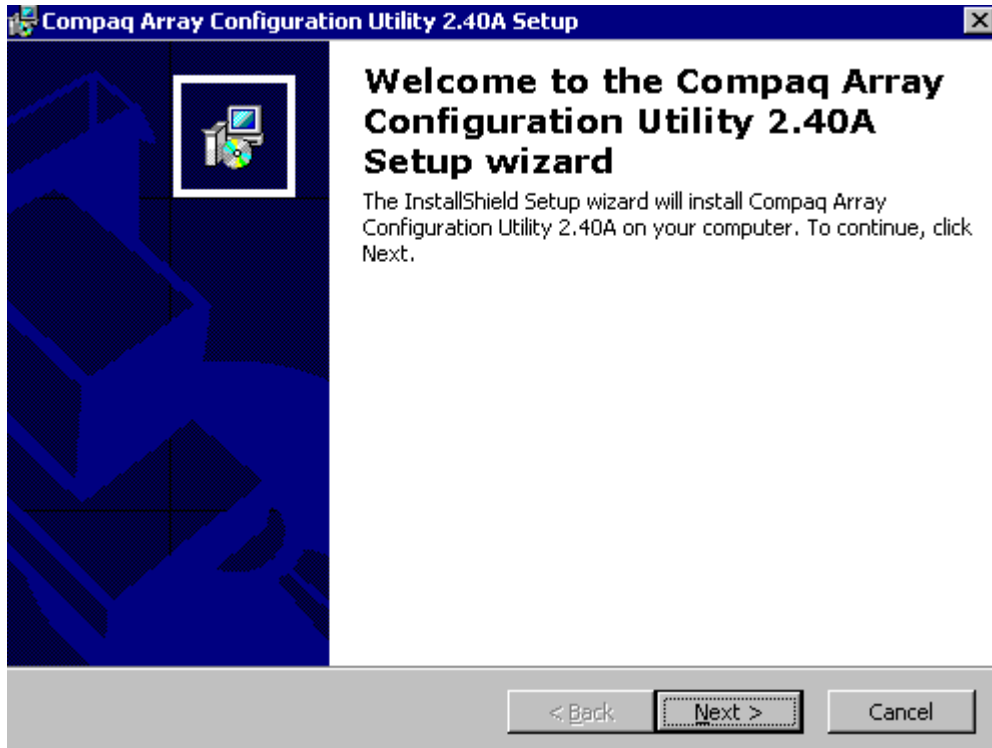


Figure 7. Compaq Array Configuration Utility installation screen 1

Click the Next button and you will see the screen in Figure 8. We recommend you perform the complete installation, which is the default.

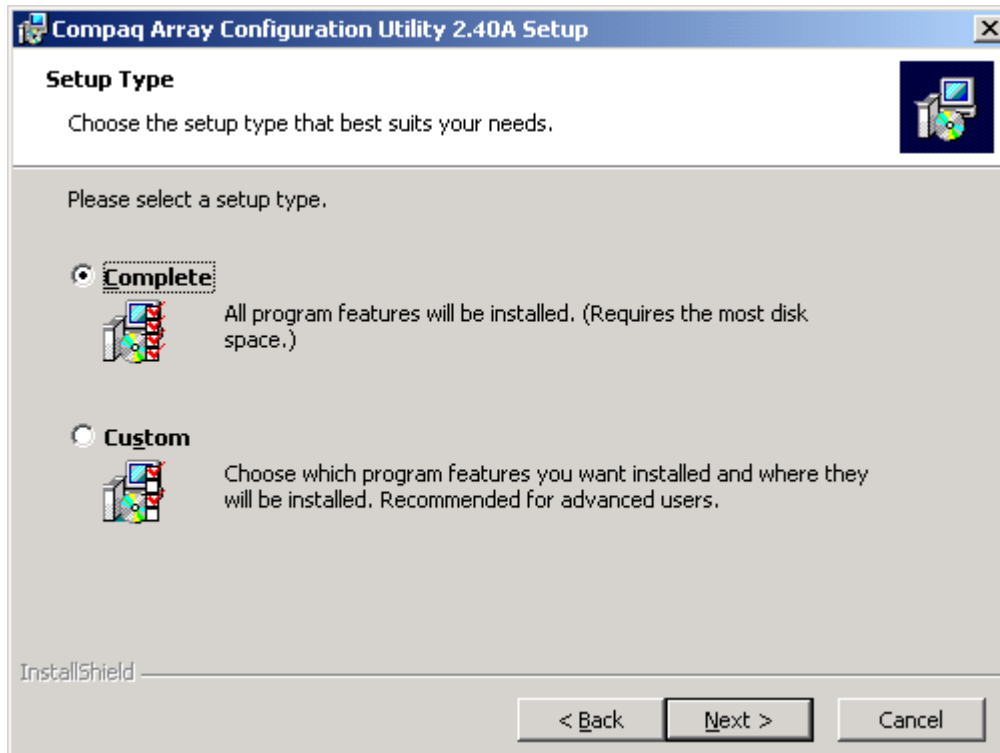


Figure 8. Compaq Array Configuration Utility installation screen 2

Upgrade Scenario 4 – Compaq Management Agents

CAUTION: In some circumstances, our lab testing showed that some utilities, such as the Compaq Array Configuration Utility, did not operate properly with the Compaq Management Agents loaded. If you have problem with Compaq utilities after loading the management agents, we recommend you disable them. This issue should be resolved in a future release.

Compaq Management Agents can be loaded through two drivers in Windows 2000, Compaq Advanced System Management Controller (*CPQASM.SYS*) and Compaq System Management Controller (*CPQCSM.SYS*). However, some testing showed that the *CPQASM.SYS* driver caused a blue screen on the Compaq ProLiant 7000 with Pentium II Xeon and the Compaq ProLiant 6000 with Pentium II Xeon. An update is scheduled for this equipment with Windows 2000 Release Candidate 3. Until that time, we recommend that you do not load the *CPQASM.SYS* driver on these machines.

CPQASM.SYS testing also showed some problems with the OS driver verifier. If you receive a blue screen with an error message concerning the attempt to access memory after it has been freed, deselect *CPQASM.SYS* from the Driver Verifier Selection Screen and reboot. This issue should be resolved in a future release.

Troubleshooting

This section provides tips for troubleshooting some common problems found in the Compaq labs regarding Compaq ProLiant Servers running Windows 2000 Server Edition and Windows 2000 Advanced Server Edition. We recommend that you check the [Compaq Windows 2000](#) website for additional information. Please read the Known Issues section of the Compaq SSD for Windows 2000 for specific driver information.

Teamed NICs

The NIC Teaming Transport Driver, used in Windows NT 4.0, does not translate to Windows 2000, so Compaq engineers developed a new driver to team NICs and better utilize them in a Windows 2000 environment. This driver is still in the testing phase and should be available for Release Candidate 3. If you currently use teamed NICs, dissolve the teams before the upgrade to Windows 2000. See Figure 9.

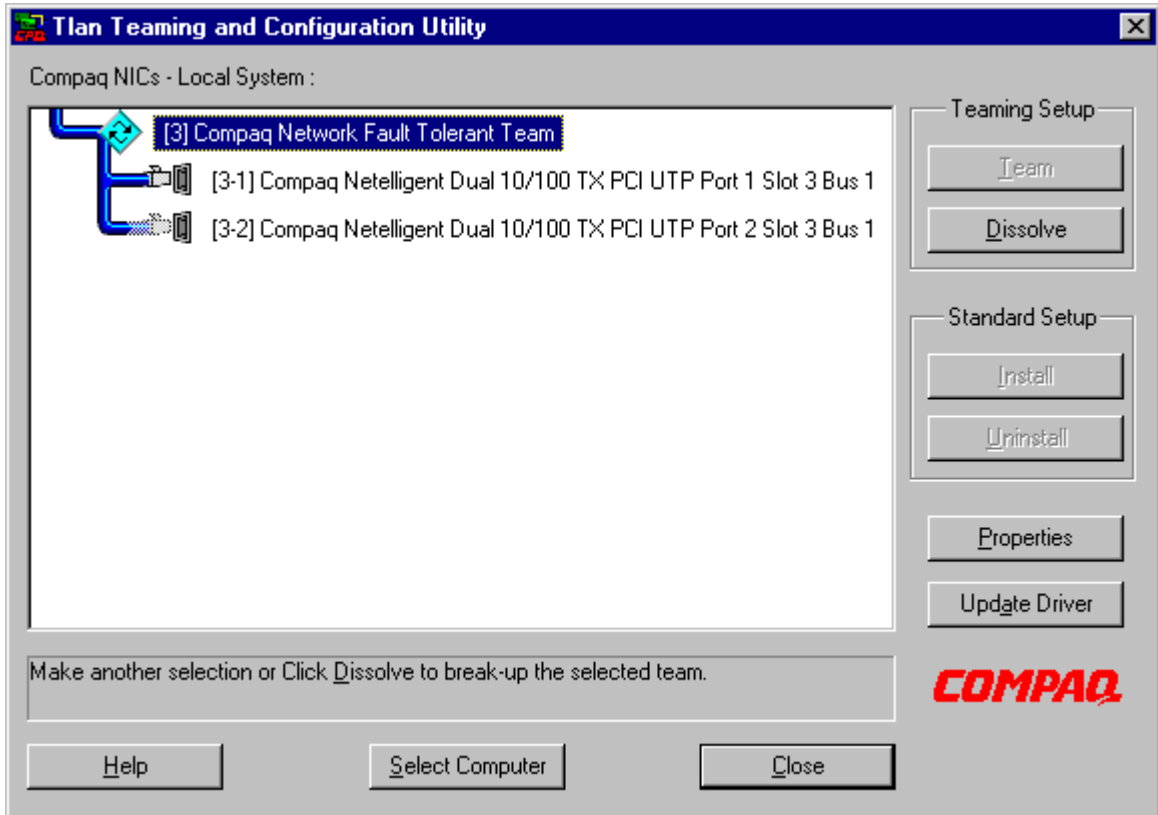


Figure 9. Teaming and Configuration Utility Screen

Upgrade to Windows 2000 after dissolving the team.

After completing the upgrade, the NICs show as a broken connection on the lower right-hand corner of your task bar as shown in Figure 10.



Figure 10. Task bar showing broken NIC connections

Load the appropriate drivers for your NICs through Device Manager.

When you see the screen in Figure 11, check the box titled Install one of the other drivers.

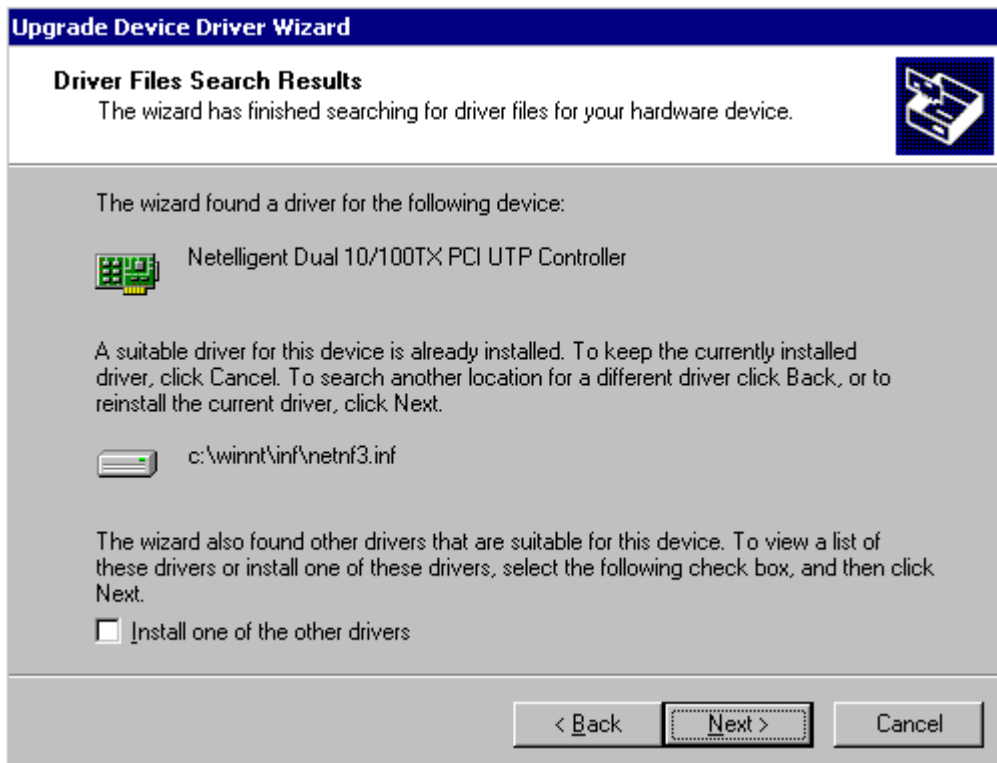


Figure 11. Driver files search results screen

Make sure the location of the drivers is the same as the location you loaded the Compaq for Windows 2000 SSD files. The Windows 2000 CD contains other drivers with the same name. The Compaq for Windows 2000 SSD has the most updated drivers for your system.

IMPORTANT: Loading the drivers for both NICs makes them operational but not teamed as they were in Windows NT 4.0 or 3.51.

Third-Party Drivers

The Windows 2000 Primer Utility from Compaq was developed to remove Compaq drivers that are not compatible with Windows 2000. It does not remove drivers developed by third-party vendors, such as Adaptec controllers. Contact the manufacturer of third-party hardware to determine if their drivers are Windows 2000 compatible or if an upgrade is required.

Protocols and Domains

TCP/IP is the required protocol for many Windows 2000 components including login and Active Directory. There are many references to domains when installing network support for Windows 2000. Incorrectly identifying your network domain can result in unpredictable network behavior. Carefully read the Microsoft documentation before installing Windows 2000, and become familiar with the differences between the Windows NT domain concept, the Active Directory domain, and the DNS domain.

Read each prompt carefully, and make sure you know what is being requested. When asked for Active Directory domain or DNS domain, use the Fully Qualified Domain Name (FQDN).

Other Drivers

Before upgrading to Windows 2000, update your [system ROMs](#) and [option ROMs](#) to the latest versions. These ROMPaqs contain enhancements and updates consistent with Windows 2000 requirements.

When adapters are added after installing Windows 2000, non-plug-and-play devices (EISA and ISA) might show up as *Unknown Device* in the Device Manager. Ignore these unknown device messages. The functionality of the controllers is not affected. You can correct this manually through the Add New Hardware Wizard. Select non-Plug and Play. Two devices will be displayed, one with a yellow exclamation mark. Delete the driver marked with the yellow exclamation mark.

After the installation of, or upgrade to, Windows 2000, the default video resolution may not be retained. If you see the Display Properties screen, ensure the settings are correct and click on Apply. Otherwise, reset the video settings after installation of Windows 2000 by right clicking on the background and selecting Properties.

Compaq Fibre Channel Storage Controllers cannot be used as a boot device. If attempted, it causes a blue-screen error condition with Windows 2000. We expect this behavior. No boot capability exists for Fibre Channel devices. Logical drives created on Fibre Channel devices should not be used as boot devices, nor as system devices.

Appendix A, Compaq-supported Systems

Microsoft Windows 2000 might load and run with virtually any Compaq product, however, it is not possible for all hardware and software configurations to be tested by Compaq. The listing of a particular system or option in the tables that follow does not mean that all of the subsystems embedded in that system are fully supported, or that all systems and options have undergone extensive functional testing.

Carefully review the minimum requirements outlined in this document to make the best use of your Compaq resources. However, do not use this document as your sole source of information. Other information is available through the Compaq websites mentioned in Appendix C; also visit the Microsoft website at <http://windows/microsoft.com/windows2000/en/server/help/>.

Compaq supports mixing processors with different cache sizes for Windows 2000, although Intel, Microsoft, and other hardware vendors do not. The ProLiant Servers with mixed stepping support include the ProLiant 5500 Xeon, ProLiant 6000 Xeon, ProLiant 6400R Xeon, ProLiant 6500 Xeon, ProLiant 7000 Xeon, ProLiant 8000, and ProLiant 8500.

IMPORTANT: Detailed information and warnings are available through our website at <http://www.compaq.com/products/servers/processor-mixing/>. Please review this information carefully before upgrading to Windows 2000.

Supported Platforms

Table 3 lists Compaq servers and ROMPaq revisions that Compaq supports under Windows 2000; the revisions were the latest available at the time this document went to publication. Use the latest [ROMPaq](#) version for your system.

Documents are available on the Compaq website to assist in determining the ROM version and family of your Compaq Server products. You can determine your system [ROM Family Code, Family Table, and version](#) through our website.

Table 3. Supported system platforms for Windows 2000

| Server Platform | ROM Family | Minimum ROMPaq Revision | Version |
|----------------------|-------------|-------------------------|----------|
| ProSignia 200 | P05 and P01 | 4.02A | 12-30-98 |
| Prosignia Server 720 | D01/F01 | 4.01A | 06-16-99 |
| Prosignia Server 740 | S01 | 4.02A | 07-14-99 |
| ProLiant 400 | D01/F01 | 4.01A | 06-16-99 |
| ProLiant 800 | P02 | 4.03A | 12-30-98 |
| | P14 | 4.05A | 07-14-99 |
| | P18 | 4.06A | 06-28-99 |
| ProLiant 850R | P04 | 4.04A | 12-30-98 |
| ProLiant 1200 | E35 | 4.03A | 03-02-99 |
| ProLiant 1500 | E12 and E27 | 4.01A | 08-17-98 |
| ProLiant 1600 | E34 | 4.03A | 03-02-99 |
| | P08 | 4.04A | 04-21-99 |

continued

Table 3. Supported system platforms for Windows 2000 *(continued)*

| | | | |
|--------------------|-----|-------|----------|
| ProLiant 1850R | P07 | 4.04A | 04-21-99 |
| ProLiant 2500 | E24 | 4.02A | 12-30-98 |
| | E50 | 4.03A | 01-14-99 |
| ProLiant 3000 | P09 | 4.04A | 04-21-99 |
| | E39 | 4.03A | 03-02-99 |
| ProLiant 4500 | E14 | 4.01A | 08-17-98 |
| ProLiant 5000 | E16 | 4.01A | 08-17-98 |
| ProLiant 5500 | E39 | 4.03A | 03-02-99 |
| ProLiant 5500 Xeon | P12 | 4.04A | 04-02-99 |
| ProLiant 6000 | E20 | 4.03A | 12-30-98 |
| ProLiant 6000 Xeon | P40 | 4.04A | 02-26-99 |
| | P43 | 4.04A | 02-26-99 |
| ProLiant 6400R | P11 | 4.04A | 03-04-99 |
| ProLiant 6500 | E25 | 4.03A | 12-30-98 |
| ProLiant 6500 Xeon | P11 | 4.04A | 03-04-99 |
| ProLiant 7000 | E40 | 4.03A | 12-30-98 |
| ProLiant 7000 Xeon | P40 | 4.04A | 02-26-99 |
| | P43 | 4.04A | 02-26-99 |
| ProLiant 8000 | P41 | N/A | |
| ProLiant 8500 | P42 | N/A | |

Supported Storage Options

Table 4 lists supported Compaq storage options and driver revisions needed to interface with Windows 2000.

Table 4. Supported Compaq storage options for Windows 2000

| Option | Driver | Location |
|--|--------------|--------------------|
| Compaq 32-bit Fast-Wide SCSI-2 Controller /E | CPQ32FS2.SYS | Windows 2000 CD |
| Compaq 32-bit Fast-Wide SCSI-2 Controller /P | CPQ32FS2.SYS | Windows 2000 CD |
| Compaq 4.3 - 36-GB Hard Disk Drives | N/A | No driver required |
| Compaq 4/8-GB SLR Tape Drive | TANDQIC.SYS | Windows 2000 CD |
| Compaq 4x-32x CD-ROM Drives | | Windows 2000 CD |
| Compaq 64-bit Fast Ultra-2 SCSI Controller | CPQ32FS2.SYS | Windows 2000 CD |
| Compaq DAT Tape Drives | | Windows 2000 CD |
| Compaq DDS2 4/16-GB Autoloader | | Windows 2000 CD |
| Compaq DDS3 12/24-GB DAT Autoloader | | Windows 2000 CD |

continued

Table 4. Supported Compaq storage options for Windows 2000 (continued)

| Option | Driver | Location |
|---|---|---|
| Compaq DLT Autoloader M35/70 | | Windows 2000 CD |
| Compaq DLT Library 7000 | | Windows 2000 CD |
| Compaq DLT Tape Array | | Windows 2000 CD |
| Compaq Dual Channel Wide-Ultra SCSI-3 Controller | CPQ32FS2.SYS | Windows 2000 CD |
| Compaq Fibre Channel Array | | Windows 2000 CD |
| Compaq Fibre Channel Filter Driver | CPQFCFTR.SYS | http://www.compaq.com/support/files/server/WINNT/index.html |
| Compaq Fibre Channel Host Controller /E | CPQFCALM.SYS | |
| Compaq Fibre Channel Host Controller /P | CPQFCALM.SYS | |
| Compaq ProLiant Storage System | No driver supplied; base functionality only | |
| Compaq Smart Array 4200, Smart Array 4250ES, and Integrated Smart Array Controllers | CPQARRAY2.SYS | |
| Compaq SMART SCSI Array, SMART-2 Array, SmartArray 221 RAID, SmartArray 3100ES RAID, and SmartArray 3200 RAID Controllers | CPQARRAY.SYS | Windows 2000 CD See Note 2. |
| Compaq Wide-Ultra SCSI-2 Controller | CPQ32FS2.SYS | Windows 2000 CD |

Note 1: Many of these devices have firmware upgrades available through the Options ROMPaq. The latest version of the Options ROMPaq can be obtained from <http://www.compaq.com/support/files/server/softpaqs/Rompag/OPTROM.html>.

Note 2: The Windows 2000 CD includes CPQARRAY.SYS. After installing Windows 2000, update the driver with the CPQARRAY.SYS included on the SoftPaq for Windows 2000 to ensure the highest level of service and reliability.

Supported Network Adapters

Table 5 lists supported Compaq network adapters, including the minimum firmware and driver revisions needed to interface with Windows 2000.

Table 5. Supported Compaq network adapters for Windows 2000

| Compaq NIC | Driver | Location |
|---|-------------|-----------------|
| Compaq 32-Bit DualSpeed Token Ring Controller | NETFLX.SYS | Windows 2000 CD |
| Compaq 100 FDDI PCI DAS Fiber-SC Controller | SKFPWIN.SYS | Windows 2000 CD |
| Compaq 100 FDDI PCI DAS UTP Controller | SKFPWIN.SYS | Windows 2000 CD |
| Compaq 100 FDDI PCI SAS Fiber-SC Controller | SKFPWIN.SYS | Windows 2000 CD |
| Compaq 100 FDDI PCI SAS Fiber-MIC Controller | SKFPWIN.SYS | Windows 2000 CD |

continued

Table 5. Supported Compaq network adapters for Windows 2000 (continued)

| | | |
|---|--------------|---|
| Compaq 100 FDDI PCI SAS UTP Controller | SKFPWIN.SYS | Windows 2000 CD |
| Compaq NC1120 Ethernet | N100NT5.SYS | Windows 2000 CD |
| Compaq NC3120 Fast Ethernet | N100NT5.SYS | Windows 2000 CD |
| Compaq NC3121 Fast Ethernet | N100NT5.SYS | Windows 2000 CD |
| Compaq NC3122 Fast Ethernet | N100NT5.SYS | Windows 2000 CD |
| Compaq NC3123 Fast Ethernet | N100NT5.SYS | Windows 2000 CD |
| Compaq NC3131 Fast Ethernet | N100NT5.SYS | Windows 2000 CD |
| Compaq NC3132 Fast Ethernet Upgrade Module | N100NT5.SYS | Windows 2000 CD |
| Compaq NC3133 Fast Ethernet Upgrade Module | N100NT5.SYS | Windows 2000 CD |
| Compaq NC3160 Fast Ethernet (Embedded) | N100NT5.SYS | Windows 2000 CD |
| Compaq NC3161 Fast Ethernet (Embedded) | N100NT5.SYS | Windows 2000 CD |
| Compaq NC3162 Fast Ethernet (Embedded) | N100NT5.SYS | Windows 2000 CD |
| Compaq NC3163 Fast Ethernet (Embedded) | N100NT5.SYS | Windows 2000 CD |
| Compaq NC4621 Token Ring NIC | CPQTRND5.SYS | Windows 2000 CD |
| Compaq NC6132 Gigabit Module | E1000NT5.SYS | Windows 2000 CD |
| Compaq NC6133 Gigabit Module | N1000NT5.SYS | Windows 2000 CD |
| Compaq NC6134 Gigabit NIC | N1000NT5.SYS | Windows 2000 CD |
| Compaq NetFlex/NetFlex-2 ENET/TR Controller | NETFLX.SYS | Windows 2000 CD |
| Compaq NetFlex-2 DualPort ENET Controller | NETFLX.SYS | Windows 2000 CD |
| Compaq NetFlex-2 DualPort TR Controller | NETFLX.SYS | Windows 2000 CD |
| Compaq NetFlex-2 TR Controller | NETFLX.SYS | Windows 2000 CD |
| IBM 16/4 TOKEN RING PCI SPECIAL | IBMTRP.SYS | Windows 2000 CD |
| Netelligent 10/100 TX | NETFLX3.SYS | http://www.compaq.com/support/files/server/WINNT/index.html |
| Netelligent 10/100 TX Embedded UTP | NETFLX3.SYS | http://www.compaq.com/support/files/server/WINNT/index.html |
| Netelligent 10/100 TX Embedded UTP/AUI | NETFLX3.SYS | http://www.compaq.com/support/files/server/WINNT/index.html |
| Netelligent 10/100 TX Embedded UTP/Coax | NETFLX3.SYS | http://www.compaq.com/support/files/server/WINNT/index.html |
| Netelligent 10/100 TX PCI Dual UTP | NETFLX3.SYS | http://www.compaq.com/support/files/server/WINNT/index.html |
| Netelligent 10/100 TX PCI UTP | NETFLX3.SYS | http://www.compaq.com/support/files/server/WINNT/index.html |

continued

Table 5. Supported Compaq network adapters for Windows 2000 (continued)

| | | |
|--|--------------|--|
| Netelligent 10/100 TX UTP | NETFLX3.SYS | http://www.compaq.com/support/files/server/WINNT/index.html |
| Netelligent 10/100 TX WOL PCI UTP – Intel | N100NT5.SYS | Windows 2000 CD |
| Netelligent 10 T/2 PCI UTP Coax Controller | NETFLX3.SYS | |
| Netelligent 16/4 PCI IBM UTP/STP Controller | IBMTRP.SYS | Windows 2000 CD |
| Netelligent 4/16 TR PCI UTP/STP Controller | CPQTRND4.SYS | Windows 2000 CD |
| NetFlex-3/E | NETFLX3.SYS | http://www.compaq.com/support/files/server/WINNT/index.html See Note. |
| NetFlex-3/P | NETFLX3.SYS | http://www.compaq.com/support/files/server/WINNT/index.html See Note. |
| NetFlex-3 Embedded | NETFLX3.SYS | http://www.compaq.com/support/files/server/WINNT/index.html See Note. |

Note: The Windows 2000 CD includes NETFLX3.SYS. However, after installing Windows 2000, update the driver to the version on the SoftPaq to ensure the highest level of service and reliability.

IMPORTANT: The drivers for the network adapters on the Windows 2000 CD have undergone some preliminary testing by Microsoft and Compaq. However, only the embedded network adapters have undergone extensive functional testing.

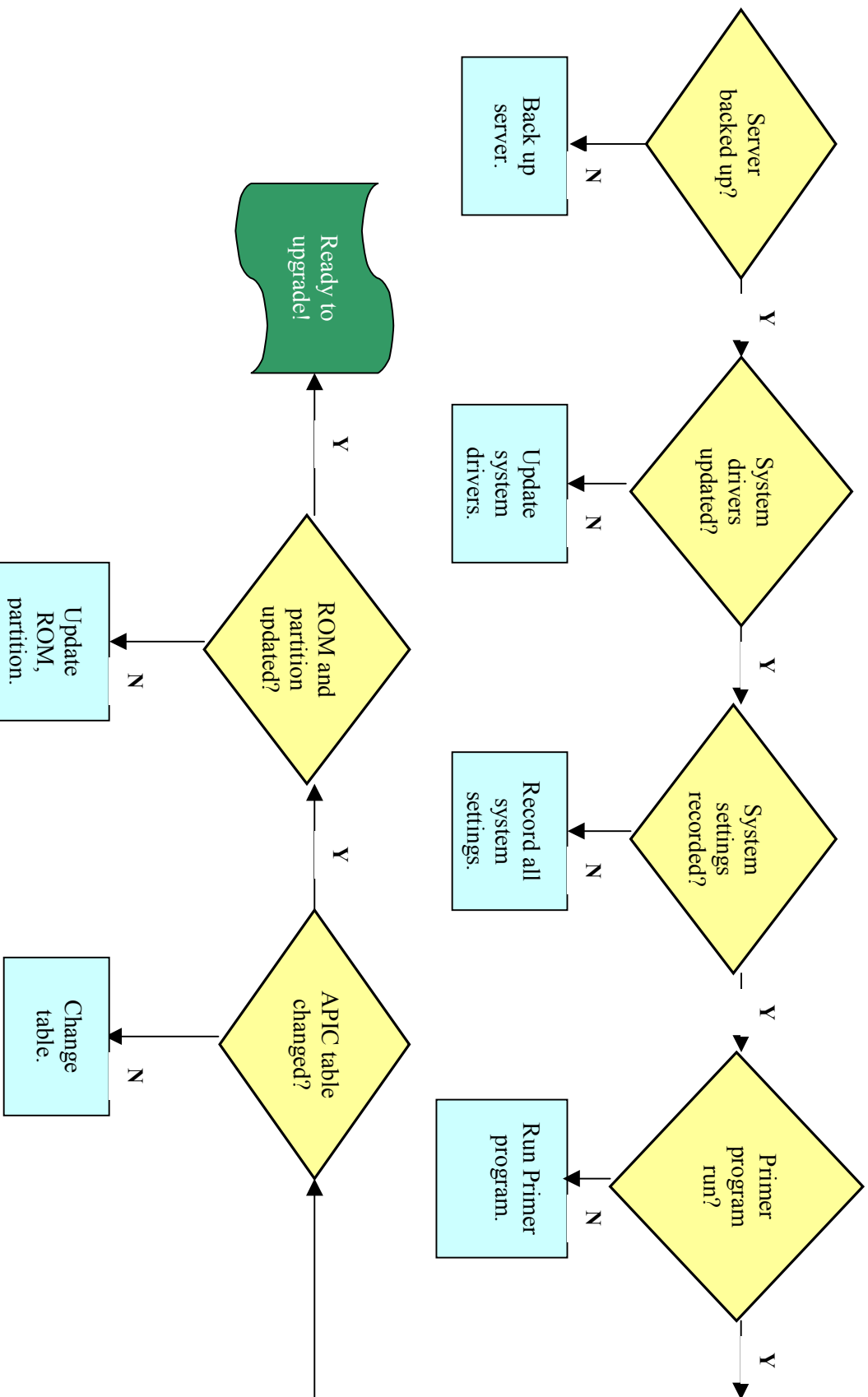
Supported Software

Table 6 lists supported Compaq utilities, the minimum versions needed to interface with Windows 2000, and the URL to obtain the software.

Table 6. Supported Compaq utilities for Windows 2000

| Utility | Version | Location |
|-------------------------------------|---------|---|
| Compaq Array Configuration Utility | 2.40A | http://www.compaq.com/partners/Microsoft/windows2000/betasupport/servers.html |
| Compaq Insight Manager | 4.50 | http://www.compaq.com/support/files/server/softpaqs/mgmtsol/cimcmplt.html |
| Compaq Server Diagnostics | 10.23A | http://www.compaq.com/support/files/server/softpaqs/Rompaq/SERVDIAG.html |
| Compaq System Configuration Utility | 2.44A | http://www.compaq.com/support/files/server/softpaqs/Rompaq/SYSCONFIG.html |

Appendix B, Upgrade Preparation Flow Chart



Appendix C, Compaq Information Products

In addition to hardware and software products, Compaq also provides information enabling you to stay current on the latest developments and assisting you in making deployment decisions.

The Compaq Windows 2000 website provides the latest information available on upgrading and testing Microsoft Windows 2000 on your Compaq products.

Windows NT Advantage is a free online magazine designed to be your primary source of timely, useful information for planning and implementing Microsoft Windows NT on Compaq hardware.

Compaq *ActiveAnswers*[™] gives you the benefit of our experience to help manage your system and reduce the time, risks, and complexity associated with deploying solutions.

If you require more timely access to information products, Compaq provides a service called Compaq Info Messenger, which can be accessed through the Compaq website. If you submit a profile to Compaq Info Messenger, telling it what platforms and operating systems you are interested in, the service tracks your areas of interest and advises you when related information products are released.

Customer Advisories inform you of any known problems and workarounds because of a Service Pack release.

Communiqués and press releases announce the availability of new products and versions.

Service Advisories notify Compaq resellers and retailers of any known service-related issues and provide them with the information they need to effectively support their customers.

Solution Stories describe how Compaq customers have addressed their business needs through the combination of Compaq products and third-party software products.

TechNotes and Tech Briefs update customers on the latest developments in Compaq products.

White papers inform you of ways to optimize your environment and obtain the maximum benefit from software enhancements.

These information products range from those with no specific OS focus to those that address specific OS issues and answers. Information products specific to Microsoft are also collected and distributed as part of the Compaq Resource Paq for Microsoft produced twice a year.

Table 7 lists Compaq resources on the web.

Table 7. Compaq resources

| Item | Web Location |
|---|---|
| Windows 2000 on Compaq | http://www.compaq.com/partners/Microsoft/Windows2000/index.html |
| <i>Windows NT Advantage</i> online magazine | http://www.windowsnt-advantage.com |
| Compaq <i>ActiveAnswers</i> | http://www.compaq.com/activeanswers |
| Compaq Info Messenger | http://www.compaq.com/infomessenger |
| Compaq Insight Manager | http://www.compaq.com/sysmanage |
| Compaq Management CD | http://www.compaq.com/support/files/server/MGMTSQL/index.html |
| Compaq Option ROMPaq | http://www.compaq.com/support/files/server/WINNT/index.html |
| Compaq Resource Paq for Microsoft Windows 2000 and Windows NT | http://www.compaq.com/partners/microsoft/resourcepaq.html |
| Compaq SmartStart Subscription Service | http://www.compaq.com/support/paqfax/1233.html |
| Compaq System ROMPaq | http://www.compaq.com/partners/Microsoft/Windows2000/betasupport/servers.html |
| Customer Advisories | http://www.compaq.com/support/techpubs/customer_advisories/Customer_Advisories_WINNT.html |
| Microsoft Frontline Partnership | http://www.compaq.com/partners/Microsoft |
| Press releases | http://www.compaq.com/newsroom/pr |
| SoftPaqs (complete listing) | http://www.compaq.com/support/files/server/WINNT/index.html |
| Compaq SSD for Windows 2000 | http://www.compaq.com/partners/Microsoft/Windows2000/betasupport/servers.html |
| Compaq SSD for Windows NT | http://www.compaq.com/support/files/server/WINNT/index.html |
| Compaq Survey Utility | http://www.compaq.com/support/files/server |
| White Papers and other technical document (complete listing) | http://www.compaq.com/support/techpubs/whitepapers/index.html |