

Overview

Windows-powered unified storage built on industry standards

You have better things to do than worry about storage. You're juggling multiple management interfaces, security concerns, and shrinking backup windows -- all while your users demand more and more space. You need a shared storage solution that's powerful and easy to manage, and you need it now.

HP StorageWorks X1000 Network Storage Systems are the fast and easy way to add Windows-powered shared storage to your small or medium IT environment. They're versatile unified storage, so you get more for your money since it can be a file server, an iSCSI target for application/virtual environment storage, or both. You'll spend less time and effort on maintenance and management once you consolidate to a centralized shared storage system, and industry standards will protect your investment by providing compatibility with your network and applications. The operating system is pre-installed and comes with HP StorageWorks X1000 Automated Storage Manager, so you'll be up and running in minutes.

What is an X1000 Network Storage System?

HP StorageWorks X1000 Network Storage Systems are enhanced Windows-powered shared storage solutions for your small or medium business, branch office, or workgroup environment. They are built on industry-standard HP ProLiant servers and come with the Microsoft® Windows Storage Server 2008 operating system pre-installed. Like many Network Attached Storage (NAS) devices, they connect via Ethernet, offer optimized file serving for heterogeneous clients, and are designed to install in minutes. They can also connect to servers or virtual machines to host application storage with the included iSCSI target. Since HP X1000 Network Storage Systems are Windows-based, integration into your Windows environment is easy, your antivirus and backup applications run right on the box, and management has a familiar look and feel. So you can add shared storage to your network quickly and get back to what matters most: running your business.

What's New

- X1600 292GB SAS Network Storage System. This model uses a new X1600 chassis with 2 rear drive slots. Those rear drive slots contain 2 x 146GB SFF SAS drives with the OS pre-installed and mirrored. The 12 LFF drive slots in the front are the same as the X1600 models. ONLY the new sku, AW528A, uses the new rear drive chassis, the other X1600 skus only have the 12LFF drive slots in the front, no rear drives.

Models

HP StorageWorks X1400 Network Storage System

HP X1400 Network Storage Systems are 1U rack-mount shared storage solutions that deliver multi-protocol file sharing, print serving, and application storage in a compact and affordable package. They're easy to install and manage, making them perfect for a small workgroup, small business or remote office.

HP StorageWorks X1400 Network Storage System (FIO Model -- no drives)

AP803A

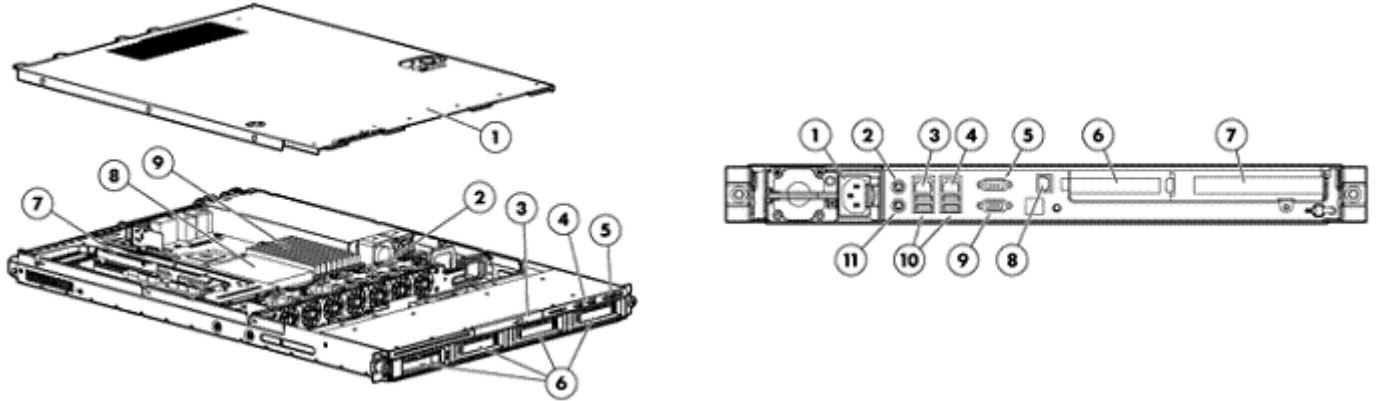
HP StorageWorks X1400 2TB SATA Network Storage System (4 x 500GB)

AP786A

HP StorageWorks X1400 4TB SATA Network Storage System (4 x 1TB)

AP787A

Overview



Front View:

1. Access panel
2. System fans
3. DVD-RW drive
4. USB Ports (2)
5. Power Button, UID Button, and Front LED Indicators
6. Four (4) 3.5" hot-plug SAS/SATA hard drive bays
7. PCIe expansion slot cage
8. Quad-Core Intel® Xeon® processor
9. DDR3 Registered (RDIMM) memory -- nine slots

Rear View:

1. Power supply
2. Mouse connector
3. NIC 1 Port / Shared iLO 2 Management Port
4. NIC 2 Port
5. Serial Port
6. PCIe slot (occupied by Smart Array controller with external SAS port for expandability)
7. PCIe slot (open)
8. Dedicated Integrated Lights-Out 2 management port (optional)
9. VGA Port
10. USB Ports (4)
11. Keyboard connector

HP StorageWorks X1600 Network Storage System

HP X1600 Network Storage Systems deliver high capacity and high performance and drive down your cost per GB. Quad-Core processing, up to 12TB internal storage capacity, and ready external expandability enhance this ultra-dense 2U shared storage solution for small, medium, and workgroup environments.

HP StorageWorks X1600 Network Storage System (FIO model -- no drives)

AP804A

HP StorageWorks X1600 292GB Storage System (2x146GB)

AW528A

HP StorageWorks X1600 6TB SATA Network Storage System (6 x 1TB)

AP788A

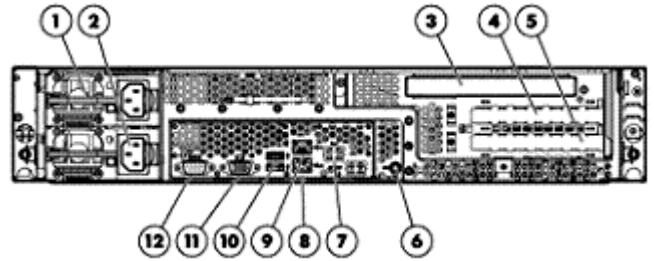
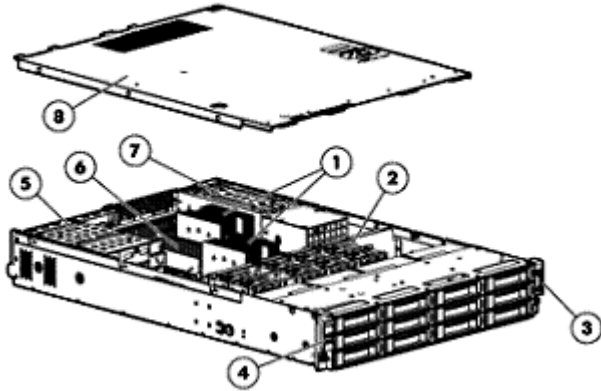
HP StorageWorks X1600 12TB SATA Network Storage System (12 x 1TB)

AP789A

HP StorageWorks X1600 5.4TB SAS Network Storage System (12 x 450GB)

AP790A

Overview



Front View:

1. Quad-Core Intel® Xeon® processors (one standard, up to two supported)
2. System fans
3. Power Button and Front LED Indicators
4. USB Ports (2)
5. PCIe expansion slot cage
6. DDR3 Registered (RDIMM) memory - twelve slots
7. Power supply cage
8. Access panel

Rear View:

1. Redundant hot-plug power supplies
2. Power supply cable socket
3. DVD-RW drive (sku AW528 does not have a DVD drive)
4. PCIe slot (open) (sku AW528 has 2 SFF drive slots)
5. PCIe slot (occupied by Smart Array controller with external SAS port for expandability)
6. UID LED Button
7. Integrated Lights-Out 2 management port
8. NIC 1 Port
9. NIC 2 Port
10. USB Ports (2)
11. VGA Port
12. Serial Port

HP StorageWorks X1800 Network Storage System

HP X1800 Network Storage Systems deliver Enterprise-class performance, expandability, and flexibility. Up to two quad-core processors, five open PCIe slots for additional options, and built-in external SAS connections for additional disk enclosures make it the shared storage solution of choice for SMB, workgroup, and small Enterprise environments.

HP StorageWorks X1800 Network Storage System (FIO model -- no drives)

AP791A

HP StorageWorks X1800 292GB SAS Network Storage System (2x146GB)

AP897A

HP StorageWorks X1800 2.4TB SAS Network Storage System (8 x 300GB)

AP792A

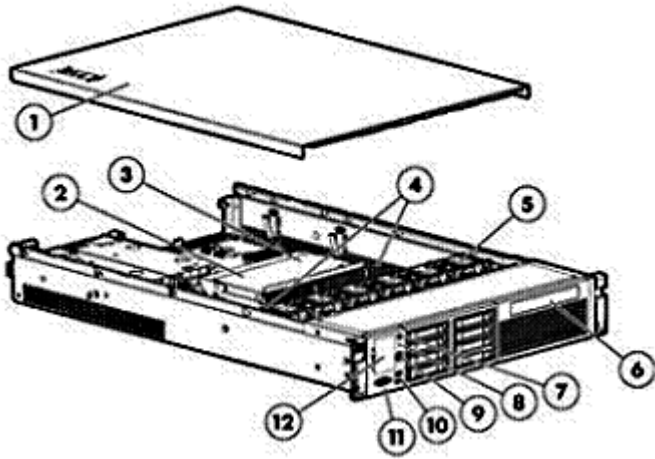
HP StorageWorks X1800 6TB SATA Network Storage System (6 x 1TB in MSA60 enclosure)

AP794A

HP StorageWorks X1800 3.6TB SAS Network Storage System (12 x 300GB in MSA70 enclosure)

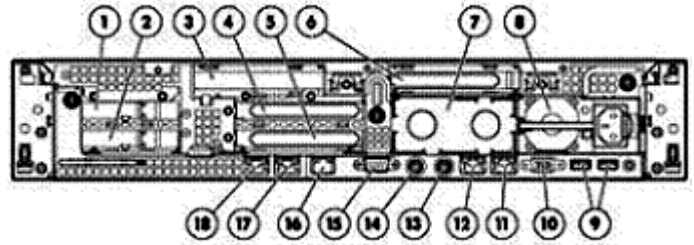
AP795A

Overview



Front View:

1. Access panel
2. Quad-Core Intel® Xeon® processor
3. Second Quad-Core Intel® Xeon® processor (optional)
4. DDR3 Registered (RDIMM) memory - eighteen slots
5. System fans, hot plug with N+1 redundancy
6. DVD-RW drive
7. UID LED button
8. Health LED
9. Power On/Standby button and system power LED
10. USB Ports (2)
11. VGA Port
12. Systems Insight Display



Rear View:

1. PCIe slot 5 (open)
2. PCIe slot 6 (open)
3. PCIe slot 4 (open)
4. PCIe slot 2 (open)
5. PCIe slot 3 (open)
6. PCIe slot 1 (occupied by Smart Array controller with external SAS ports for expandability)
7. Power supply 2 (standard)
8. Power supply 1 (standard)
9. USB Ports (2)
10. VGA Port
11. NIC 1 Port
12. NIC 2 Port
13. Mouse connector
14. Keyboard connector
15. Serial Port
16. Integrated Lights-Out 2 management port
17. NIC 3 Port
18. NIC 4 Port

Features and Benefits

Manage, expand, and protect a single centralized storage system

Consolidate islands of direct-attached storage to one easy-to-use Windows-powered shared storage platform. Since it's versatile unified storage, it can be a file server (or disk-based backup / replication target), an iSCSI target for application/virtual environment storage, or both.

Go from out-of-the-box to sharing storage in minutes, not hours.

The Windows-powered operating system is pre-installed and user storage is easy to provision with HP ASM, so you can add storage to your network quickly and securely.

Optimized file services for clients

In a Windows (SMB/CIFS) environment, there's no better way to serve files. Windows Storage Server 2008 delivers better file serving performance than standard Windows Server, has exclusive features like Single Instance Storage (SIS) file de-duplication, and supports Volume Shadow Copy Service snapshots. In mixed environments, you get the flexibility of heterogeneous support for additional protocols like NFS, HTTP, FTP, and WebDAV.

Shared storage for servers and virtual machines

NAS isn't just about sharing files any more-it's about sharing information. With the included Microsoft iSCSI Software Target, you can host server storage for applications like Microsoft Exchange, Microsoft SQL, Microsoft SharePoint, or Oracle, and you can drive additional consolidation by hosting storage for Microsoft Hyper-V, VMWare, or Xen deployments.

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, backup, and storage management applications, and the Microsoft Management Console (MMC) user interface has a familiar look and feel.

HP ProLiant industry-standard hardware

Relax -- your investment is protected because you're not locked into proprietary platforms. X1000 Network Storage Systems are built on HP ProLiant technology and feature Quad-Core Intel® Xeon® processors, support for SATA or SAS internal hot-plug hard drives, and easy external expansion with HP MSA enclosures.

HP X1000 Automated Storage Manager Software (HP ASM)

Create, migrate, manage, and protect shared storage without the need for storage expertise using HP ASM Software, which is included with all X1000 Network Storage Systems. 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 file and iSCSI data using automated best practice settings, and you can enable optional data protection features within HP ASM by installing HP Data Protector Express Software, and/or HP Storage Mirroring Software.

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, Quotas, File Screening, Storage Reporting, and Distributed File System (DFS) Replication.

Remote and Enterprise manageability

You can manage and troubleshoot from outside the office at both the operating system level (with Remote Desktop or HTTPS) and at the platform level (using Integrated Lights-Out 2 with the included Advanced Pack). X1000 Network Storage Systems also integrate with HP Systems Insight Manager (HP SIM) and support ProLiant Support Pack.

Standard Features

Operating System

Microsoft Windows Storage Server 2008, Standard x64 Edition

- 64-bit processing (compatible with 32-bit applications)
 - Optimized for File Serving: Better file serving performance out of the box than a general-purpose Windows Server 2008 installation on the same hardware.
 - HP-enhanced File Server Management Console: Features the familiar look and feel of the Microsoft Management Console (MMC).
 - HP StorageWorks Rapid Startup: Simplifies and accelerates new device deployment by presenting basic system settings on your first boot.
 - 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.
 - 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)
 - Simultaneous support for multiple file serving protocols, including SMB/CIFS, NFS, HTTP, FTP, and WebDAV
 - 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
 - Support for up to 32GB of SDRAM
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Standard Features

Microsoft iSCSI Software Target

- Microsoft iSCSI Software Target versions 3.1 and 3.2 are interoperable with iSCSI initiators that comply with the standard iSCSI protocol. At the request of certain OEM vendors, Microsoft has tested discovery, log-on/log-off, and I/O of the following non-Microsoft iSCSI initiators to determine interoperability with the Microsoft iSCSI Software Target:
- SUSE Linux Enterprise Server 10
- Red Hat Enterprise Linux 5
- QLogic QLE4062C-SP, firmware 3.00.01.24

Support

HP is the customer's primary contact for the resolution of all iSCSI initiator/iSCSI target interoperability issues. Microsoft is committed to working with HP to resolve interoperability issues involving the Microsoft iSCSI Software Target, but Microsoft is not responsible for resolving any issues caused by non-Microsoft iSCSI initiators.

- IETF-ratified iSCSI specification compliant
- IPv6 support (note: HP ASM does not support IPv6)
- iSNS integration
- IPsec encryption
- CHAP authentication
- Seamless integration into Microsoft Management Console (MMC) user interface
- LUN resizing
- IP Take-Over support
- Multi-Path I/O (MPIO) support
- Application-aware snapshots with Microsoft Volume Shadow Copy Service (VSS)
NOTE: Limit of 512 snapshots per independent iSCSI/Application volume and 64 snapshots for file share volumes. If iSCSI LUNs and file shares are on a common volume the iSCSI snapshot limit is 448.
- Compatible with backup applications certified with Microsoft Windows Server 2008
- Sample Application Server Compatibility: Microsoft Exchange 2000, 2003, and 2007 Servers; Microsoft SQL Server 2000, 2005, and 2008
- Sample Virtual Environment Compatibility: Microsoft Hyper-V, VMWare, Xen

HP X1000 Automated Storage Manager (HP ASM) 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.

- 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 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 ASM to specify a dedicated, primary network--plus a secondary subnet--for your IP-based storage traffic

Standard Features

- 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
- Provides management and provisioning of iSCSI storage for standards-compliant non-Windows iSCSI initiators such as VMWare, Linux, etc.
- Application data hosting and migration wizard using HP and Microsoft 'Best Practice' storage provisioning 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).
- 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.
- Application data hosting and iSCSI Setup wizard for other 'User Defined' Application (Oracle, MySQL, VMware ESX, etc...)
- 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 D2DAny 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)
- 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**

* 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

Standard Features

	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 ***
Application-aware snapshots	o	o	o	o

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

Management

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

Remote system management via Remote Desktop or Telnet

HP ProLiant Onboard Administrator (powered by the Integrated Lights-Out 2 management processor) simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration. It functions without additional software, and can be accessed from any location via a web browser.

Capabilities of the HP ProLiant Onboard Administrator include:

- Rom-based Setup Utility (RBSU) and Option Rom Configuration for Arrays (ORCA)
- IML and iLO event logging
- Automatic Server Recovery (ASR)
- OS independent hardware health status
- Present server power consumption
- Virtual Unit ID control
- Remote serial console
- Virtual power button control
- Dynamic Sector Repairing (with Smart Array controller)
- Drive Parameter Tracking (with Smart Array controller)
- Hot Spare Boot
- Advanced license (standard): Virtual KVM remote graphical console, power management capabilities such as power measurement, regulation, and capping, new iLO Text Console, automatic and on-demand video recording of server events, global team collaboration for up to four remote users, virtual media (floppy, CD/DVD, USB key), virtual folders, and enterprise security (directory services and two-factor authentication).

For additional information, please see: www.hp.com/go/iLO

QuickSpecs

HP StorageWorks X1000 Network Storage Systems

Standard Features

Processor / Cache Memory	X1400	X1600	X1800
	Intel® Xeon® Processor E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800)	Intel® Xeon® Processor E5520 (2.26 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)	Intel® Xeon® Processor E5530 (2.40 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)

Chipset	Intel® 5520 Chipset
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Memory	Type	DDR3 Registered (RDIMM) standard		
		Maximum (by O/S license) 32 GB		
		X1400	X1600	X1800
Standard		2GB (1 x 2GB)	6GB (3 x 2GB)	6GB (3 x 2GB)
DIMM Sockets		9	12	18

Network Controller	NIC Ports Controller	X1400	X1600	X1800
		2 (1 shared with iLO2) HP NC326i Integrated Dual Port Gigabit Server Adapter	2 HP NC362i Integrated Dual Port Gigabit Server Adapter	4 2 x HP NC382i Integrated Dual Port Multifunction Gigabit Server Adapters with TCP/IP Offload Engine

Expansion Slots	Slot Number	Bus Speed	Connector Width	Bus Number*	Form Factor	Notes
X1400	1	x16 PCI-Express	x16	21	Full length, full height	
	2	x4 PCI-Express	x8	10	Half length, low-profile	Occupied by Smart Array controller
X1600	1	x8 PCI-Express	x8	5	Full length, full height	Occupied by Smart Array controller
	2	x8 PCI-Express	x8	6	Full length, full height	
X1800	1	x8 PCI-Express	x16	7	Half Length, full height	Occupied by Smart Array controller
	2	x4 PCI-Express	x8	10	Half Length, full height	
	3	x4 PCI-Express	x8	13	Half Length, full height	



Standard Features

4	x8 PCI-Express	x16	16	Full length, full height
5	x4 PCI-Express	x8	20	Half length, low-profile
6	x4 PCI-Express	x8	23	Half length, low-profile

* Default bus assignment. Inserting cards with PCI bridges may alter the actual bus assignment number.

Storage Controller

	X1400	X1600	X1800
Controller(s)	HP Smart Array P212/256MB Controller with battery-backed write cache (BBWC)	HP Smart Array P212/256MB Controller with BBWC	Embedded HP Smart Array P410i/256MB Controller with BBWC plus HP Smart Array P411/512MB Controller with BBWC
RAID	0/1/1+0/5/5+0	0/1/1+0/5/5+0	0/1/1+0/5/5+0
Internal SAS connectors	1	1	2
External SAS connectors	1	1	2

NOTE: Smart Array Advanced Pack License Key upgrade (516471-B21) is required to enable RAID 6, 6+0.

Storage

	X1400	X1600	X1800
Hard Drives			
Internal	Four 3.5" (Large Form Factor) hot-plug bays Preconfigured models: <ul style="list-style-type: none"> 4 x 500GB SATA 7.2K LFF MDL HDDs (2TB SATA model) 4 x 1TB SATA 7.2K LFF MDL HDDs (2TB SATA model) 	Twelve 3.5" (Large Form Factor) hot-plug bays in front all models, two (Small Form Factor) hot-plugs bays in rear (AW528A only) Preconfigured models: <ul style="list-style-type: none"> 2 X146GB SAS 10K SFF (292GB SAS model) 6 x 1TB SATA 7.2K LFF MDL HDDs (6TB SATA model) 12 x 1TB SATA 7.2K LFF MDL HDDs (12TB SATA model) 12 x 450GB 3G SAS 15K LFF ENT DP HDDs (5.4TB) 	Eight 2.5" (Small Form Factor) hot-plug bays Preconfigured models: <ul style="list-style-type: none"> 8 x 300GB 6G SAS 10K SFF HDDs (2.4TB SAS model) 2 x 146GB 6G SAS 10K SFF HDDs for O/S mirror (292 GB SAS, 3.6TB SAS and 6TB SATA and models)

Standard Features

		SAS model)	
External	Support for MSA 60/70, D2600, D2700 and MDS600	Support for MSA 60/70, D2600, D2700 and MDS600	Support for MSA 60/70, D2600, D2700 and MDS600
			Preconfigured models:
			<ul style="list-style-type: none"> ● 6 x 1TB SATA 7.2K LFF MDL HDDs in an MSA60 enclosure (6TB SATA model) ● 12 x 300GB 6G SAS 10K SFF HDDs in an MSA70 enclosure (2.4TB SAS model)
Optical Drive	DVD-RW (all models)		

Maximum Storage Capacity (raw)

	X1400	X1600	X1800
Internal SATA	8 TB	24TB	4TB
Internal SAS	4 TB	5.4 TB	2.4 TB
Internal plus External	308TB 8TB internal + 100TB on P212 + 200TB on additional P411	312TB (24TB internal + 88TB on P212 + 200TB on additional P411	1.220 PB(4TB (SFF) internal + 200TB on P812 + 1016TB on up to 5 additional P812s

Power Supply

X1400	X1600	X1800
500 Watts, Non Hot Plug, Non Redundant	750 Watts, Hot Plug Redundant, 92% Efficiency	750 Watts, Hot Plug Redundant, 92% Efficiency

Power Cords

X1400	X1600	X1800
One high voltage power cord (IEC C13 to C14) standard	Two high voltage power cords (IEC C13 to C14) standard	Two high voltage power cords (IEC C13 to C14) standard

NOTE: X1000 Network Storage Systems are primarily connected to PDUs in racks, so they ship standard with only PDU C-14 to C13 power cord(s). However, you may alternatively plug an X1000 Network Storage System into a wall receptacle by ordering a separate power cord (see options below).

System Fans

X1400	X1600	X1800
Non-hot plug, Non-redundant	Non-hot plug, redundant	Fully redundant hot plug (N+1)

Standard Features

Form Factor	X1400	X1600	X1800
	Rack Mount (1U), (1.75 in/4.45 cm)	Rack Mount (2U), (3.5 in/8.89 cm)	Base and 2.4TB SAS models: Rack Mount (2U), (3.5 in/8.89 cm)
			6TB SATA and 3.6TB SAS models (with MSA enclosures): Rack (4U)

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 5,350 sq cm (830 square inches) 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 7 cm (2.75 inches)

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/proliantdl145/index.html>

Telco and Threaded Hole Rack Support

Telco Rack Kit:

NOTE: 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

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 from small office environments to ensure business continuity without an outside IT staff. Installing HP Storage Mirroring on an HP X1000 Network Storage System enables replication features within HP X1000 Automated Storage Manager Software (HP ASM), including streamlined setup of near real-time replication of file shares or application stores to a remote target. See: <http://www.hp.com/go/simplestorage> for more information.

For more information on HP Storage Mirroring Software:
<http://www.hp.com/go/storageworks/storagemirroring>

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 an X1000 Network Storage System and disaster recovery in the event of a serious incident. An X1000 Network Storage System 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 an HP X1000 Network Storage System enables data protection features within HP X1000 Automated Storage Manager Software (HP ASM), including backup of file shares or application stores using application-aware snapshots to tape, disk, or other removable media targets. 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 Data Protector Software

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 HP X1000 Network Storage Systems support using Data Protector as a backup software solution.

For more information on HP Data Protector:
<http://h18006.www1.hp.com/products/storage/software/dataprotector/index.html>

Optional Software

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), 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: 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 Storage Essentials NAS Manager Software

Provides comprehensive Network Attached Storage (NAS) management capabilities for HP ProLiant Storage Server. 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>

Models Pre-configured

These models come with factory-selected drives and the Microsoft Windows Storage Server 2008 operating system pre-installed

Choose a Pre-configured Model

NOTE: All options ship separately and are not factory integrated

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

HP X1000 Network Storage Systems

Common Specifications	Operating System	Microsoft® Windows Storage Server 2008 Standard x64 Edition with Microsoft iSCSI Software Target and HP X1000 Automated Storage Manager Software
	Optical Drive	DVD-RW standard for QuickRestore disaster recovery
	Management	Microsoft Management Console (MMC)-based user interface (also accessible via HTTPS)
	Remote Access	HP ProLiant Integrated Lights-Out 2 with Advanced Pack license; Telnet; Remote Desktop
	Factory Racking	The factory can integrate select X1000 Network Storage Systems with other HP products such as HP ProLiant Servers, MSA arrays, or Enterprise Virtual Arrays. NOTE: #0D1 will appear after the part number on the sales order if HP factory integration is supported.

X1400 Models

Common Specifications	Processor	Intel® Xeon® Processor E5504 2.00 GHz; 1 standard
	Memory	2GB (1 x 2GB)
	Storage Controller	Smart Array Controller with 1 internal SAS port for internal drives and 1 external SAS port for expansion
	Network Ports	2 x Gigabit Ethernet (1 shared with iLO2)
	Expansion Slots	2 x PCIe (one slot occupied by Smart Array Controller)
	Form Factor	1U Rack

HP StorageWorks X1400 2TB SATA Network Storage System	AP786A
Internal Storage: 4 x 500GB SATA 7.2K 3.5" MDL hot-plug HDDs	
HP StorageWorks X1400 4TB SATA Network Storage System	AP787A
Internal Storage: 4 x 1TB SATA 7.2K 3.5" MDL hot-plug HDDs	

Models Pre-configured

X1600 Models

Common Specifications	Processor	Intel® Xeon® Processor E5520 2.26 GHz; 1 standard, up to 2 supported
	Memory	6GB (3 x 2GB)
	Storage Controller	Smart Array Controller with 1 internal SAS port for internal drives and 1 external SAS port for expansion
	Network Ports	2 x Gigabit Ethernet
	Expansion Slots	2 x PCIe (one slot occupied by Smart Array Controller)
	Redundancy	Hot plug redundant power supply
	Form Factor	2U Rack

HP StorageWorks X1600 292GB SAS Network Storage System AW528A

Internal Storage: 2 x 146GB SAS 10K 2.5" DP ENT hot-plug HDDs in rear drive slots

NOTE: up to 12 additional internal drive supported in open slots

HP StorageWorks X1600 6TB SATA Network Storage System AP788A

Internal Storage: 6 x 1TB SATA 7.2K 3.5" MDL hot-plug HDDs

NOTE: Up to 6 additional internal drives supported in open slots.

HP StorageWorks X1600 12TB SATA Network Storage System AP789A

Internal Storage: 12 x 1TB SATA 7.2K 3.5" MDL hot-plug HDDs

HP StorageWorks X1600 5.4TB SAS Network Storage System AP790A

Internal Storage: 12 x 450GB 3G SAS 15K 3.5" DP ENT hot-plug HDDs

X1800 Models

Common Specifications	Processor	Intel® Xeon® Processor E5530 2.40 GHz; 1 standard, up to 2 supported
	Memory	6GB (3 x 2GB)
	Storage Controller	Embedded Smart Array Controller with 2 internal SAS port for internal drives plus integrated Smart Array Controller with 2 external SAS ports for expansion
	Network Ports	4 x Gigabit Ethernet
	Expansion Slots	6 x PCIe (one slot occupied by Smart Array Controller)
	Redundancy	Hot plug redundant power supply and fully redundant (N+1) hot plug fans
	Form Factor	2U Rack (292GB SAS and 2.4TB SAS model); 4U Rack (6TB SATA and 3.6TB SAS models)

HP StorageWorks X1800 292GB SAS Network Storage System AP897A

Internal Storage: 2 x 146GB 6G SAS 10K SFF DP hot-plug HDDs for O/S mirror

NOTE: Up to 6 additional internal SFF drives supported in open slots.

HP StorageWorks X1800 2.4TB SAS Network Storage System AP792A

Internal Storage: 8 x 300GB 6G SAS 10K SFF DP hot-plug HDDs

HP StorageWorks X1800 6TB SATA Network Storage System AP794A

Internal Storage: 2 x 146GB 6G SAS 10K SFF DP hot-plug HDDs for O/S mirror

External Storage: MSA60 enclosure with 6 x 1TB SATA 7.2K 3.5" MDL hot-plug HDDs

NOTE: Up to 6 additional internal SFF drives and up to 6 additional external LFF drives supported in open slots.

HP StorageWorks X1800 3.6TB SAS Network Storage System AP795A

Internal Storage: 2 x 146GB 6G SAS 10K SFF DP hot-plug HDDs for O/S mirror

External Storage: MSA70 enclosure with 12 x 300GB 6G SAS 10K SFF DP hot-plug HDDs

NOTE: Up to 6 additional internal and up to 13 additional external SFF drives supported in open slots.



Models (Drives Configure-to-Order)

These models come with zero drives standard and allow you to select drive quantity, type, and capacity to be integrated at the factory.

Choose a Base Model, then Select Hard Drives

NOTE: You must select a minimum number of drives with each Base model to accommodate factory installation of the Microsoft Windows Storage Server 2008 operating system. All drives must be of the same type and capacity.

NOTE: Options (other than drives selected as part of the configure-to-order process) ship separately and are not factory integrated.

HP X1000 Network Storage Systems (Base models)

Common Specifications	Operating System	Microsoft Windows Storage Server 2008, Standard x64 Edition with Microsoft iSCSI Software Target and HP X1000 Automated Storage Manager Software
	Optical Drive	DVD-RW standard for QuickRestore disaster recovery Optical drive is internal on all models, except sku AW528A. AW528A does not ship with an optical drive. A USB 2.0 compatible external DVD reader must be used for Quick Restore recovery. Any USB 2.0 compatible DVD reader will work or customers may purchase the HP dvd556s 8X USB Powered Slim Multiformat DVD Writer separately.
	Management	Microsoft Management Console (MMC)-based user interface (also accessible via HTTPS)
	Remote Access	HP ProLiant Integrated Lights-Out 2 with Advanced Pack license; Telnet; Remote Desktop
	Factory Racking	The factory can integrate select X1000 Network Storage Systems with other HP products such as HP ProLiant Servers, MSA arrays, or Enterprise Virtual Arrays. NOTE: #0D1 will appear after the part number on the sales order if HP factory integration is supported.

X1400 FIO Network Storage System

AP803A

NOTE: This model does not include pre-configured HDDs. HDDs must be selected as a Factory Integrated Option (FIO) from the list below. For AP803A, a minimum of 4 HDDs of the same type and capacity must be ordered for integration. AP803A cannot be ordered with less than 4 HDDs.

Specifications	Processor	Intel® Xeon® Processor E5504 2.00 GHz; 1 standard
	Memory	2GB (1 x 2GB)
	Storage Controller	Smart Array Controller with 1 internal SAS port for internal drives and 1 external SAS port for expansion
	Network Ports	2 x Gigabit Ethernet (1 shared with iLO2)
	Expansion Slots	2 x PCIe (one slot occupied by Smart Array Controller)
	Form Factor	1U Rack
Drive Options	Minimum Number of Drives Required	4
	Maximum Number of Drives Allowed	4

Models (Drives Configure-to-Order)

SAS Enterprise (ENT) and Midline (MDL) Drives 3.5", Hot Plug

HP 600GB 6G SAS 15K LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516828-B21
HP 450GB 6G SAS 15K LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516816-B21
HP 450GB 3G SAS 15K LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	454232-B21
HP 300GB 6G SAS 15K LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516814-B21
HP 300GB 3G SAS 15K LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	416127-B21
HP 146GB 3G SAS 15K LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	384854-B21
HP 1TB 3G SAS 7.2K rpm LFF(3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	461137-B21
HP 750GB 3G SAS 7.2K rpm LFF(3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	461135-B21

SATA Midline (MDL) and Entry (ETY) Drives 3.5", Hot Plug

HP 2TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	507632-B21
HP 1TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	454146-B21
HP 750GB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	458930-B21
HP 500GB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	458928-B21
HP 250GB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	458926-B21
HP 250GB 3G SATA 7.2K rpm LFF (3.5-inch) Entry 1yr Warranty Hard Drive	571230-B21
HP 160GB 3G SATA 7.2K rpm LFF (3.5-inch) Entry 1yr Warranty Hard Drive	458945-B21

SATA Hot Plug 3.5" Midline (MDL) Solid State Drives

HP 120GB 3G SATA 3.5in MDL 1y Wty SSD	570763-B21
HP 60GB 3G SATA 3.5in MDL 1y Wty SSD	570761-B21

X1600 FIO Network Storage System

AP804A

NOTE: This model does not include pre-configured HDDs. HDDs must be selected as a Factory Integrated Option (FIO) from the list below. For an AP804A, a minimum of 2 HDDs of the same type and capacity must be ordered for integration. AP804A cannot be ordered with less than 2 HDDs.

Specifications	Processor	Intel® Xeon® Processor E5520 2.26 GHz; 1 standard, up to 2 supported
	Memory	6GB (3 x 2GB)
	Storage Controller	Smart Array Controller with 1 internal SAS port for internal drives and 1 external SAS port for expansion
	Network Ports	2 x Gigabit Ethernet
	Expansion Slots	2 x PCIe (one slot occupied by Smart Array Controller)
	Redundancy	Hot plug redundant power supply
	Form Factor	2U Rack
	Drive Options	Minimum Number of Drives Required
Maximum Number of Drives Allowed		12 (14 in AW528A)

Models (Drives Configure-to-Order)

SAS Enterprise (ENT) and Midline (MDL) Drives 3.5", Hot Plug

HP 600GB 6G SAS 15K LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516828-B21
HP 450GB 6G SAS 15K LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516816-B21
HP 450GB 3G SAS 15K LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	454232-B21
HP 300GB 6G SAS 15K LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516814-B21
HP 300GB 3G SAS 15K LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	416127-B21
HP 146GB 3G SAS 15K LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	384854-B21
HP 1TB 3G SAS 7.2K rpm LFF(3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	461137-B21
HP 750GB 3G SAS 7.2K rpm LFF(3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	461135-B21

SATA Midline (MDL) and Entry (ETY) Drives 3.5", Hot Plug

HP 2TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	507632-B21
HP 1TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	454146-B21
HP 750GB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	458930-B21
HP 500GB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	458928-B21
HP 250GB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	458926-B21
HP 250GB 3G SATA 7.2K rpm LFF (3.5-inch) Entry 1yr Warranty Hard Drive	454146-B21
HP 160GB 3G SATA 7.2K rpm LFF (3.5-inch) Entry 1yr Warranty Hard Drive	458930-B21

SATA Hot Plug 3.5" Midline (MDL) Solid State Drives

HP 120GB 3G SATA 3.5in MDL 1y Wty SSD	570763-B21
HP 60GB 3G SATA 3.5in MDL 1y Wty SSD	570761-B21

X1800 Network Storage System

AP791A

NOTE: This model does not include pre-configured HDDs. HDDs must be selected as a Factory Integrated Option (FIO) from the list below. For an AP791A, a minimum of 2 HDDs of the same type and capacity must be ordered for integration. AP791A cannot be ordered with less than 2 HDDs.

Specifications	Processor	Intel® Xeon® Processor E5530 2.40 GHz; 1 standard, up to 2 supported
	Memory	6GB (3 x 2GB)
	Storage Controller	Embedded Smart Array Controller with 2 internal SAS port for internal drives plus integrated Smart Array Controller with 2 external SAS ports for expansion
	Network Ports	4 x Gigabit Ethernet
	Expansion Slots	6 x PCIe (one slot occupied by Smart Array Controller)
	Redundancy	Hot plug redundant power supply and fully redundant (N+1) hot plug fans
	Form Factor	2U Rack
	Drive Options	Minimum Number of Drives Required
Maximum Number of Drives Allowed		8

Models (Drives Configure-to-Order)

SAS Enterprise (ENT) and Midline (MDL) Drives 2.5" Drives, Hot Plug

HP 300GB 6G SAS 10K SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507127-B21
HP 300GB 3G SAS 10K SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	492620-B21
HP 146GB 6G SAS 15K SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512547-B21
HP 146GB 3G SAS 15K SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	504062-B21
HP 146GB 6G SAS 10K SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507125-B21
HP 146GB 3G SAS 10K SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	418367-B21
HP 72GB 6G SAS 15K SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512545-B21
HP 72GB 3G SAS 15K SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	418371-B21
HP 500GB 6G SAS 7.2K rpm SFF (2.5inch) Midline 1yr Warranty Hard Drive	507610-B21

SATA Hot Plug Midline (MDL and Entry (ETY) Drives

HP 500GB 3G SATA 7.2K rpm SFF (2.5-inch) Midline 1yr Warranty Hard Drive	507750-B21
HP 160GB 3G SATA 7.2K rpm SFF (2.5-inch) Midline 1yr Warranty Hard Drive	530888-B21
HP 250GB 3G SATA 5.4K rpm SFF (2.5-inch) Entry 1yr Warranty Hard Drive	460355-B21
HP 120GB 1.5G SATA 5.4K rpm SFF (2.5-inch) Entry 1yr Warranty Hard Drive	458924-B21

SATA Hot Plug Midline (MDL) Solid State Drives

HP 120GB 3G SATA 2.5in MDL 1y Wty SSD	572073-B21
HP 60GB 3G SATA 2.5in MDL 1y Wty SSD	572071-B21

Options

The following options are available for both pre-configured and drive configure-to-order models

NOTE: Options ship separately and are not factory integrated

NOTE: Carefully match options to your model to ensure compatibility

Add Another Processor

You can add a second processor to X1600 and X1800 models

NOTE: X1400 models support one processor only.

X1600	Intel® Xeon® Processor E5520 (2.26 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)	508342-B21
X1800	Intel® Xeon® Processor E5530 (2.40 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)	492237-B21

Add More Memory

NOTE: All models are expandable to 32GB (limited by O/S license).

NOTE: Number of available DIMM sockets varies by model.

X1400 / X1600 / X1800	Registered DIMMs (RDIMMs)	
	HP 2GB 2Rx8 PC3-10600R-9 Kit	500656-B21
	HP 4GB 2Rx4 PC3-10600R-9 Kit	500658-B21
	HP 4GB 4Rx8 PC3-8500R-7 LP Kit	500660-B21
	HP 8GB 2Rx4 PC3-8500R-7 Kit	516423-B21

NOTE: All DDR3 memory option kits consist of one DIMM per kit.

NOTE: Kits described as LP include Low Power DIMMs.

Add a Network Adapter

NOTE: Expansion slot availability varies by model.

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

X1400 / X1600 / X1800	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 NC375T PCI Express Quad Port Gigabit Server Adapter	538696-B21
	HP NC382T PCI Express Dual Port Multifunction Gigabit Server Adapter	458492-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.

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: www.hp.com/go/ProLiantNICs

X1400 / X1800	HP NC112T PCIe Gigabit Server Adapter	503746-B21
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Options

X1400	Dedicated Integrated Lights-Out 2 management port	514206-B21
HP Security - TPM	HP Trusted Platform Module Option Kit	488069-B21

Add More Storage

HP X1000 Network Storage Systems come standard with at least one installed Smart Array Controller that supports internal drives and easy external expansion.

NOTE: Expansion slot availability varies by model.

X1400 / X1600 / X1800 SAS Controllers

Smart Array P800 Controller

HP Smart Array P800/512MB BBWC Controller 381513-B21

HP Smart Array P212 Controller

HP P212/256 Smart Array Controller 462834-B21

HP P212/ZM Smart Array Controller 462828-B21

HP Smart Array P411 Controller

HP P411/256 Smart Array Controller 462830-B21

HP P411/512 BBWC Smart Array Controller 462832-B21

HP Smart Array P411/512MB Flash Backed Write Cache 578229-B21

HP Smart Array P411/1G Flash Backed Write Cache 572531-B21

Smart Array P812 Controller

HP Smart Array P812/1G Flash Backed Cache Controller 487204-B21

Optional Upgrades

256 MB Cache Module 462968-B21

NOTE: Supported on HP Smart Array P212 Controller

512MB Battery-backed write cache 462967-B21

Battery Kit upgrade (for BBWC) 462969-B21

NOTE: For X1600, when adding a second SmartArray P212 or P411 Controller and BBWC, a small spacer must be removed from the second battery holder. This is easily accomplished using a flat blade screw driver.

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

http://h18000.www1.hp.com/products/quickspecs/13203_div/13203_div.html
(Smart Array P212 Controller)

http://h18000.www1.hp.com/products/quickspecs/13201_div/13201_div.html
(Smart Array P411 Controller)

http://h18000.www1.hp.com/products/quickspecs/12616_div/12616_div.html
(Smart Array P800 Controller)

SCSI HBAs

HP U320e SCSI Host Bus Adapter AH627A

NOTE: The AH62A is only supported on the X1400 and X1600.

Options

HP SC11Xe Host Bus Adapter 412911-B21
NOTE: Recommended HBA for SCSI tape drive connect.

NOTE: Please see the QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/12566_div/12566_div.html
 (SC11Xe HBA)

Fibre Channel HBAs

NOTE: For more information on Fibre Channel HBAs, see:
<http://h18006.www1.hp.com/storage/saninfrastructure/hba.html>.

Brocade Fibre Channel HBAs

HP 81B PCIe 8Gb FC Single Port HBA	AP769A
HP 82B PCIe 8Gb FC Dual Port HBA	AP770A
HP 41B PCIe 4Gb FC Single Port HBA	AP767A
HP 42B PCIe 4Gb FC Dual Port HBA	AP768A

Emulex Fibre Channel HBAs

HP StorageWorks 81E 8Gb SP PCI-e FC HBA	AJ762A
HP StorageWorks 82E 8Gb Dual-port PCI-e FC HBA	AJ763A
HP StorageWorks FC2142SR 4Gb PCI-e HBA	A8002A
HP StorageWorks FC2242SR Dual Channel 4 Gb PCI-e HBA	A8003A

QLogic Fibre Channel HBAs

HP StorageWorks 81Q PCI-e FC HBA	AK344A
HP StorageWorks 82Q 8Gb Dual Port PCI-e FC HBA	AJ764A
HP StorageWorks FC1142SR 4Gb PCI-e HBA	AE311A
HP StorageWorks FC1242SR Dual Channel 4 Gb PCI-e HBA	AE312A

X1400 / X1800

SAS HBAs

HP SC08Ge Host Bus Adapter 488765-B21
NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18004.www1.hp.com/products/quickspecs/13082_div/13082_div.html
 (SC08Ge HBA)

HP StorageWorks D2000 Disk Enclosures

HP StorageWorks D2600 Disk Enclosure	AJ940A
HP StorageWorks D2700 Disk Enclosure	AJ941A
HP StorageWorks D2600 w/12 450GB 6G SAS 15K LFF Dual Port HDD 5.4TB Bundle	AW522A
HP StorageWorks D2600 w/12 600GB 6G SAS 15K LFF Dual Port HDD 7.2TB Bundle	AW523A
HP StorageWorks D2700 w/25 146GB 6G SAS 15K SFF Dual Port HDD 3.6TB Bundle	AW524A
HP StorageWorks D2700 w/25 300GB 6G SAS 10K SFF Dual Port HDD 7.5TB Bundle	AW525A

Options

HP StorageWorks D2700 w/25 500GB 6G SAS 7.2K SFF Dual Port MDL HDD 12.5TB Bundle AW526A

NOTE: Please see the following QuickSpecs for Technical Specifications additional D2000 hard drives, controllers, options and cable information:

http://h18000.www1.hp.com/products/quickspecs/13404_div/13404_div.html

MDS600

HP MDS600 with two Dual Port I/O Module System AJ866A

HP StorageWorks MDS 600 Dual I/O Module Option Kit AP763A

HP StorageWorks MDS 600 with (35) 1TB LFF SATA Hard Disk Drive Bundle AP764A

HP StorageWorks MDS 600 with (35) 450GB LFF SAS Hard Disk Drive Bundle AP765A

HP StorageWorks MDS 600 with (35) 300GB LFF SAS Hard Disk Drive Bundle AX670A

HP StorageWorks MDS600 with (70) 1TB LFF SATA Hard Disk Drive Bundle AX668A

HP StorageWorks MDS 600 with (70) 450GB LFF SAS Hard Disk Drive Bundle AX669A

HP StorageWorks MDS 600 with (70) 300GB LFF SAS Hard Disk Drive Bundle AX671A

NOTE: Please see the following QuickSpecs for Technical Specifications additional MDS600 hard drive, controllers, options and cable information:

http://h18000.www1.hp.com/products/quickspecs/13257_div/13257_div.html

X1400 / X1600 / X1800 HP StorageWorks Modular Smart Array External Enclosures

All HP X1000 Network Storage Systems come standard with a Smart Array Controller with at least one external SAS port ready for enclosure expansion

HP StorageWorks 60 Modular Smart Array (MSA60) 418408-B21

NOTE: Rack-mountable 12 drive (3.5" SAS/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

HP StorageWorks 70 Modular Smart Array (MSA70) 418800-B21

NOTE: Rack-mountable 25 drive (2.5" SAS/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

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

http://h18000.www1.hp.com/products/quickspecs/12627_div/12627_div.html (MSA60)

http://h18000.www1.hp.com/products/quickspecs/12652_div/12652_div.html (MSA70)

Options

X1400 / X1600 / MSA60	Large Form Factor (LFF) Hard Drives	
	SAS Enterprise (ENT) Drives 3.5", Hot Plug	
	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 SAS 15K 3.5" DP HDD	416127-B21
	HP 146GB 3G SAS 15K 3.5" DP HDD	384854-B21
	HP 72GB 3G SAS 15K 3.5" DP HDD	384852-B21
	SAS Midline (MDL) DP Drives 3.5", Hot Plug	
	HP 1TB 3G SAS 7.2K 3.5" DP MDL HDD	461137-B21
	HP 750GB 3G SAS 7.2K 3.5" DP MDL HDD	461135-B21
	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
	SATA Entry (ETY) Drives 3.5", Hot Plug	
	HP 160GB 3G SATA 7.2K 3.5" ETY HDD	458945-B21

X1800 / MSA70	Small Form Factor (SFF) Hard Drives	
	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 10K SFF DP ENT HDD	507125-B21
	HP 146GB 3G SAS 10K SFF DP ENT HDD	418367-B21
	HP 146GB 3G SAS 15K SFF DP ENT HDD	504062-B21
	HP 72GB 3G SAS 15K SFF DP ENT HDD	418371-B21
	HP 72GB 3G SAS 10K SFF DP ENT HDD	384842-B21
	HP 36GB 3G SAS 15K SFF DP ENT HDD	418369-B21

NOTE: SAS Enterprise drives have a 3-year warranty. Please see the QuickSpecs for Technical Specifications and additional information:

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 QuickSpecs for Technical Specifications and additional information:

http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html
(Worldwide)

Options

Add a Power Cord

HP X1000 Network Storage Systems come standard with at least one rack (IEC-IEC) PDU power cord. If you wish to use wall outlet power instead, you can choose a country- or region-specific power cord.

X1400 / X1600 / X1800	HP 1.83m 10A C13-UL US Power Cord	AF556A
	HP 1.83m 10A C13 China Power Cord	AF557A
	HP 2.5m 10A C13-Argentina Power Cord	AF558A
	HP 1.83m 10A C13 Brazil Power Cord	AF559A
	HP 1.83m 10A C13 Korea Power Cord	AF560A
	HP 1.83m 10A C13 Taiwan Power Cord	AF561A
	HP 2.0m 10A C13 India Power Cord	AF562A
	HP 2.5m C13 AU/NZ Power Cord	AF569A
	HP 1.83m 10A C13 CH Power Cord	AF565A
	HP 1.83m 10A C13 DK Power Cord	AF566A
	HP 1.83m 10A C13 EU Power Cord	AF568A
	HP 1.83m 10A C13 IL Power Cord	AF564A
	HP 1.83m C13 IT/CL Power Cord	AF571A
	HP 2m C13 Japan Power Cord	AF572A
	HP 1.83m 10A C13 UK Power Cord	AF570A
	HP 2.5m C13 ZA/IN Power Cord	AF567A
	HP 1.83m 10A C13 NBR14136 Brazil Power Cord	AF591A

Add Optional Software

X1400 / X1600 / X1800 HP Data Protector Express Software

Data Protector Express is simple yet powerful backup and recovery software. It makes it easy to protect your X1000 Network Storage System and the data stored on it.

The base product is the Data Protector Express Backup Server. Installing this creates the Data Protector Express Storage Domain and 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. See <http://www.hp.com/go/simplestorage> for more information.

HP Data Protector Express 4.0 Backup Server (base product) BB117BA

HP Data Protector Express Software Options

Data Protector Express is a modular software product. Option licenses are installed to add additional features and protect additional machines.

HP Data Protector Express 4.0 Network Server Agent BB121BA

Used to add an additional machine to the Data Protector Express Storage Domain for backup. Or, is used to add an X1000 Network Storage System to an existing Data Protector Express Storage Domain.

HP Data Protector Express 4.0 Network Server Agent 3 pack BB122BA

HP Data Protector Express 4.0 Application Online Agent BB125BA

Enables online protection for Microsoft Exchange Servers and Microsoft SQL Servers. One LTU needed per machine for each application protected.

Options

HP Data Protector Express 4.0 Bare Metal Disaster Recovery Option Add disaster recovery protection to your X1000 Network Storage System or other machine in the Data Protector Express Storage Domain to get productive again quickly after a disaster or failure. One LTU per machine that requires automated disaster recovery.	BB128BA
HP Data Protector Express 4.0 D2Any2Any Option Enable multi-tier backup between different media types. Automate the movement of backed up data from backup media to tertiary media for longer term retention and additional protection. Enables the X1000 Network Storage System to be a disk backup target with automatic, policy-driven movement of backup data X1000 Network Storage System disk to tape.	BB130BA
HP Data Protector Express 4.0 Drive Expansion Option Adds support for multi-drive tape libraries, virtual tape libraries and Data Protector Express Virtual Libraries. One license required for each drive in excess of one per tape library, virtual tape library or Virtual Library.	BB133BA

NOTE: For more information on HP Data Protector Express Software:
<http://www.hp.com/go/dataprotectorexpress>

X1400 / X1600 / X1800 HP StorageWorks Storage Mirroring Software v5.2

Natural and man-made disasters can occur when you least expect it - serving as a reminder that in less than a moment's notice, volumes of data loss can occur. To prevent data loss from failure, error, or disaster, HP StorageWorks Storage Mirroring Software provides replication and recovery of valuable Windows and Linux data to another server. Proactive replication is a key strategy coupled with tape backup and snapshot technology for up-to-the-second data protection. Having replicated data co-located enables customers to recover their static and transactional data in seconds to minutes.

Patented replication and failover technology continuously captures byte-level data changes as they occur in your production environment and replicates those changes to one or more servers in any location without geographic limitations. By replicating only the bytes that change, Storage Mirroring Software uses the absolute minimum bandwidth required to replicate customer data. The software does not require special hardware to run and utilizes existing LAN or WAN infrastructure -saving time, additional investment, and maintenance. Storage Mirroring software is storage independent and will support any DAS, NAS, and SAN storage device. Additional flexibility is achieved with Windows and Linux operating system support. Storage Mirroring works on Windows Server 2003, Windows Server 2008, Windows Storage Server, 64-bit Windows, Windows on Itanium and Red Hat Linux. The platform flexibility, resource optimization, and application-specific protection enable customers to solidify their data and disaster protection strategies.

Special note about Microsoft iSCSI Software Target and replication:

All StorageWorks X1000 Network Storage Systems include the Distributed File System Replication (DFS-R) feature in the pre-installed Windows Storage Server 2008 operating system. 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

Options

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. Storage Mirroring will now be offered in 3 different product SKU families

Stock LTU (channel stocked license(s))

E-LTU (electronic delivery - order any number of licenses - 10 or higher)

LTU (paper delivery which replaces all previous 10 pack licenses -an alternative to electronic delivery)

NOTE: For more information on HP StorageWorks Storage Mirroring Software:
<http://www.hp.com/go/storageworks/storagemirroring>

HP ProLiant G5 Storage Servers

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.

HP StorageWorks X1000 Upgrade to Windows Storage Server 2008 Standard Software

TA725A

Add a Backup Solution

NOTE: For the complete listing of data protection offerings for X1000 Network Storage Systems, please visit:
<http://www.hp.com/products1/storage/compatibility/tapebackup/NAS/index.html>

Service and Support, HP Care Pack, and Warranty Information

Warranty

HP StorageWorks X1000 Network Storage Systems come with a standard 3-3-3 warranty (3 years parts exchange, 3 years labor and 3 years onsite, next business day response). Software media is warranted to be free of physical defect for a period of 90 days from delivery.

Services Included with the Product One year of HP Software Support, standard 9x5 business hours (software advisory and remedial software telephone support, new version license rights, and media and documentation distribution service).

For increased uptime, productivity and ROI -HP Care Pack packaged services for Storage

These days, you need to get the most out of your storage investment-you can't afford not to. When you buy HP storage products and solutions, it's also a good time to think about what levels of service and support you may need. To help take the worry out of deploying, designing, maintaining, and managing your environment, we've designed a portfolio of service options that are as: flexible, reliable and scalable as your storage. Unlike storage-only vendors, we take a holistic approach to your entire environment, bridging storage, servers, blades, software and network infrastructures with our HP Care Pack packaged services for Storage.

Protect your business beyond the warranty

When it comes to robustness and reliability, standard warranties on today's computing equipment have matured just as the technologies have matured. Good news on some fronts-but also a source of potential problems and subsequent consequences that come from depending on standard warranties alone. Standard warranty protects against product defects and some causes of downtime- but not the business. By using a standard approach to warranty uplifts, such as HP Care Pack Services, you can reduce downtime risks and be more certain of operational consistency for both mission-critical and standard business computing. Simply put, HP Care Pack Services normalize the warranty of combined products - helping you proactively guard against unplanned downtime.

Extending warranties with HP Care Pack Services

For cost-effective upgrading or extending your standard warranty, HP Care Pack Services offer a suite of standard reactive hardware and software support services that are sold separately, or combined as with our Support Plus and Support Plus 24 services. The portfolio also provides a combination of proactive and reactive services, such as Proactive 24 Service and Critical Service. In addition, with HP Proactive Select we offer an innovative approach to service delivery that gives you the flexibility to acquire the specific proactive services you need today, then add services as your needs evolve. HP Proactive Select offers a broad set of technical or per-event type service options - including server, storage, and network, SAN device, and software, environment, installation and education services. Services that you can mix and match depending on your specific requirements, from preliminary planning and equipment delivery to installation, configuration, integration, and testing, through every level of ongoing support. Our HP Care Pack packaged services for Storage assures help when you need it most. And for many products, post-warranty HP Care Pack Services are available when your original warranty has expired.

HP Storage Services: Offering reliability, flexibility and value-just like your storage

HP Storage Services offers a full spectrum of customer care, from technology support to complex migrations to complete completely managed services. HP Factory Express provides customization, integration and deployment services for turnkey solutions. HP Education offers flexible, comprehensive training on storage networking, disk storage systems, and storage software to help your IT staff get the most out of your investments. And HP Financial solutions extend innovative financing and asset management programs to cost-effective buy, manage and eventually retire your older equipment.

HP Storage Services, the trusted business technology experts who manage your technology in action, because when technology works, business works. <http://www.hp.com/hps/storage>

NOTE: Care Pack Services availability may vary by product and country.

HP Care Pack Services are sold by HP and HP Authorized Service Partners:

- Services for customers purchasing from HP or an enterprise reseller are quoted using HP order configuration tools.
- Customers purchasing from a commercial reseller can find HP Care Pack Services at <http://www.hp.com/go/lookuptool>

Service and Support, HP Care Pack, and Warranty Information

Recommended Support **Recommended HP Care Pack Services for optimal satisfaction with your HP product.**

3-Year HP Support Plus 24

For a higher return on your storage investment, HP Support Plus 24 provides integrated hardware and software support services designed specifically for your technology. Available 24x7, this 3-year combined reactive support option delivers onsite hardware support and over-the-phone software support around-the-clock. Leverage the full strength of HP Technology Services - customers can trust the services professionals at HP to work collaboratively with them, putting our strategic and technical know-how to work across their entire infrastructure.

- Improve uptime with responsive hardware and software services
- Enjoy consistent service coverage across geographically dispersed sites
- Update HP software at a predictable cost
- Increase customer satisfaction-with no interoperability gaps

<http://h20195.www2.hp.com/v2/GetPDF.aspx/5981-6638EN.pdf>

Recommended Deployment

HP Installation and Startup Service for X1000/X3000 Storage Systems

For smooth startup, HP Installation and Startup Service for X1000/X3000 Storage Systems - provides deployment of your HP ProLiant Storage Server while helping you establish readily available access to and management of your critical data and applications. Leverage the full strength of HP Technology Services - customers can trust the services professionals at HP to work collaboratively with them, putting our strategic and technical know-how to work across their entire infrastructure.

- System installation and setup by a HP technical specialist
- Reduced implementation time and cost
- Verification prior to installation that all service prerequisites are met
- Availability of an HP service specialist to answer basic questions related to this service during the orientation session
- Potential expansion of the number of shares and hosts

<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA2-6112ENL.pdf>

Related Services

Services that will enhance the user experience in many product deployments

3-Year HP Proactive 24

As an alternative to our recommended support level, for customers who want enhanced operational effectiveness and proactive problem identification:

HP Proactive 24 Service (P24) integrates hardware and software support to help you improve the stability and operational effectiveness of your IT environment. An HP Account Manager acts as your primary point of contact to ensure that HP meets your support needs effectively.

P24 provides the maximum value when multiple technologies in the environment (e.g. servers, storage, SAN and the network), are all covered. It provides an environment-wide view and consistent support of all of these components which affect stability of your key applications.

Choose P24 when you want to:

- enhance operational effectiveness with proactive problem identification and recommendations from HP

Service and Support, HP Care Pack, and Warranty Information

- partner with technical experts who help coordinate support, provide hands-on assistance, and share knowledge with your staff
- rapidly access support and expertise spanning your environment
- obtain personalized services tailored to your business environment and critical success factors
- anticipate necessary change - and execute it correctly the first time
- efficiently manage infrastructure resources to meet your performance objectives

<http://h20219.www2.hp.com/services/cache/11157-0-0-225-121.html>

HP Enhanced Implementation Service for SANs

For customers who are building a new or expanding an existing Fibre Channel, FCOE, FCIP, SAS or iSCSI SAN:

HP Enhanced Implementation Service for SANs - For customers who are building a new SAN or expanding their existing one, we offer the HP Enhanced Implementation Service for SANs. This provides complete design and implementation services for Fibre Channel, FCOE, FCIP, SAS and iSCSI SAN connectivity components.

<http://h20195.www2.hp.com/v2/GetPDF.aspx/5981-8527EN.pdf>

HP Entry Storage Data Migration Service for Windows

For customers who need to safely migrate Windows data within their TCP/IP networks with minimal impact to their operations:

You have a need to migrate data between Windows servers within your TCP/IP network. Or you have a need to migrate storage for your Windows servers. Or both. And you need to accomplish these migrations efficiently while minimizing risk at the same time.

HP Entry Storage Data Migration Service for Windows offers you a cost competitive and convenient way to accommodate data migration triggered by a need to refresh or consolidate storage, or to create different storage tiers. This service offers a migration cost in line with the costs of storage products in small and medium-sized storage environments. The service is delivered via a skilled HP service specialist with special consideration for data availability, integrity, and ongoing operational performance during the transfer process.

<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA2-4734ENW.pdf>

eSupport

HP eSupport is a portfolio of technology-based services that assist you with managing your business environment - from the desktop to the data center.

Support Portal

The HP support portal provides one-stop access to the information, tools and services you need to manage the daily operations of your IT environment.

Features include:

- Access to self-solve tools (including search technical knowledge base)
- Efficient logging and tracking of support cases
- Collaboration with other business and IT professionals
- Download of patches and drivers
- Access to diagnostic tools
- Proactive notification of relevant information

Access to certain features of the support portal requires an HP service agreement. To access the support portal, visit: <http://www.hp.com/support>

HP Insight Remote Support software delivers secure remote support for your HP Servers and Storage, 24

Service and Support, HP Care Pack, and Warranty Information

X 7, so you can spend less time solving problems and more time focused on your business. You can have your systems remotely monitored for hardware failure using secure technology that's been proven at thousands of companies around the world. In many cases, you can avoid problems before they occur.

Customer Technical Training

Consider education as an integral part of your strategy to get the best return on investment for your HP storage solution. HP offers a variety of training courses on storage software, networking, archiving and disk storage systems. Our classes are available in many delivery modalities from traditional instructor-led courses at one of our 80 training centers worldwide to on-site training customized to your needs or online. www.hp.com/learn/storage

HP Services Awards

HP Services continues to be recognized for service and support excellence by customers, partners, industry organizations and publications around the world. Recent honors and award reflect our services team's dedications, technical expertise, professionalism and uncompromising commitment to customer satisfaction. For a list of all our awards, please visit <http://h20219.www2.hp.com/services/cache/433028-0-0-225-121.html>

Additional Services Information

For more information about HP Care Pack Services for Storage, please visit: <http://www.hp.com/hps/storage>

If you have specific questions, contact your local HP representative. Contact information for a representative in your area can be found at "Contact HP" <http://www.hp.com>

Memory

Standard Memory

DDR3 Registered (RDIMM) with ECC Capabilities

- 2GB (1 x 2GB): X1400
- 6GB (3 x 2GB): X1600 and X1800

Maximum Memory

- 32 GB

DDR3 memory population guidelines

Installation guidelines for additional memory are summarized below:

- For X1400 Network Storage Systems (with nine memory slots)
 - There are three (3) channels per processor
 - There are three (3) DIMM slots for each memory channel; nine (9) total slots
 - Memory channel 1 consists of the three (3) DIMMs that are closest to the processor
 - Memory channel 3 consists of the three (3) DIMMs that are furthest from the processor
- For X1600 Network Storage Systems (with twelve memory slots)
 - There are three (3) channels per processor; six (6) channels total
 - There are two (2) DIMM slots for each memory channel; twelve (12) total slots
 - Memory channel 1 consists of the two (2) DIMMs that are closest to the processor
 - Memory channel 3 consists of the two (2) DIMMs that are furthest from the processor
- For X1800 Network Storage Systems (with eighteen memory slots)
 - There are three (3) channels per processor; six (6) channels total
 - There are three (3) DIMM slots for each memory channel; eighteen (18) total slots
 - Memory channel 1 consists of the three (3) DIMMs that are closest to the processor
 - Memory channel 3 consists of the three (3) DIMMs that are furthest from the processor
- DIMM slots that are white should be populated first
- Do not mix Unbuffered memory (UDIMMs) with Registered memory (RDIMMs)
- Do not install DIMMs if the corresponding processor is not installed
- If only one processor is installed in a 2CPU system, only half of the DIMM slots are available

For more information on memory configuration, consult QuickSpecs for the HP ProLiant DL320 G6 Server (X1400), HP ProLiant DL180 G6 Server (X1600), HP ProLiant DL380 G6 Server (X1800), or the Online DDR3 Memory Configuration Tool:

www.hp.com/go/ddr3memory-configurator

Memory options:

Registered DIMMs (RDIMMs)

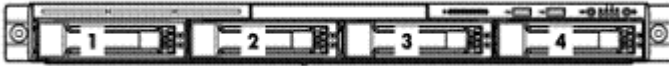
HP 2GB 2Rx8 PC3-10600R-9 Kit	500656-B21
HP 4GB 2Rx4 PC3-10600R-9 Kit	500658-B21
HP 4GB 4Rx8 PC3-8500R-7 LP Kit	500660-B21
HP 8GB 2Rx4 PC3-8500R-7 Kit	516423-B21

NOTE: All DDR3 memory option kits consist of one DIMM per kit.

NOTE: Kits described as LP include Low Power DIMMs.

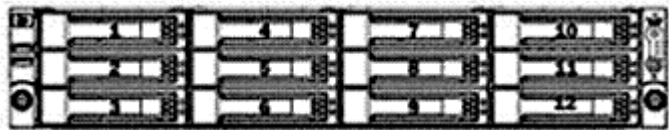
Storage

X1400



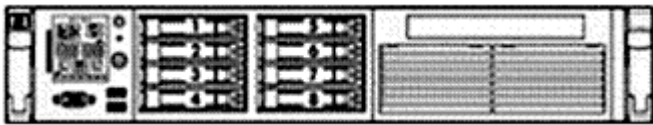
1 - 4 Four 3.5" (LFF) hot plug SATA / SAS hard drive bays

X1600



1 - 12 Twelve 3.5" (LFF) hot plug SATA / SAS hard drive bays

X1800



1 - 8 Eight 2.5" (SFF) hot plug SAS / SATA hard drive bays

Hard Drive Factory Pre-configurations

Model	Drives	Position Installed	O/S Volume	Notes
X1400 2TB SATA	4 x 500GB 3G 7.2K LFF SATA	1 - 4 (X1400)	RAID5 (Drives 1 - 4)	Internal drives connected to SA P212 internal SAS port; external SAS port open for expansion
X1400 4TB SATA	4 x 1TB 3G 7.2K LFF SATA	1 - 4 (X1400)	RAID5 (Drives 1 - 4)	Internal drives connected to SA P212 internal SAS port; external SAS port open for expansion
X1600 292GB SAS	2 x 146GB 6G 10K SFF SAS	In rear drive slots	RAID 1	12 open LFF internal drive slots; Internal drives connected to SA P212 internal SAS port; external SAS port open for expansion
X1600 6TB SATA	6 x 1TB 3G 7.2K LFF SATA	1 - 6 (X1600)	RAID5 (Drives 1 - 6)	Six open LFF internal drive slots; Internal drives connected to SA P212 internal SAS port; external SAS port open for expansion
X1600 12TB SATA	12 x 1TB 3G 7.2K LFF SATA	1 - 12 (X1600)	RAID1 (Drives 1, 2)	Internal drives connected to SA P212 internal SAS port; external SAS port open for expansion
X1600 5.4TB SAS	12 x 450GB 3G 15K LFF SAS	1 - 12 (X1600)	RAID1 (Drives 1, 2)	Internal drives connected to SA P212 internal SAS port; external SAS port open for expansion

Storage

X1800 292 SAS	2 x 146GB 6G 10K SFF SAS	1, 2 (X1800)	RAID1 (Internal drives 1, 2)	Internal drives connected to embedded SA P410i
X1800 2.4TB SAS	8 x 300GB 6G 10K SFF SAS	1 - 8 (X1800)	RAID5 (Drives 1 - 8)	Internal drives connected to embedded SA P410i; two external SAS ports on SA P411 open for expansion
X1800 6TB SATA	2 x 146GB 6G 10K SFF SAS	1,2 (X1800)	RAID1 (Internal drives 1, 2)	Internal drives connected to embedded SA P410i; MSA60 connected to one of two external SAS ports on SA P411
	6 x 1TB 3G 7.2K LFF SATA	1 - 6 (MSA60)		
X1800 3.6TB SAS	2 x 146GB 6G 10K SFF SAS	1,2 (X1800)	RAID1 (Internal drives 1, 2)	Internal drives connected to embedded SA P410i; MSA70 connected to one of two external SAS ports on SA P411
	12 x 300GB 6G 10K SFF SAS	1 - 12 (MSA70)		

External Expansion

NOTE: All HP StorageWorks X1000 Network Storage Systems accommodate easy external expansion with at least one open Smart Array Controller external SAS port.

	Installed Controller(s)	MSA Enclosure	Support
X1400	Smart Array P212/256MB	Modular Smart Array 60 (MSA60)	Single enclosure
		Modular Smart Array 70 (MSA70)	Single enclosure
X1600	Smart Array P212/256MB	MSA60	Up to 3 enclosures
		MSA70	Single enclosure
X1800	Smart Array P410i/256MB and Smart Array P411/512MB	MSA60	Up to 8 enclosures
		MSA70	Up to 4 enclosures

Maximum Raw Storage Capacity Supported

	X1400	X1600	X1800
Internal SATA	4 TB (4 x 1TB LFF SATA)	12 TB (12 x 1TB LFF SATA)	2 TB (8 x 250GB SFF SATA)
Internal SAS	4 TB (4 x 450 GB LFF SAS)	5.4 TB (12 x 450GB LFF SAS)	2.4 TB (8 x 300GB SFF SAS)
Internal plus External	12 TB (4 x 1TB LFF SATA internal + 1 x MSA60 full of 1TB LFF SATA external)	48 TB (12 x LFF 1TB SATA internal + 3 x MSA60 full of 1TB LFF SATA external)	98.4 TB (8 x 300GB SFF SAS int. + 8 x MSA60 full of 1TB LFF SATA external)

Power Specifications

X1600 / X1800

HP 750W Power Supply

Part Number - AC 750W PSU

512327-B21

Input Voltage Range (Vrms)

100 to 240

Frequency Range (Nominal) (Hz)

50/60

Nominal Input Voltage (Vrms)

100	120	208	200	220	230	240
-----	-----	-----	-----	-----	-----	-----

Maximum Rated Output Wattage

750	750	750	750	750	750	750
-----	-----	-----	-----	-----	-----	-----

Nominal Input Current (A rms)

8.9	7.4	4.3	4.1	3.9	3.7	3.6
-----	-----	-----	-----	-----	-----	-----

Max Rated Input Wattage Rating (Watts)

857	847	824	825	820	820	820
-----	-----	-----	-----	-----	-----	-----

Max. Rated VA (Volt-Amp)

894	884	859	859	854	854	854
-----	-----	-----	-----	-----	-----	-----

Efficiency (%) at Max. Rated Output Wattage

87.5	88.5	91	91	91.5	91.5	91.5
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Power Factor

0.97	0.97	0.97	0.97	0.97	0.97	0.97
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Leakage Current (mA)

0.42	0.50	0.83	0.87	0.92	0.96	1.00
------	------	------	------	------	------	------

Max. Inrush Current (A peak)

30	30	30	30	30	30	30
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Max. Inrush Current duration (mS)

20	20	20	20	20	20	20
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Maximum British Thermal Unit Rating (BTU-Hr)

2925	2892	2812	2812	2797	2797	2797
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Technical Specifications

X1400

System Unit

Dimensions (H x W x D) (with bezel)	1.70 x 17.64 x 26.85 in (4.32 x 44.80 x 68.20 cm)	
Weight (approximate)	All hard drives, power supplies, and processors installed	33.50 lb (15.20kg)
Input Requirements (per power supply)	Rated Line Voltage	90 - 132 VAC, 180 - 264 VAC
	Rated Input Current	6 A (at 100 VAC), 3 A (at 200 VAC)
	Rated Input Frequency	47 to 63 Hz
	Rated Input Power	486 W (at 100 VAC), 479 W (at 200 VAC)
BTU Rating	Maximum	1836 BTU/hr (at 100 VAC), 1706 BTU/hr (at 200 VAC)
System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).
	Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
Relative Humidity (non-condensing)	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
	Non-operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
Altitude	Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
Acoustic Noise	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).	
	Idle	
	LWAd	6.30 B

Technical Specifications

	LpAm	52.07dBA
Operating		
	LWAd	6.38 B
	LpAm	52.77 dBA

X1600

System Unit

Dimensions (H x W x D) (with bezel)		3.44x 17.64 x 27.50 in (8.75 x 44.80 x 69.88cm)
Weight (approximate)	Maximum	51.5 lb (19.22 kg) (all hard drives, power supplies and processors installed)
Input Requirements (per power supply)	Rated Line Voltage	100 - 240 VAC
	Rated Input Current	9.10 A (at 100 VAC), 4.5 A (at 200 VAC)
	Rated Input Frequency	50 to 60 Hz
	Rated Input Power	910 W (at 100 VAC), 900 W (at 200 VAC)
BTU Rating	Maximum	3107.82 BTU/hr (at 100 VAC), 3073.67 BTU/hr (at 200 VAC)
System Inlet Temperature	Operating	50° to 95°F (10° to 35°C) at sea level with an altitude derating of 1.8°F per every 1000 ft (1.0°C per every 305 m) above sea level to a maximum of 10,000 ft (3050 m), no direct sustained sunlight. Maximum rate of change is 18°F/hr (10°C/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 86°F (30°C).
	Non-operating	-22° to 140° F (-30° to 60° C). Maximum rate of change is 36° F/hr (20° C/hr).
Relative Humidity (non-condensing)	Operating	10 to 90% relative humidity (Rh), 82.4° F (28° C) maximum wet bulb temperature, non-condensing.
	Non-operating	5 to 95% relative humidity (Rh), 101.7° F (38.7° C) maximum wet bulb temperature, non-condensing.
Altitude	Operating	10,000 ft (3050 m). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 1500 ft/min (457 m/min).
	Non-operating	30,000 ft (9144 m). Maximum allowable altitude change rate is 1500 ft/min (457 m/min).
Acoustic Noise		Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when

Technical Specifications

the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).

Emissions Classification (EMC)	Idle		
		LWAd	6.7 B
		LpAm	51 dBA
	Operating		
		LWAd	6.7 B
		LpAm	51 dBA
	FCC Rating	A	
	Normative Standards	CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1	

NOTE: Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.

X1800

System Unit	Dimensions (H x W x D) (with bezel)	3.38 x 17.54 x 27.25 in (8.59 x 44.54 x 69.98 cm)	
	Weight (approximate)	Maximum (all hard drives, power supply, and processor installed)	60 lb (27.22 kg)
Input Requirements (per power supply)	Rated Line Voltage	100 to 240 VAC	
	Rated Input Current	7.1 Amps (at 120VAC) to 3.5 Amps (at 240 VAC)	
	Rated Input Frequency	50 to 60 Hz	
BTU Rating	Maximum	750W - 2892 BTU / hr (at 120 VAC), 2797 (at 240 VAC)	
System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed.	
	Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).	
Relative Humidity (non-condensing)	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-	

Technical Specifications

		condensing.
Altitude	Non-operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
	Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
Acoustic Noise	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). NOTE: The Listed sound levels apply to standard shipping configurations. Additional options may result in increased sound levels.	
	Idle	1P SKU 2P SKU
	LWAd	4.1 B 4.7 B
	LpAm	22 dBA 28 dBA
	Operating	1P SKU 2P SKU
	LWAd	4.1 B 4.7 B
	LpAm	22 dBA 28 dBA
Emissions Classification (EMC)	FCC Rating	Class A
	Normative Standards	CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1

NOTE: Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.

Technical Specifications

X1400

Embedded NC326i Dual Port Gigabit Server Adapter	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	Four lane (x4), 100MHz PCI Express Reference Clock	
	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)	2000 Mb/s
	Connector	RJ-45	
	Cable Support	10Base-T	Categories 3, 4 or 5 UTP; up to 328 ft (100 m)
		10/100/1000Base-TX	Category 5 UTP; up to 328 ft (100 m)

X1600

NC362i Integrated Dual Port Gigabit Server Adapter	Network Interface	Integrated 10/100/1000BASE-T Transceiver Combines a triple-speed IEEE 802.3TM - Compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver.	
	Data Transfer Method	Compliant to x1 PCIe Specification	
	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)	2000 Mb/s
	Connector	RJ-45	
	Cable Support	Performs all the physical layer functions for 10BASE-T, 100BASE-T, and 1000BASE-T Ethernet on standard Category 5 UT	

Technical Specifications

X1800

HP NC382i Dual Port Multifunction Gigabit Server Adapters	Network Interface	10Base-T/100Base-TX/1000Base-TX		
	Compatibility	EEE 802.3 10Base-T		
		IEEE 802.3ab 1000Base-T		
		IEEE 802.3u 100Base-TX		
		IEEE 802.3ad 1000Base-TX		
		IEEE 802.1p 100Base-TX		
		IEEE 802.1q 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)		

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

