

# WHITE PAPER

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## Preparing for the Year 2000

*The Year 2000 is quickly approaching, and the media coverage of the turn of the century can leave you wondering just how big the computer challenge will be. This white paper addresses the Year 2000 transition and how Compaq is helping you prepare for it. The Year 2000 transition includes hardware, operating system, and application issues. This white paper will help you become better educated on these issues and help you prepare for the transition.*

### UNDERSTANDING THE YEAR 2000 TRANSITION

The media has given much attention to the Year 2000 transition and associated issues. A majority of this attention has been focused on the ability of older "legacy" mainframe and minicomputer systems and their applications to handle the century rollover. While this focus is very appropriate, PCs also face associated issues.

PC industry Year 2000 issues involve hardware, firmware, and software. A transition problem occurs when a computer is unable to determine the correct date when the year advances from December 31, 1999 to January 1, 2000. To keep track of the current date and time, PCs use a battery backed-up hardware timer called a real-time clock (RTC). To comply with the IBM AT x86 specification for PCs, the standard RTC was designed to store only the last two digits of the year. This limited storage is the hardware issue.

To overcome the hardware limitation, a static CMOS byte was allocated to track the century information. When the PC is turned on, the ROM BIOS combines the century CMOS information with the RTC's decade information to yield a four-digit year. Unfortunately, when the RTC rolls forward from 11:59PM December 31, 1999 to 12:00AM January 1, 2000, the decade information, "99", correctly increments to "00", but the CMOS century information remains at "19". The failure of the ROM BIOS to increment the century byte is the firmware issue.

The operating system (OS) software is typically initialized immediately following the completion of the hardware power-on self-test (POST) routine. The large majority of existing OSs are capable of handling the century rollover and updating the date. In some instances, the OS vendor may have generated software upgrades to handle the rollover. Applications typically acquire date information from the OS. However, many older applications could be at risk because they may track the date as a two-digit number or bypass the OS and query the BIOS directly. The capabilities and interaction of the OS and applications define the software issues.

One of the greatest difficulties of the Year 2000 transition is determining all the places where dates are located. In a computer system, the date can be located in the hardware, operating system, and multiple applications. Thus, it will require the combined efforts of hardware, operating system, and application vendors, as well as in-house systems analysts, to resolve the problem. Compaq is leading the efforts to minimize this problem by enabling Compaq computers to handle the Year 2000 rollover. Here are some of the details that will help you understand and prepare for the Year 2000.

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## COMPAQ HARDWARE

Compaq has addressed hardware and firmware Year 2000 issues in its computers by modifying the ROM BIOS. Two modifications are involved.

The first modification addresses the situation when system power is off during the rollover. When the system is powered on after the rollover, an incorrect date may be supplied. An algorithm has been added in the ROM BIOS that looks at the RTC data during the POST routine and calculates "IF YEAR LESS THAN 50 SET CENTURY EQUALS 20." This allows the ROM BIOS to correctly increment the century byte upon system startup after the rollover.

The second modification addresses the scenario where the system is running during the rollover. In most cases, the OS will handle detection of the rollover and CMOS century updates. To provide for applications that may bypass the OS during date queries, or for OSs that are incapable of handling the rollover correctly, Compaq has created another algorithm in the run-time ROM BIOS that looks at the RTC data upon date requests and calculates "IF YEAR EQUALS 00 SET CENTURY EQUALS 20." Any valid date data function call after the rollover, whether it occurs during the hardware boot cycle or regular operation, will result in the correct date response and a century byte update. Regardless of the method used, once the century byte has been updated to "20", manual intervention by the user or date manipulation via the OS would be required to change the century value back to "19". Year 2000 is a leap year and the RTC correctly handles it as such.

The amount of customer intervention will depend on the revision of the system ROM BIOS and software issues. The information that follows explains how to determine ROM BIOS version, identifies the files required to upgrade the ROM BIOS, and discusses common OS issues.

### Determining ROM BIOS using Compaq Utilities

To know whether your computer already has an upgraded ROM BIOS, determine the revision date of the ROM BIOS using one of the methods listed below.

If you have Compaq Insight Manager installed on your computer, you can use the management console to collect ROM BIOS information online across the network. In addition, Compaq works with 14 leading providers of LAN, systems, and enterprise management software to enable Compaq management information to be available to their applications. For details on Insight Manager, see the Compaq Web site at <http://www.compaq.com/support/techpubs/whitepapers>. Move to the section titled, "Compaq Technology." This section includes documents on the following topics: Insight Manager, Intelligent Manageability, and Remote System Management.

Another alternative offered to users on some systems is the F10 prompt that occurs during the POST routine. Pressing F10 at this prompt will initiate Compaq Utilities. Select INSPECT and view the ROM BIOS version.

For Compaq servers that are not using Insight Manager and cannot afford operation interruption, another utility is available, Compaq Survey Utility. Several technical documents are available describing capabilities, limitations, and usage of this tool. The downloadable file and associated documentation can be found on the Compaq Web site:

<http://www.compaq.com/products/servers/management/survey.html>.

### Determining ROM BIOS using Product-Serial Numbers

Compaq computers with serial numbers x730xxxxxxx or higher have the upgraded ROM BIOS to support the Year 2000 rollover. For Year 2000 ROM BIOS support on all other Compaq computers, refer to the following section.

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**NOTE:**

*Any application that bypasses the OS and ROM BIOS to obtain date data directly from the RTC may receive an incorrect date.*

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## Upgrading ROM BIOS

Compare the current ROM BIOS revision of your system to the revisions listed below. If the system ROM BIOS revision of your system is not equal to or later than the revision listed in the tables, an upgrade should be performed. Download the required file identified by a SoftPAQ (SP) number. Use the Compaq ROMPAQ utility, included in the SoftPAQ download files, to upgrade your ROM. To obtain the appropriate SoftPAQ file, visit the Compaq Web site at <http://www.compaq.com/support/index.html>. Click on DOWNLOADABLES and select your product model.

**TIP:**

The SoftPaq solutions mentioned in the following tables are available on Compaq QuickFind and [www.compaq.com](http://www.compaq.com).

**NOTE:**

Warranty claims may not be submitted for updating ROM BIOS for Year 2000 support.

## PORTABLES:

Product:	Action Required:
Armada 4100	If the system ROM is earlier than Version 586J_032197 (March 21, 1997), flash the system ROM with SoftPaq Version SP2935 or later.
Armada 1100	If the system ROM is earlier than Version 586K_031297 (March 12, 1997), flash the system ROM with SoftPaq Version SP3061 or later.
Armada 7700	No action required.
Armada 7300	No action required.
LTE 5000 Series	If the system ROM date is earlier than Version 7.02 (May 19, 1997), flash the system ROM with SoftPaq Version SP3668 or later.

Note: For all Compaq commercial portables, the century byte will not be updated if the turn of the century occurs while the portable is in Standby mode or Hibernation mode. The century byte will be updated automatically following a cold system re-boot, otherwise, a manual date adjustment is required.

## COMMERCIAL PCs:

Product:	Action Required:
Deskpro 2000 (Pentium)	If the system ROM is earlier than Version 586C_042597, flash the system ROM with SoftPaq Version SP3237 or later.
Deskpro 2000 (PentiumPro)	If the system ROM is earlier than Version 586C2_121196, flash the system ROM with SoftPaq Version SP3236 or later.
Deskpro 2000 (Pentium) 586M Family	No action required.
Deskpro 2000 (PentiumPro) 686M Family	No action required.
Deskpro 4000/6000 (Pentium)	If the system ROM is earlier than Version 686G5_120396, flash the system ROM with SoftPaq Version SP2703 or later.
Deskpro 4000/6000 (PentiumPro or Pentium II)	If the system ROM is earlier than Version 686G6_120396, flash the system ROM with SoftPaq Version SP3180 or later.

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Product (continued):	Action Required:
Deskpro 4000 (Pentium) 586V Family	No action required.
486 and Pentium Deskpro/ProLinea 486G Family	If the system ROM date is earlier than Version 486G_040497, flash the system ROM with SoftPaq Version SP3639 or later.
486 and Pentium Deskpro/ProLinea 486Y Family	If the system ROM date is earlier than Version 486Y_112096, flash the system ROM with SoftPaq Version SP3652 or later.
Pentium, and Pentium Pro Deskpro XL 486W Family	If the system ROM date is earlier than Version 486W_040497, flash the system ROM with SoftPaq Version SP3642 or later.
Pentium ProLinea 586Z Family	If the system ROM date is earlier than Version 586Z_040497, flash the system ROM with SoftPaq Version SP3638 or later.

### PROFESSIONAL WORKSTATIONS:

Product:	Action Required:
Professional Workstation 5000	If the system ROM date is earlier than Version 686W1_022797 (February 27, 1997), flash the system ROM with SoftPaq Version SP2846 or later.
Other Professional Workstation models	No action required.

### CONSUMER DESKTOP AND PORTABLE PCs:

Product:	Action Required:
Presario 1000 and 2000 Series PCs	No action required.
Presario 3000, 4000, 6000, 8000 Series PCs	If the system ROM date is earlier than Version May 23, 1997, flash the system ROM with SoftPaq Version SP3891 or later.

Note: For all Compaq consumer portables, the century byte will not be updated if the turn of the century occurs while the portable is in Standby mode or Hibernation mode. The century byte will be updated automatically following a cold system re-boot, otherwise, a manual date adjustment is required.

### SERVERS:

Product:	Action Required:
ProLiant 800	If the system ROM date is earlier than January 8, 1997, flash the system ROM with SoftPaq Version SP2405 or later.
ProLiant 850R	No action required.
ProLiant 1000 Rack and Tower	If the system ROM date is earlier than December 30, 1996, flash the system ROM with SoftPaq Version SP2404 or later.
ProLiant 2500 Rack and Tower	If the system ROM date is earlier than December 30, 1996, flash the system ROM with SoftPaq Version SP2405 or later.

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Product (continued):	Action Required:
ProLiant 1500, 2000, 4000, 4500, 5000 Rack and Tower	If the system ROM date is earlier than December 30, 1996, flash the system ROM with SoftPaq Version SP2404 or later.
ProLiant 6000 Rack and Tower	No action required.
ProSignia 200	If the system ROM date is earlier than December 31, 1996, flash the system ROM with SoftPaq Version SP2403 or later.
Other ProSignia Servers	If the system ROM date is earlier than December 30, 1996, flash the system ROM with SoftPaq Version SP2403 or later.
Systempro/XL	If the system ROM date is earlier than December 30, 1996, flash the system ROM with SoftPaq Version SP2403 or later.

### ALL OTHER COMPAQ COMPUTERS:

#### Manual Date Set Method:

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If the computer has a serial number less than x730xxxxxxx and is not described in the previous tables, a manual date change may be required. On January 1, 2000, DOS and Windows customers should:

1. Change the date via the DATE command at the MS-DOS prompt, or
2. Change the date via the DATE icon in the Windows Control Panel.

The century byte in CMOS will be updated and the correct date maintained through the Year 2099. This has been verified with MS-DOS 6.2, Windows 3.1, Windows 95, Windows NT 3.51, and Windows NT 4.0.

### OPERATING SYSTEMS

Operating systems vary in their treatment of the Year 2000 transition. Many of the operating system vendors have already incorporated changes that allow the system to rollover from 1999 to 2000. Details for Windows 95, Windows NT, MS-DOS, NetWare, SCO Unix, OS/2 WARP, Solaris, and Banyan Vines are outlined below. Since these OSs are not Compaq products, you should contact the relevant vendors before making any related decisions affecting your systems.

#### Microsoft Windows 95, Windows NT, and MS-DOS

Microsoft Windows 95 and Windows NT are designed to support dates well into the next century. Programs and applications running under Windows 95 and Windows NT access the current date and time using well-defined APIs designed to handle 4-digit year formats. The values returned by these APIs are based on the internal OS system time, and therefore will correctly handle the Year 2000 transition. The system may be powered on or off during the transition. Microsoft DOS, Version 3.1 or later, is also capable of handling the century rollover.

For more information on MS-DOS, Windows 95, Windows NT, and the Year 2000, visit Microsoft's Web site at <http://www.microsoft.com/cio/year.html>.

#### Novell NetWare

Novell is committed to providing Year 2000 support for all of its current products. NetWare Versions 4.11 or later and IntraNetWare are designed to support the Year 2000 rollover without additional patches or upgrades. Versions prior to or earlier than Version 4.11 require a patch from Novell to properly handle the transition from 1999 to 2000.

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**NOTE:**

*Compaq is currently testing other hardware not described in this document. Additional information and status of its readiness will be provided via a revision to this White Paper.*

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**TIP:**

*More Windows support information can be found at "<http://www.microsoft.com/cio/year.htm>"*

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Product:	Action Required:
NetWare v3.11	Upgrade to patch 311PTG.EXE or later.
NetWare v3.12	Upgrade to patch 312PTA.EXE or later.
NetWare v4.10	Upgrade to patch 410PT6.EXE or later.
NetWare v4.11 or later	No action required.

The patches and information detailing minimum OS, Netware Loadable Modules (NLMs), and file updates may be obtained directly from Novell via its Web site at <http://support.novell.com/search/patlst.htm>.

NetWare is designed to transition from 1999 to 2000 and reset the RTC. Additionally, when the NetWare command "DOWN" is executed, NetWare is designed to correctly set the DOS date.

Although the consequences of not upgrading to the latest patch level are highly system-dependent, the most likely consequences are incorrect time-stamps on files. NetWare is designed to provide correct time and date information using current hardware until 2079, assuming the specified patches are loaded.

Novell is checking its entire product line for date dependencies and will have updated versions available shortly. Current versions of GroupWise are designed to provide correct time and date information until 2023.

For more information about Novell NetWare and the Year 2000 problem, see Novell's Web site at <http://www.novell.com/year2000>.

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**TIP:**

More NetWare support information can be found at "<http://www.novell.com/year2000>"

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### SCO UNIX

Newer versions of SCO UNIX and some other SCO products are designed to support the rollover to the Year 2000 without requiring any additional action. These products include:

- OpenServer Release 5 Enterprise, Host, Desktop and Development Systems
- UNIX System V/386 Release 3.2 Operating System Version 4.2 Development System
- Open Server Release 3.0 Development System
- Merge Server System and Desktop System
- Wabi Server System and Desktop System
- Virtual Disk Manager (VDM)

The following SCO products require Support Level Supplement (SLS) UOD426:

- UNIX System V/386 Release 3.2 Operating System Version 2.0, 4.0, 4.1, and 4.2
- UNIX System V/386 Release 3.2 Operating System Version 2.0, 4.0, 4.1, and 4.2

Development Systems

- UNIX System V/386 Release 3.2.0
- Open Server Release 3.0 Enterprise, Network, Desktop, Lite
- Open Desktop Server System Supplement 2.0
- Open Desktop Server System 1.1, 2.0
- Open Desktop Server Upgrade 1.0, 1.1
- Open Desktop Personal System 1.0, 1.1, 2.0

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SCO products requiring Support Level Supplement (SLS) UOD426 (*continued*):

- FoxBASE+ 386 Release 2.1.2
- Microsoft Word for UNIX Systems Release 5.1.1
- Portfolio Release 1.0.1, 2.0.0

The following SCO products require SLS XNX427:

- XENIX 386 Operating System Release 2.3.2, 2.3.3, 2.3.4
- XENIX 286 Operating System Release 2.3.2
- XENIX 386 Development System Release 2.3.1
- XENIX 286 Development System Release 2.2.1
- FoxBASE+ 386 Release 2.1.2
- Microsoft Word for XENIX Systems Release 5.1.1
- Portfolio Release 1.0.1, 2.0.0
- XENIX-NET Release 1.3.0

Both SLSs UOD426 and XNX427 include a tool, "fix2000," which checks for and corrects SCO product files. Once either SLS is installed, the patch remains on the system. It can then be used to check other files or utilities requiring correction. The patch also allows the system to correctly handle the Year 2000 leap year.

For more information on SCO products, visit SCO's Web site at <http://www.sco.com/technology/y2k.html>.

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**TIP:**

More SCO support information can be found at "<http://www.sco.com/Support/ssl.html>"

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**TIP:**

More IBM OS/2 support information can be found at "<http://www.ibm.com>"

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**NOTE:**

Base API calls are Year 2000 ready. Other components and products available as part of the OS/2 package continue to be investigated and will be fixed, as appropriate.

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### IBM OS/2 WARP

IBM OS/2 Warp Server Advanced with SMP version 4.0 is the only version of OS/2 that currently supports the Year 2000 rollover and leap year. Customers using other versions of OS/2 should refer to the table below. For technical information, white papers, and supported software lists, visit IBM's Year 2000 Support Center at <http://www.software.ibm.com/year2000/index.html>. For general information, education, and planning guides, visit IBM at <http://www.ibm.com/year2000>.

Program Product Number	Product Name	Year 2000 Ready	Year 2000 Ready by Year End 1997
83G8102	OS/2 Warp V3 CD-ROM		X, See Note
83G8100	OS/2 Warp V3 3.5 inch diskettes		X, See Note
10H9800	OS/2 Warp 3 Connect		X, See Note
10H9810	OS/2 Warp 3 Connect with WIN-OS2		X, See Note
84H1426	OS/2 Warp 4		X, See Note
25H8002	OS/2 Warp Server V4		X, See Note
25H8030	OS/2 Warp Server Advanced V4		X, See Note
28H0150	OS/2 Warp Server Advanced with SMP, Version 4	X	

OS/2 2.x and OS/2 SMP 2.11 are not Year 2000 ready. IBM has not indicated that these versions of the OS/2 operating system will be made Year 2000 ready. IBM OS/2 customers should continue to monitor the IBM Web site for additional information.



### SunSoft Solaris

The core of the Solaris for Intel Edition OS environment is designed to handle the Year 2000 rollover. However, there are known problems that occur after the Year 2000 with non-core elements such as libraries or utilities that combine with the core elements to make up the complete OS. SunSoft plans on offering OS patches or upgrades that eliminate such problems related to all libraries, functions, and utilities. These upgrades are planned to be backward-compatible with previous versions of the OS, including Versions 2.4 and 2.5.

The first version of Solaris that will not require a Year 2000 patch or upgrade will be Version 2.6. All date-related libraries, functions, and utilities in this version will be designed to support the Year 2000 rollover and leap year as shipped.

For more information on SunSoft products, visit SunSoft's Web site at <http://www.sun.com>.

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**TIP:**  
More SunSoft support  
information can be found at  
"<http://www.sun.com>"

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### Banyan VINES

Initial rollover testing of Banyan VINES shows the system must be up and running during the rollover from 1999 to 2000. When the system power remains on, the OS is capable of handling the rollover. If the system is rebooted after the rollover, the date will remain correct. For an existing system, if the system is shut down during the rollover and then powered up sometime after January 1, 2000, the date will be incorrect. These scenarios apply to the Year 2000 leap year transition as well. If the system stays operational, the date will roll over correctly. If the system is down during the rollover, the date will be incorrect.

For more detail on Banyan products, visit Banyan's Web site at <http://www.banyan.com>.

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**TIP:**  
More Banyan support  
information can be found at  
"<http://www.banyan.com>"

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### APPLICATIONS

It is not enough that the hardware and OS handle the Year 2000 transition. Applications must also be Year 2000-ready. Industry applications and custom software such as accounting, payroll, commerce transactions, and others, all require correct date handling. At this time, to understand the Year 2000 readiness of your applications, contact your application vendors. Compaq is working with its key application partners to help them enable their products to perform correctly on all Compaq platforms. Compaq is currently testing its utilities and applications. Additional information and status of their readiness will be provided via revision of this White Paper. For large organizations that may require additional assistance, Year 2000 independent consultants are an excellent resource for the century transition. For more information, visit the Year 2000 web page at <http://www.year2000.com>.

### TESTING YOUR HARDWARE

#### NSTL Year 2000 Test Program

If you would like to verify whether or not your personal computer will support the century change, a test program is available from NSTL/National Software Testing Laboratories. NSTL is one of the world's leading independent information technology testing organizations. The NSTL test, YMark2000, can be obtained at no charge by visiting the NSTL Web site at <http://www.nstl.com>. Detailed information on the test is included in the YMark2000 readme file and its respective White Paper. It should be noted that YMark2000 only tests PC hardware and firmware, not operating systems or applications.

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The YMark2000 test verifies the following:

- date is at compatible indices so that non-DOS based operating systems which access the clock directly will obtain the correct date
- century byte is in correct location in CMOS
- real-time progression from December 31, 1999 to January 1, 2000
- recognition of leap year, when appropriate, for years 2000 through 2009

Compaq is currently testing its computers using the YMark2000 test and will publish the results on its Web site late in the third quarter of 1997. Visit the Compaq Web site at <http://www.compaq.com> and look for the appearance of a new link referencing the YMark2000 test.