

March 2002
13PS-0102C-WWEN

Prepared by ISSG Technology
Communications

Compaq Computer Corporation

Contents

Overview	3
Evaluating the Compaq Data Center Program	3
Target Audience.....	3
Key Features: Windows 2000 Datacenter Server OS.....	4
Certifying Windows 2000 Datacenter Server	4
Datacenter OEM Requirements.....	4
Compaq Data Center Program Certification.....	5
Application Certification.....	7
Hardware Certification.....	7
Change Management.....	7
Evaluating the Compaq Data Center Program	11
Features.....	11
Hardware.....	17
Software.....	18
Implementing the Compaq Data Center Program	19
Installation.....	19
Restrictions.....	22
Appendix A—Compaq Web Resources	24
Appendix B—Microsoft Web Resources	24

Evaluating and Implementing the Compaq Data Center Program for Microsoft Windows 2000 Datacenter Server

Abstract: Compaq leads the way in revolutionizing the economics of enterprise computing with reliable, stable industry-standard solutions for the data center. The powerful combination of ProLiant Servers, StorageWorks and SANworks Enterprise Storage solutions, Intelligent Manageability tools, and an industry-leading portfolio of lifecycle services uniquely positions Compaq to deliver the total Data Center solution.

Compaq recognizes that Data Center customers require the highest level of reliability and stability as well as scalability in their solutions because they run business critical applications. Data Center customers cannot afford downtime. Compaq provides a fully stress tested solution which includes the servers, operating system, storage and applications. We do not stop with a reliable and stable solution. Compaq knows that it is important to strictly maintain the solutions over the product lifecycle to ensure continuing stability, so we have implemented a unique change management program specially modeled for the data center. We are confident in our data center solutions and are backing it up with combined support for the server and operating system as well as cooperative support agreements with application vendors. Compaq is your one-stop shopping and support provider for reliable and stable industry-standard data center solutions.

This integration note includes certification and change management information, installation instructions, and dos and don'ts for implementing the Compaq Data Center Program.

Help us improve our technical communication. Let us know what you think about the technical information in this document. Your feedback is valuable and will help us structure future communications. Please send your comments to: datacentercc@compaq.com

Notice

13PS-0102C-WWEN © 2002 Compaq Information Technologies Group, L.P.

ActiveAnswers, Compaq, the Compaq logo, Compaq Insight Manager, NetFlex, ProLiant, SANworks, and StorageWorks are trademarks and/or service marks of Compaq Information Technologies Group, L.P. in the U.S. and/or other countries.

Microsoft, Windows, Windows NT, and Windows NT Server are trademarks and/or registered trademarks of Microsoft Corporation.

Intel, Pentium, Xeon, and Pentium III Xeon are registered trademarks of Intel Corporation.

Other product names mentioned herein may be trademarks and/or registered trademarks of their respective companies.

Compaq shall not be liable for technical or editorial errors or omissions contained herein. The information in this document is provided “as is” without warranty of any kind and is subject to change without notice. The warranties for Compaq products are set forth in the express limited warranty statements accompanying such products. Nothing herein should be construed as constituting an additional warranty.

Evaluating and Implementing the Compaq Data Center Program for Microsoft Windows 2000 Datacenter Server

Integration Note prepared by ISSG Technology Communications

Third Edition (March 2002)

Document Number 13PS-0102C-WWEN

Overview

The Microsoft Windows 2000 Datacenter operating system is available only through certified original equipment manufacturers (OEMs)—Compaq being the first OEM to be certified by Microsoft.

Kernel mode components in an application place a file with a .SYS extension in the system32 directory of the server. See Table 4 for a link to the full process for determining kernel mode components.

The Compaq Data Center Program integrates hardware, software, and service into one powerful centralized business solution. Compaq certifies all hardware and software elements touching the kernel elements (for example, software drivers). Compaq has met the stringent requirements established by Microsoft including scalable hardware, joint support teams, and rigorous testing and qualification focused on the entire system. Compaq exceeds the requirements by adding certification for

Compaq StorageWorks and SANworks, implementing a unique change management model for lifecycle data center solution support, running additional stress tests with enterprise applications loaded, and providing additional service offerings such as the optional 99.99% uptime guarantee.

Evaluating the Compaq Data Center Program

The following sections discuss the target audience for the Compaq Data Center Program and the important features of the Windows 2000 Datacenter operating system (OS).

Target Audience

Any business wanting to increase levels of reliability, availability, and scalability for its business-critical applications is an ideal candidate for deploying a Compaq Data Center Program solution. These solutions are specifically for customers running business critical solutions. Ideal customers include:

- Enterprises with critical ERP, data warehousing and messaging/collaboration applications that have high transaction volumes and physical distribution of resources across many sites.
- Application Service Providers (ASPs) deploying, hosting, implementing, and supporting applications from a centrally managed facility across a wide area network (WAN).
- Education, environmental analysis, Public Safety, and Government Information Systems can benefit from the enormous performance scalability, storage capacity, and high availability capacity of the Compaq Data Center Program. These segments leverage huge amounts of imagery data.
- Fortune 500 companies with large unpartitionable databases.
- Companies requiring more “head room” than available with Windows 2000 Advanced Server.
- Dot-coms with requirements for high availability and security, including site integrity, and data protection.
- C/SIs who are seeking industry standard cost affectivity to provide reliable services to their clients and/or end users.

Key Features: Windows 2000 Datacenter Server OS

Designed for the most demanding levels of availability and scalability, Windows 2000 Datacenter Server includes the following key features:

- Windows 2000 features, such as Active Directory
- Enhanced 4-node clustering
- Support for up to 64 GB main memory (vs. 8 GB for Windows 2000 Advanced Server)
- Support for up to 32-way Symmetric Multiprocessing (SMP) (vs. 8 processors for Windows 2000 Advanced Server)
- Compatibility with the Windows 2000 Datacenter Hardware Compatibility List (HCL)
- Support for Winsock Direct, which streamlines communications between distributed components
- VI System Area Network (SAN)

Table 1 shows a comparison between the Windows 2000 operating systems.

Table 1. Windows 2000 server operating systems

Feature	Windows 2000 Server	Windows 2000 Advanced Server	Windows 2000 Datacenter Server
Processor limit	4	8	32
Memory support	4 GB Intel	8 GB Intel Physical Address Extensions (PAE)	64 GB Intel (PAE)
Network Load Balancing	No	Yes (maximum 32 nodes)	Yes (maximum 32 nodes)
MSCS Server clustering	No	Yes (maximum 2 nodes)	Yes (maximum 4 nodes)
Job object	Job Object API	Job Object API	Process Control tool
Winsock Direct	No	No	Yes
Hardware Compatibility List	Yes	Yes	Datacenter HCL

Certifying Windows 2000 Datacenter Server

The certification process involves meeting stringent requirements set by Microsoft, and for Compaq, exceeding these requirements is key to achieving the total Data Center solution. Compaq extends the 14-day stress test by adding external storage to the systems in certification and adding applications with kernel level drivers such as backup, management, and virus protection software.

Datacenter OEM Requirements

The Windows 2000 Datacenter Server operating system and service pack updates can only be purchased through an OEM vendor certified by Microsoft. Because of the need for reliability and accountability, Microsoft set stringent requirements for OEM vendors to participate in Windows 2000 Datacenter.

The Datacenter OEM requirements along with details on how Compaq exceeds these requirements are included in Table 2.

Table 2. Compaq exceeds Datacenter OEM requirements

Datacenter OEM Requirements		How Compaq Meets/Exceeds Requirements
Reliability with Datacenter HCL testing of all components		Compaq exceeds the requirements by adding external storage (StorageWorks) to the certification
Availability through 4-node clustering		Compaq meets this requirement
Operate an Authorized Microsoft Certified Support Center (MCSC) in each country in which the OEM sells a Datacenter solution		Compaq exceeds by being a Worldwide MCSC – competitors are only MCSC in the locations in which they sell Windows 2000 Datacenter
Accountability requirements for the OEM delivering Datacenter configurations	<ul style="list-style-type: none"> ▪ Offer four-hour response time 24x7 	Compaq exceeds with a 2-hour offering
	<ul style="list-style-type: none"> ▪ Provide minimum 99.9% uptime guarantee offering 	Compaq exceeds with availability reviews and an optional 99.99% uptime offering
	<ul style="list-style-type: none"> ▪ Furnish a joint support queue with Microsoft 	Compaq exceeds with a dedicated physical location for our joint support queue and matching Microsoft support personnel for every Compaq support personnel

Compaq Data Center Program Certification

Microsoft certified Compaq as the first OEM to offer solutions for Windows 2000 Datacenter and Compaq opened the first Joint Support Center with Microsoft on May 24, 2000.

The Compaq Data Center Program exceeds all the requirements established by Microsoft to provide a deployment strategy to meet application and environment needs. Compaq has the people, the technology, the experience, and the commitment to deliver proven industry-standard computing to the Data Center.

If the application places a file with a .SYS extension in the system32 directory of the server, then the application has a kernel mode component. See Table 4 for a link to the full process for determining kernel mode components.

Data Center Program certification involves the complete solution, not just the components. All kernel-touching elements, along with the hardware pieces, are part of the certified package. Compaq delivers the highest levels of reliability and stability possible through the Datacenter certification program and change management process.

High-availability features within ProLiant servers and StorageWorks storage systems deliver access to mission-critical data. The Datacenter support infrastructure, including a Joint Support team from Compaq and Microsoft, ensures customers have a single point of accountability for fast problem resolution. To achieve highly reliable and available solutions, the Compaq and Microsoft Datacenter programs require certified configurations with extensive testing to enable the special customer services offerings available with the program.

For more information on the Compaq Data Center testing and certification, see <http://www.compaq.com/solutions/datacenter/application.html> and <http://www.veritest.com/mslogos/windows2000/compaq/>.

Figure 1 presents a graphical representation of the software and hardware certification process for the Compaq Data Center Program.

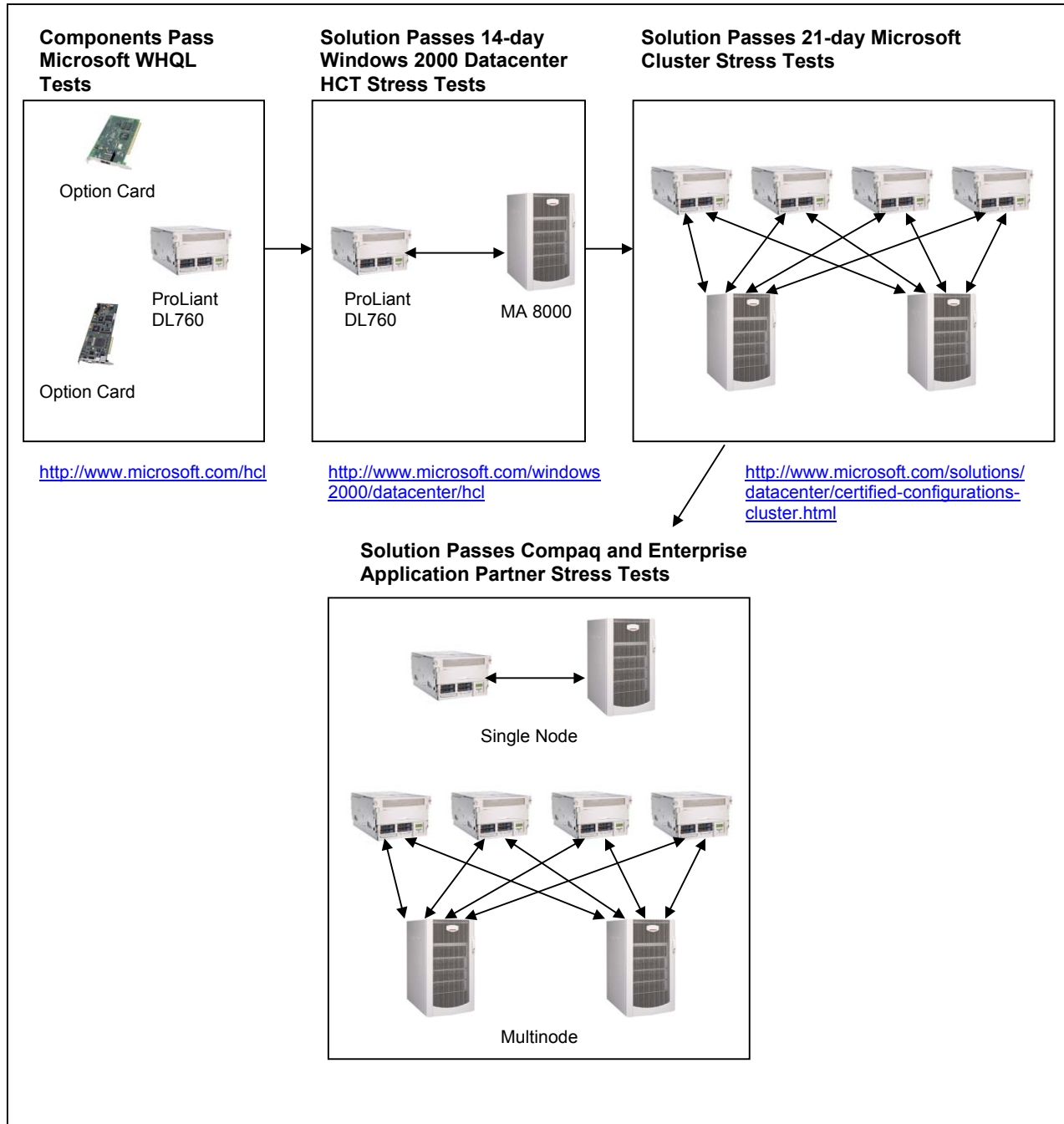


Figure 1. Certification for the Compaq Data Center Program

The following sections detail the software and hardware certification process.

Application Certification

Application certification is only required for kernel touching applications (for example, applications with software drivers). Applications that deposit a kernel-mode driver such as management, backup, and virus protection software, are certified by running the Hardware Compatibility Test (HCT) in the Bellevue, WA Windows 2000 Datacenter Certification Lab. Passing applications are included in the Microsoft Hardware Compatibility List (HCL) (<http://www.microsoft.com/hcl/default.asp>) and listed on the Compaq Data Center website (<http://www.compaq.com/datacenter>).

In addition, Compaq believes that extending the Data Center value proposition beyond the platform and operating system to the applications is key. To this end, Compaq has been working closely with targeted enterprise application vendors to stress the complete solution—ProLiant DL760, Windows 2000 Datacenter Server, and the application in single node or in clustered configurations.

Compaq works with enterprise application vendors to coordinate software releases on 6-month cycles with the hardware and operating system updates. Information about the Compaq Data Center Program and additional stress testing can be found at <http://www.compaq.com/datacenter>.

Microsoft provides a Windows 2000 Datacenter Server application logo program detailed on the Microsoft website (<http://msdn.microsoft.com/certification>) and on the VeriTest website (<http://www.veritest.com/>). Compaq feels strongly about the importance of running the certification tests on ProLiant servers, so we have invested millions of dollars in providing ProLiant 4-node clusters to each of the VeriTest labs around the world. Compaq is the exclusive 8-way server provider for VeriTest Windows 2000 Datacenter testing; therefore, customers can be confident that applications receiving the Microsoft Datacenter Server logo have been thoroughly tested on ProLiant servers.

Hardware Certification

Compaq hardware provided in the Compaq Data Center Program achieves certification from the Microsoft Windows Hardware Quality Lab (WHQL), a test program ensuring the compatibility of vendor hardware with Microsoft operating systems. This certification process requires that hardware vendors like Compaq use WHQL test kits for the qualification of complete Data Center Program bundles. Qualifying WHQL results enable vendors to obtain Microsoft Windows logos and to join the Microsoft Hardware Compatibility List (HCL).

Change Management

Compaq leads the change management process across all hardware and software elements of the Data Center Program. Customers have the ability to plan flexibly scheduled updates that have been rigorously tested against fixed configurations. Customers can then deploy these solutions with confidence.

Benefits

Table 3 below shows the release cycles for software included in traditional environments. In this case, an administrator must constantly manage changes in his/her environment to incorporate necessary software upgrades.

Table 3. Customers managing change in a traditional environment

Product	Release Cycle
ProLiant DL760 Server	Every 2 years
Drivers	Every 8 weeks
Network Operating System	Every 2.5 years
Microsoft Service Packs	Every 6-9 months
Anti-Virus Software	Every 2.5 years
Backup Server Software	Every year

Baselines are specific hardware and software components comprising the Compaq Data Center Program.

With the Compaq Data Center Program, Compaq manages the change for customers, bundling everything they need into one complete solution. Customers can choose to receive the latest baselines to obtain access and support for updates, bug fixes, and new options, or sit on their configuration for up to 2 years—the decision is theirs. Of course, the solutions are supported for their complete lifecycle, but customers may be required to upgrade the server with a newer change management release if it is older than 2 years.

All changes to the Compaq Data Center Program are stress tested together on the specific model to ensure optimal compatibility within your data center environment. Each year Compaq releases a fully tested new server model and every 6-9 months Compaq releases baselines for these server models.

Figure 2 conceptually shows the change management relationship.

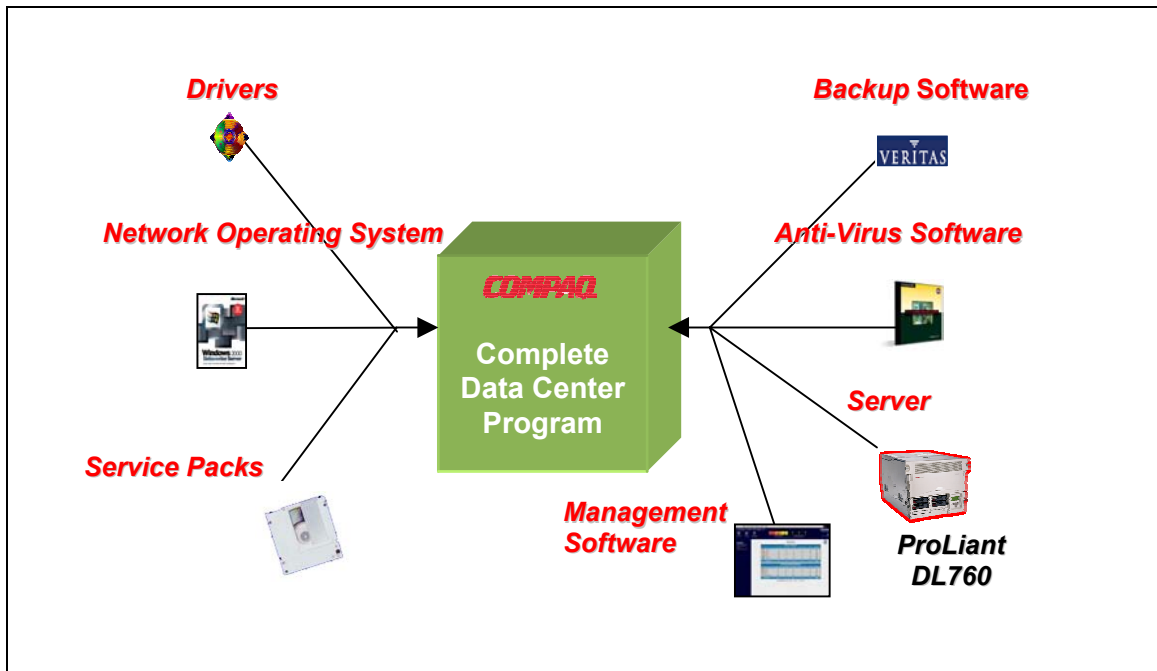


Figure 2. Compaq managing the change for customers

Process

All Compaq Data Center Program components, including hardware, firmware, and software, are locked down upon certification with a guaranteed lifecycle of 2 years and remain under strict change control.

This process pertains to all monitored components of the solution such as the following:

- All hardware and firmware revisions pertaining to the Compaq Data Center Program
- Addition of a new qualified vendor for a particular Compaq Data Center Program part
- Changes to Compaq Data Center Program spare parts
- Any SoftPaq or ROMPaq for Compaq Data Center Program drivers, utilities, or ROMs/BIOS
- New versions and revisions of Compaq Data Center Program software
- Any previously uncertified software or hardware to be added to a Compaq Data Center Program
- Maintenance releases of Windows 2000 Datacenter Server (for example, Microsoft Service Packs)
- New releases of the operating system

All changes are combined and recertified using the 7-day Windows 2000 Datacenter stress test. These combined packs of changes are released to customers on a 6-month schedule (in January and in July) so customers may easily schedule their server updates.

Baselines

The specific components released in the Compaq Data Center Program are part of a 2 year protected baseline. Each component is obtainable and/or updateable for up to 2 years after the Compaq Data Center Program release to address customer issues. This availability affects options, spares, and software. After establishing a baseline at certification, the list of core components and options certified as part of that baseline become fixed. New hardware and software made available after a baseline release must wait until the next planned update, which occurs every 6 months, to be included as part of a certified Compaq Data Center Program baseline.

Baselines, including a certified collection of software components for the Compaq Data Center Program, are released in 6-month intervals, allowing customers to control their environment by minimizing the rate of change.

Compaq conducts a full certification—going beyond the defined Microsoft certification standards—for the latest component updates and new, applicable options, including Microsoft Service Packs, resulting in a new certified baseline that customers can adopt in their environment as desired. Baselines provide access and support for updates, bug fixes, and new options. Compaq offers an upgrade kit to facilitate moving from one baseline to the next.

In order to protect the data center environment, Compaq includes provisions to the 6-month interval release cycle for 2 reasons: (1) to update anti-virus software and (2) to update critical software bugs.

Reason 1—Updating Anti-Virus Software

Anti-virus software requires continuous asynchronous updates due to the fact that new viruses are constantly being released. Updates typically come in 2 forms: (1) virus definition files and (2) pattern files. Both forms do not affect the kernel or any certification involving the anti-virus product and engine updates. In many cases, companies want to remain as current as possible for all anti-virus updates on the systems they have deployed; therefore, it is essential that anti-virus updates be permitted for all systems, including Data Center solutions. The Compaq Data Center Program provides this flexibility.

Compaq works closely with anti-virus vendors to ensure any product updates affecting the Datacenter certifications are re-certified as quickly as possible.

Symantec Norton Antivirus, Computer Associates InoculateIT, and Trend Micro ServerProtect are currently certified anti-virus software vendors supported by the Compaq Data Center Program. Compaq plans to certify McAfee Virus Scan, NAI Netshield, and others in following releases. Additional updates and schedules will be maintained on <http://www.compaq.com/datacenter>.

Reason 2—Updating Critical Software Bugs

Non-critical bug fixes and driver revisions are provided as part of a certified planned baseline update for the Compaq Data Center Program. In case of an extremely serious field issue that carries an unacceptably high risk to a customer's operations, a "hot fix" (for example, SoftPaq, Hot Fix, Quick Fix Engineering Patch (QFE), or similar update) will be issued against the installed baseline.

This type of hot fix will be a mandatory update for all at-risk customers running that baseline, redefining the baseline. The emergency fix will be quickly certified by Compaq in the 24x7 Compaq Data Center Certification Lab and released to customers. Compaq will work closely with customers to perform an update on their solutions to preclude any loss of data.

Evaluating the Compaq Data Center Program

Compaq leads the way in revolutionizing the economics of enterprise computing with reliable, stable industry-standard solutions for the data center. The powerful combination of ProLiant Servers, StorageWorks and SANworks Enterprise Storage solutions, Intelligent Manageability tools and an industry-leading portfolio of lifecycle services uniquely positions Compaq to deliver the total Data Center solution.

Features

Due to the critical need for reliability in the enterprise, all elements touching the Windows 2000 Datacenter kernel must be certified by Microsoft. The Windows 2000 Datacenter solution offered by any OEM must include certified hardware, software, and services. Testing, training, and experience provide the basis for certification under this Microsoft program.

The Compaq Data Center Program exceeds the Microsoft requirements by adding features and services, such as:

Compaq Scalability

Compaq uniquely offers both scale-out and scale-up architecture with the 8-way ProLiant DL760 Data Center Solution.

Compaq Reliability

Compaq extends the reliability of its solution by including StorageWorks hardware and SANworks software in each Compaq Data Center Program certified solution.

Compaq includes kernel-touching applications in the Data Center certification runs. Compaq also has cooperative support agreements with leading independent software vendors (ISVs) and extended support relationships through our partnership in TSAnet (<http://www.tsanet.org>), so customers can receive complete support for their hardware, operating system, and software from the Compaq Data Center Support Center. For continued system reliability, the Compaq Data Center Program maintains a change control. Change management involves configuration updates flexibly scheduled according to customer requirements while remaining within the strict monitoring and certification framework of the Data Center program. Compaq collects all hardware and software and runs the combination of changes through a 7-day stress test.

Compaq Availability

The Compaq ProLiant HA/F500 4-node cluster for Datacenter provides increased availability and server. In a 4-node environment, clusters can be configured to provide for multiple failures and still offer 24x7 access to applications and data.

With disaster tolerant configurations, Compaq offers stretch clustering with the Compaq ProLiant DL760 Data Center Solution. This unique combination of Windows MSCS failover functionality

with StorageWorks Data Replication Manager (DRM) software, nodes, and storage can be placed at extended distances from each other. In case of site failure, client access to applications and data can be back on line in minutes, not hours or days.

Compaq Global Services

To reap all the benefits of the sophisticated Windows 2000 Datacenter environment, depend on Compaq ProLiant servers and Compaq StorageWorks technology, supported by lifecycle services from Compaq Global Services. Our Microsoft-certified experts are uniquely equipped to help you plan, design, and implement support and manage your entire Windows 2000 eBusiness infrastructure.

Compaq Global Services offers planning, design, implementation, installation and startup, availability, and management and security services. The Windows 2000 Datacenter support infrastructure, including the Joint Support Team from Compaq and Microsoft, ensures customers have a single point of accountability for fast problem resolution.

Microsoft Windows 2000 Datacenter running on Compaq ProLiant systems provides a robust and reliable platform for demanding business environments. However, research shows the best systems alone cannot guarantee high availability. In fact, failures in hardware and operating systems cause only a small percentage of outages. More important are issues of interoperability and IT management practices.

Compaq Global Services takes a holistic approach toward availability by going beyond the platform to address all the domains affecting availability in the customer's environment— not only the hardware and operating system, but also applications, the network, the physical environment, and IT management practices. Available services include:

- Readiness Assessment
- Design Review
- Pilot
- Planning and Design
- Implementation

Basic Support Services

Basic support services include installation and startup, enterprise support, and Windows 2000 Datacenter OS Update Subscription service.

- **Installation and Startup Services**

Count on Compaq for fast, smooth, worry-free deployment of your Microsoft Windows 2000 Datacenter solution.

Our highly experienced Microsoft-certified professionals provide comprehensive installation, configuration, and startup services for your Datacenter hardware and operating software, as well as Compaq management tools.

Activities performed include: installation of Datacenter system software, Microsoft Cluster Server software, and other required software; installation and configuration of certified internal options; setup of network interface cards; installation and configuration of Compaq Insight Manager software; configuration checking and cluster verification; system backup initiation; orientation on product usage; and more.

Choose from 3 fixed-priced, fixed-deliverables packages to meet your specific needs:

- Installation and Startup for Data Center Server
- Installation and Startup for 2-node Data Center Cluster
- Installation and Startup for 4-node Data Center Cluster

You can purchase the easy-to-buy, easy-to-use CarePak#itrade service packages directly from Compaq or through your reseller.

- **Enterprise Support Plan**

Compaq's highly responsive service professionals will ensure essential protection from day one. The Enterprise Support Plan enhances the performance and availability of your business-critical environment with one-stop hardware and software support for Windows 2000 Datacenter Server on Compaq ProLiant platforms.

The Compaq Enterprise Support team gains detailed knowledge of your environment and works to help you maximize uptime and minimize risk. Compaq and Microsoft support experts co-located at a dedicated Data Center Solutions Lab ensure that you'll always receive a fast, focused response.

Enterprise Support Plan features include:

- Single point of contact: a named Technical Account Manager who understands your environment and takes responsibility for problem resolution and services coordination
- 24x7 support from personnel with in-depth software and hardware expertise
- Access to a joint Microsoft-Compaq support team for problem escalation
- Maximum 2- or 4-hour on-site response for hardware issues
- Proactive services for problem prevention: electronic notification of patches; notification of known problems; quarterly review of service calls; quarterly technical newsletter; upgrade planning assistance - all managed through Compaq's exclusive web-based Electronic Site Management Guide
- Upgrade planning and change control assistance, including recommendations and advice on configuration changes and integrating new products in your business-critical environment

- **Windows 2000 Datacenter OS Update Subscription Service**

Stay in step with new Datacenter Server operating system releases. This convenient subscription service automatically brings you vital software updates from Microsoft and Compaq - including New Version Releases and Maintenance Releases (Service Packs) of the Windows 2000 Datacenter Server operating system and the complementary Compaq SoftPaks.

Each time a new version of the Datacenter Server operating system is released, you'll receive:

- New version operating system software binaries on CD-ROM
- An upgrade license agreement and Product Identification Number, if applicable
- The new version of complementary software on CD-ROM
- Online and/or hardcopy product-related documentation updates

Each time a Service Pack for the Datacenter Server operating system software or Compaq Support Paq is released, you'll receive updated software binaries on CD-ROM.

Enhanced Support Services

Enhanced support services include a site-specific availability assessment and an uptime guarantee.

- **Site-Specific Availability Assessment**

Design availability into your Data Center environment. If you want the highest possible availability for your Windows 2000 Datacenter Environment, you need to build it into your environment from the ground up. The Compaq Data Center Availability Assessment service helps you understand and enhance the availability characteristics of your Compaq Data Center Solution - including the operating environment as well as the server hardware and storage technology.

A Compaq Business Critical Consultant reviews your proposed solution, business objectives, availability targets, and IT operations infrastructure. Compaq examines each of the 6 domains that impact availability - the hardware, system software, applications, network, physical environment, and IT management practices.

After gathering all the relevant data, Compaq presents your team with a report, identifying risk areas and proposing changes to the platform and to IT operations to reduce risk. The focus is on providing an objective, expert perspective and analysis, so you can make more informed and proactive decisions.

The Availability Assessment is a clearly defined service with a fixed price for a set engagement time.

- **Enterprise-Wide Uptime Guarantee**

This guarantee is the ultimate partnership for the highest level of business-critical availability.

Compaq offers Uptime Guarantees to support your business-critical environments. Compaq works with you to determine your availability requirements and then develop a solution to help you achieve that level.

Our program allows you to choose a guarantee providing up to 99.99% uptime for Windows 2000 Datacenter on ProLiant DL760 servers. Alternatively, Compaq Business Critical consultants will work with you to develop a customized solution at even higher levels.

When you meet certain requirements for technology, service and IT management, Compaq delivers on the promised availability level. If the uptime levels are not met, you don't pay the full service price.

The guarantee costs you nothing extra, once you've met the requirements. Your unique IT configurations, business requirements and usage define your partnership with Compaq.

The services required to obtain the Uptime Guarantee support for Windows 2000 Data Center include:

- *Availability Review*

This service analyzes the entire IT environment. The consultant determines the cost of downtime per system and customers gain a thorough understanding of their environment to eliminate downtime risks. Availability Review also provides the cost justification data needed to budget technology and service investments based on the revenue impact of their systems.

- *Availability Partnership*

Compaq works closely with the customer over time to develop and implement a fully customized plan for maintaining their target availability levels and ensuring uninterrupted computing. The service includes assessing and managing planned and unplanned change, such as migrations, upgrades, business growth, or mergers. Compaq achieves this with careful contingency planning as well as availability monitoring that leverages advanced computing tools and techniques.

Through the Availability Partnership, Compaq can work with customers to put an uptime guarantee in place for their Windows 2000 Datacenter solution.

- *Installation and Startup Services*

The Data Center Enterprise Support Plan can be purchased through Compaq or from the customer's reseller as a [CarePaq](#). For more information, customers should contact their Compaq sales representative or [e-mail Compaq](#).

Support Centers

Utilizing the industry-leading Compaq Support Centers that include the largest number of Certified Microsoft Specialists in the industry, Compaq will deliver unparalleled support to Datacenter customers. Through the Datacenter support team, customers will have a single point of contact for issues associated with their hardware and operating system. If escalation is necessary, the joint Compaq/Microsoft support team will own problem resolution, providing quick relief and, when required, prioritized quick-fix engineering for both operating system and hardware issues. Compaq already provides support for many of the leading software applications, including Microsoft applications, SQL Server, and Exchange.

The joint Compaq and Microsoft Support Team provides a second-level escalation point for both hardware and software support issues, and is located in the Compaq Data Center Solutions Lab in Bellevue, Washington. At this lab, Compaq has certified configurations for each of the Windows 2000 Datacenter solutions to enable support teams to replicate and diagnose problems more quickly than ever before.

As the only worldwide-authorized Prime Integrator for Microsoft Windows 2000 platforms and as the Microsoft Global Services Partner of the Year 2000, Compaq is uniquely qualified to deliver comprehensive data center solutions.

Managed Services

Let Compaq move your IT environment to Windows 2000 while you focus on your company's primary goals. Compaq's outsourcing services provide the capability, capacity, and global coverage to deploy and manage Windows 2000. You can make the move more quickly and productively, with less risk, by relying on Compaq's expertise to take full responsibility for the migration and ongoing management. You focus on where your business needs to go while Compaq gets you there.

Services include:

- Desktop Operations Management
- Asset Management
- Global Enterprise Help Desk
- Enterprise Infrastructure Management
- Systems Management
- Network Monitoring and Management
- Business Protection and Recovery

The best and most complete lifecycle services in the industry are available from Compaq Global Services. Backed by the largest group of certified Microsoft Specialists in the world and incorporating proactive support and customer-specific technical account management, Compaq Global Services prevents problems before they occur. This world-class team has first-hand knowledge of how to support Data Center customers with the following:

- 28,000 service professionals
- Service delivered in more than 200 countries
- 24 x 7 business critical support
- 60,000 partner sales and support specialists
- Alliances with eBusiness industry leaders
- 20,000 networking infrastructures delivered
- Innovative eServices delivery capabilities
- Robust set of high-end security services
- NonStop™ eBusiness lifecycle services

Hardware

Compaq leads the way in revolutionizing the economics of enterprise computing with reliable, stable industry-standard solutions. The Compaq Data Center Program combines the ProLiant 8-way server platform with StorageWorks and SANworks products for a complete hardware strategy.

ProLiant Server Platform



With the Compaq Data Center Program, customers have the ability to scale out or scale up by choosing a ProLiant DL760 Data Center Solution. The features of this server are highlighted below.

As part of the Compaq Data Center Program, each ProLiant DL760 Data Center Solution undergoes a rigorous certification process and includes change control to maintain stability.

The ProLiant DL760 Data Center Solution has the following key features:

- Pentium III Xeon 900 MHz/2 MB processors and PCI-X I/O technology
- Breakthrough scalable performance of I/O, memory and processors to address customers' most demanding data center applications
- Innovative modular design for increased ease of serviceability and future upgradeability in a space-saving 7U design
- Highest levels of reliability, management, and serviceability for the 24x7 data center to reduce downtime and IT costs, delivering the Compaq commitment of superior investment protection

By adding additional memory and processors, the maximum performance of the ProLiant DL760 Data Center model may be realized. The maximum solution has been completely stress tested and certified in the Compaq Data Center Certification Lab.

For further information on the ProLiant DL760 Data Center Solution, refer to the Compaq website, <http://www.compaq.com/products/servers/proliantdl760dc/index.html>.

Compaq Storage Solutions

The StorageWorks hardware and SANworks software in the Compaq Data Center Program takes storage availability to a higher level by integrating, certifying, testing, and delivering a fully configured storage environment. The Compaq Data Center Program includes the following StorageWorks hardware and SANworks software:

- StorageWorks Modular Array 8000/Enterprise Modular Array 12000
- Storage Area Network (SAN) infrastructure
- SANworks Secure Path v3.1
- StorageWorks Enterprise Backup Solution (EBS)

Additional information may be obtained from the Compaq website at <http://www.compaq.com/products/storageworks/announcements/W2k-Datacenter.html>.

Software

The Compaq Data Center Program includes a large variety of software products, Compaq support software and third-party software, to meet customers' data center needs.

Third-Party Software

The Compaq Data Center Program supports all third-party software containing the Windows 2000 Datacenter logo. Passing applications are included in the Microsoft Hardware Compatibility List (HCL) (<http://www.microsoft.com/hcl/default.asp>) and listed on the Compaq Data Center website (<http://www.compaq.com/datacenter>).

Compaq Support Software

Compaq provides value-added software products to manage and optimize the data center environment as discussed in the "Compaq Support Paq for Microsoft Windows 2000" and "Compaq Intelligent Manageability Software" sections.

Compaq Support Paq for Microsoft Windows 2000

The Compaq Support Paq for Microsoft Windows 2000, an advanced software delivery tool, includes an installer that analyzes system requirements and automatically installs applicable drivers, utilities, agents, and services based on this analysis. This software is provided with each SmartStart for Servers release.

Compaq Intelligent Manageability Software

Systems configured with Compaq Management Agents are more reliable than the same systems without them.

Compaq Intelligent Manageability software offers IT professionals reliability and stability with their Compaq hardware so it was only natural that Intelligent Manageability play a key role in the Compaq Data Center Solution. The Compaq Data Program includes the Compaq Management Agents, provided in the Compaq Support Paq for Microsoft Windows 2000, and Compaq Insight Manager 7.

Compaq Insight Manager 7 leverages the power of the Internet to provide web-based systems management, and is the essential enabler for the Compaq vision of virtual presence. Compaq Insight Manager 7 reduces systems management cost, improves operational efficiency and effectiveness, and minimizes systems downtime. It provides device management capabilities that consolidate and integrate management data from Compaq and third-party devices using SNMP, DMI, and HTTP. With Compaq Insight Manager 7, customers can monitor and manage groups of servers, clients, clusters and networking products anywhere, anytime from a standard web browser.

Additionally, the Remote Insight Board Lights-Out Edition, an option with the ProLiant DL760, provides IT administrators with full graphical access to Compaq servers through a client browser, providing total control of servers in all of their operational states. Designed and priced to provide remote server management in corporate data centers and remote sites, Compaq Remote Insight Lights-Out Edition allows browser access to Compaq servers through a seamless, hardware-based, OS-independent graphical remote console. Since it is hardware-based, it does not require any additional software or use any host server CPU cycles. Other features include a virtual power button, DNS/DHCP IP auto-configuration, and ROM-based configuration capability.

Cluster configurations include the Compaq Intelligent Cluster Administrator, an advanced cluster utility that provides web-enabled cluster administration and Single Point of Control for MSCS

clusters. The new version, 2.1, includes advanced support for 4-node clusters made possible with Microsoft Windows 2000 Datacenter.

Get more information on Compaq Intelligent Manageability products by visiting <http://www.compaq.com/manage/index.html>.

Implementing the Compaq Data Center Program

These sections provide information on installing and implementing the Windows 2000 Datacenter Server operating system (OS) on the Compaq Data Center Program. Step-by-step installation instructions are provided along with the dos and don'ts for the entire Compaq Data Center Program.

Installation

These installation instructions are for the installation of Microsoft Windows 2000 Datacenter Server operating system on a Compaq ProLiant DL760 server using Data Center Program External Recovery CD. These instructions are a supplement to the SmartStart for Servers guide. Before beginning the installation, gather the SmartStart for Servers documentation.

IMPORTANT: The customer must purchase the Compaq Data Center Enterprise Support Plan or software incident package to obtain support for Windows 2000 Datacenter Server running on ProLiant DL760 servers. Neither Compaq nor Microsoft will take support calls on Windows 2000 Datacenter Server without the purchase of a support contract.

There are 9 main tasks for completing the installation and post-installation requirements.

Task 1—Installing Approved Hardware Options


The Compaq ProLiant DL760 Data Center server has special requirements for installing supported hardware options, such as the Compaq Remote Insight Lights-Out Edition board or Compaq Fast Ethernet or Gigabit Network Interface Controllers. For the most current list of approved ProLiant DL760 Data Center server options, refer to the QuickSpecs: http://www.compaq.com/products/quickspecs/10813_div/10813_div.html.

Task 2—Erasing the System and Beginning the OS Installation

To begin the installation and restore process:

1. Insert the SmartStart for Servers CD and reboot or power on the server.
2. If your system has been previously configured, the System Utilities screen will display. Select **Run System Erase Utility** and click the **OK** button. Follow the instructions on the screen.

If the System Utilities screen does not display, go to step 3.

 **CAUTION:** Selecting the **System Erase Utility** will erase all data on your ProLiant DL760 server and any external drives.

3. When you get to the operating system installation screen, select **Manual Configuration** and click the **Begin** button. If you do not see Windows 2000 Datacenter as an option in the operating system selection screen, choose Microsoft Windows 2000 Advanced Server, click the **Next** button, and then click the **OK** button. Follow the instructions on the screen. These instructions will enable you to load the Windows 2000 Datacenter Server operating system from the ProLiant DL760 Datacenter OS Install Option Kit CD.

Task 3—Creating Logical Drives

The Array Configuration Utility will run automatically. To create logical drives from unconfigured drive space:

1. Click **Next**.
2. Select the **(RAID 0 + 1) Drive Mirroring** radio button. The default Drive View is Logical. Use the default selection and click **Next**.
3. Click the Save Configuration Now button.
4. Go to the Controller menu and select **Exit**. If prompted to save changes, click **Yes**. The ProLiant DL760 server will be restarted.
5. Click **Next** to continue the SmartStart for Servers installation process.
6. Remove the SmartStart for Servers CD and click **Continue**.

Task 4—Completing OS Installation

1. Insert the ProLiant DL760 Datacenter OS Install Option Kit CD. Follow the on-screen instructions to install the OS.

Notes:

- The ProLiant DL760 Datacenter OS Install Option Kit contains the Certificate of Authenticity code that you will need to enter. Affix this certificate to the server for easy reference.
 - Compaq recommends creating a partition of 8196 MB for the OS installation.
-

Task 5—Installing Compaq Support Software

To install the Compaq Datacenter Support Paq:

1. With the operating system running, insert the SmartStart for Servers CD. If the CD does not run automatically, go to the \win95 directory on the SmartStart for Servers CD and execute the file *HOMER.EXE*.
2. Read the license agreement and accept to continue.
3. Select the **Install Compaq Support Paq** icon and click **OK**.
4. Select the **Install** button from the Compaq Remote Deployment Utility graphical user interface and follow the on-screen instructions.

5. Click **OK** to reboot the system. If the system does not shutdown, select the **Reboot** button, and then click **Yes**.

IMPORTANT: The Compaq Management CD is not supported in the Compaq Data Center Program.

Task 6—Completing the Compaq Remote Insight Lights-Out Edition Installation

The Compaq Remote Insight Lights-Out Edition board option, if purchased, will need to be installed in the server (see Task 1). The driver is installed during the Compaq Support Paq installation. After the Compaq Support Paq installation is complete, check for the following error messages.

After the Compaq Remote Insight Lights-Out Edition driver installs, the following errors occur:

- In the Device Manager screen, 2 entries will display for the ATI Video Controller. One of these entries will have a yellow exclamation mark indicating that no driver is installed.
- In the Event Viewer, the following message displays:

Unable to map address range for graphics card

These errors occur because the Compaq Remote Insight Lights-Out Edition board and the server are using the same video controller. The operation of the server is not affected by these error messages.

Disable 1 entry for the ATI Video Controller to prevent the error messages from occurring.

1. Right-click the Device Manager entry for the ATI Video Controller, displaying a yellow exclamation mark.
2. Click **Disable**.

After the ATI Video Controller entry becomes disabled, or when the server restarts, a red X displays in place of the yellow exclamation mark. This indicates that the device is disabled. The disabled entry does not affect the operation of the server.

Task 7—Formatting and Partitioning the Logical Drives

The following steps use Disk Management to format any remaining unpartitioned drives.

1. Click **Start** to display the Start menu.
2. Select **Programs | Administrative Tools**.
3. Select **Computer Management**.
4. Expand the Storage directory, then click **Disk Management**. The disk and logical drive information displays on the right side of the window.
5. If the new logical drive created by the Compaq Array Configuration Utility does not appear on the bottom right side of the Computer Management window as unallocated space, click **Action**, then click **Rescan Disks**.
6. Right-click on the Disk 1 box, which displays a small red circle on the hard disk icon, on the bottom right panel, then click **Write Signature**.

7. Select **Disk 1**, then click **OK** on the Write Signature screen. The small red circle should disappear and the disk should be identified as a Basic disk.
8. Right-click the box containing the disk size amount and labeled as Unallocated, to the right of the Disk 1 box. Click **Create** from the pop-up window.
9. Click **Next** when the Create Partition Wizard window appears.
10. Select Primary partition, then click **Next** at the Select Partition Type screen.
11. Click **Next** to use the maximum disk space, or enter a desired amount for the partition size at the Specify Partition Size screen.
12. Click **Next** to accept the drive letter assigned by default at the Assign Drive Letter or Path screen.
13. Select File System Type, Allocation Unit Size, and Volume Label at the Format Partition screen.
14. Click **Next**.
15. Click **Finish** at the Completing the Create Partition Wizard window. The partition will be formatted and labeled Healthy at the completion of the formatting process.

Refer to the operating system documentation for more information on configuring the new hard drives.

Note: Repeat steps 1 through 11 for all new additional logical drives.

Task 8—Backing Up the Server

After you complete the Windows 2000 Datacenter Server installation and the server is operational, back up the server using an approved tape backup system and software.

For product and installation information for the solution offered by VERITAS, visit the VERITAS website, <http://www.veritas.com/us> or the VERITAS NetBackup™ DataCenter product page, <http://www.veritas.com/us/products/nbux/>.

Task 9—Registering the Server


Register the server online at <http://www.compaq.com/register>.

Restrictions

Since Compaq delivers a complete certified solution for data centers, there are certain restrictions implied regarding platforms and options as discussed in the “Data Center Dos” and “Data Center Don’ts” sections.

Data Center Dos

With the Compaq Data Center Program, you can:

-  Apply quick fixes resolving specific issues as directed by Compaq (Compaq must agree to certify these fixes before you can apply them).

- 👍 Install your system configuration from scratch using the Compaq Data Center Program ProLiant DL760 Data Center Server External Recovery CD. Use SmartStart for Servers Release 5.20 (or greater).

Note: Check the certification list at <http://www.compaq.com/solutions/datacenter/application.html> to see which SmartStart for Server versions are supported.

- 👍 Keep a configuration for up to 2 years without being required to upgrade in order to receive support.
- 👍 Add more hardware instances (up to the certified number) using the same firmware and/or drivers versions used on hardware instances in original configuration.

Note: The Configuration Verification Tool, available for download from <http://www.microsoft.com/hcl/default.asp>, must be run following any configuration change. The output from the tool must be sent to the Data Center Support team if there is an escalation process. This includes both software and hardware configuration changes. This is also part of the on-going relationship between the Compaq Technical Account Manager (TAM) and you to proactively ensure that configuration changes have not happened inadvertently.

Data Center Don'ts

With the Compaq Data Center Program, you cannot:

- 👎 Apply uncertified Microsoft Service Packs or Compaq Support Paqs.
- 👎 Add any uncertified kernel-touching components (drivers, agents, DLLs, etc.).
- 👎 Install uncertified hardware components.

Appendix A—Compaq Web Resources

Table 4 lists the Internet links noted throughout this document as well as additional links that you might find helpful when investigating the Compaq Data Center Program.

Table 4. Compaq resources

Resource Description	Web Address
Compaq Data Center Program website	http://www.compaq.com/datacenter
Kernel-Touching Applications Explanation and Process (see the kernel-touching components link)	http://www.compaq.com/solutions/datacenter/application.html - kernel
Windows 2000 on Compaq	http://www.compaq.com/partners/Microsoft/Windows2000/index.html
Compaq Global Services for Windows 2000 Datacenter	http://www.compaq.com/services/datacenter/index.html
<i>Windows Advantage</i> Online Magazine	http://www.windowsadvantage.com/
Microsoft Frontline Partnership	http://www.compaq.com/partners/Microsoft
White Papers and Other Technical Documentation (complete listing)	http://www3.compaq.com/support/reference_library/selectproduct.asp

Appendix B—Microsoft Web Resources

Throughout this paper, we have discussed Microsoft certification procedures and requirements. After you visit the Compaq Web resources, refer to the Microsoft Windows 2000 Datacenter Server website for additional tools and information critical to your evaluation process. Table 5 lists Microsoft resources on the Web.

Table 5. Microsoft resources

Resource Description	Web Address
Windows 2000 Datacenter Server	http://www.microsoft.com/windows2000/datacenter/default.asp
Windows 2000 Datacenter Server Help documentation	http://windows.microsoft.com/windows2000/en/datacenter/help/default.asp
Windows 2000 Datacenter Server Certified Applications	http://www.microsoft.com/windows2000/datacenter/evaluation/features/software/certified.asp
Windows 2000 Datacenter Server Certified Logo	http://msdn.Microsoft.com/certification
Windows 2000 Datacenter Server Hardware and Software Compatibility Testing	http://www.microsoft.com/windows2000/server/howtobuy/upgrading/compat/default.asp
Microsoft Hardware Compatibility List (HCL)	http://www.microsoft.com/hcl/default.asp Note: The latest version of the Configuration Verification Tool is available on this site for download.