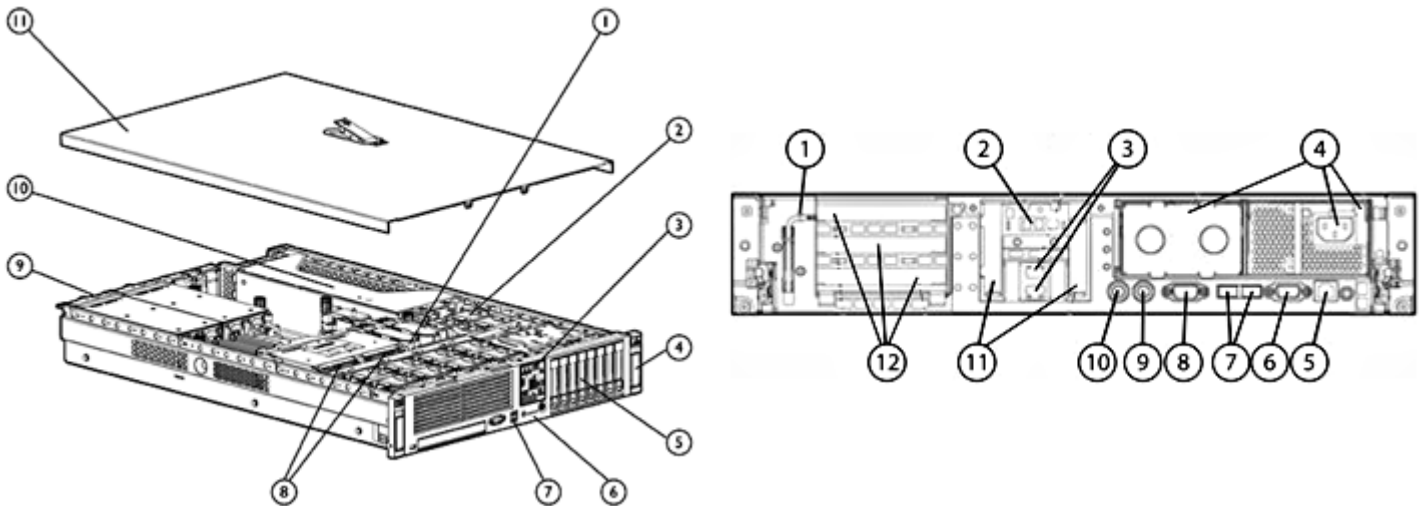


Overview

You have better things to do than worry about file storage. You're juggling multiple interfaces, security concerns, and shrinking backup windows—all while your users demand more storage space. You need scalable file storage that's powerful and easy to manage, and you need it soon.

A DL380 G5 Storage Server is the fast and easy way to add high-performance network file storage to your enterprise or workgroup IT environment, or to add data services to your SAN. The Microsoft Windows-powered operating system is pre-installed and HP All-in-One Storage Manager is included (except SAN Gateway), so you'll be up and running in minutes. It's a network attached storage (NAS) solution with multi-protocol support, so you can consolidate files or create a disk-based backup target. A single, centralized solution helps you spend less time on maintenance, and industry-standard building blocks protect your investment by providing compatibility with your network, applications, and data services.



Front View:

1. Eight sockets for PC2-5300 Fully Buffered DIMMs (DDR2-667)-low power memory standard
2. Hot-plug fans, full redundancy
3. Systems Insight Display
4. Quick release lever for rapid server access
5. Support for up to eight internal Small Form Factor hot plug hard drives
6. Front LEDs (show server status) and Unit Identification button/LED (for easy in rack server identification)
7. Two front USB ports (2 rear USB ports, 1 internal USB port)
8. Quad-Core Intel Xeon Processor(s)
9. Redundant hot plug power supplies

Front View:

1. Torx service tool
2. Optional pass through cable door
3. Two Embedded NC373i Multifunction Gigabit Server Adapters with TCP/IP Offload Engine
4. Hot plug power supply bays with redundant power supply
5. Integrated Lights-Out 2 (iLO 2) Remote management port
6. Video Port
7. Two USB 2.0 Ports
8. Serial Port
9. Keyboard Port
10. Mouse PS/2 Port

Overview

10. Three full-size PCIe expansion slots in standard expansion cage. Two additional low-profile PCIe slots embedded on the system board. Four slots available for use; one consumed by Smart Array controller.
11. Quick removal access panel
11. Two low-profile PCI Express x8 slots. Slot 1 is consumed by Smart Array P400 controller (SAN Gateway model only)
12. Three full-size PCI Express slots in standard cage. One slot is consumed by Smart Array P800 controller (all models except SAN Gateway model)

What is a ProLiant Storage Server? ProLiant Storage Servers are enhanced Windows-powered file and print server solutions for small or medium business, branch office, workgroup, or data center IT environments. These network storage devices are built on industry-standard HP ProLiant servers and come with either Microsoft Windows Storage Server 2003 R2 or Windows Unified Data Storage Server 2003 operating system pre-installed. Like many Network Attached Storage (NAS) devices, they support heterogeneous file serving environments and are pre-configured to install in minutes. And since they're Windows-based, network integration is easy, your antivirus and backup applications run right on the box, and management has a familiar look and feel. So you can add storage to your network quickly and spend less time on storage management, then get back to what matters most: running your business.

What's New

- Create, migrate, manage, and protect shared storage without the need for storage expertise using All-in-One Storage Manager (HP ASM) Software, which is now included with DL380 G5 Storage Servers (except for the SAN Gateway model). HP ASM is designed for IT generalists and is like getting a storage expert in the box. It includes tools to quickly and easily migrate and manage data using automated best practice settings, and you can enable optional features within HP ASM by installing Microsoft iSCSI Software Target, HP Data Protector Express Software, and/or HP Storage Mirroring Software

Go to: <http://www.hp.com/go/simplestorage> for more information.

- Quad-Core Intel® Xeon® E5430 2.66 GHz processors
- At least 4GB SDRAM standard
- Support for 1TB SATA and 450GB SAS drives with MSA60 bundle SKUs

Highlights

ProLiant DL380 G5 Storage Servers deliver Enterprise-level performance, scalability and flexibility. Up to two quad-core processors, expandability to multiple terabytes of storage via external arrays, and a powerful new SAN gateway option make it the network storage solution of choice for SMB, workgroup, and small Enterprise environments.

- **Operating System:**
 - Microsoft Windows Storage Server 2003 Release 2, Standard x64 Edition with HP All-in-One Storage Manager (all models except SAN Gateway model)
 - Microsoft Windows Unified Data Storage Server 2003, Enterprise x64 Edition (SAN Gateway model)
- **Processor:**
 - Quad-Core Intel® Xeon® E5430 2.66 GHz
 - Single processor (all models except SAN Gateway model); two processors (SAN Gateway model)
- **Memory:**
 - 4GB (2 x 2GB) standard (all models except SAN Gateway model)
 - 8GB (4 x 2GB) standard (SAN Gateway model)
- **Storage Controller:**
 - Smart Array P800/512MB Controller (RAID 0/1/5/6) with BBWC and external expansion (all models except SAN Gateway model)

Overview

- Smart Array P400/512MB Controller (RAID 0/1/5/6) with BBWC (SAN Gateway model)
 - **Drive Support:**
 - Eight small form factor (SFF) hot-plug internal bays that support SAS or SATA HDDs
 - 2 x 72GB SAS SFF HDDs for mirrored OS (all models except 1.16TB SAS model)
 - 8 x 146GB SAS SFF (1.16TB SAS model)
 - External SAS or SATA HDD support via bundled HP StorageWorks 60 Modular Smart Array enclosures
 - 6 x 750GB SATA LFF (4.5TB SATA model)
 - 6 x 1TB SATA LFF (6TB SATA model)
 - 6 x 300GB SAS LFF (1.8TB SAS model)
 - 6 x 450GB SAS LFF (2.7TB SAS model)
 - Slimline DVD-ROM Drive (8x/24x) to support System Restore
 - **Network Controller:**
 - Dual embedded NC373i Multifunction Gigabit Server Adapters with TCP/IP Offload Engine
 - **Expansion Slots:**
 - Two embedded half-height low profile x4 PCIe slots (one slot occupied by Smart Array P400/512MB controller on SAN Gateway model)
 - PCIe Riser: one x4 PCIe slot and two x8 PCIe slots (one slot occupied by Smart Array P800/512MB controller on all models except SAN Gateway model)
 - **Redundancy:**
 - Hot-plug SAS/SATA hard disk drives
 - Hot plug redundant power supplies
 - Fully redundant hot plug fans (N+1)
 - **Management:**
 - HP All-in-One Storage Manager Software (not compatible with SAN Gateway model)
 - File share creation and scheduled snapshots included
 - iSCSI features require optional installation of Microsoft iSCSI Software Target
 - Data protection features require optional installation of HP Data Protector Express Software
 - Streamlined data replication features require optional installation of HP Storage Mirroring Software
 - Microsoft Management Console (MMC)-based user interface
 - Remote system management via Remote Desktop or Telnet
 - Remote hardware management via Integrated Lights Out 2 (iLO 2) - Advanced License included
 - **Form Factor:**
 - Rack (2U), (3.5-inch); Depth 26 inches (66 cm)
 - **Warranty:**
 - Protected by HP Services and a worldwide network of resellers and service providers. Three-year Next Business Day, on-site limited global warranty (three years parts, three years labor, and three years on-site support). Certain restrictions and exclusions apply. SATA hard drives have a one-year warranty.
-

Overview

Go from out-of-the-box to file serving in minutes, not hours. The Windows-powered operating system is pre-installed and user storage is pre-configured, so it's a quick, secure, and easy way to add storage and print services to your network or to add intelligent file and iSCSI services to your Fibre-Channel SAN.

A single centralized file server platform to manage and protect Consolidate islands of direct-attached storage to one easy-to-use Windows platform or create a scalable disk-based backup or replication target.

Multi-protocol file serving You can deploy in wide range of heterogeneous file serving environments with support for SMB/CIFS, NFS, HTTP, FTP, and WebDAV file protocols.

Add file access to your SAN or tier SAN block access The SAN Gateway model is a file and iSCSI gateway into a Fibre Channel SAN or Fibre Channel or SAS array, providing IP-based access to virtually unlimited storage. In addition to enabling file storage, it can help tier storage for application servers by creating block access via inexpensive Ethernet infrastructure.

Seamless integration into your Windows environment It's running Windows, so it integrates natively into your Active Directory and DFS environments, runs your favorite antivirus or backup applications, and management via the Microsoft Management Console (MMC) has a familiar look and feel.

Intelligent storage services Make more efficient use of storage space using the file de-duplicating Single-instance Storage (SIS) feature and enjoy the benefits of other storage-specific tools like Indexed search, SharePoint® Services support, Quotas, File Screening, Storage Reporting, and Distributed File System (DFS) Replication.

Remote manageability You can manage and troubleshoot from almost anywhere at both the system level (with Remote Desktop or HTTPS) and at the hardware component level (using Integrated Lights-out 2).

HP ProLiant industry-standard hardware Relax--your investment is protected because you're not locked into proprietary hardware. The high-performance 2U rack mount platform supports up to 2 quad-core processors, up to 8 internal SFF drives, easy external expansion, and redundant power and cooling.

Optional data services that integrate with HP All-in-One Storage Manager Upgrade to host block-based storage for Exchange, SQL or other applications with Microsoft® iSCSI Software Target; backup to disk, tape, or other removable media with HP Data Protector Express Software; and replicate data on a scheduled basis to another system using HP Storage Mirroring Software.

NOTE: The SAN Gateway model features the Microsoft Windows Unified Data Storage Server 2003 Enterprise x64 Edition O/S, which already includes iSCSI software target but does not support HP All-in-One Storage Manager. It does support other optional software, such as HP Data Protector Express and HP Storage Mirroring.

Standard Features

Operating System

Base, 1.16TB SAS, 4.5TB SATA, 6TB SATA, 1.8TB SAS, and 2.7TB SAS models

Microsoft Windows Storage Server 2003 R2, Standard x64 Edition

- 64-bit processing (compatible with 32-bit applications)
- Optimized for File Serving: Up to 20% faster file serving performance than a general-purpose Windows Server 2003 R2 installation on the same hardware.
- HP-enhanced File Server Management Console: Features the familiar look and feel of the Microsoft Management Console (MMC).
- HP Rapid Start-up Wizard: Simplifies and accelerates new device deployment by walking you through basic system settings step-by-step.
- Single-instance Storage (SIS): Recovers up to 35% of disk space by de-duplicating files and reducing the amount of redundant data stored. Identifies identical files, stores a single copy of the file in a central repository, and replaces the files with pointers to the file in the SIS common store.
- Search Enhancements: Indexing Service extracts the information from a set of documents and organizes it in a way that makes it quick and easy to access that information through the Search function for computers running Windows 2000 or Windows XP.
- File Server Resource Manager (FSRM): Provides both on-demand and scheduled reports detailing storage use, allows administrators to create and manage folder and volume quotas, and permits both name-based screening of files and allowing/disallowing file creation on specified folder trees.
- Windows SharePoint® Services: A powerful Web-based team collaboration environment that provides an integrated portfolio of collaboration and communication services designed to connect people, information, processes, and systems.
- Distributed File System (DFS) Management Console: Updated DFS namespace failover, failback and prioritization controls.
- Distributed File System Replication (DFS-R): State-based, multi-master replication engine that supports replication scheduling and bandwidth throttling. DFS-R uses a new compression algorithm that efficiently updates files over limited bandwidth networks by replicating only the changes needed to ensure global file consistency.
- Full support of Volume Shadow Copy Service, which creates point-in-time copies of files and folders at predetermined time intervals that can then be accessed from client computers.
- Unlimited Client Access Licenses (CALs) included
- Microsoft Services for Network File System (NFS)
- Support for multiple file serving protocols, including SMB/CIFS, NFS, HTTP, FTP, WebDAV, and AppleTalk
- Print Management Console: Manage multiple printers (license for unlimited printer support) from a single console, whether locally or over the WAN.
- Support for any number of SATA or SAS drives and multiple network ports

SAN Gateway model

Microsoft Windows Unified Data Storage Server 2003, Enterprise x64 Edition

Includes all Windows Storage Server 2003 R2, Standard x64 Edition features plus:

- Microsoft Windows iSCSI Software Target: Adds block storage capability and creates a single platform that delivers file, print, and application storage services, all over existing Ethernet networks. New wizards give you the ability to easily create and manage iSCSI targets, create and manage disks for storage, and implement backup and recovery support using snapshots.
- Microsoft Cluster Server (MSCS) license included
 - **NOTE:** The DL380 G5 SAN Gateway Storage Server may only be clustered with servers also running Microsoft Windows Unified Data Storage Server 2003, Enterprise x64 Edition

Standard Features

- operating system (HP recommends like hardware as well). Microsoft Windows Unified Data Storage Server 2003, Enterprise x64 Edition can not be clustered with ProLiant Storage Servers based on 32-bit (Windows Storage Server 2003 R2 or older) operating systems
- Storage Manager for SANs (SMfS): Natively provides basic SAN management (such as device discovery, LUN creation, and storage allocation) for SAN gateway installations. Moreover, SMfS enables shared storage solutions and clustering.
- Unified Share and Storage Management Snap-in: With a consistent and familiar interface, simplifies management of shares and volumes by unifying SMB and NFS share provisioning, integrating share and storage provisioning, and providing an overview of storage and shares.
- Remote Administration Enhancements: Key new functionality enables Windows Storage Server to be used and managed in environments that are not predominantly Windows-based.

For more information about this OS see:

<http://www.microsoft.com/windowsserversystem/storage/wudss.msp>

HP All-in-One Storage Manager Software

This easy-to-use, integrated storage management tool works from an application point-of-view and can help you orchestrate the many aspects of your storage environment---even if you lack storage expertise. It's like having your own storage expert in the box.

NOTE: Not supported on DL380 G5 SAN Gateway model.

- Rapid startup tools for fast and easy installation and out-of-the box configuration
- File Share creation wizard for CIFS or NFS shares with storage allocation, directory quota management, and scheduled snapshots.
- Quota monitoring and alerting per share or application.
- Remote management via Microsoft Internet Explorer or Terminal Services
- Best practice and advanced dialog improvements to HP ASM wizards grant more control to those with more storage management experience
- Support for setup and management of both internal storage as well as supported direct attached MSA storage enclosures
- Supports management of tiered storage environments where both SAS and SATA hard drives are attached to the All-in-One Storage System either internally or in externally-attached HP StorageWorks MSA enclosures.
- You can use HP ASM to specify a dedicated, primary network--plus a secondary subnet--for your IP-based storage traffic
- Disaster recovery tools work in concert with backup applications to preserve storage subsystem settings in case they need restored after a system rebuild
- Provides end-to-end management and provisioning of iSCSI storage for non-clustered 32-bit and 64-bit Windows Server 2003 or Windows Server 2008 hosts (including derivatives like Windows Small Business Server 2008 and Windows Essential Business Server 2008) from the iSCSI Target all the way through to the host (Requires Microsoft iSCSI Software Target from HP)
- Provides management and provisioning of iSCSI storage for standards-compliant non-Windows iSCSI initiators such as VMWare, Linux, etc. (Requires Microsoft iSCSI Software Target from HP)
- Application data hosting and migration wizard using HP and Microsoft 'Best Practice' storage configurations for Microsoft Exchange 2003/2007 Storage Groups and Microsoft SQL Server 2000/2005/2008* databases (*SQL Server 2008 support requires installation of "SQL Server 2005 Backward Compatibility" option; file stream functionality not supported). (Requires Microsoft iSCSI Software Target from HP)
- Application-level capacity provisioning and online growth for shares, SQL Server and Exchange. SQL Server support includes data file and log directory provisioning and Exchange support includes Mailstore, Publicstore and log directory provisioning. (Requires Microsoft iSCSI Software

Standard Features

- Target from HP)
- Application data hosting and iSCSI Setup wizard for other 'User Defined' Application (Oracle, MySQL, VMware ESX, etc...) (Requires Microsoft iSCSI Software Target from HP)
- Data protection policy assignment (snapshots, backup, and HP StorageWorks Storage Mirroring replication) integrated into application migration and share creation wizards for data hosted on the system. (Requires HP Data Protector Express Software and/or HP StorageWorks Storage Mirroring Software)
- Data Protector Express Virtual Library (D2D) device provisioning and space management as well as support for Data Protector Express D2D2Any add-on option. (Requires HP Data Protector Express Software)
- Integration with HP StorageWorks Storage Mirroring Software to accommodate asynchronous replication of file and block data to another system. (Requires HP StorageWorks Storage Mirroring Software)
- HP ASM agents now support domain servers (including Windows Server 2008, Small Business Server 2003 and Small Business Server 2008) as application host machines

HP ASM Agent Application & OS Support Matrix

	Microsoft Windows Server 2003 SP1	Microsoft Windows Small Business Server 2003	Microsoft Windows Server 2008	Microsoft Windows Essential Business Server 2008
Microsoft Exchange 2003 SP1	o	o		
Microsoft Exchange 2007	o*	o*	o*	o*
Microsoft SQL Server 2000 SP4	o	o		
Microsoft SQL Server 2005 SP2	o	o	o	o
Microsoft SQL Server 2008	o**	o**	o**	o**

All application support requires installation of Microsoft iSCSI Software Target from HP (T4433A)

* Exchange 2007 is only supported on 64-bit Operating Systems

** SQL Server 2008 support requires installation of "SQL Server 2005 Backward Compatibility" option; file stream functionality not supported

HP ASM Feature Support Matrix

	Microsoft Windows Server 2003 SP1	Microsoft Windows Small Business Server 2003	Microsoft Windows Server 2008	Microsoft Windows Essential Business Server 2008
Data Migration	o	o	o	o
Replication (HP Storage Mirroring Software)	o	o	o	o
Backup (HP Data Protector Express Software)	o	o	o	o
Virtual Library (HP Data Protector Express Software)	o	o	o ***	o ***

Standard Features

Application-aware snapshots ○ ○ ○ ○

*** Utilizing Virtual Library (D2D) functionality requires HP Data Protector Express Software v4.x to support Windows Server 2008

Processors

Base, 1.16TB SAS, 4.5TB SATA, 6TB SATA, 1.8TB SAS, and 2.7TB SAS models

1 x Quad-Core Intel® Xeon® Processor E5430 (2.66 GHz, 80 Watts, 1333 FSB)

SAN Gateway model

2 x Quad-Core Intel® Xeon® Processor E5430 (2.66 GHz, 80 Watts, 1333 FSB)

Cache Memory

12 MB (2 x 6 MB) Level 2

Chipset

Intel® 5000P Chipset

NOTE: For more information regarding Intel chipsets, please see the following URL:

<http://www.intel.com/products/server/chipsets/>.

Memory

Type PC2-5300 Fully Buffered DIMMs (DDR2-667) with 4:1 and 2:1 interleaving available (interleaving requires identical DIMMs)

Memory Protection Advanced ECC (multi-bit error protection), Online Spare, Mirroring, 4-way Interleaving

DIMM Sockets 8

Base, 1.16TB SAS, 4.5TB SATA, 6TB SATA, 1.8TB SAS, and 2.7TB SAS models

Standard 4 GB (2 x 2GB) low-power

Maximum configuration 32 GB

SAN Gateway model

Standard 8 GB (4 x 2GB) low-power

Maximum configuration 64 GB

Network Controller

Dual Embedded NC373i Multifunction Gigabit NICs with TCP/IP Offload Engine

NOTE: Supports the included Microsoft Windows Server 2003 Scalable Networking Pack, which includes TCP Chimney Offload, Receive-side Scaling (RSS), and NetDMA features

Standard Features

Expansion Slots

Embedded Slots

Slot Number	Bus Speed*	Bus Number**	Device Number***	Hot Plug	PCI Voltage
1	x4 PCIe (x8 connector)	6	0	no	N/A
2	x4 PCIe (x8 connector)	11	0	no	N/A

NOTE: One slot occupied by integrated Smart Array P400/512MB controller (SAN Gateway model only).

NOTE: Embedded slots support half-height low profile cards.

PCIe Riser

Slot Number	Bus Speed*	Bus Number**	Device Number***	Hot Plug	PCI Voltage
3	x4 PCIe (x8 connector)	14	0	no	N/A
4	x8 PCIe (x16 connector)	23	0	no	N/A
5	x8 PCIe (x16 connector)	19	0	no	N/A

NOTE: One slot occupied by integrated Smart Array P800/512MB controller (Base, 1.16TB SAS, 4.5TB SATA, 6TB SATA, 1.8TB SAS, and 2.7TB SAS models).

NOTE: Riser slots support full-size PCIe cards.

Storage Controller

Base, 1.16TB SAS, 4.5TB SATA, 6TB SATA, 1.8TB SAS, and 2.7TB SAS models

HP Smart Array P800/512MB Controller with battery-backed write cache (BBWC)

- RAID 0/1/1+0/5 and RAID 6 with Advanced Data Guarding
- x8 2.5G PCIe host interface
- External expansion ports

SAN Gateway model

HP Smart Array P400/512MB Controller with battery-backed write cache (BBWC)

- RAID 0/1/1+0/5 and RAID 6 with Advanced Data Guarding
- x8 2.5G PCIe host interface

Fibre Channel SAN connectivity for all models requires a Host Bus Adapter (must be purchased separately). Please see 'SAN Compatibility' for more information.

Standard Features

Storage	Hard Drives	Internal: <ul style="list-style-type: none">• 2 x 72GB 3G SAS 10K SFF HDDs for mirrored OS (Base, 4.5TB SATA, 6TB SATA, 1.8TB SAS, 2.7TB SAS, and SAN Gateway models)• 8 x 146GB 3G SAS 10K SFF HDDs (1.16TB SAS model) External: <ul style="list-style-type: none">• 6 x 750GB SATA 7.2K LFF MDL HDDs installed in external MSA60 array enclosure (4.5TB SATA model)• 6 x 1TB SATA 7.2K LFF MDL HDDs installed in external MSA60 array enclosure (6TB SATA model)• 6 x 300GB 3G SAS 15K LFF DP ENT HDDs installed in external MSA60 array enclosure (1.8TB SAS model)• 6 x 450GB 3G SAS 15K LFF DP ENT HDDs installed in external MSA60 array enclosure (2.7TB SAS model)
	Optical Drive	Slimline DVD-ROM Drive (8x/24x)

Maximum Storage Capacity (raw)	Internal (Hot Plug SFF SAS)	1.168TB	8 x 146GB SFF SAS HDDs
	Internal plus External	97.16TB	8 x 146GB SFF SAS int. + 96 x 1TB LFF SATA ext.

Interfaces	Serial	1
	Pointing Device (Mouse)	1
	Graphics	1
	Keyboard	1
	VGA	2 (1 front, 1 back)
	Network RJ-45	2
	iLO 2 remote management port	1
	USB 2.0 Ports	5 total: 2 front, 2 back, 1 internal

NOTE: Please see the following URL for additional information regarding USB support:
<http://h18004.www1.hp.com/products/servers/platforms/usb-support.html>.

Graphics	Integrated ATI ES1000 1280 x 1024 x 16M color (32MB video standard)
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Standard Features

Management

HP StorageWorks All-in-One Storage Manager (HP ASM) Software

- File share creation wizard and scheduled snapshots included
- iSCSI features including "Host an Exchange Storage Group" and "Host a SQL Server Database" wizards require optional installation of Microsoft iSCSI Software Target (T4433A)
- Data protection features including support for backup of file shares or application stores to disk, tape, or other removable media using application-aware snapshots require optional installation of HP Data Protector Express Software (BB117BA)
- Streamlined data replication for file shares or application stores requires optional installation of HP Storage Mirroring Software (T5442A); Installable 60-day demo version included

NOTE: HP All-in-One Storage Manager Software does not support SAN and array storage and is incompatible with the DL380 G5 SAN Gateway Storage Server

Microsoft Management Console (MMC)-based user interface (also accessible via HTTPS)

Remote system management via Remote Desktop or Telnet

Integrated Lights-Out 2 featuring Integrated Remote Console with KVM over IP performance over shared network access (Advanced License included standard)

- Virtual Text Remote Console
- Virtual Power Button Control
- Integrated Remote Console
- Dedicated & full function shared network connectivity
- Browser, command line and scripted access
- Automatic IP Configuration via DHCP/DNS/WINS
- Industry Standard 128-bit Secure Sockets Layer (SSL) and Secure Shell security (SSH)
- OS independent hardware health status
- IML and iLO Event Logging
- Support for 12 user accounts with customizable access privilege
- Advanced license: upgrades the iLO 2 processor with comprehensive remote control including Virtual KVM graphical console, virtual media, and enterprise security.

Form Factor

Storage Server only: Rack (2U); Height 3.38-inch (8.59 cm); Depth: 26 inches (66 cm)
Storage Server plus MSA60 enclosure: Rack (4U)

Industry Standard Compliance

ACPI 2.0 Compliant
PCI 2.2 Compliant
WOL Support
Microsoft® Logo certifications
USB 2.0 Support

Server Power Cords

Two high voltage power cords (6 foot IEC C13 to C14) standard

Power Supply

Hot Plug Redundant, 800Watt, CE Mark Compliant

Standard Features

UPS and PDU Power Cord Matrix

Please see the UPS and PDU cable matrix that lists cable descriptions, requirements, and specifications for UPS and PDU units:

<ftp://ftp.compaq.com/pub/products/servers/ProLiantstorage/power-protection/powercordmatrix.pdf>.

System Fans

Fully redundant hot plug fans ship standard (N+1).

Rack Airflow Requirements

Rack 10000 series Cabinets

The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors.

CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment:

- Front and rear doors: If your 42U server rack includes closing front and rear doors, you must allow 830 square inches (5,350 sq cm) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation).
- Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 2.75 inches (7 cm).

CAUTION: Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

NOTE: For additional information, refer to the Setup and Installation Guide or the Documentation CD provided with the server, or to the server documentation located in the Support section at the following URL: <http://h18000.www1.hp.com/products/servers/proliantdl380/index.html>.

Rack Kit

The HP ProLiant DL380 G5 quick deploy rail system provides tool-free support for racks with square or round mounting holes (including Compaq/HP 7000*, 9000, 10000 and HP series), with an adjustment range of 24" - 36". The ambidextrous cable management arm can be mounted on either the left or right side for improved cable management.

*High Airflow Inserts (High Air Flow Rack Door Insert for the 7142 Rack (single) - PN: 327281-B21; or High Air Flow Rack Door Insert for the 7142 Rack (6-pack) - PN: 327281-B22) are required to support the HP ProLiant DL380 G5 in 7000 series racks. The DL380 G5 Cable Management Arm is not supported on 7000 series racks.

NOTE: Cable management arm must be removed to access hot-plug power supplies when the cable management arm is mounted on the right.

Telco Rack Support

DL380 G5 Telco Rack Kit:

Support for all 2-post Telco racks requires the use of the standard rack kit and an additional option kit from Rack Solutions (<http://www.racksolutions.com/hp/>)

Optional Software

Optional Software from HP for Storage Servers

NOTE: DL380 G5 Storage Servers come with either Windows Storage Server 2003 R2 (Standard x64 Edition) or Windows Unified Data Storage Server (Enterprise x64 Edition) pre-installed; check software qualification with 64-bit Windows operating systems before purchase and installation

- **Microsoft® iSCSI Software Target** - Powerful iSCSI software target solution that provides affordable application storage provisioning, protection, and availability for small and medium office environments. The software adds block storage capability to ProLiant Storage Servers and creates a single platform that delivers file, print, and application storage services, all over existing Ethernet networks. It helps administrators consolidate storage capacity, improve storage utilization, minimize system downtime, simplify backup operations, enable rapid recovery, and provides high availability for key applications and services.

Installing Microsoft iSCSI Software Target on a ProLiant Storage Server that supports HP All-in-One Storage Manager enables several features within HP ASM, including "Host an Exchange Storage Group" and "Host a SQL Server Database" wizards and the ability to provision and manage storage for standards-compliant non-Windows iSCSI initiators such as VMWare and Linux. Select ProLiant Storage Server models (including DL380 G5 Storage Servers except for the SAN Gateway model) are compatible with All-in-One Storage Manager; see: <http://www.hp.com/go/simplestorage> for more information.

NOTE: Microsoft iSCSI Software Target is available for Base, 1.16TB SAS, 4.5TB SATA, 6TB SATA, 1.8TB SAS, and 2.7TB SAS models only; the SAN Gateway model includes Microsoft iSCSI Software Target as part of its Windows Unified Data Storage Server 2003 (Enterprise x64 Edition) operating system.

For more information: http://h18006.www1.hp.com/products/storageworks/ms_iscsi/index.html

- **HP Data Protector Express Software** - HP Data Protector Express is easy-to-use data protection and disaster recovery software. It is designed for smaller environments where ease of installation, use, and installation are needed. It enables backup to disk and/or tape of data stored on a ProLiant Storage Server and disaster recovery in the event of a serious incident. A ProLiant Storage Server can also act as the Backup Server and as a target for backup of data on other LAN connected machines or data protection can be integrated into an existing Data Protector Express installation.

Installing HP Data Protector Express on a ProLiant Storage Server that supports HP All-in-One Storage Manager enables data protection features within HP ASM, including backup of file shares or application stores using application-aware snapshots to tape, disk, or other removable media target. All ProLiant Storage Servers support using Data Protector as a backup software solution and select models (including DL380 G5 Storage Servers except for the SAN Gateway model) are compatible with All-in-One Storage Manager; see: <http://www.hp.com/go/simplestorage> for more information.

For more information on HP Data Protector Express Software:

<http://www.hp.com/go/dataprotectorexpress>

- **HP StorageWorks Storage Mirroring Software** - HP StorageWorks Storage Mirroring offers a host-based application that performs remote copy over an IP LAN/WAN. Key features include asynchronous replication that can be scheduled to a fine granular level, Logical Unit Number (LUN), file or byte level. Other features include multiple replication configuration options including peer-to-peer and many-to-one. In addition, Storage Mirroring is a very cost effective disaster recovery alternative from one host to another within a LAN, storage center, or between direct attached storage in metro offices and regional centers. Additional configurations allow replication

Optional Software

from small office environments to ensure business continuity without an outside IT staff.

Installing HP Storage Mirroring on a ProLiant Storage Server that supports HP All-in-One Storage Manager enables replication features within HP ASM including streamlined setup of near real-time replication of file shares or application stores to a remote target. All ProLiant Storage Servers support using HP Storage Mirroring as a host-based replication solution and select models (including DL380 G5 Storage Servers except for the SAN Gateway model) are compatible with All-in-One Storage Manager; see: <http://www.hp.com/go/simplestorage> for more information.

For more information on HP Storage Mirroring Software:

<http://h18006.www1.hp.com/products/storage/software/sm/index.html>

- **HP Data Protector Software** - The HP Data Protector software is enterprise data protection and disaster recovery, ensuring recovery from any disruption. Data Protector integrates a variety of techniques to eliminate backup and recovery windows. The capabilities to eliminate planned downtime range from online backup and backup of open files to zero-downtime, zero-impact backup. The software provides industry-leading instant recovery as well as several disaster recovery alternatives to eliminate unplanned downtime, allowing recovery of entire data centers in minutes.

Data Protector is enabling organizations to reduce costs by automating routine tasks to maximize the effectiveness of the data protection staff. For the price of an entry-level product, it provides the enterprise functionality customers need. Data Protector scales from single server to distributed enterprise, covering an extensive range of heterogeneous applications, operating environments and storage configurations with a single solution.

All ProLiant Storage Servers support using Data Protector as their backup software solution.

For more information on HP Data Storage Protector:

<http://h18006.www1.hp.com/products/storage/software/dataprotector/index.html>

- **HP StorageWorks File Migration Agent** - HP FMA is an automated solution designed to help simplify Windows-based file, web, and application server administration in small business to enterprise environments. This is accomplished through policy-based file migration and archive to popular storage targets, including HP StorageWorks Reference Information Storage System (RISS), HP StorageWorks File System Extender, and NAS, via Common Internet File System (CIFS).

The following Windows Storage Server features or add-ons are currently NOT supported by HP File Archiving software:

NOTE: DL380 G5 SAN Gateway Storage Server with Windows Unified Data Storage Server 2003 (WUDSS) - (NOT SUPPORTED)

NOTE: Single Instance Storage (SIS) - (NOT SUPPORTED)

NOTE: DFS-Replication (DFS-R) - (NOT SUPPORTED)

NOTE: File Server Resource Manager (FSRM) - Content Filter, & File Screening - (NOT SUPPORTED)

For more information: <http://h18006.www1.hp.com/products/storage/software/fma/>

- **HP Systems Insight Manager Software** - HP SIM 5.x is the first unified server and storage management platform. Now, from a single management console, administrators can manage their complete HP server and storage environment with a feature rich, extensible and secure management tool set.

Optional Software

- HP SIM also serves as a central access point for ProLiant Essentials, Integrity Essentials, and Storage Essentials software options that deliver targeted functionality for these platforms. For more information: <http://h18013.www1.hp.com/products/servers/management/hpsim/index.html>
 - **Insight Management Agents** - Allow all HP servers to present system instrumentation, health and configuration information into HP Systems Insight Manager and the HP System Management Homepage. The HP System Management Homepage aggregates systems data from Insight Management Agents and other HP management tools, providing a consolidated browser-based interface for managing individual servers.
- **HP Storage Essentials NAS Manager Software** - Provides comprehensive Network Attached Storage (NAS) management capabilities for HP ProLiant Storage Servers. Visualize your distributed HP NAS solutions and centrally manage their capacity, performance, events, and dependencies to ensure NAS availability and performance and unify SAN and NAS management. For more information on the complete line of HP Storage Essential products go to: <http://www.hp.com/go/storageessentials>

SAN Compatibility

This information applies primarily to the DL380 G5 SAN Gateway Storage Server, which is designed and optimized for integration with a Fibre Channel SAN or storage array (Fibre Channel or SAS HBA not included). However, any DL380 G5 Storage Server model can be connected to a SAN or storage array by adding a recommended HBA.

Host Bus Adapter (HBA) Support HBA selection is left as your choice based on existing infrastructure and/or desired array support. Please see compatible HBAs listed in Step 5 of the product configuration wizard below.

NOTE: Please see the following URL for additional information about Fibre Channel HBAs:
<http://h18006.www1.hp.com/storage/saninfrastructure/hba.html>

SAN Support	HP StorageWorks Enterprise Virtual Array (EVA)	http://h18006.www1.hp.com/products/storageworks/eva/index.html
	HP StorageWorks Disk Array XP	http://h18006.www1.hp.com/storage/xparrays.html
	HP StorageWorks Modular Smart Array (MSA)	http://h18006.www1.hp.com/storage/disk_storage/msa_diskarrays/index.html

HP ProLiant Storage Servers and third-party storage arrays/SAN interoperability statement

HP acknowledges that some third party storage arrays/SAN environments have been successfully tested for interoperability with the HP ProLiant Storage Server or HP StorageWorks NAS products. HP will provide support for the HP ProLiant Storage Servers or HP StorageWorks NAS products when connected to third-party storage arrays, but HP will not provide support on third party storage arrays/SAN unless specifically called out in an HP Support contract. HP may support the third party SAN environment attached to HP ProLiant Storage Servers or the HP StorageWorks NAS products when specifically under contract with HP, but that SAN coverage does not extend to supporting the SAN connectivity of the third-party array.

If you call HP Services and the problem is determined to be caused by a third-party storage array or the storage arrays' connectivity into a non-HP supported SAN, you will be directed to contact the third-party storage array supplier for support. Please refer to the third-party supplier for information relating to specific support of their storage arrays with Windows Storage Server 2003 R2 and Windows Unified Data Storage Server 2003 platforms.

Service and Support, HP Care Pack, and Warranty Information

Warranty All DL380 G5 Storage Servers come with a standard 3-3-3 warranty (3 years parts exchange, 3 years labor and 3 years onsite next business day response)

Services Included with the Product One year of HP Software Support, standard 9x5 business hours (software technical support and software product and documentation updates).

Service and Support Upgrade options

- Response - Upgrade on-site response from next business day to same day 4-hours
- Coverage - Extend hours of coverage from 5 days x 9 hours to 7 days x 24 hours
- Duration - Select duration of coverage for a minimum period of 1 year or multiple years

HP offers a portfolio of services ranging from Storage Design and Architecture that provides a complete multi-site design and implementation, to various levels of on-going maintenance support. Additionally the basic warranty service can be enhanced and/or HP Installation services can be purchased. Specifically HP Care Pack services include

Product number(s)	Care Pack	Duration	Commercial reseller channels	Direct & Enterprise channels
AG815B	HP Software	1 year	Bundled	Bundled
AG816B	Support for Storage, 9 x 5	3 years	n/a	HA106A3 - 84N
		4 years	n/a	HA106A4 - 84N
		5 years	n/a	HA106A5 - 84N
	HP Software	1 year	n/a	HA107A1 - 84N
	Support for Storage, 24 x 7	3 years	n/a	HA107A3 - 84N
		4 years	n/a	HA107A4 - 84N
		5 years	n/a	HA107A5 - 84N
	Support Plus for Storage	1 year	UD572E	HA109A1 - 84N
		3 years	UD574E	HA109A3 - 84N
		4 years	n/a	HA109A4 - 84N
		5 years	n/a	HA109A5 - 84N
		Post Warranty	UL100PE	n/a
	Support Plus 24 for Storage	1 year	UD573E	HA110A1 - 84N
		3 years	UD575E	HA110A3 - 84N
		4 years	n/a	HA110A4 - 84N
		5 years	n/a	HA110A5 - 84N
		Post Warranty	UL101PE	n/a
	Proactive 24 (P24)	1 year	n/a	HA111A1 - 84N
		3 years	n/a	HA111A3 - 84N
		4 years	n/a	HA111A4 - 84N
		5 years	n/a	HA111A5 - 84N
	Critical Support (CS)	1 year	n/a	HA112A1 - 84N
		3 years	n/a	HA112A3 - 84N
		4 years	n/a	HA112A4 - 84N
		5 years	n/a	HA112A5 - 84N



Service and Support, HP Care Pack, and Warranty Information

	6 hour CTR	1 year	UD576E	HA105A1 - 84N
		3 years	UD577E	HA105A3 - 84N
		4 years	n/a	HA105A4 - 84N
		5 years	n/a	HA105A5 - 84N
	Installation	n/a	U7986E	HA113A1 - 5LR
AG817B	HP Software	1 year	Bundled	Bundled
AN983A	Support for Storage,	3 years	n/a	HA106A3 - 7KU
AG819B	9 x 5	4 years	n/a	HA106A4 - 7KU
AN984A		5 years	n/a	HA106A5 - 7KU
	HP Software	1 year	n/a	HA107A1 - 7KU
	Support for Storage,	3 years	n/a	HA107A3 - 7KU
	24 x 7	4 years	n/a	HA107A4 - 7KU
		5 years	n/a	HA107A5 - 7KU
	Support Plus for	1 year	UH596E	HA109A1 - 7KU
	Storage	3 years	UH599E	HA109A3 - 7KU
		4 years	n/a	HA109A4 - 7KU
		5 years	n/a	HA109A5 - 7KU
		Post Warranty	UL100PE	n/a
	Support Plus 24 for	1 year	UH597E	HA110A1 - 7KU
	Storage	3 years	UH600E	HA110A3 - 7KU
		4 years	n/a	HA110A4 - 7KU
		5 years	n/a	HA110A5 - 7KU
		Post Warranty	UL101PE	n/a
	Proactive 24 (P24)	1 year	n/a	HA111A1 - 7KU
		3 years	n/a	HA111A3 - 7KU
		4 years	n/a	HA111A4 - 7KU
		5 years	n/a	HA111A5 - 7KU
	Critical Support	1 year	n/a	HA112A1 - 7KU
	(CS)	3 years	n/a	HA112A3 - 7KU
		4 years	n/a	HA112A4 - 7KU
		5 years	n/a	HA112A5 - 7KU
	6 hour CTR	1 year	UH598E	HA105A1 - 7KU
		3 years	UH601E	HA105A3 - 7KU
		4 years	n/a	HA105A4 - 7KU
		5 years	n/a	HA105A5 - 7KU
	Installation	n/a	U7986E	HA113A1 - 5LR
AG771B	HP Software	1 year	Bundled	Bundled

Service and Support, HP Care Pack, and Warranty Information

Support for Storage, 9 x 5	3 years	n/a	HA106A3 - 7JY
	4 years	n/a	HA106A4 - 7JY
	5 years	n/a	HA106A5 - 7JY
HP Software Support for Storage, 24 x 7	1 year	n/a	HA107A1 - 7JY
	3 years	n/a	HA107A3 - 7JY
	4 years	n/a	HA107A4 - 7JY
Support Plus for Storage	5 years	n/a	HA107A5 - 7JY
	1 year	UH066E	HA109A1 - 7JY
	3 years	UH069E	HA109A3 - 7JY
Support Plus 24 for Storage	4 years	n/a	HA109A4 - 7JY
	5 years	n/a	HA109A5 - 7JY
	Post Warranty	UL100PE	n/a
	1 year	UH067E	HA110A1 - 7JY
	3 years	UH070E	HA110A3 - 7JY
	4 years	n/a	HA110A4 - 7JY
Proactive 24 (P24)	5 years	n/a	HA110A5 - 7JY
	Post Warranty	UL101PE	n/a
	1 year	n/a	HA111A1 - 7JY
	3 years	n/a	HA111A3 - 7JY
	4 years	n/a	HA111A4 - 7JY
Critical Support (CS)	5 years	n/a	HA111A5 - 7JY
	1 year	n/a	HA112A1 - 7JY
	3 years	n/a	HA112A3 - 7JY
	4 years	n/a	HA112A4 - 7JY
6 hour CTR	5 years	n/a	HA112A5 - 7JY
	1 year	UH068E	HA105A1 - 7JY
	3 years	UH071E	HA105A3 - 7JY
	4 years	n/a	HA105A4 - 7JY
Installation	5 years	n/a	HA105A5 - 7JY
	n/a	U7986E	HA113A1 - 5LR

Service and Support, HP Care Pack, and Warranty Information

HP Software Support

- Connect with HP Response Center engineers via telephone, electronic communication, or FAX for assistance in resolving software implementation or operations problems.
- HP Services provides corrective support to resolve identifiable and reproducible software product problems, and to help you identify problems that are difficult to reproduce.
- 9x5 coverage - Service is available during standard business hours, Monday through Friday (excluding holidays).

HP Software Support, 24 x 7

HP Support Plus

- Provides all the benefits of the regular Software Support, plus HP Services engineers are available around the clock 365 days per year.
- Increases the performance and availability of your IT infrastructure with comprehensive, consistent hardware and software services. HP Services engineers deliver onsite hardware support and over-the-phone software support 13 hours per day, 5 days per week.
- Encompasses the HP ProLiant Storage Server products, selected multi-vendor hardware and provides trouble-shooting software problems which range from the Storage Server 2003 operating system to the available utilities. In addition, this service makes software updates available to you at substantial savings.
- Provides recovery and re-configuration assistance of the HP ProLiant Storage Server using the recovery disk and your saved configuration file.

HP Support Plus 24

- Provides all the benefits of the regular Support Plus Care Pack, plus HP Services engineers are available to deliver onsite hardware and over-the-phone software support around-the-clock 365 days per year.

HP Proactive 24

- An integrated hardware and software support solution that combines efficient problem prevention with responsive technical assistance whenever you need it.
- Improves the effectiveness of technologies across your IT infrastructure, and also, establishes a collaborative relationship between you and HP that strengthens your IT team and gives you rapid access to our expertise as issues arise

Software Product Services

- Standard HP warranty ensures Software media will be free of physical defects for a period of 90 days from delivery.
 - These services are available to upgrade the warranty to (1 or 3) full year of 9 hours by 5 days (or 24x7) software advisory and remedial software telephone support, new version license rights, and media and documentation distribution service.
-

Service and Support, HP Care Pack, and Warranty Information

Hardware Product Services

- Installation services
- On-site maintenance (includes warranty support)
- Response time upgrades during the warranty period
- Post-warranty coverage
- RAID setup and performance consulting via statement of work
- Migration service consulting via statement of work

For additional hardware installation and maintenance information, please refer to the URLs listed below:
http://www.hp.com/hps/storage/ns_nas.html

HP offers a portfolio of services ranging from Storage Design and Architecture that provides a complete multi-site design and implementation, to various levels of on-going maintenance support. Additionally the basic warranty service can be enhanced and/or HP Installation services can be purchased. Our Proactive 24 annuity service (with the SAN Module) allows continuous SAN/NAS growth by ensuring that your entire SAN/NAS is safely kept updated with analysis and recommendations on relevant, ongoing firmware (FW) changes and it ensures rapid resolution of complex SAN/NAS issues.

Our SAN Solution Service is a one-time review of your entire SAN/NAS and all the components (applications, HBAs, switches and FW, arrays etc) to ensure that all components are at tested, HP Certified levels. The HP SAN Design/Architecture Service provides as broad and as deep a review and recommendation as needed of how your SAN/NAS environment can be designed and implemented to meet your business storage needs.

The on-going support offerings include various response times (4 hour same day, next day, etc) as well as coverage periods (Monday - Friday, 24x7, 1 yr, 3 yr, etc). These services are available for both hardware and software to ensure all customer support needs are met and can be purchased from either value or volume channels.

Finally HP offers an optional migration service to assist the customer in moving to the newest product release. This may be in the form of a defined kit and service, or may alternatively be performed on a time & material basis.

HP Services allows the customer to leverage HP's experience in selecting and configuring the most widely used security features, and provides an environment that is immediately more available due to increased change control and significantly improved data security.

For more information on these and other service options, please contact any of our worldwide sales offices or visit our Web site at: http://www.hp.com/hps/storage/ns_nas.html

Installation Services

The service deployment activities will include:

- Unpacking the product, performing initial inspection, and setting up product hardware and power connectivity
- Connecting Customer-provided cables
- Setting the network address and setting appropriate domain variables in the NAS operating system
- Configuring the storage by creating a file share
- Configuring user mapping to make the share available for access
- Creating a sample file data copy or Snapshot

Service and Support, HP Care Pack, and Warranty Information

Product number(s):	Care Pack	Duration	Commercial reseller channels	Direct & Enterprise channels
All	Installation for Storage (per event)	One time	Available	HA113A1 - 5D6

Components

The following brick level options/components do not have individual HP Care Pack Services. These items will be included in product HP Care Pack Services into which they are installed.

Disk Drives	Tape Drives	CD/DVD ROM	SCSI Hubs in SBBs
Bus Converters	Backplane RAID Controllers	Power Supplies	Cabling

Product Configuration

In the following you will be guided through a series of steps to help you configure your ProLiant Storage Server.

NOTE: Options ship separately and are not factory integrated.

Step 1 – Choose a Model

Select one of seven available DL380 G5 Storage Server models

NOTE: Models names are based on raw storage capacity, not available user storage.

HP ProLiant DL380 G5 Storage Server Common Specifications	Processor	Quad-Core Intel® Xeon® E5430 (2.66 GHz, 80 Watts, 1333 FSB)
	Cache Memory	12 MB (2 x 6 MB) Level 2
	Memory Type	PC2-5300 Fully Buffered DIMMs (DDR2-667) with Advanced ECC, mirrored and online spare memory capabilities
	Network Controller	Dual Embedded Dual NC373i Multifunction Gigabit NICs with TCP/IP Offload Engine
	Expansion Slots (embedded)	Two half-height low profile x4 PCIe slots
	Additional Expansion Slots (riser card)	PCIe Riser: one x4 PCIe slot and two x8 PCIe slots
	Optical Drive	Slimline DVD-ROM Drive (8x/24x)
	Redundancy	Hot plug redundant power supplies and fully redundant (N+1) hot plug fans
	Remote Management	iLO2 Port with Advanced License Pack Included
	Factory Racking	Factory integrates select Storage Servers with other HP products such as HP ProLiant Servers or Enterprise Virtual Arrays.
		NOTE: #0D1 will appear after the part number on the sales order if HP factory integration is supported.

HP ProLiant DL380 G5 Base Storage Server AG815B	Operating System	Microsoft Windows Storage Server 2003 Release 2, Standard x64 Edition with HP All-in-One Storage Manager
	Number of Processors	1
	Memory	4 GB (2 x 2GB); up to 32GB supported
	Storage Controller	Smart Array P800/512MB BBWC Controller (RAID 0/1/1+0/5/6); occupies single PCIe slot
	Internal Storage	2 x 72GB 3G SAS 10K SFF DP HDDs (for mirrored OS internal to server); No internal hard drives designated for user storage shipped with this model
	External Storage	Support for a maximum of eight MSA60 or four MSA70 enclosures per Smart Array P800 controller. MSA enclosures can be intermixed depending on storage requirements.
	Form Factor	Rack (2U), (3.5-inch)

HP ProLiant DL380 G5 1.16TB SAS Storage Server AG816B	Operating System	Microsoft Windows Storage Server 2003 Release 2, Standard x64 Edition with HP All-in-One Storage Manager
	Number of Processors	1
	Memory	4 GB (2 x 2GB); up to 32GB supported
	Storage Controller	Smart Array P800/512MB BBWC Controller (RAID 0/1/1+0/5/6); occupies single PCIe slot
	Internal Storage	8 x HP 146GB 3G SAS 10K SFF DP HDDs

Product Configuration

External Storage	Support for a maximum of eight MSA60 or four MSA70 enclosures per Smart Array P800 controller. MSA enclosures can be intermixed depending on storage requirements.
Form Factor	Rack (2U), (3.5-inch)

HP ProLiant DL380 G5 4.5TB SATA Storage Server AG817B

Operating System	Microsoft Windows Storage Server 2003 Release 2, Standard x64 Edition with HP All-in-One Storage Manager
Number of Processors	1
Memory	4 GB (2 x 2GB); up to 32GB supported
Storage Controller	Smart Array P800/512MB BBWC Controller (RAID 0/1/1+0/5/6); occupies single PCIe slot
Internal Storage	2 x 72GB 3G SAS 10K SFF DP HDDs (for mirrored OS internal to server); No internal hard drives designated for user storage shipped with this model
External Storage	HP StorageWorks 60 Modular Smart Array enclosure with dual power supplies and 6 x 750GB SATA 7.2K LFF MDL HDDs NOTE: 4.5TB (raw) of user storage is installed in the included MSA60 external enclosure NOTE: Maximum of eight MSA60 or four MSA70 enclosures per Smart Array P800 controller. MSA enclosures can be intermixed depending on storage requirements
Form Factor	Rack (4U), (7-inch): DL380 G5 Storage Server (2U) plus MSA60 enclosure (2U)

HP ProLiant DL380 G5 6TB SATA Storage Server AN983A

Operating System	Microsoft Windows Storage Server 2003 Release 2, Standard x64 Edition with HP All-in-One Storage Manager
Number of Processors	1
Memory	4 GB (2 x 2GB); up to 32GB supported
Storage Controller	Smart Array P800/512MB BBWC Controller (RAID 0/1/1+0/5/6); occupies single PCIe slot
Internal Storage	2 x 72GB 3G SAS 10K SFF DP HDDs (for mirrored OS internal to server); No internal hard drives designated for user storage shipped with this model
External Storage	HP StorageWorks 60 Modular Smart Array enclosure with dual power supplies and 6 x 1TB SATA 7.2K LFF MDL HDDs NOTE: 6TB (raw) of user storage is installed in the included MSA60 external enclosure NOTE: Maximum of eight MSA60 or four MSA70 enclosures per Smart Array P800 controller. MSA enclosures can be intermixed depending on storage requirements
Form Factor	Rack (4U), (7-inch): DL380 G5 Storage Server (2U) plus MSA60 enclosure (2U)

HP ProLiant DL380 G5 1.8TB SAS Storage Server AG819B

Operating System	Microsoft Windows Storage Server 2003 Release 2, Standard x64 Edition with HP All-in-One Storage Manager
Number of Processors	1
Memory	4 GB (2 x 2GB); up to 32GB supported
Storage Controller	Smart Array P800/512MB BBWC Controller (RAID 0/1/1+0/5/6); occupies single PCIe slot

Product Configuration

Internal Storage	2 x 72GB 3G SAS 10K SFF DP HDDs (for mirrored OS internal to server); No internal hard drives designated for user storage shipped with this model
External Storage	HP StorageWorks 60 Modular Smart Array enclosure with dual power supplies and 6 x 300GB 3G SAS 15K LFF DP ENT HDDs NOTE: 1.8TB (raw) of user storage is installed in the included MSA60 external enclosure NOTE: Maximum of eight MSA60 or four MSA70 enclosures per Smart Array P800 controller. MSA enclosures can be intermixed depending on storage requirements
Form Factor	Rack (4U), (7-inch): DL380 G5 Storage Server (2U) plus MSA60 enclosure (2U)

HP ProLiant DL380 G5 2.7TB SAS Storage Server AN984A	Operating System	Microsoft Windows Storage Server 2003 Release 2, Standard x64 Edition with HP All-in-One Storage Manager
	Number of Processors	1
	Memory	4 GB (2 x 2GB); up to 32GB supported
	Storage Controller	Smart Array P800/512MB BBWC Controller (RAID 0/1/1+0/5/6); occupies single PCIe slot
	Internal Storage	2 x 72GB 3G SAS 10K SFF DP HDDs (for mirrored OS internal to server); No internal hard drives designated for user storage shipped with this model
	External Storage	HP StorageWorks 60 Modular Smart Array enclosure with dual power supplies and 6 x 450GB 3G SAS 15K LFF DP ENT HDDs NOTE: 2.7TB (raw) of user storage is installed in the included MSA60 external enclosure NOTE: Maximum of eight MSA60 or four MSA70 enclosures per Smart Array P800 controller. MSA enclosures can be intermixed depending on customer storage requirements
	Form Factor	Rack (4U), (7-inch): DL380 G5 Storage Server (2U) plus MSA60 enclosure (2U)

HP ProLiant DL380 G5 SAN Gateway Storage Server AG771B	Operating System	Microsoft Windows Unified Data Storage Server 2003, Enterprise x64 Edition
	Number of Processors	2
	Memory	8 GB (4 x 2GB); up to 64GB supported
	Storage Controller	Smart Array P400/512MB BBWC Controller (RAID 0/1/1+0/5/6); occupies single PCIe slot
	Internal Storage	2 x 72GB 3G SAS 10K SFF DP HDDs (for mirrored OS internal to server); No internal hard drives designated for user storage shipped with this model
	External Storage	Designed for attachment to XP, EVA, MSA2000 or Fibre Channel SAN via Fibre-channel or SAS HBA (not included) NOTE: This model is primarily intended for use as a clustered SAN gateway, but can support direct attached storage with addition of a Smart Array P800 controller and MSA 60/70 enclosures.
Form Factor	Rack (2U), (3.5-inch)	

Product Configuration

Step 2 - Add Another Processor

You can add a second processor to the Base, 1.16TB SAS, 4.5TB SATA, 6TB SATA, 1.8TB SAS, and 2.7TB SAS models.

NOTE: The SAN Gateway model comes standard with two processors

Processor	Quad-Core Intel® Xeon® Processor E5430 (2.66 GHz, 80 Watts, 1333 FSB)	458575-B21
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Step 3 - Add More Memory

Memory

NOTE: Base, 1.16TB SAS, 4.5TB SATA, 6TB SATA, 1.8TB SAS, and 2.7TB SAS models come standard with 4 GB (2 x 2GB) of low power memory and are expandable to 32GB. The SAN Gateway model comes standard with 8GB (4 x 2GB) of low power memory and is expandable to 64GB

2 GB FBD PC2-5300 2 x 1 GB Low Power Single Rank Kit	461826-B21
4 GB FBD PC2-5300 2 x 2 GB Low Power Dual Rank Kit	461828-B21
8 GB FBD PC2-5300 2 x 4 GB Low Power Dual Rank Kit	466440-B21
1 GB FBD PC2-5300 2 x 512 MB Single Rank Kit	397409-B21
2 GB FBD PC2-5300 2 x 1 GB Dual Rank Kit	397411-B21
4 GB FBD PC2-5300 2 x 2 GB Dual Rank Kit	397413-B21
8 GB FBD PC2-5300 2 x 4 GB Dual Rank Kit	397415-B21
16 GB FBD PC2-5300 2 x 8 GB Dual Rank Kit	413015-B21
64 GB FBD PC2-5300 8 x 8 GB Dual Rank Kit	495604-B21

Step 4 - Add Network Adapters

NOTE: DL380 G5 Storage Servers support only PCIe expansion cards.

Dual Embedded NC373i Multifunction Gigabit Server Adapters with TCP/IP Offload Engine standard. Select additional cards for higher performance and further redundancy.

NOTE: Multifunction Server Adapters (including the embedded NC373i) support the installed Microsoft Windows Server 2003 Scalable Networking Pack, which enables TCP Chimney offload, Receive-side Scaling (RSS), and Network Direct Memory Access (NetDMA) features.

Network Adapters	HP NC110T PCI Express Gigabit Server Adapter	434905-B21
	HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
	HP NC364T PCI Express Quad Port Gigabit Server Adapter	435508-B21
	HP NC373F PCI Express Multifunction Gigabit Server Adapter	394793-B21
	HP NC373T PCI Express Multifunction Gigabit Server Adapter	394791-B21
	HP NC380T PCI Express Dual Port Multifunction Gigabit Server Adapter	394795-B21
	HP NC522SFP Dual Port 10GbE Server Adapter	468332-B21

NOTE: A minimum of two gigabyte (2 GB) of server memory is required per each NC522SFP adapter.

Step 5 – Add More Storage

NOTE: DL380 G5 Storage Servers support only PCIe expansion cards.



Product Configuration

DL380 G5 Storage Servers (except the SAN Gateway model) come standard with one installed Smart Array P800 controller for internal drives and easy external expansion; the SAN Gateway model comes standard with one Smart Array P400 controller. Select additional controllers from the below list only if required.

NOTE: Please consult specifications for available expansion slots (which varies by model) when ordering addition storage controllers.

DL380 G5 Storage Servers accommodate an internal maximum of 2 operating system SFF HDDs plus 6 data SFF HDDs (note that the 1.16TB SAS model comes standard with eight internal SAS drives that span both O/S and data; all other models come standard with two 72GB SFF O/S drives only).

NOTE: The DL380 G5 SAN Gateway Storage Server is primarily intended for use as a SAN/array gateway, but can support internal storage and/or direct attach storage with a Smart Array P800 controller and MSA50/60/70 enclosures. Conversely, all other models can support SAN/array connection via installation of a recommended Fibre Channel or SAS HBA.

Storage Controllers	SAS Controllers	
	Smart Array E500 Controller	
	Smart Array E500/256MB Controller	435129-B21
	Smart Array P400 Controller	
	HP Smart Array P400/256MB Controller	405132-B21
	HP Smart Array P400/512MB BBWC Controller	411064-B21
	512MB Battery-backed cache upgrade	405148-B21
	NOTE: Contains batter and memory module. For Smart Array P400 Controller.	
	Battery-backed write cache upgrade	383280-B21
	NOTE: Contains battery only. For Smart Array P400 Controller.	
	Smart Array P400 Battery Attach Kit	417836-B21
	NOTE: This option kit contains a 24" battery cable and adhesive material for installing a battery into the HP ProLiant DL380 G5 if a Smart Array P400 is integrated outside of the factory. For all solutions, please refer to the server QuickSpecs and User's Manual for detailed installation instructions.	
	Smart Array P800 Controller	
	HP Smart Array P800/512 BBWC Controller	381513-B21
	NOTE: Please see the following QuickSpecs for Technical Specifications and additional information:	
	http://h18000.www1.hp.com/products/quickspecs/12700_div/12700_div.html (Smart Array E500 Controller)	
	http://h18000.www1.hp.com/products/quickspecs/12400_div/12400_div.html (Smart Array P400 Controller)	
	http://h18000.www1.hp.com/products/quickspecs/12616_div/12616_div.html (Smart Array P800 Controller)	
	SAS HBAs	
	HP SC44Ge Host Bus Adapter	416096-B21
	HP SC08Ge SAS HBA	488765-B21
	NOTE: Supports MSA2012sa Modular Storage Arrays	
	NOTE: Please see the following QuickSpecs for additional information:	
	http://h18004.www1.hp.com/products/quickspecs/12617_div/12617_div.html (SC44Ge HBA)	
	SCSI HBAs	
	HP SC11Xe Host Bus Adapter	412911-B21
	HP U320e SCSI Host Bus Adapter	AH627A

Product Configuration

NOTE: Please see the following QuickSpecs for Technical Specifications and additional information:

http://h18000.www1.hp.com/products/quickspecs/12566_div/12566_div.html
(SC11Xe HBA)

Host Bus Adapters for Shared Storage

The DL380 G5 SAN Gateway Storage Server is designed and optimized for integration with a SAN or storage array; however any DL380 G5 Storage Server model can be connected to a SAS storage array or Fibre Channel SAN or array by adding a recommended HBA.

NOTE: An HBA is not included as standard with any ProLiant Storage Server. HBA selection is left as your choice based on existing infrastructure and/or desired array support.

NOTE: DL380 G5 Storage Servers support only PCIe expansion cards.

NOTE: For the complete listing of Fibre Channel Host Bus Adapters, please see: <http://h18006.www1.hp.com/storage/saninfrastructure/hba.html>

HP StorageWorks FC2142SR 4Gb PCIe HBA	A8002A
HP StorageWorks FC2242SR Dual Channel 4 Gb PCIe HBA	A8003A
HP StorageWorks FC1142SR 4Gb PCIe HBA	AE311A
HP StorageWorks FC1242SR Dual Channel 4 Gb PCIe HBA	AE312A
HP StorageWorks 81Q PCI-e FC HBA	AK344A
HP 82Q 8Gb Dual Port PCI-e FC HBA	AJ764A
HP StorageWorks 81E 8Gb SP PCI-e FC HBA	AJ762A
HP 82E 8Gb Dual-port PCI-e FC HBA	AJ763A
HP SC08Ge SAS HBA	488765-B21

External Storage Enclosures

HP StorageWorks Modular Smart Arrays

HP StorageWorks 60 Modular Smart Array 418408-B21

NOTE: Rack-mountable 12-drive (3.5" 3G SAS/1.5G SATA) 2U enclosure with 3Gb/s SAS host connectivity and redundant power supplies.

HP StorageWorks MSA60 1.8TB SAS HDD Bundle (MSA60 w/12 146GB 15K SAS LFF HDD) AG822A

HP StorageWorks MSA60 9TB SATA HDD Bundle (MSA60 w/12 750GB 15K SATA LFF HDD) AG823A

HP StorageWorks MSA60 3.6TB SAS HDD Bundle (MSA60 w/12 300GB 15K SAS LFF HDD) AG824A

NOTE: The MSA60 bundles are available in the Americas, Asia Pacific (AP) and Japan only. They are not available in Europe, Middle East and Africa.

HP StorageWorks 70 Modular Smart Array 418800-B21

NOTE: Rack-mountable 25-drive (2.5" 3G SAS/1.5G SATA) 2U enclosure with 3Gb/s SAS host connectivity and redundant power supplies.

HP StorageWorks MSA70 1.8TB SAS HDD Bundle (MSA70 w/25 72GB 15K SAS SFF HDD) AG825A

HP StorageWorks MSA70 3.6TB SAS HDD Bundle (MSA70 w/25 146GB 10K SAS SFF HDD) AG893A

Product Configuration

NOTE: The MSA70 bundles are available in the Americas, Asia Pacific (AP) and Japan only. They are not available in Europe, Middle East and Africa.

SAN / Array Support: MSA, EVA, and XP

NOTE: Fibre Channel and SAS models require addition of a Host Bus Adapter.

NOTE: Please see the Storage Array Systems QuickSpecs below for more information about configuration requirements.

HP StorageWorks Modular Smart Arrays

http://h18006.www1.hp.com/products/quickspecs/13187_div/13187_div.html

http://h18006.www1.hp.com/products/quickspecs/13331_div/13331_div.html

http://h18006.www1.hp.com/products/quickspecs/13330_div/13330_div.html

HP StorageWorks Enterprise Virtual Array Family

http://h18006.www1.hp.com/products/quickspecs/12408_div/12408_div.html

HP StorageWorks XP Disk Arrays

http://h18006.www1.hp.com/products/quickspecs/12072_div/12072_div.html

Hard Drives (Internal Expansion)

SAS Enterprise (ENT) Drives 2.5" Drives, Hot Plug

HP 300GB 6G SAS 10K SFF DP ENT HDD	507127-B21
HP 300GB 3G SAS 10K SFF DP ENT HDD	492620-B21
HP 146GB 6G SAS 15K SFF DP ENT HDD	512547-B21
HP 146GB 6G SAS 10K SFF DP ENT HDD	507125-B21
HP 146GB 3G SAS 15K SFF DP ENT HDD	504062-B21
HP 146GB 3G SAS 10K SFF DP HDD	418367-B21
HP 146GB 3G SAS 10K SFF SP HDD	431958-B21
HP 72GB 6G SAS 15K SFF DP ENT HDD	512545-B21
HP 72GB 3G SAS 15K SFF DP HDD	418371-B21
HP 72GB 3G SAS 15K SFF SP HDD	431935-B21
HP 72GB 3G SAS 10K SFF DP HDD	384842-B21
HP 72GB 3G SAS 10K SFF SP HDD	375861-B21
HP 36GB 3G SAS 15K SFF DP HDD	418369-B21
HP 36GB 3G SAS 15K SFF SP HDD	431933-B21

NOTE: Please see the SAS Hard Drive QuickSpecs for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature:

http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html
(Worldwide)

SATA Entry (ETY) Drives 2.5", Hot Plug

HP 250GB 3G SATA 5.4K SFF ETY HDD	460355-B21
HP 120GB 1.5G SATA 5.4K SFF ETY HDD	458924-B21

NOTE: SATA drives have a 1 year warranty. Please see the SATA Hard Drive QuickSpecs for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature:

http://h18000.www1.hp.com/products/quickspecs/11940_div/11940_div.html
(Worldwide)

Hard Drives

SAS Enterprise (ENT) Drives 3.5", Hot Plug



Product Configuration

(External Expansion)

HP 450GB 3G 15K 3.5" DP SAS ENT HDD	454232-B21
HP 400GB 3G SAS 10K 3.5" DP ENT HDD	459508-B21
HP 300GB 3G 15K SAS 3.5" SP HDD	431944-B21
HP 300GB 3G 15K SAS 3.5" DP HDD	416127-B21
HP 146GB 3G 15K SAS 3.5" SP HDD	375872-B21
HP 146GB 3G 15K SAS 3.5" DP HDD	384854-B21
HP 72GB 3G 15K SAS 3.5" SP HD	375870-B21
HP 72GB 3G 15K SAS 3.5" DP HDD	384852-B21
SAS Midline (MDL) Drives 3.5", Hot Plug	
HP 1TB 7.2K 3.5" DP SAS MDL HDD	461137-B21
HP 750GB 7.2K 3.5" DP SAS MDL HDD	461135-B21
SAS Enterprise (ENT) Drives 2.5" Drives, Hot Plug	
HP 300GB 3G 10K 2.5-inch SAS DP HDD	492620-B21
HP 146GB 3G SAS 10K SFF SP HDD	431958-B21
HP 146GB 3G SAS 10K SFF DP HDD	418367-B21
HP 72GB 3G SAS 10K SFF SP HDD	375861-B21
HP 72GB 3G SAS 10K SFF DP HDD	384842-B21
HP 72GB 3G SAS 15K SFF SP HDD	431935-B21
HP 72GB 3G SAS 15K SFF DP HDD	418371-B21
HP 36GB 3G SAS 15K SFF SP HDD	431933-B21
HP 36GB 3G SAS 15K SFF DP HDD	418369-B21

NOTE: Please see the SAS Hard Drive QuickSpecs for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature:

http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html
(Worldwide)

SATA Midline (MDL) Drives 3.5", Hot Plug

HP 1TB 3G SATA 7.2K 3.5" MDL HDD	454146-B21
HP 750GB 3G SATA 7.2K 3.5" MDL HDD	458930-B21
HP 500GB 3G SATA 7.2K 3.5" MDL HDD	458928-B21
HP 250GB 3G SATA 7.2K 3.5" MDL HDD	458926-B21
HP StorageWorks MSA2 500GB 7.2K 3.5 inch SATA HDD (MSA2000 series only)	AJ738A
HP StorageWorks MSA2 750GB 7.2K 3.5 inch SATA HDD (MSA2000 series only)	AJ739A

SATA Entry (ETY) Drives 2.5", Hot Plug

HP 250 GB 3G 5.4K 2.5-inch SFF SATA ETY HDD	460355-B21
HP 120 GB 1.5G 5.4K 2.5inch SFF SATA ETY HDD	458924-B21
HP 60 GB 1.5 G 5.4K 2.5-inch SFF SATA HDD	379306-B21

NOTE: SATA drives have a 1 year warranty. Please see the SATA Hard Drive QuickSpecs for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature:

http://h18000.www1.hp.com/products/quickspecs/12091_div/12091_div.html
(Worldwide)

Product Configuration

Step 6 - Add Optional Software

HP x64 Windows Unified Data Storage Server OS Upgrade Software-only Microsoft Windows Unified Data Storage Server 2003, Enterprise x64 Edition operating system upgrade for select legacy ProLiant Storage Server SAN Gateway models running Microsoft Windows Storage Server 2003 (Enterprise Edition only): T5322A

- DL380 G5 SAN Storage Server (AG456A)
- DL585 Storage Server (AE454A)
- DL585 Storage Server (383719-B21)
- DL585 Storage Server (393973-B21)
- DL380 G4 SAN Storage Server (AE438A)
- DL380 G4 SAN Storage Server (371227-B21)

This upgrade requires a clean install and includes all Windows Unified Storage Server 2003, Enterprise x64 Edition features, including Microsoft iSCSI Software Target, Microsoft Cluster Server (MSCS), and 64-bit processing.

NOTE: Check for HP and 3rd-party software qualification with 64-bit Windows operating systems before purchase and installation

NOTE: This upgrade is incompatible with ProLiant Storage Servers running Windows Storage Server 2003 R2 Standard Edition (either x86 or x64)

Microsoft® iSCSI Software Target from HP

NOTE: Microsoft iSCSI Target Software is compatible only with ProLiant Storage Servers running Windows Storage Server 2003 R2, Standard x86 or x64 Edition (including the DL380 G5 Base, 1.16TB SAS, 4.5TB SATA, 6TB SATA, 1.8TB SAS, and 2.7TB SAS models). The DL380 G5 SAN Gateway model already includes Microsoft iSCSI Software Target as part of its Windows Unified Data Storage Server 2003 operating system.

Microsoft iSCSI Software Target adds block storage capability to ProLiant Storage Servers and creates a single platform that delivers file, print, and application storage services, all over existing Ethernet networks. It is a powerful iSCSI software solution that provides affordable application storage provisioning, protection, and availability for small and medium office environments. It helps administrators consolidate storage capacity, improve storage utilization, minimize system downtime, simplify backup operations, enable rapid recovery, and provides high availability for key applications and services.

Installing Microsoft iSCSI Software Target on a ProLiant Storage Server that supports HP All-in-One Storage Manager enables several features within HP ASM, including "Host an Exchange Storage Group" and "Host a SQL Server Database" wizards and the ability to provision and manage storage for standards-compliant non-Windows iSCSI initiators such as VMWare and Linux. Select ProLiant Storage Server models (including DL380 G5 Storage Servers except for the SAN Gateway model) are compatible with All-in-One Storage Manager; see:

<http://www.hp.com/go/simplestorage> for more information.

Microsoft iSCSI Target Software 1 LTU

T4433A

Product Configuration

NOTE: For more information on Microsoft® iSCSI Software Target from HP:
http://h18006.www1.hp.com/products/storageworks/ms_iscsi/index.html

HP Data Protector Express Software Data Protector Express has a very simple product structure yet easily enables powerful and robust data protection and disaster recovery. The base product is the Data Protector Express Backup Server. Installing this creates the Data Protector Express Storage Domain. Options are installed to add other machines to the Data Protector Express Storage Domain for protection and to add additional functionality. Installing HP Data Protector Express (Backup Server) on a ProLiant Storage Server that supports HP All-in-One Storage Manager enables data protection features within HP ASM, including backup of file shares or application stores using application-aware snapshots to tape, disk, or other removable media target. All ProLiant Storage Servers support using Data Protector as a backup software solution and select models (including DL380 G5 Storage Servers except for the SAN Gateway model) are compatible with All-in-One Storage Manager; see:

<http://www.hp.com/go/simplestorage> for more information.

HP Data Protector Express 4.0 Backup Server (base product)

BB117BA

NOTE: Please see the [HP Data Protector Express QuickSpecs](#) for additional information on adding options to HP Data Protector Express software:

http://h18000.www1.hp.com/products/quickspecs/12337_div/12337_div.html (Worldwide)

HP Data Protector Express Software Options

HP Data Protector Express 4.0 Network Server Agent

BB121BA

HP Data Protector Express 4.0 Network Server Agent 3 pack

BB122BA

HP Data Protector Express 4.0 Application Online Agent

BB125BA

HP Data Protector Express 4.0 Bare Metal Disaster Recovery Option

BB128BA

HP Data Protector Express 4.0 D2Any2Any Option

BB130BA

HP Data Protector Express 4.0 Drive Expansion Option

BB133BA

NOTE: For more information on HP Data Protector Express Software:

<http://www.hp.com/go/dataprotectorexpress>

HP StorageWorks Storage Mirroring Software HP StorageWorks Storage Mirroring (SM) Software is an ideal entry host-based software product for IP networks. SM does not require high bandwidth Fibre Channel networks, high capacity replication and zero down time service levels. Storage Mirroring provides near real-time full application or file recovery up to the last byte replication. SM is an excellent choice for low bandwidth; low storage volume changes and meets business recovery goals within tens of minutes or hours. The immediate return on investment is realized in the reduced management cost associated with branch or small offices networks.

NOTE: An installable 60-day demo of Storage Mirroring Software is included with all ProLiant Storage Servers.

Installing HP Storage Mirroring on a ProLiant Storage Server that supports HP All-in-One Storage Manager enables replication features within HP ASM including streamlined setup of near real-time replication of file shares or application stores to a remote target. All ProLiant Storage Servers support using HP Storage Mirroring as a host-based replication solution and select models (including DL380 G5 Storage Servers except for the SAN Gateway model) are compatible with All-in-One Storage

Product Configuration

Manager; see: <http://www.hp.com/go/simplestorage> for more information.

Special note about Microsoft iSCSI Software Target and replication:

All HP ProLiant Storage Servers include the Distributed File System Replication (DFS-R) feature in the pre-installed Windows Storage Server 2003 R2 and Windows Unified Data Storage Server 2003 operating systems. DFS-R is a file-based replication technology that only replicates files when they are closed. Microsoft iSCSI Software Target does not close the virtual disk files (.vhd files) while they are in use, and so these files are not replicated during normal usage when replicating using DFS-R. Therefore, if iSCSI Software Target virtual disk files need to be replicated, DFS-R should not be used, and HP StorageWorks Storage Mirroring software should be considered instead. Storage Mirroring software asynchronously replicates each write into the file system to a secondary system, and therefore it can be used to effectively replicate iSCSI Software Target virtual disk files.

NOTE: DL380 G5 Storage Servers include a desktop link to a white paper with more information on replicating iSCSI targets.

HP Storage Mirroring v5.1 Windows Media Kit

TA696A

HP Storage Mirroring NAS Edition Stock LTU

TA713A

HP Storage Mirroring NAS Edition E-LTU

TA701AAE

NOTE: For more information go to the HP StorageWorks Storage Mirroring website at: <http://h18006.www1.hp.com/products/storage/software/sm/index.html>

HP StorageWorks X1000 Upgrade to Windows Storage Server 2008 Standard Software

Select ProLiant G5 Storage Servers with the Microsoft Windows Storage Server 2003 R2 Standard x64 Edition operating system are eligible for a software-only upgrade to the Microsoft Windows Storage Server 2008 Standard x64 Edition operating system:

- DL160 G5 Storage Servers (AJ672A, AJ673A, AJ674A, AJ675A, AJ676A)
- DL185 G5 Storage Servers (AG914A, AG915A, AG916A, AG917A, AG918A, AG919A, AG920A, AM472A)
- DL380 G5 Storage Servers (AG815A*, AG816A, AG817A*, AG818A*, AG819A*, AG820A*, AG815B, AG816B, AG817B, AG819B, AN983A, AN984A)

This upgrade requires a clean install and contains all X1000 Network Storage System features, including Microsoft iSCSI Software Target and HP X1000 Automated Storage Manager Software.

* Require replacement of 2 x 36GB mirrored drives in the first two drive slots with 2 x 72GB (or greater) drives before installation

NOTE: ML110 G5 and ML350 G5 Storage Servers are not eligible, nor are HP All-in-One Storage Systems and HP ProLiant Storage Servers older than G5.

NOTE: Some expansion cards, including HBAs and NICs, may not be supported by Windows Storage Server 2008. Check Windows Server 2008 driver availability before purchase and installation.

NOTE: Check for HP and 3rd-party software qualification with 64-bit Windows Server 2008 operating systems before purchase and installation.

Product Configuration

HP StorageWorks X1000 Upgrade to Windows Storage Server 2008 Standard Software

TA725A

HP StorageWorks X3000 Upgrade to Windows Storage Server 2008 Enterprise Software Select ProLiant G5 SAN Gateway Storage Servers with the Microsoft Windows Unified Data Storage Server 2003 Enterprise x64 Edition operating system are eligible for a software-only upgrade to the Microsoft Windows Storage Server 2008 Enterprise x64 Edition operating system:

- DL380 G5 x64 SAN Storage Server (AG771A)
- DL380 G5 SAN Gateway Storage Server (AG771B)
- DL380 G5 Integrated HA Storage Server (AQ245A)-requires an upgrade license for each node
- SB460c SAN Gateway Storage Server (AN583A)

This upgrade requires a clean install and contains all X3000 Network Storage System features, including Microsoft iSCSI Software Target and a Microsoft Cluster Server (MSCS) license.

NOTE: X3000 Network Storage Gateways may be clustered only with gateways also running Microsoft Windows Storage Server 2008, Enterprise x64 Edition operating system (HP recommends like hardware as well).

NOTE: Some expansion cards, including HBAs and NICs, may not be supported by Windows Storage Server 2008. Check Windows Server 2008 driver availability before purchase and installation.

NOTE: Check for HP and 3rd-party software qualification with 64-bit Windows Server 2008 operating systems before purchase and installation.

HP StorageWorks X3000 Upgrade to Windows Storage Server 2008 Enterprise Software

TA726A

Step 7 - Add a Backup Solution

NOTE: For the complete listing of data protection offerings for HP ProLiant Storage Servers, please visit: <http://www.hp.com/products1/storage/compatibility/tapebackup/NAS/index.html>

Step 8 - Order HPTS Service Care Packs

Service Care Packs or warranty upgrades enhance the base hardware warranty provided with your HP ProLiant Storage Server. The Care Packs provide support for product software and operating system with extended hours of coverage and reduced response time. And Care Packs allow the customer to budget fixed cost support rather than variable costs that include parts and labor.

Note that the standard HP warranty ensures software media will be free of physical defect for a period of 90 days from delivery. However, all ProLiant Storage Servers come with a full year of 9 hours by 5 days software advisory and remedial software telephone support, new version license rights, and media and documentation distribution service. Extended hours of coverage and additional years of service are available should the customer require more support.

See "**Service and Support Upgrade options**" section for more information on available Care Packs for your ProLiant Storage Server.

Memory

Standard Memory

PC2-5300 Fully Buffered DIMMs (DDR2-667) with 4:1 and 2:1 interleaving available (interleaving requires identical DIMMs)

- 4 GB (2 x 2GB) low-power: Base, 1.16TB SAS, 4.5TB SATA, 6TB SATA, 1.8TB SAS, and 2.7TB SAS models
- 8 GB (4 x 2GB) low-power: SAN Gateway model

Upgrading Memory and Memory Interleaving

When upgrading memory, DIMMs 1A and 2A must match. DIMMs 3B and 4B, DIMMs 5C and 6C, and DIMMs 7D and 8D must match and must be installed as a pair. When DIMMs 1A and 2A are populated the system is automatically configured for 2:1 interleaving. When all 4 banks are populated the system is automatically configured for 4:1 interleaving. When four, six, or eight DIMMs are populated with identical DIMMs the system is automatically configured for bank interleaving.

Maximum Memory

- 32 GB (all models except SAN Gateway model)
- 64 GB (SAN Gateway model)

Standard Memory Replaced with Optional Memory

Up to 64 GB of memory is available with the removal of the standard memory and the optional installation of 8 GB PC2-5300 Fully Buffered DIMMs (DDR2-667) memory kits.

NOTE: Chart does not represent all possible configurations.

Configuration		Slot							
		1	2	3	4	5	6	7	8
Standard (all models except SAN Gateway model)	4 GB	2 GB	2 GB	Empty	Empty	Empty	Empty	Empty	Empty
Standard (SAN Gateway model)	8 GB	2 GB	2 GB	2 GB	2 GB	Empty	Empty	Empty	Empty
Maximum (all models except SAN Gateway model)	32 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB
Maximum (SAN Gateway model)	64 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB

NOTE: In the online spare configuration, the ROM automatically configures the last populated bank as the spare memory. If only banks A and B are populated, bank B is the spare bank. If banks A, B, and C are populated, bank C is the spare bank, Online spare memory is configured through RBSU.

NOTE: Mirrored Memory uses mirrored banks to provide a high level of memory redundancy. Customer chooses to implement or not: User selectable via BIOS and default is off.

Memory

Following are memory options available from HP:

2 GB FBD PC2-5300 2 x 1 GB Low Power Single Rank Kit	461826-B21
4 GB FBD PC2-5300 2 x 2 GB Low Power Dual Rank Kit	461828-B21
8 GB FBD PC2-5300 2 x 4 GB Low Power Dual Rank Kit	466440-B21
1 GB FBD PC2-5300 2 x 512 MB Single Rank Kit	397409-B21
2 GB FBD PC2-5300 2 x 1 GB Dual Rank Kit	397411-B21
4 GB FBD PC2-5300 2 x 2 GB Dual Rank Kit	397413-B21
8 GB FBD PC2-5300 2 x 4 GB Dual Rank Kit	397415-B21
16 GB FBD PC2-5300 2 x 8 GB Dual Rank Kit	413015-B21
64 GB FBD PC2-5300 8 x 8 GB Dual Rank Kit	495604-B21

In Advanced ECC mode, FBDIMMs must be populated as specified in the following table:

Configuration	Bank A 1A and 3A	Bank B 5B and 7B	Bank C 2C and 4C	Bank D 6D and 8D
1	X	-	-	-
2	X	X	-	-
3	X	X	X	-
4	X	X	X	X

Online spare memory configuration

Online spare FBDIMM configuration requirements (in addition to general configuration requirements):

- When only bank A is being used, it must be fully populated with dual-rank FBDIMMs.
- If banks A and C are being used, they must be fully populated.
- If installed, bank A and bank C must contain FBDIMMs with identical part numbers.
- If installed, bank B and bank D must also contain FBDIMMs with identical part numbers

In online spare mode, FBDIMMs must be populated as specified in the following table:

Configuration	Branch 0 Bank A 1A and 3A	Branch 0 Bank C 2C and 4C	Branch 1 Bank B 5B and 7B	Branch 1 Bank D 6D and 8D
1*	X	-	-	-
2	X	X	-	-
3	X	X	X	X

*Configuration 1 is only supported if using bank A, populated with dual-rank FBDIMMs. All FBDIMMs 1GB and above are dual-rank.

After installing FBDIMMs, use RBSU to configure the system for online spare memory support.

Memory

Mirrored memory configuration

Mirrored memory FBDIMM configuration requirements (in addition to general configuration requirements):

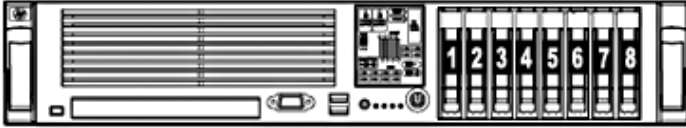
- Banks A and B must be fully populated.
- Bank A and bank B must contain FBDIMMs with identical part numbers. If installed, bank C and bank D must also contain FBDIMMs with identical part numbers.

When using mirrored memory mode, FBDIMMs must be populated as specified in the following table:

Configuration	Bank A 1A and 3A	Bank B 5B and 7B	Bank C 2C and 4C	Bank D 6D and 8D
1	X	X	-	-
2	X	X	X	X

NOTE: After installing FBDIMMs, use RBSU to configure the system for mirrored memory support ("Configuring mirrored memory" on page 57).

Storage



1-8 Eight SFF SAS hot plug hard drive bays

Drive Support

	Quantity Supported	Position Supported	Controller
Removable Media			
Slimline DVD-ROM Drive	1	Slimline bay	Integrated IDE

Hard Drives (Internal Storage)

Hot Plug 2.5" (SFF) SAS

	Quantity Configured	Position Supported	Controller
146GB 3G SAS 10K SP	2 x 72GB 10k standard (all models except 1.16TB SAS model)	Mirrored O/S drives installed in slots 1 & 2	Smart Array P800 Controller (all models except SAN Gateway model)
146GB 3G SAS 10K DP			
72GB 3G SAS 10K SP			
72GB 3G SAS 10K DP			
72GB 3G SAS 15K SP			
72GB 3G SAS 15K DP			
36GB 3G SAS 15K SP			
36GB 3G SAS 15K DP			
	Up to 6 additional internal drives supported		
	8 x 146GB standard (1.16TB SAS model)	1-8	Smart Array P800 Controller

Hot Plug 2.5" (SFF) SATA

	Quantity Supported	Position Supported	Controller
60GB SATA 5.4K	Up to 6 in empty slots	3-8	Smart Array P800 or P400 Controller
120GB SATA 5.4K			
250GB SATA 5.4K			

Storage

External Storage

	Quantity Supported	Position Supported	Controller
Modular Smart Array 60	Up to 8 per Smart Array P800 controller	External	Smart Array P800 Controller Smart Array E500 controller
Modular Smart Array 70	Up to 4 per Smart Array P800 controller	External	Smart Array P800 Controller Smart Array E500 controller
HP 2000sa Modular Smart Array Controller	Up to 4	External	HP SC08Ge Host Bus Adapter

Modular Smart Array 2000fc: http://h18000.www1.hp.com/products/quickspecs/12991_div/12991_div.html (Worldwide)

Maximum Raw Storage Capacity

Internal	1.16TB raw (8 x 146GB SAS SFF)
External	96TB raw (96 x 1TB SATA) [1 x SA P800 connected to 8 x MSA60 full of 1TB SATA HDDs]
Total	97.16TB raw (8 x 146GB int. + 96 x 1TB ext.)

Factory RAID Configuration

NOTE: Where applicable, user storage is factory configured into 2TB (maximum) logical drives to accommodate Microsoft iSCSI Software Target (which currently does not support either dynamic disks or logical drives greater than 2TB on basic disks). However, Windows Storage Server 2003 R2 or Windows Unified Data Storage Server 2003 O/S and Smart Array P800 and P400 controllers do support creation of logical drives greater than 2TB using GUID Partitioning Table (GPT) disk architecture.

Base, 4.5TB SATA, 6TB SATA, 1.8TB SAS, 2.7TB SAS, and SAN Gateway models

	Volume	RAID level	Physical Drives
Logical Disk 1	Operating System	RAID 1	0-1
Logical Disk 2	DON'T ERASE recovery partition	RAID 1	0-1

1.16TB SAS model

	Volume	RAID level	Physical Drives
Logical Disk 1	Operating System	RAID 5	0-7
Logical Disk 2	DON'T ERASE recovery partition	RAID 5	0-7
Logical Disk 3	User Data	RAID 5	0-7

Storage

Tape Drives, Tape Autoloaders, and Tape Libraries

NOTE: For an up-to-date listing of the latest O/S Support details for each of the Tape Drives listed below, please see the following: <http://h18000.www1.hp.com/products/quickspecs/division/10233.html> (Worldwide)

NOTE: For an up-to-date listing of the latest O/S Support details for each of the Tape Autoloaders & Tape Libraries listed below, please see the following: <http://h18000.www1.hp.com/products/quickspecs/division/10809.html> (Worldwide)

NOTE: SAS Tape Drives: Connecting hard drive cage and SAS tape to the same SAS Controller using split cable (supplied with tape drive) deactivates 1 of the hard drive bays. Actual hard drive bay deactivated depends on where split cable plugs into SAS drive connector. Example: 3x SAS cable connector plugged into SAS drive connector (5-8) on the back of the hard drive cage would mean drive bay 8 is deactivated.

NOTE: For complete listing of tape drive offerings see <http://www.hp.com/products1/storage/compatibility/tapebackup/ISS/index.html>
For recommended tape drive offerings for this ProLiant server see the following:

	Position Supported	Controller	Part Number
HP StorageWorks SCSI Tape Drives, External LTO-1 Ultrium 232 LTO-2 Ultrium 448 LTO-3 Ultrium 960 LTO-3 Ultrium 920 LTO-4 Ultrium 1760 LTO-4 Ultrium 1840 DAT 40 DAT 72 DAT 160 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP SC11Xe Host Bus Adapter	412911-B21
HP StorageWorks USB Tape Drives, External DAT 40 USB DAT 72 USB DAT 160 USB 1U USB Rack-Mount Kit	External	USB 2.0 Port	N/A
HP StorageWorks SAS Tape Drives, External DAT 160 SAS LTO-2 Ultrium 448 SAS LTO-3 Ultrium 920 SAS LTO-4 Ultrium 1760 SAS LTO-4 Ultrium 1840 SAS 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP SC44Ge Host Bus Adapter NOTE: Please visit http://www.hp.com/go/connect for details about minimum SAS controller firmware version and SAS cabling requirements.	416096-B21
HP StorageWorks SCSI	External	HP SC11Xe Host Bus Adapter	412911-B21



Storage

Tape Automation, External

DAT 72X10 Autoloader
1/8 G2 Autoloader
MSL2024
MSL4048

HP U320e SCSI Host Bus Adapter
NOTE: Only valid for MSL tape libraries.

AH627A

HP StorageWorks SAS Tape Automation, External

1/8 G2 Autoloader
MSL2024
MSL4048

External

HP SC44Ge Host Bus Adapter

416096-B21

NOTE: Please visit <http://www.hp.com/go/connect> for details about minimum SAS controller firmware version and SAS cabling requirements.

HP StorageWorks Fibre Tape Libraries, External

MSL2024
MSL4048

External

Please consult the EBS connectivity matrix at <http://www.hp.com/go/ebs> for detailed connectivity information

N/A

HP StorageWorks D2D Backup Systems

D2D120
D2D130
D2D2503i
D2D4004i

External

Embedded Network Controller

N/A

Power Specifications

Power Supply Specification – AC	Part number		380622-001			
	Spare Kit		403781-001			
Operational Input Voltage Range (Vrms)	90 to 264					
Frequency Range (Nominal) (Hz)	47 to 63 (50/60)					
Nominal Input Voltage (Vrms)	100	120	208	220	230	240
Max Rated Output Wattage Rating	800	850	1000	1000	1000	1000
Nominal Input Current (A rms)	10.0	8.8	5.85	5.5	5.2	4.97
Max Rated Input Wattage Rating (Watts)	980	1035	1193	1186	1172	1169
Max. Rated VA (Volt-Amp)	1000	1056	1217	1210	1196	1193
Efficiency (%)	81.5	82	84	84	85	85.5
Power Factor	0.98	0.98	0.98	0.98	0.98	0.98
Leakage Current (mA)	0.44	0.52	0.91	0.96	1.00	1.04
Max. Inrush Current (A peak)	30	30	30	30	30	30
Max. Inrush Current duration (mS)	3	3	3	3	3	3

Power Supply Specification - DC	Part number		433634-B21			
	Spare Kit		419613-001			
Operational Input Voltage Range (Vrms)	-36.0 to -72.0V DC					
Frequency Range (Nominal) (Hz)	DC					
Nominal Input Voltage (Vrms)	36	48	72			
Max Rated Output Wattage Rating	1210	1210	1210			
Nominal Input Current (A rms)	38	29	20			
Max Rated Input Wattage Rating (Watts)	980	1035	1193			
Max. Rated VA (Volt-Amp)	1368	1392	1440			
Efficiency (%)	87.6	87.6	86			
Max. Inrush Current (A peak)	60	60	60			
Max. Inrush Current duration (mS)	100	100	100			

NOTES:

- To review typical system power ratings use the Active Answers Power Calculator which is available via the online tool located at url: <http://h30099.www3.hp.com/configurator/calc/Power%20Calculator%20Catalog.xls>

To drill down to calculators:

- Click on: "ProLiant Servers"
- Click on the Server of interest. Example: DL380 G5
- Click on: "Power Calculator" link. (You may need to scroll down to see it)

Technical Specifications

System Unit	Dimensions (HxWxD) (with feet/bezel)	3.38 x 17.54 x 26.01 in (8.59 x 44.54 x 66.07 cm)	
	Weight (approximate)	Maximum	60 lb (27.22 kg)
		Minimum	47.18 lb (20.41 kg)
Input Requirements (per power supply)	Input Requirements (per power supply)	Rated Line Voltage	100-132 VAC, 200-240 VAC
		Rated Input Current	10A (100VAC), 10A (120VAC), 6.1A (200VAC)
		Rated Input Frequency	50 to 60 Hz
		Rated Input Power	1000/1056/1205 W
BTU Rating	BTU/HR	3490/3680/4150	
Power Specifications	Power Specifications	To review typical system power ratings use the Active Answers Power Calculator which is available via the online tool located at URL: http://h30099.www3.hp.com/configurator/powercalcs.asp .	
		To drill down to calculators: - Click on: "ProLiant Servers" - Click on the Server of interest. Example: DL380 G5 - Click on: "Power Calculator" link. (You may need to scroll down to see it.)	
Power Supply Output Power (per power supply)	Power Supply Output Power (per power supply)	Rated Steady-State Power	800/850/1000 W
		Maximum Peak Power	800/850/1000 W
Temperature Range	Temperature Range	Operating	50° to 95° F (10° to 35° C) at sea level with an altitude de-rating of 1.8° F per 1000 ft (1.0° C per 304.8 m) to 10,000 ft (3048 m) no direct sunlight allowed. Maximum rate of change is 18° F/Hr (10° C/Hr). Upper operating limit is 10,000 ft (3,048 m) or 70 Kpa/10.1 psia. System performance may be reduced if operating with a fan fault or above 30° C.
		Non-operating	-22° to 140° F (-30° to 60° C) Maximum rate of change is 36° F/Hr (20° C/Hr). Upper non-operating limit is 30,000 ft (9,144 m) or 30.3KPa/4.4 psia.
Maximum Wet Bulb Temperature	Maximum Wet Bulb Temperature	101.7° F (38.7° C)	
Relative Humidity (non-condensing)	Relative Humidity (non-condensing)	Operating	10% to 90% relative humidity (Rh), 28° C maximum wet bulb temperature.
		Non-operating	5% to 95% relative humidity (Rh), 38.7° C maximum wet bulb temperature.
Acoustic Noise	Acoustic Noise	Idle Minimum (Fixed Disk Drives Spinning)	
		L WAd (BELS)	6.1
		L pAm (dBA)	44
		Operating Minimum (Random Seeks to Fixed Disks)	
	L WAd (BELS)	6.1	

Technical Specifications

L pAm (dBA) 44

Smart Array P400 Controller	Disk Drive and Enclosure Interface	3G SAS (Serial Attached SCSI) 1.5G SATA (Serial Advanced Technology Attachment)
	SAS Connectors	2 internal (SFF8484) x4 wide port connectors
	Cache Memory Speed	DDR2-533MHz with 40 or 72-bit wide bus provides up to 4.2 GB/s maximum bandwidth.
	Server Interface	x8 2.5G PCIe provides 2GB/s maximum bandwidth.
	SAS Speed	x8 3G SAS provides 2.4GB/s maximum bandwidth.
	Cache Memory	40-bit 256MB cache (72-bit 512MB module upgrades available); ECC protection, battery-backed, and transportable
	Logical Drives Supported	Up to 32 logical drives
	Maximum Logical Drive Capacity	3TB (6 x 500GB)
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space
	RAID Support	RAID 6 with ADG (Advanced Data Guarding) requires Battery Backed Write Cache Upgrade RAID 5 (Distributed Data Guarding) RAID 1+0 (Striping & Mirroring) RAID 0 (Striping)

Two Embedded NC373i Multifunction Server Adapters	Network Interface	10Base-T/100Base-TX/1000Base-TX		
	Compatibility	IEEE 802.3 10Base-T		
		IEEE 802.3ab 1000Base-T		
		IEEE 802.3u 100Base-TX		
	Data Transfer Method	PCI Express, four lanes (x4)		
	Network Transfer Rate	10Base-T (Half-Duplex)	10 Mb/s	
		10Base-T (Full-Duplex)	20 Mb/s	
		100Base-TX (Half-Duplex)	100 Mb/s	
		100Base-TX (Full-Duplex)	200 Mb/s	
		1000Base-TX (Half and Full-Duplex)	2000Mb/s	
Connector	Two RJ-45			
Cable Support	10Base-T	Categories 3, 4 or 5 UTP; up to 328 ft (100 m)		
	100Base-TX	Category 5 or higher UTP; up to 328 ft (100 m)		
	1000BaseTX	Category 5 or higher UTP; up to 328 ft (100 m)		

NOTE: The NC373i Multifunction Gigabit Server Adapters support the installed Microsoft Windows Server 2003 Scalable Networking Pack, which enables TCP Chimney offload, Receive-side Scaling (RSS), and Network Direct Memory Access (NetDMA) features.



Technical Specifications

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For hard drives, 1 GB = 1 billion bytes. Actual formatted capacity is less.