hp industry standard servers

september 2002

integration note
13PS-0902D-WWEN

evaluating and implementing the hp data center program for Microsoft Windows 2000 Datacenter Server

table of contents

abstract

HP 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 HP to deliver a complete, industry-standard HP Data Center Program solution.

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. HP provides a fully stress tested solution which includes servers, operating system, storage and applications. HP does not stop with a reliable and stable solution. It is important to strictly maintain the solutions over the product lifecycle to ensure continuing stability, so HP has implemented a unique change management program specially modeled for the data center. We are confident in HP Data Center Program solutions and are backing them up with combined support for the server and operating system as well as cooperative support agreements with application vendors. HP 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 HP Data Center Program.

overview

The Microsoft® Windows® 2000 Datacenter Server operating system is available only through certified original equipment manufacturers (OEMs). Compaq, a part of the new HP, was the first OEM to be certified by Microsoft.

The HP Data Center Program integrates hardware, software, and service into one powerful centralized business solution. HP engineers certify all hardware and software elements touching the kernel elements (for example, software drivers). HP has met the stringent requirements established by Microsoft including scalable hardware, support teams, and rigorous testing and qualification focused on the entire system. HP exceeds the requirements by adding certification for StorageWorks and SANworks, implementing a unique change management model for lifecycle HP Data Center Program solution support, running additional stress tests with enterprise applications loaded and providing additional service offerings such as the optional 99.99% uptime guarantee.

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 HP Data Center Program solution. These solutions are specifically for customers running business critical solutions. Ideal customers include:

- enterprises with critical enterprise resource planning (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 that 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
- consultant/systems integrators (C/SI) who are seeking industry standard cost affectivity to provide reliable services to their clients and 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 (compared to 2-node clustering for Windows 2000 Advanced Server)
- support for up to 64 GB main memory (compared to 8 GB for Windows 2000 Advanced Server)
- support for up to 32-way Symmetric Multiprocessing (SMP) (compared to 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)
Microsoft Cluster Server (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 the OS

The certification process involves meeting stringent requirements set by Microsoft. For HP, exceeding these requirements is key to achieving the total data center solution. HP engineers extend prolonged stress tests by 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 HP exceeds these requirements are included in Table 2.

table 2. exceeding Datacenter OEM requirements

Datacenter OEM requirements		how hp meets/exceeds requirements
reliability with Datacenter HCL testing of all components		exceeds the requirements by adding external storage (StorageWorks) to the certification
availability through 4-node clustering		meets this requirement
operate an Authorized Microsoft Certified Support Center (MCSC) in each country in which the OEM sells a Datacenter solution		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	• offer 4-hour response time 24x7	exceeds with a 2-hour offering
	• provide minimum 99.9% uptime guarantee offering	exceeds with availability reviews and an optional 99.99% uptime offering

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

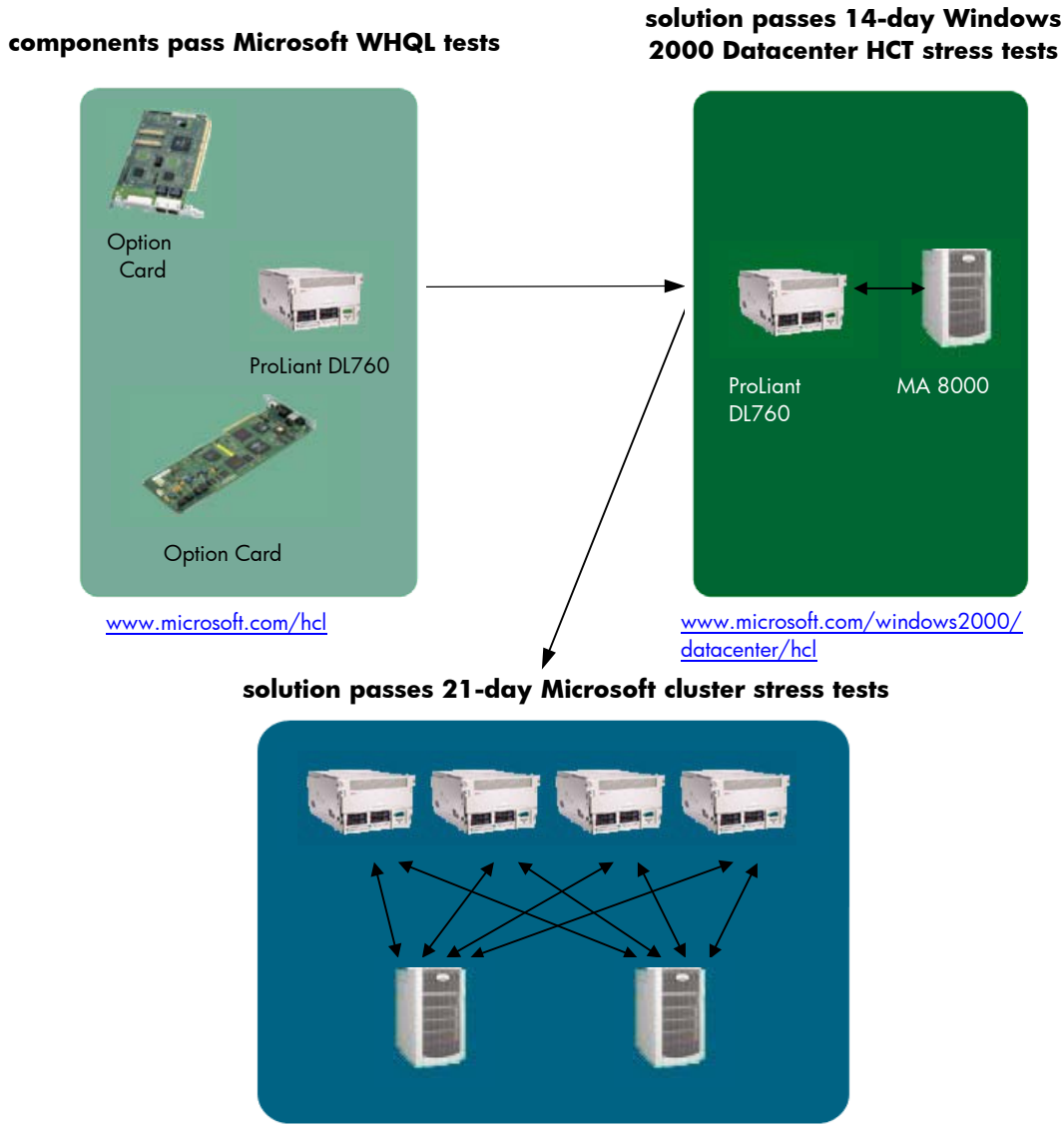
Datacenter program certification involves the complete solution, not just the components. All kernel-touching elements, along with the hardware pieces, are part of the certified package. HP delivers the highest levels of reliability and stability possible through the Datacenter certification program.

High-availability features within ProLiant servers and StorageWorks storage systems deliver access to mission-critical data. The Datacenter support infrastructure, including a support team, ensures customers have a single point of accountability for fast problem resolution. To achieve highly reliable and available solutions, the HP 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 HP Data Center Program solution testing and certification, see www.compaq.com/solutions/datacenter/application.html and www.veritest.com/mslogos/windows2000/compaq/.

Figure 1 presents a graphical representation of the software and hardware certification process for the Datacenter program.

figure 1. certification for the datacenter program



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 Windows 2000 Datacenter Certification Lab, located in Bellevue, Washington. Passing applications are included in the Microsoft Hardware Compatibility List (HCL) (www.microsoft.com/hcl/default.asp) and listed on the HP Data Center Program website (www.hp.com/solutions/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 (www.veritest.com/). HP feels strongly about the importance of running certification tests on ProLiant servers. As a proof point, HP has invested millions of dollars in providing ProLiant 4-node clusters to each of the VeriTest labs around the world. HP 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

HP hardware provided in the HP 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 HP use WHQL test kits for the qualification of complete HP Data Center Program bundles. Qualifying WHQL results enable vendors to obtain Microsoft Windows logos and to join the HCL.

change management

HP leads the change management process across all hardware and software elements of the HP 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

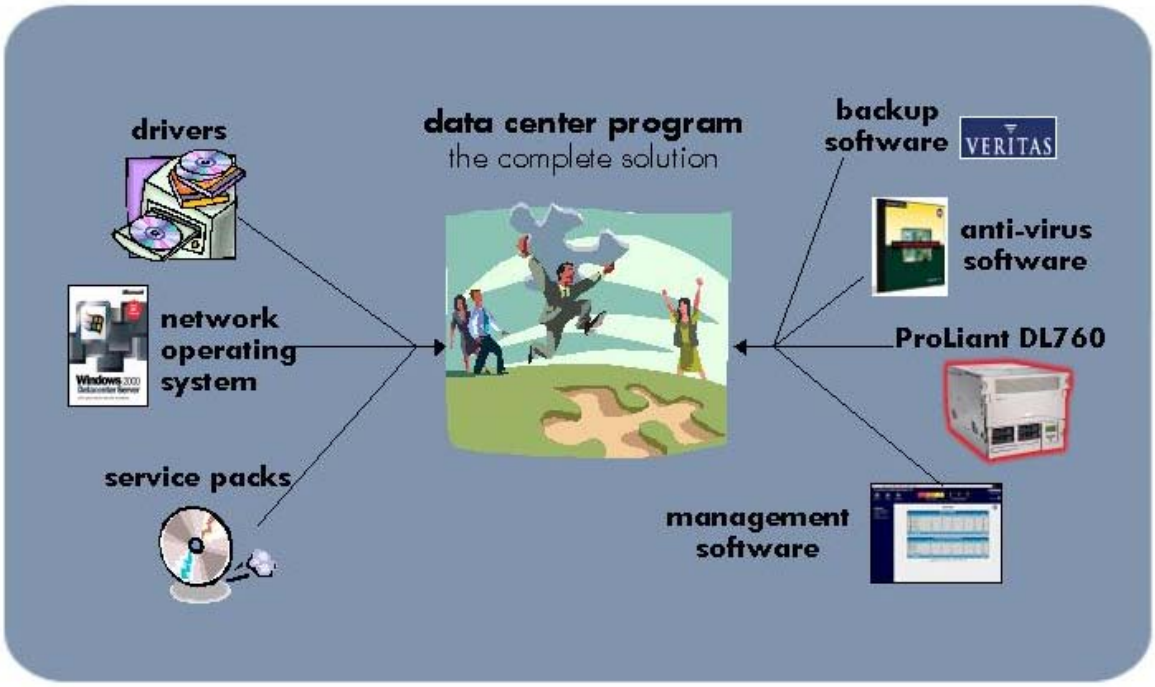
product	release cycle
ProLiant DL760 server	every 2 years
drivers	every 8 weeks
network operating system	every 2.5 years
Microsoft Service Packs	every 6 to 9 months
anti-virus software	every 2.5 years
backup server software	every year

With the HP Data Center Program, HP 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 HP Data Center Program solutions are stress tested together on the specific model to ensure optimal compatibility within customers' data center environment. Each year HP releases a fully tested new server model, and every 6 to 9 months HP releases baselines for these server models.

Figure 2 conceptually shows the change management relationship.

figure 2. managing the change for customers



process

All HP Data Center Program components, including hardware, firmware, and software, are locked down upon certification with a guaranteed lifecycle of 2 years.

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

- all hardware and firmware revisions pertaining to the HP Data Center Program
- addition of a new qualified vendor for a particular HP Data Center Program part
- any SoftPaq or ROMPaq for HP Data Center Program drivers, utilities, or ROMs/BIOS
- new versions and revisions of HP Data Center Program software
- any previously uncertified software or hardware to be added to a HP 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 that customers can easily schedule their server updates.

baselines

The specific components released in the HP 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 HP 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 HP Data Center Program baseline.

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

HP 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. HP offers an upgrade kit to facilitate moving from one baseline to the next.

In order to protect the data center environment, HP includes provisions to the 6-month interval release cycle for two reasons:

- **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 two 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 deployed; therefore, it is essential that anti-virus updates be permitted for all systems, including HP Data Center Program solutions. The HP Data Center Program provides this flexibility.

  HP engineers work closely with anti-virus vendors to ensure any product updates affecting Datacenter certifications are re-certified as quickly as possible.

  The HP Data Center Program supports several certified anti-virus software vendors. Certification updates and schedules are maintained on the following site: www.hp.com/solutions/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 HP 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.

evaluating the hp data center program

HP 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 HP to deliver the total data center solution.

features and services

Due to the critical need for reliability in the enterprise, Microsoft must certify all elements touching the Windows 2000 Datacenter kernel. 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 HP Data Center Program exceeds the Microsoft requirements by adding features and services, such as scalability, reliability, availability, and HP Services.

scalability

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

reliability

HP has extended support relationships through our partnership in TSAnet (www.tsanet.org/) so that customers can receive complete support for their hardware, operating system, and software from the HP Data Center Support Center.

availability

The 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, HP offers Geo clustering with the ProLiant DL760 Data Center Solution. This unique combination of 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.

hp services

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

HP Services offers planning, design, implementation, installation and startup, availability, and management, and security services. The Windows 2000 Datacenter support infrastructure, including a support team, ensures customers have a single point of accountability for fast problem resolution.

Microsoft Windows 2000 Datacenter running on 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.

HP 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

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

- **installation and startup services:** HP's experienced Microsoft-certified professionals provide comprehensive installation, configuration, and startup services for customers' Datacenter hardware and operating software, as well as ProLiant management tools.

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

  Choose from three fixed-priced, fixed-deliverable 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

  Customers can purchase the easy-to-buy, easy-to-use CarePaq service packages directly from HP or through a reseller.

- **enterprise support plan:** HP's responsive service professionals 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 ProLiant platforms.

  The Enterprise Support team gains detailed knowledge of the customer's environment and works to help the customer maximize uptime and minimize risk. HP support experts located at a dedicated HP Data Center Program Solutions Lab ensure that customers always receive a fast, focused response. Enterprise Support Plan features include:

  – single point of contact: a named Technical Account Manager who understands the customer's environment and takes responsibility for problem resolution and services coordination

  – 24x7 support from personnel with in-depth software and hardware expertise

  – access to a 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, and upgrade planning assistance that are all managed through HP'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 the customer's business-critical environment

- **Windows 2000 Datacenter OS update subscription service:** Customers can stay in step with new Datacenter Server operating system releases using HP's subscription service. This convenient subscription service automatically distributes vital software updates from Microsoft and HP to customers. Vital software updates include new version releases and maintenance releases (Service Packs) of the Windows 2000 Datacenter Server operating system and the complementary SoftPaqs.

  Each time a new version of the Datacenter Server operating system is released, customers 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 Data Center Support Paq is released, customers 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:** To get the highest possible availability for the Windows 2000 Datacenter environment, customers need to build it into their environments from the ground up. The Data Center Availability Assessment service helps customers understand and enhance the availability characteristics of the HP Data Center Program solution, including the operating environment as well as the server hardware and storage technology.

  A Business Critical Consultant reviews the customer's proposed solution, business objectives, availability targets, and IT operations infrastructure. HP examines each of the six domains that impact availability, which include the hardware, system software, applications, network, physical environment, and IT management practices.

  After gathering all the relevant data, HP presents the customer 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 the customer 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.

  HP offers Uptime Guarantees to support customers' business-critical environments. HP works with customers to determine their availability requirements and then develop a solution to help them achieve that level.

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

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

The guarantee costs customers nothing extra, once customers met the requirements. Unique IT configurations, business requirements, and usage define a customer's partnership with HP.

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:* HP 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. HP achieves this with careful contingency planning as well as availability monitoring that leverages advanced computing tools and techniques.

  Through the Availability Partnership, HP can work with customers to put an uptime guarantee in place for their Windows 2000 Datacenter solution.
- *installation and startup services:* The HP Data Center Enterprise Support Plan can be purchased through HP or from the customer's reseller as a CarePaq. For more information, customers should contact their sales representative or e-mail us.

support centers

Utilizing the industry-leading HP Support Centers that include the largest number of Certified Microsoft Specialists in the industry, HP 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 HP support team will own problem resolution, providing quick relief and, when required, prioritized quick-fix engineering for both operating system and hardware issues. HP already provides support for many of the leading software applications, including Microsoft applications, SQL Server, and Exchange.

The HP support team provides a second-level escalation point for both hardware and software support issues and is located in the HP Data Center Program Solutions Lab in Bellevue, Washington. At this lab, HP 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.

managed services

HP's outsourcing services provide the capability, capacity, and global coverage to deploy and manage Windows 2000. Customers can make the move more quickly and productively, with less risk, by relying on HP's expertise to take full responsibility for the migration and ongoing management. Customers focus on where their business needs to go while HP gets them 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 HP Services. Backed by the largest group of certified Microsoft Specialists in the world and incorporating proactive support and customer-specific technical account management, HP 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

HP leads the way in revolutionizing the economics of enterprise computing with reliable, stable industry-standard solutions. The HP 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 HP Data Center Program, customers have the ability to scale out or scale up by choosing a ProLiant DL760 Data Center Solution. As part of the 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 Input/Output (I/O) technology
- breakthrough scalable performance of I/O and memory and processors to address customers' most demanding Datacenter 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 HP 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 HP Data Center Program Solutions Lab.

For additional information on the ProLiant DL760 Data Center Solution, visit: www.compaq.com/products/servers/proliantdl760dc/index.html.

storage solutions

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

- StorageWorks Enterprise Virtual Array
- StorageWorks Modular Array 8000/Enterprise Modular Array 12000
- Storage Area Network (SAN) infrastructure
- SANworks Secure Path Version 3.1
- StorageWorks Enterprise Backup Solution (EBS)

Additional information may be obtained from the HP StorageWorks website at www.compaq.com/products/storageworks/announcements/W2k-Datacenter.html.

software

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

third-party software

The HP Data Center Program supports all third-party software containing the Windows 2000 Datacenter logo. Passing applications are included in the HCL (www.microsoft.com/hcl/default.asp) and listed on the HP Data Center Program website (www.hp.com/solutions/datacenter).

ProLiant value-add software

HP provides value-added software products to manage and optimize the data center environment as discussed below.

- **data center support paq for Microsoft Windows 2000:** This product, 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 HP Data Center External Recovery and OS Update Subscription Service release.
- **intelligent manageability software:** This software offers IT professionals reliability and stability with their ProLiant servers, so it was only natural that Intelligent Manageability play a key role in the HP Data Center Program solution. The HP Data Center Program includes the Management Agents, provided in the Data Center Support Paq for Microsoft Windows 2000, and Insight Manager 7.

  Insight Manager 7 leverages the power of the Internet to provide web-based systems management and is the essential enabler for the HP vision of virtual presence. 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 HP and third-party devices using SNMP, DMI, and HTTP. With Insight Manager 7, customers can monitor and manage groups of servers, clients, clusters and networking products anywhere, anytime from a standard web browser.

Additionally, Remote Insight Board Lights-Out Edition, an option with the ProLiant DL760 server, provides IT administrators with full graphical access to ProLiant 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, Remote Insight Lights-Out Edition allows browser access to ProLiant servers through a seamless, hardware-based, OS-independent graphical remote console. Since this product 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 Intelligent Cluster Administrator, an advanced cluster utility that provides web-enabled cluster administration and Single Point of Control for MSCS clusters. Version 2.1 includes advanced support for 4-node clusters made possible with Microsoft Windows 2000 Datacenter.

Find more information about Intelligent Manageability products by visiting www.compaq.com/manage/index.html.

implementing the hp data center program

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

pre-installation tasks

Before beginning the installation tasks, create the System Partition and Server Diagnostics diskettes needed to complete Task 1.

To create both the System Configuration diskettes and Server Diagnostics diskette from the images provided on the HP Data Center External Recovery CD, access the online documentation provided on the HP Data Center External Recovery CD (x:\content\introduction.htm, where x represents the CD-ROM drive letter). This web page contains a link that opens a File Explorer session within the browser. From there, double-click the QRST5 program to begin diskette creation.

installation tasks

The following sections detail the tasks necessary to perform a fresh installation on the ProLiant DL760 server based upon the HP Data Center Baseline 2.03A (or later).

Once complete, you will have a system that contains a fully supported and certified Data Center configuration. For details on what is contained in Baseline 2.03A (or later), refer to the Baseline documentation contained on the HP External Recovery CD Version 2.03A (or later) or the OS Update Subscription Service CD Version 2.03A (or later).

Important: Any variation in the installation process and/or components installed might result in an unsupported and uncertified configuration.

---

task 1: preparing the system

Preparing a ProLiant DL760 server for a fresh installation of the HP Data Center Baseline 2.03A (or later) can be accomplished by using the utilities native to the platform. The general steps required to properly prepare a system for fresh installation are:

1. Delete the logical drives on the boot controller.
2. Erase the system's nonvolatile random access memory (NVRAM).

3. Reconfigure the system NVRAM.
4. Create the boot logical drive on the boot controller.

Important: If you are performing a reinstallation of an existing system, perform a backup of all files you wish to save before proceeding with the system preparation instructions.

To prepare the system:

1. Delete all logical partitions on the boot controller using the Option ROM Configuration for Array Utility (ORCA). The boot controller for HP Data Center platforms is typically the Integrated Smart Array Controller.

   To access ORCA and delete the partitions:

   a. Boot the system.
   b. When the initialization for the boot controller begins, wait for the message "*Press <F8> to run Option ROM Configuration for Arrays*" to display. Then, press the **<F8>** key to enter ORCA.

   Important: If the "*Press <F8>...*" message does not appear directly after the boot controller initialization message, it will be necessary to first upgrade the firmware version for that adapter using the Options ROMPaq diskettes contained in the Subscription Service CD Baseline Version 2.03A (or later).

   c. Select **Delete Logical Drive** and press the **<Enter>** key. All known Logical Drives are displayed.
   d. Select the desired Logical Drive and the press the **<F8>** key to delete the partition.
   e. Press the **<F3>** key to confirm the delete and save the configuration, then press the **<Enter>** key to return back to the Main menu.
   f. Repeat steps c through e for every Logical Partition on the boot controller.
   g. Once all Logical Drives have been deleted, press the **<Esc>** key to exit ORCA.
   h. Reboot the system.
2. Erase system NVRAM. When the "*Press F9 to configure the system*" message displays (near the end of the system initialization process), press the **<F9>** key. The ROM-Base Setup Utility (RBSU) is started. To erase NVRAM:

   a. From the Main menu, scroll to the Advanced Options selection and press the **<Enter>** key.
   b. From the Advanced Options menu, scroll to the Erase Non-volatile memory selection and press the **<Enter>** key. A confirmation menu is displayed.
   c. Scroll to the Yes selection. Select to Erase the selection and press the **<Enter>** key.

      The message "*Power Cycle Required!*" is displayed. At this point, system NVRAM has been cleared and reset to initial factory settings.

d. Power cycle the system.

3. Reconfigure the system NVRAM. Following a successful reset of NVRAM and reboot of the server, you will enter RBSU automatically.

   To reconfigure system NVRAM:

   a. Follow the onscreen instructions to configure the Language and OS.
   b. When the "*Press <F10> to exist and Reboot or any other key to modify configuration*" displays, press the **<Enter>** key. This action returns you to the Main menu.
   c. Scroll to the Boot Controller Order selection and press the **<Enter>** key.
   d. View the Controller Order screen and make any changes necessary to ensure the correct controller is listed as controller #1.
   e. Press the **<Esc>** key to close this menu.
   f. Press the **<Esc>** key to exit RBSU when you have finished viewing and/or modifying system options.
   g. Press the **<F10>** key to confirm the exit. The system automatically reboots at this time.

4. Create the boot logical drive on the boot controller as directed below:

   a. When the initialization for the boot controller begins, wait for the message "*Press <F8> to run Option ROM Configuration for Arrays*" to display. Then, press the **<F8>** key to enter ORCA.
   b. Select **Create Logical Drive** from the Main menu and press the **<Enter>** key.
   c. Tab to the Available Physical Drives menu and check the desired drives to be included. If the boot controller is the Integrated Smart Array Controller, select all available drives.
   d. Tab to the RAID Configurations menu and arrow down to the RAID 1 (0+1) selection. This configuration gives you the maximum amount of redundancy and available space.

   Note: HP recommends using four drives in the internal drive bays for optimal performance with RAID 1 (0+1). To select RAID 1 (0+1), install an even number of drives.

   e. Leave the checkbox unselected in the Spare menu.
   f. Press the **<Enter>** key to create the logical drive.
   g. Press the **<F8>** key to verify the logical drive information and save the configuration.

h. Press the **<Enter>** key to return to the Main menu.

i. Press the **<Esc>** key to exit ORCA.

Important: If required, a System Partition containing the Baseline version of the server utilities should be created at this time.

— Obtain the System Configuration diskettes mentioned in the "pre-installation" section.

— Boot the system using these diskettes, and follow the on-screen instructions.

— During the System Partition installation, also select to install the Server Diagnostics utility using the diskette mentioned in the "pre-installation" section.

Note: For more information, access the online documentation provided on the Data Center External Recovery CD (x:\content\introduction.htm, where x represents the CD-ROM drive letter).

You are now ready to proceed to Task 2.

task 2: installing the operating system

Installation of Microsoft Windows 2000 Datacenter Server is accomplished by using the standard installation process provided by Microsoft, which is contained on the HP Data Center External Recovery CD. You will be required to answer various questions during the installation interview, and the system will reboot several times.

Simply follow the instructions below and the on-screen instructions during installation.

1. Insert the HP Data Center External Recovery CD in the CD-ROM drive.
2. Boot the system with the CD in the CD-ROM drive.
3. Follow the on-screen instructions.

Note: During the installation process, you will be prompted to create a boot partition. This partition should be created using at least 8 GB of logical drive space. This partition leaves sufficient room for the OS as well as all applications.

During Windows 2000 Setup (after the first reboot), both the \i386 and \CSP directories are copied from CD to the local partition. This process takes approximately fifteen minutes.

After the OS installation completes and the system reboots for the second time, the OS is fully installed and operational.

4. Log-on with the administrator logon ID. Once the Desktop displays, Data Center Support Paq installation is automatically initiated. After successful installation, a system reboot is initiated to ensure the changes take effect.

   Once this reboot is complete and the system is operational, proceed to Task 3.

task 3: completing the baseline

Completing the HP Data Center Baseline installation is accomplished by using the contents and procedures outlined in the HP Data Center External Recovery CD. This CD provides a guide installation process that contains complete Baseline documentation.

This process involves the following three steps:

1. **system ROM installation:** During this step, the Baseline version of the system ROM is installed. The Online ROM Flash component packages are provided as part of the Baseline.
2. **adapter firmware installation:** During this step, the Baseline versions for adapter firmware (Smart Array and RILOE controllers) are installed. Both the Online ROM Flash component packages and Options ROMPaq diskettes are provided as part of the Baseline.
3. **server utility installation:** During this step, the Baseline version for the Server Diagnostics is installed. The diskette installation images are provided as part of the Baseline.

To access the installation details for each above-mentioned step, insert the HP Data Center External Recovery CD into the CD-ROM drive of the active system and an AutoRun browser page will be displayed. If not, follow these steps after ensuring the CD is located in the CD-ROM drive:

1. Click **Start** on the Windows Taskbar.
2. Select **Run** from the Start menu.
3. Type `x:\Content\Introduction.htm` (where x represents the CD-ROM drive letter).
4. Click **OK**.
5. Select the appropriate links on the CD menu to browse the installation instructions and Baseline documentation.

If you received a version of the OS Update Subscription Service CD after receiving the HP Data Center External Recovery CD, the procedures listed below should be followed. This process involves the following three steps:

1. **manual installation:** During this step, the Baseline version of the system ROM, storage adapter firmware, Remote Insight Lights-Out Edition adapter firmware, and server utilities is installed.
2. **automated installation:** During this step, the Baseline version of the Microsoft Service Pack and Compaq Data Center Support Paq is installed.
3. **optional installation:** During this step, the Microsoft diagnostic and debug tools are optionally installed.

To access the installation details for each step, insert the Subscription Service CD and an AutoRun browser page will be displayed. If not, complete the following steps with the CD inserted in the drive:

1. Click **Start** on the Windows Taskbar.
2. Select **Run** from the Start menu.
3. Type `x:\Content\Introduction.htm` (where x represents the CD-ROM drive letter).
4. Click **OK**.
5. Select the appropriate links on the CD menu to browse the installation instructions and Baseline documentation.

task 4: completing the remote insight lights-out edition installation

The Remote Insight Lights-Out Edition option, if purchased, must be installed in the server prior to installing the driver during the Data Center Support Paq installation. After the Data Center Support Paq installation is complete, check for error messages.

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

- In the Device Manager screen, two entries are displayed 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 Remote Insight Lights-Out Edition option and the server are using the same video controller. The operation of the server is not affected by these error messages.

Disable one entry for the ATI Video Controller to prevent the error messages from occurring as follows:

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 symbol indicates that the device is disabled. The disabled entry does not affect the operation of the server.

task 5: 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 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 (located 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 new hard drives.

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

task 6: 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, www.veritas.com/us or the VERITAS NetBackup™ Datacenter product page, www.veritas.com/us/products/nbux/.

task 7: registering the server

Register the server online at www.compaq.com/register.

restrictions

Since HP 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 HP Data Center Program, you can:

- install your system configuration from scratch using the HP Data Center External Recovery CD

  Note: Use the Subscription Service CD if the release is later than 2.03A to complete the Baseline installation. Also, check the certification list at www.compaq.com/solutions/datacenter/application.html to see which applications 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 www.microsoft.com/hcl/default.asp, must be run following any configuration change. The output from the tool must be sent to the HP 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 HP Technical Account Manager (TAM) and you to proactively ensure that configuration changes have not happened inadvertently.

data center don'ts

With the HP Data Center Program, you cannot:

- apply uncertified Microsoft Service Packs or Support Paqs
- add any uncertified kernel-touching components (drivers, agents, DLLs, etc.)
- install uncertified hardware components

hp 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 HP Data Center Program.

table 4. hp resources

resource description	web address
hp data center program website	www.hp.com/solutions/datacenter
kernel-touching applications explanation and process	www.compaq.com/solutions/datacenter/application.html - kernel
Windows 2000	www.compaq.com/partners/Microsoft/Windows2000/index.html
hp services for Windows 2000 Datacenter	www.compaq.com/services/datacenter/index.html
Microsoft frontline partnership	www.compaq.com/partners/Microsoft
white papers and other technical documentation (complete listing)	www.compaq.com/support/reference_library/selectproduct.asp

Microsoft web resources

Throughout this paper, we have discussed Microsoft certification procedures and requirements. Table 5 lists additional tools and information critical to your evaluation process.

table 5. Microsoft resources

resource description	web address
Windows 2000 Datacenter Server	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	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	www.microsoft.com/windows2000/server/howtobuy/upgrading/compat/default.asp
Microsoft hardware compatibility list (HCL)	www.microsoft.com/hcl/default.asp **Note:** The latest version of the Configuration Verification Tool is available on this site for download.

feedback

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: OSIntegrationFeedback@hp.com.

09/2002

Document Number 13PS-0902D-WWEN