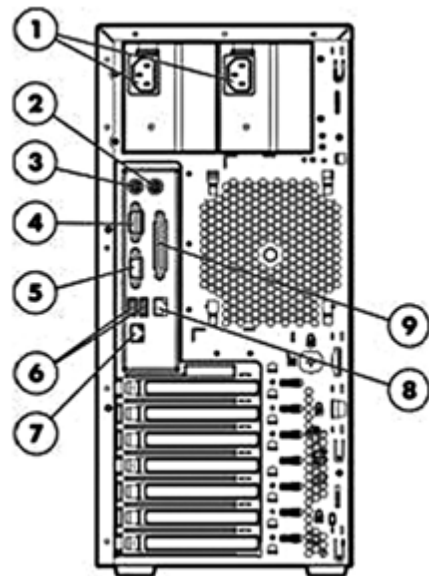
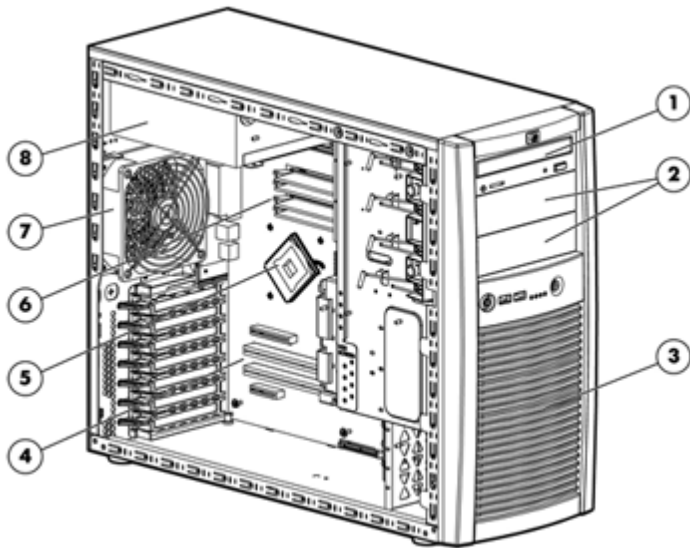


### Overview

The HP ProLiant ML310 G4 Storage Server is an affordable Windows-powered file and print tower solution that enables small and remote office environments to add networked storage capacity quickly and easily. This solution can also facilitate consolidation of multiple direct-attached storage (DAS) installations and management interfaces to a single centralized networked storage device, or it can be an effective disk-based backup or replication target. It supports multiple file sharing protocols and Windows storage-specific tools that make file share maintenance both easy and powerful. And with the optional Microsoft® iSCSI Software Target, you can upgrade to host block-based storage for Exchange, SQL or other applications.

This network storage solution not only aids in storage expansion, consolidation, and cost reduction, but also helps you spend less time and effort deploying and managing file and print services. It comes with Microsoft Windows Storage Server 2003 Release 2 Operating System pre-installed, and user storage is pre-configured. It's quick to install and it's Windows through-and-through--if you know how to use the Microsoft Management Console (MMC), you probably already know how to manage it. And the unique Rapid Start-up Wizard streamlines installation even more. Finally, remote management capability at both the system level and at the hardware component level (with Integrated Lights-out 2) means you can manage and troubleshoot from anywhere.

The HP ProLiant ML310 G4 Storage Server leverages industry-standard components to protect and optimize your hardware investment. It packs all the storage and I/O you need into a tower form factor and it offers five capacity points and support for both SATA and SAS drives to help you balance your storage requirements with affordability and performance



### Overview

#### Front View:

1. 16x DVD+RW Internal
2. Removable Media Bays
3. Four Hot-Plug Drive Bays with SATA and SAS drive support
4. Four Expansion Slots (Two PCI-X, Two PCI Express—one PCI-e slot occupied by SA E200 Controller)
5. Dual-Core Intel® Pentium® D or Dual-Core Intel® Xeon® processor
6. Four DIMM Sockets for up to 4GB DDR2 memory  
(NOTE: 4GB max on all models due to OS limitation)
7. System Fan
8. 410W Non-Hot Plug Non-Redundant Power Supply (SATA models) or 430W Hot Plug Redundant Power Supplies (SAS model)

#### Rear View:

1. Power cord connections for Power Supply 1 & 2
2. Mouse connector
3. Keyboard connector
4. Serial Port
5. Video Port
6. USB 2.0 (qty 2)
7. Embedded NIC
8. Integrated Lights-Out 2 (iLo2) connector
9. Printer PS1

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

### Highlights

HP ProLiant ML310 G4 Storage Servers deliver affordability, fast deployment, and ease of use to small and remote file serving environments.

- **Operating System:**
  - Windows Storage Server 2003 Release 2, Standard Edition
- **Processors:**
  - Dual-Core Intel® Pentium® D 945 3.4 GHz (all SATA models)
  - Dual-Core Intel® Xeon® 3050 2.13 GHz (584GB SAS model)
- **Memory:**
  - 1GB (1 x 1GB) standard (all SATA models)
  - 2GB (2 x 1GB) standard (584GB SAS model)
- **Storage Controller:**
  - Smart Array E200/128MB Controller with BBWC
- **Drive Support:**
  - Four 3.5" (large form factor) hot-plug internal bays that support SAS or SATA HDDs
    - 4 x 160GB SATA LFF (640GB SATA model)
    - 4 x 250GB SATA LFF (1TB SATA model)
    - 4 x 500GB SATA LFF (2TB SATA model)
    - 4 x 750GB SATA LFF (3TB SATA model)
    - 4 x 146GB SAS LFF (584GB SAS model)
  - Half-height DVD+R/RW 16X drive to support System Restore
- **Network Controller:**
  - Embedded NC320i PCIe Gigabit Server Adapter
- **Expansion Slots:**

### Overview

- (2) PCI-X 64-bit/100MHz
- (2) PCI Express (one slot occupied by SA E200 controller)
- **Redundancy:**
  - Hot-plug SAS/SATA hard disk drives
  - Hot plug redundant power supplies (584GB SAS model only)
- **Management:**
  - Microsoft Management Console (MMC)-based user interface
  - Remote system management via Remote Desktop or Telnet
  - Remote hardware management via Integrated Lights Out 2 (iLO 2) - Advanced License included
- **Form Factor:**
  - Tower (Optional Tower-to-Rack Enabling Kit available)
- **Warranty:**
  - Protected by HP Services and a worldwide network of resellers and service providers. One-year Next Business Day, on-site limited global warranty (one year parts, one year labor, one year on-site support). Certain restrictions and exclusions apply. SATA hard drives have a one-year warranty.

**The fast and easy way to add a file server to your network** The Windows-powered operating system is pre-installed and user storage is pre-configured, so it's a quick, secure, and easy way to add storage to your network. Go from out-of-the-box to file serving in minutes, not hours.

**A single centralized file server platform to manage and protect** Simplify tasks and lower your total cost of storage ownership by consolidating islands of direct-attached storage to one easy-to-use Windows platform. You can also use an ML310 G4 Storage Server as an affordable disk-based backup/replication target.

**Multi-protocol file serving** Support for SMB/CIFS, NFS, HTTP, FTP, WebDAV, AppleTalk, and NetWare file protocols means you can deploy in wide range of heterogeneous file serving environments.

**Microsoft® Windows-powered operating system pre-installed** It's Windows! So it integrates seamlessly into your Active Directory and DFS environments, runs your favorite antivirus or backup applications, and if you've used Microsoft Management Console (MMC) before, there's no steep learning curve to worry about because you're already familiar with the user interface.

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

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

**HP ProLiant industry-standard hardware** Relax—your investment is protected because you're not locked into a proprietary platform. This tower supports four hot-plug hard drives for a capacity of up to 3TB (4 x 750GB SATA) and also supports redundant power (standard on 584GB SAS model only).

**Print server support** Don't forget that the ML310 G4 Storage Server is a Windows print server too, offering consolidation benefits to your Windows print environment.

**Microsoft® iSCSI Software Target support** Upgrade your ProLiant Storage Server to host block-based application storage to further consolidate and lower hardware and administrative costs with optional software (T4433A).

### Standard Features

#### Operating System

Microsoft Windows Storage Server 2003 R2, Standard x86 Edition

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

#### Processor

640GB, 1TB, 2TB, and 3TB SATA models	Dual-Core Intel® Pentium® D 945 (3.4 GHz, 95 Watts, 800 FSB)
584GB SAS model	Dual-Core Intel® Xeon® 3050 (2.13 GHz, 65 Watts, 1066 FSB)

#### Cache Memory

640GB, 1TB, 2TB, and 3TB SATA models	2 x 2MB Level 2
584GB SAS model	2MB Level 2

### Standard Features

<b>Memory</b>	Type	PC2-5300 unbuffered DDR2 SDRAM (667MHz)
	Memory Protection	ECC
	DIMM Sockets	4
	Maximum Memory (Limited by O/S license)	4 GB
	<b>640GB, 1TB, 2TB, and 3TB SATA models</b>	
	Standard	1 GB (1 x 1 GB)
	<b>584GB SAS model</b>	
Standard	2 GB (2 x 1 GB)	

**Network Controller** Embedded NC320i PCIe Gigabit Server Adapter

Expansion Slots	Slot Number	Bus Speed	Maximum Card Length	Hot Plug	Connector Type
	4	PCI Express x4	12.3	No	x8
	3	64-bit/100MHz PCI-X	12.3	No	3.3V
	2	64-bit/100MHz PCI-X	12.3	No	3.3V
	1	PCI Express x1	12.3	No	x8

**\*NOTE:** Slot 4 is occupied by the integrated Smart Array E200/128MB controller.

**Storage Controller** Smart Array E200 Storage Controller with 128MB Battery Backed Write Cache

- RAID 0/1/5
- x4 2.5G PCI Express host interface

<b>Storage</b>	Hard Drives	Internal:
		<ul style="list-style-type: none"> <li>• 4 x 160GB 1.5G SATA 7.2K LFF HDDs (640GB SATA model)</li> <li>• 4 x 250GB 1.5G SATA 7.2K LFF HDDs (1TB SATA model)</li> <li>• 4 x 500GB 1.5G SATA 7.2K LFF HDDs (2TB SATA model)</li> <li>• 4 x 750GB 1.5G SATA 7.2K LFF HDDs (3TB SATA model)</li> <li>• 4 x 146GB 3G SAS 15K LFF HDDs (584GB SAS model)</li> </ul>
	Optical Drive	HP DVD+R/RW 16X Half Height

<b>Maximum Storage Capacity (raw)</b>	Internal hot plug LFF SATA	3 TB	4 x 750GB SATA
	Internal hot plug LFF SAS	584GB	4 x 146GB SAS
	Internal plus External	12TB	4 x 750GB LFF SATA int. + 12 x 750GB LFF SATA ext.

### Standard Features

Interfaces	Parallel	1
	Serial	1 (Optional second serial port available)
	Pointing Device (Mouse)	1
	Graphics	1
	Keyboard	1
	USB Ports	5 (2 front; 2 rear; 1 internal) <b>NOTE:</b> Please see the following URL for additional information regarding USB support: <a href="http://h18004.www1.hp.com/products/servers/platforms/usb-support.html">http://h18004.www1.hp.com/products/servers/platforms/usb-support.html</a>
	Dedicated USB Port	1 (available for USB tape connectivity)
	Network RJ-45 (Ethernet)	1
	iLO 2 Remote Management port	1

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Graphics	Integrated ATI ES1000 Video Controller with 16-MB SDRAM Video Memory
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Management	<p>Microsoft Management Console (MMC)-based user interface (also accessible via HTTPS)</p> <p>Remote system management via Remote Desktop or Telnet</p> <p>Integrated Lights-Out 2 featuring Integrated Remote Console with KVM over IP performance over shared network access (Advanced License included standard)</p> <ul style="list-style-type: none"><li>• Virtual Text Remote Console</li><li>• Virtual Power Button Control</li><li>• Integrated Remote Console</li><li>• Dedicated &amp; full function shared network connectivity</li><li>• Browser, command line and scripted access</li><li>• Automatic IP Configuration via DHCP/DNS/WINS</li><li>• Industry Standard 128-bit Secure Sockets Layer (SSL) and Secure Shell security (SSH)</li><li>• OS independent hardware health status</li><li>• IML and iLO Event Logging</li><li>• Support for 12 user accounts with customizable access privilege</li><li>• Advanced license: upgrades the iLO 2 processor with comprehensive remote control including Virtual KVM graphical console, virtual media, and enterprise security.</li></ul>
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Form Factor	Tower (5U) Optional Tower-to-Rack Enabling Kit available (system & tray occupy 6U)
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Industry Standard Compliance	ACPI V1.0b and 2.0 PCI 3.0 PCI-X 3.0 PCI-Express 3.0 PXE Support WOL Support Microsoft Logo certifications USB 2.0
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### Standard Features

**Server Power Cords**      6' country-specific NEMA power cord

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**Power Supply**            **640GB, 1TB, 2TB, and 3TB SATA models**  
410 Watt PFC (Power Factor Correcting) non-hot plug non-redundant  
**584GB SAS model**  
430 Watt PFC hot plug redundant power supplies (ships with two power supplies)

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**UPS and PDU Power Cord Matrix**      Please see the UPS and PDU cable matrix that lists cable descriptions, requirements, and specifications for UPS and PDU units:  
<http://h18004.www1.hp.com/products/servers/proliantstorage/power-protection/index.html>

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**Fans**                      1 - Non-hot plug, Non-redundant system fan  
**NOTE:** Does not include fans in CPU heatsink or power supply.

### Optional Software

#### Optional Software from HP for Storage Servers

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

For more information:

[http://h18006.www1.hp.com/products/storageworks/ms\\_iscsi/index.html](http://h18006.www1.hp.com/products/storageworks/ms_iscsi/index.html)

- **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.

For more information:

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

- **HP OpenView Storage Data Protector Software** - The HP OpenView Storage 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.

The ProLiant DL320s Storage Server supports using Data Protector as the backup software solution.

For more information on HP OpenView Data Storage Protector:

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

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

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

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



### Optional Software

management tool set.

HP SIM also serves as a central access point for ProLiant Essentials, Integrity Essentials, and Storage Essentials software options that deliver targeted functionality for these platforms. For more information:

<http://h18013.www1.hp.com/products/servers/management/hpsim/index.html>

- **Insight Management Agents** - Allow all HP servers to present system instrumentation, health and configuration information into HP Systems Insight Manager and the HP System Management Homepage. The HP System Management Homepage aggregates systems data from Insight Management Agents and other HP management tools, providing a consolidated browser-based interface for managing individual servers.
- **HP Storage Essentials NAS Manager Software** - Provides comprehensive Network Attached Storage (NAS) management capabilities for HP ProLiant Storage 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>

### Service and Support, HP Care Pack, and Warranty Information

**Warranty** HP ProLiant ML310 G4 Storage Servers come with a 1-1-1 warranty (1 year parts exchange, 1 year labor, and 1 year on-site, next business day response)

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

**Service and Support Upgrade Options**

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

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

Product number(s)	Care Pack	Duration	Commercial reseller channels	Direct & Enterprise channels
AE393A	Support Plus for Storage	1 year	UD551E	HA110A1 - 8YP
AE394A		3 years	UD553E	HA110A3 - 8YP
AE395A		4 years	n/a	HA110A4 - 8YP
AE396A		5 years	n/a	HA110A5 - 8YP
AE397A				
AE398A	Support Plus 24 for Storage	1 year	UD552E	HA109A1 - 8YP
AE399A		3 years	UD554E	HA109A3 - 8YP
AE400A		4 years	n/a	HA109A4 - 8YP
AE401A		5 years	n/a	HA109A5 - 8YP
AE402A				
AE403A	Proactive 24 (P24)	1 year	n/a	HA111A1 - 8YP
AE404A		3 years	n/a	HA111A3 - 8YP
AE405A		4 years	n/a	HA111A4 - 8YP
AE406A		5 years	n/a	HA111A5 - 8YP
AE407A				
AE408A	6 hour CTR	1 year	UD555A/E	HA11051 - 8YP
AE409A		3 years	UD556A/E	HA105A3 - 8YP
AE410A		4 years	n/a	HA105A4 - 8YP
AE411A		5 years	n/a	HA105A5 - 8YP
AE412A				

### Service and Support, HP Care Pack, and Warranty Information

- |                                    |   |
|------------------------------------|---|
| <b>HP Software Support</b>         | <ul style="list-style-type: none"><li>• Connect with HP Response Center engineers via telephone, electronic communication, or FAX for assistance in resolving software implementation or operations problems.</li><li>• HP Services provides corrective support to resolve identifiable and reproducible software product problems, and to help you identify problems that are difficult to reproduce.</li><li>• 9x5 coverage - Service is available during standard business hours, Monday through Friday (excluding holidays).</li></ul>  |
| <b>HP Software Support, 24 x 7</b> | <ul style="list-style-type: none"><li>• Provides all the benefits of the regular Software Support, plus HP Services engineers are available around the clock 365 days per year.</li></ul>   |
| <b>HP Support Plus</b>             | <ul style="list-style-type: none"><li>• Increases the performance and availability of your IT infrastructure with comprehensive, consistent hardware and software services. HP Services engineers deliver onsite hardware support and over-the-phone software support 13 hours per day, 5 days per week.</li><li>• Encompasses the HP ProLiant Storage Server products, selected multi-vendor hardware and provides trouble-shooting software problems which range from the Storage Server 2003 operating system to the available utilities. In addition, this service makes software updates available to you at substantial savings.</li><li>• Provides recovery and re-configuration assistance of the HP ProLiant Storage Server using the recovery disk and your saved configuration file.</li></ul> |
| <b>HP Support Plus 24</b>          | <ul style="list-style-type: none"><li>• Provides all the benefits of the regular Support Plus Care Pack, plus HP Services engineers are available to deliver onsite hardware and over-the-phone software support around-the-clock 365 days per year.</li></ul>  |
| <b>HP Proactive 24</b>             | <ul style="list-style-type: none"><li>• An integrated hardware and software support solution that combines efficient problem prevention with responsive technical assistance whenever you need it.</li><li>• Improves the effectiveness of technologies across your IT infrastructure, and also, establishes a collaborative relationship between you and HP that strengthens your IT team and gives you rapid access to our expertise as issues arise.</li></ul>   |

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|----------------------------------|--|
| <b>Software Product Services</b> | <ul style="list-style-type: none"><li>• Standard HP warranty ensures Software media will be free of physical defects for a period of 90 days from delivery.</li><li>• These services are available to upgrade the warranty to (1 or 3) full year of 9 hours by 5 days (or 24x7) software advisory and remedial software telephone support, new version license rights, and media and documentation distribution service.</li></ul> |
|----------------------------------|--|
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### Service and Support, HP Care Pack, and Warranty Information

#### Hardware Product Services

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

For additional hardware installation and maintenance information, please refer to the URLs listed below:  
[http://www.hp.com/hps/storage/ns\\_nas.html](http://www.hp.com/hps/storage/ns_nas.html)

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

Our Proactive 24 annuity service (with the SAN Module) allows continuous SAN/NAS growth by ensuring that your entire SAN/NAS is safely kept updated with analysis and recommendations on relevant, ongoing firmware (FW) changes and it ensures rapid resolution of complex SAN/NAS issues.

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

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

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

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

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

### Service and Support, HP Care Pack, and Warranty Information

#### Installation Services

The service deployment activities will include:

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

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

#### Components

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

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

### Product Configuration Wizard

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

**NOTE:** Options ship separately and are not factory integrated.

### Step 1 - Choose a Model

Select one of five available ML310 G4 Storage Server models.

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

<b>HP ProLiant ML310 G4 Storage Server Common Specifications</b>	<b>Operating System</b>	Microsoft Windows Storage Server 2003 Release 2, Standard Edition
	<b>Number of Processors</b>	1
	<b>Memory Type</b>	PC2-5300 unbuffered DDR2 SDRAM (667MHz)
	<b>Storage Controller</b>	Smart Array E200 Storage Controller with 128MB battery-backed write cache (BBWC); occupies x4 PCIe slot
	<b>Network Controller</b>	Embedded NC320i PCIe Gigabit Server Adapter
	<b>Expansion Slots</b>	Four Expansion Slots <ul style="list-style-type: none"> <li>• Two PCI-X 64-bit/100MHz</li> <li>• Two PCI Express (one slot occupied by SA E200 controller)</li> </ul>
	<b>Optical Drive</b>	HP DVD+R/RW 16X Half Height
	<b>Remote Management</b>	iLO2 Port with Advanced License Pack Included
<b>Form Factor</b>	Tower (5U) (Tower to Rack Enabling Kit available)	

<b>HP ProLiant ML310 G4 640GB SATA Storage Server AG600A</b>	<b>Processor</b>	Dual-Core Intel® Pentium® D 945 (3.4 GHz, 95 Watts, 800 FSB)
	<b>Processor Cache Memory</b>	2 x 2MB Level 2
	<b>Memory</b>	1 GB (1 x 1GB)
	<b>Internal Storage</b>	4 x 160GB 1.5G SATA 7.2K 3.5" hot plug HDDs

<b>HP ProLiant ML310 G4 1TB SATA Storage Server AG605A</b>	<b>Processor</b>	Dual-Core Intel® Pentium® D 945 (3.4 GHz, 95 Watts, 800 FSB)
	<b>Processor Cache Memory</b>	2 x 2MB Level 2
	<b>Memory</b>	1 GB (1 x 1GB)
	<b>Internal Storage</b>	4 x 250GB 1.5G SATA 7.2K 3.5" hot plug HDDs

<b>HP ProLiant ML310 G4 2TB SATA Storage Server AG610A</b>	<b>Processor</b>	Dual-Core Intel® Pentium® D 945 (3.4 GHz, 95 Watts, 800 FSB)
	<b>Processor Cache Memory</b>	2 x 2MB Level 2
	<b>Memory</b>	1 GB (1 x 1GB)
	<b>Internal Storage</b>	4 x 500GB 1.5G SATA 7.2K 3.5" hot plug HDDs

<b>HP ProLiant ML310 G4 3TB SATA Storage Server AG615A</b>	<b>Processor</b>	Dual-Core Intel® Pentium® D 945 (3.4 GHz, 95 Watts, 800 FSB)
	<b>Processor Cache Memory</b>	2 x 2MB Level 2
	<b>Memory</b>	1 GB (1 x 1GB)
	<b>Internal Storage</b>	4 x 750GB 1.5G SATA 7.2K 3.5" hot plug HDDs

### Product Configuration Wizard

HP ProLiant ML310 G4	Processor	Dual-Core Intel® Xeon® 3050 (2.13 GHz, 65 Watts, 1066 FSB)
584GB SAS Storage Server	Processor Cache Memory	2MB Level 2
AG620A	Memory	2 GB (2 x 1GB)
	Internal Storage	4 x 146 GB 3G SAS 15K 3.5" SP hot plug HDDs
	Redundancy	Hot plug redundant power supplies

### Step 2 – Add More Memory

Memory	<b>NOTE:</b> 640GB, 1TB, 2TB, and 3TB SATA models come standard with 1 GB (1 x 1GB) of memory, while the 584GB SAS model comes standard with 2GB (2 x 1GB) of memory. All models are expandable to 4GB.	
	2 GB Unbuffered PC2-5300 ECC DIMM (1 x 2 GB)	432806-B21
	1 GB Unbuffered PC2-5300 ECC DIMM (1 x 1 GB)	432804-B21
	512 MB Unbuffered PC2-5300 ECC DIMM (1 x 512 MB)	432803-B21

### Step 3 – Add Network Adapters

An embedded NC320i PCIe Gigabit Server Adapter is standard. Select additional cards if required for higher performance or redundancy.

**NOTE:** Multifunction Server Adapters support installation of the Microsoft Windows Server 2003 Scalable Networking Pack (a free download from Microsoft) to enable TCP Chimney offload, Receive-side Scaling (RSS), and Network Direct Memory Access (NetDMA) features.

Network Adapters	HP NC110T PCI Express Gigabit Server Adapter	434905-B21
	HP NC150T PCI 4-port Gigabit 1000T Combo Switch Adapter	367132-B21
	HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
	HP NC364T PCI Express Quad Port Gigabit Server Adapter	435508-B21
	HP NC373F PCI Express Multifunction Gigabit Server Adapter	394793-B21
	HP NC373T PCI Express Multifunction Gigabit Server Adapter	394791-B21
	HP NC380T PCI Express Dual Port Multifunction Gigabit Server Adapter	394795-B21

### Step 4 - Add More Storage

ProLiant ML310 G4 Storage Servers come standard with a Smart Array E200/128MB controller for internal drives. Select additional controllers from the list below to accommodate additional performance, expansion, or backup needs.

**NOTE:** Please consult specifications for available expansion slots when ordering additional storage controllers.

### Product Configuration Wizard

#### Storage Controllers

#### SAS Controllers

##### Smart Array E200 Controller

HP Smart Array E200/128 Controller 411508-B21

##### Smart Array E500 Controller

HP Smart Array E500/256MB Controller 435129-B21

##### Smart Array P400 Controller

HP Smart Array P400/256MB Controller 405132-B21

HP Smart Array P400 Controller/512MB and BBWC 411064-B21

Battery-backed write cache upgrade 383280-B21

**NOTE:** For Smart Array P400 Controller only.

512MB Battery-backed cache upgrade 405148-B21

**NOTE:** For Smart Array P400 Controller only.

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

[http://h18000.www1.hp.com/products/quickspecs/12460\\_na/12460\\_na.html](http://h18000.www1.hp.com/products/quickspecs/12460_na/12460_na.html)  
(Smart Array E200 Controller)

[http://h18000.www1.hp.com/products/quickspecs/12700\\_na/12700\\_na.html](http://h18000.www1.hp.com/products/quickspecs/12700_na/12700_na.html)  
(Smart Array E500 Controller)

[http://h18000.www1.hp.com/products/quickspecs/12400\\_na/12400\\_na.html](http://h18000.www1.hp.com/products/quickspecs/12400_na/12400_na.html)  
(Smart Array P400 Controller)

#### SAS HBAs

HP SC44Ge Host Bus Adapter 416096-B21

HP 8 Internal Port SAS HBA with RAID 347786-B21

**NOTE:** Please see the HBA QuickSpecs for additional information:

[http://h18004.www1.hp.com/products/quickspecs/12617\\_na/12617\\_na.html](http://h18004.www1.hp.com/products/quickspecs/12617_na/12617_na.html)  
(SC44Ge HBA)

[http://h18004.www1.hp.com/products/quickspecs/12332\\_na/12332\\_na.html](http://h18004.www1.hp.com/products/quickspecs/12332_na/12332_na.html)  
(8 Internal Port SAS HBA)

#### SCSI HBAs

64-Bit/133-MHz (PCI-X) Single Channel Ultra320 SCSI HBA G2 374654-B21

HP SC11Xe Host Bus Adapter (PCI-e) 412911-B21

**NOTE:** Please see the following QuickSpecs for additional information: T3842AA

[http://h18004.www1.hp.com/products/quickspecs/11943\\_na/11943\\_na.html](http://h18004.www1.hp.com/products/quickspecs/11943_na/11943_na.html)  
(SCSI HBA)

[http://h18000.www1.hp.com/products/quickspecs/12566\\_na/12566\\_na.HTML](http://h18000.www1.hp.com/products/quickspecs/12566_na/12566_na.HTML)  
(SC11Xe HBA)



### Product Configuration Wizard

<b>External Storage Enclosures</b>	<b>HP StorageWorks Modular Smart Arrays</b>	
	HP StorageWorks Modular Smart Array 50 Enclosure (MSA50)	364430-B21
	<b>NOTE:</b> Rack-mountable 10 drive (2.5" SAS/SATA) 1U enclosure with 3Gb/s SAS host connectivity and redundant power supplies.	
	HP StorageWorks 60 Modular Smart Array (MSA60)	418408-B21
	<b>NOTE:</b> Rack-mountable 12 drive (3.5" SAS/SATA) 2U enclosure with 3Gb/s SAS host connectivity and redundant power supplies.	
	HP StorageWorks 70 Modular Smart Array (MSA70)	418800-B21
	<b>NOTE:</b> Rack-mountable 25 drive (2.5" SAS/SATA) 2U enclosure with 3Gb/s SAS host connectivity and redundant power supplies.	
	<b>NOTE:</b> Please see the following QuickSpecs for Technical Specifications additional information:	
	<a href="http://h18000.www1.hp.com/products/quickspecs/12245_na/12245_na.html">http://h18000.www1.hp.com/products/quickspecs/12245_na/12245_na.html</a>	
	(MSA50)	
	<a href="http://h18000.www1.hp.com/products/quickspecs/12627_na/12627_na.html">http://h18000.www1.hp.com/products/quickspecs/12627_na/12627_na.html</a>	
	(MSA60)	
	<a href="http://h18000.www1.hp.com/products/quickspecs/12652_na/12652_na.html">http://h18000.www1.hp.com/products/quickspecs/12652_na/12652_na.html</a>	
	(MSA70)	
<b>Hard Drives (External Array Expansion)</b>	<b>Serial Attached SCSI (SAS) Hard Drives</b>	
	<b>Hot Plug 3.5" (LFF) SAS</b>	
	HP 36GB 15K SAS 3.5" Hot Plug Hard Drive	375868-B21
	HP 72GB 15K SAS 3.5" Hot Plug Hard Drive	375870-B21
	HP 146GB 15K SAS 3.5" Hot Plug Hard Drive	375872-B21
	HP 300GB 15K SAS 3.5" Hot Plug Hard Drive	431944-B21
	<b>Hot Plug 2.5" (SFF) SAS</b>	
	HP 146GB 3G SAS 10K SFF SP HDD	431958-B21
	HP 146GB 3G SAS 10K SFF DP HDD	418367-B21
	HP 72GB 3G SAS 10K SFF SP HDD	375861-B21
	HP 72GB 3G SAS 10K SFF DP HDD	384842-B21
	HP 72GB 3G SAS 15K SFF SP HDD	431935-B21
	HP 72GB 3G SAS 15K SFF DP HDD	418371-B21
	HP 36GB 3G SAS 10K SFF SP HDD	375859-B21
	HP 36GB 3G SAS 15K SFF SP HDD	431933-B21
	HP 36GB 3G SAS 15K SFF DP HDD	418369-B21
	<b>NOTE:</b> Please see the SAS Hard Drive QuickSpecs for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature:	
	<a href="http://h18000.www1.hp.com/products/quickspecs/12244_na/12244_na.html">http://h18000.www1.hp.com/products/quickspecs/12244_na/12244_na.html</a>	
	<b>Serial ATA (SATA) Hard Drives</b>	
	<b>Hot Plug 3.5" (LFF) SATA</b>	
	HP 750GB 1.5G SATA 7.2K 3.5" HDD	432341-B21
	HP 500GB 1.5G SATA 7.2K 3.5" HDD	395473-B21
HP 250GB 1.5G SATA 7.2K 3.5" HDD	349239-B21	
<b>Hot Plug 2.5" (SFF) SATA</b>		
HP 120GB 1.5G SATA 5.4K SFF HDD	431786-B21	
HP 60GB 1.5G SATA 5.4K SFF HDD	379306-B21	

### Product Configuration Wizard

**NOTE:** SATA drives have a 1 year warranty. Please see the [SATA Hard Drive QuickSpecs](#) for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature:  
[http://h18000.www1.hp.com/products/quickspecs/12091\\_na/12091\\_na.html](http://h18000.www1.hp.com/products/quickspecs/12091_na/12091_na.html)

## Step 5 - Add Optional Software

### Microsoft® iSCSI Software Target

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

Microsoft iSCSI Target Software 1 LTU

T4433A

**NOTE:** For more information go to HP's Microsoft® iSCSI Software Target website at:  
[http://h18006.www1.hp.com/products/storageworks/ms\\_iscsi/index.html](http://h18006.www1.hp.com/products/storageworks/ms_iscsi/index.html)

### HP StorageWorks Storage Mirroring Software

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

#### Product Highlights:

- High availability with Microsoft Windows 2000/NT/2003 servers
- Application aware and supported with Exchange, SQL and Oracle
- Host-based remote storage copy with TCP/IP networks
- Data distribution one-to-many or 'fan-out' to multiple destinations
- Data migration utility for transferring large data projects
- Centralize backup, data protection and recovery operations
- Built in scheduler for off hours replication
- Built in network bandwidth utilization management
- Disaster recovery between source and destination failover sites
- Powered by NSI Software's Double-Take patented 'Sequential Transfer Asynchronous Replication' technology
- Sequential transfer maintains write sequential across multiple files for data integrity
- Asynchronous replication allows hosts to continue processing for maximum performance

### Product Configuration Wizard

#### Special note about Microsoft iSCSI Software Target and replication:

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

HP StorageWorks Storage Mirroring Media Kit v4.5	T4440A
HP StorageWorks Storage Mirroring NAS Edition LTU 1	T4445A
HP StorageWorks Storage Mirroring NAS Edition LTU 10	T4446A

**NOTE:** For more information go to the HP StorageWorks Storage Mirroring website at:

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

## Step 6 - Add a Backup Solution

### Tape Drives

**NOTE:** For the complete listing of Tape Drive offerings, please see:

<http://www.hp.com/products1/storage/compatibility/tapebackup/ISS/index.html>

#### USB Tape Drives

HP StorageWorks 1U USB Rack-Mount Kit with one DAT 160 USB drive	AG703A
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#### SAS Tape Drives

**NOTE:** For the ML310 G4 Storage Server, HP recommends purchasing the HP SC44Ge HBA (416096-B21) for a dedicated SAS HBA for tape.

HP StorageWorks LTO-2 Ultrium 448 SAS Internal Tape Drive	DW085A
HP StorageWorks LTO-3 Ultrium 920 SAS Internal Tape Drive	EH847A

**NOTE:** Please refer to the "Tape Drives, Tape Autoloaders & Tape Libraries" table in the Storage section of this document for a list of SAS controllers with tape support.

#### Ultrium Tape Drives

HP StorageWorks Ultrium 232 Internal Tape Drive (Carbonite)	DW064A
<b>NOTE:</b> HP recommends combining this tape drive with the 1U SCSI Rack-Mount kit (A7445B) for a complete rack-mount solution.	
HP StorageWorks LTO-2 Ultrium 448 SCSI Internal Tape Drive (Carbonite)	DW016A
HP StorageWorks LTO-3 Ultrium 920 SCSI Internal Tape Drive	EH841A

**NOTE:** Please see the HP StorageWorks LTO Ultrium Tape Drive QuickSpecs for additional options such as controllers, media, and other related items:

[http://h18006.www1.hp.com/products/quickspecs/11739\\_na/11739\\_na.html](http://h18006.www1.hp.com/products/quickspecs/11739_na/11739_na.html)

[http://h18006.www1.hp.com/products/quickspecs/12128\\_na/12128\\_na.html](http://h18006.www1.hp.com/products/quickspecs/12128_na/12128_na.html)

For an up-to-date listing of the latest O/S and software support details for HP Ultrium tape drives, please visit: <http://www.hp.com/go/connect>.

#### Rack-Mount Tape Drive Enclosures

### Product Configuration Wizard

<p>HP StorageWorks 1U SCSI Rack-Mount kit  <b>NOTE:</b> The 1U Rack-Mount Kit can support up to (2) half-height tape drives and is compatible with multiple Single-Ended and LVD SCSI tape drives including the DAT 24, DAT 40, DAT 72, DLT VS80, DLT VS160, Ultrium 215, Ultrium 232, Ultrium 448 and Ultrium 920 tape drives.</p>	A7445B
<p>HP StorageWorks 1U USB Rack-Mount Kit  <b>NOTE:</b> The 1U USB Rack-Mount Kit can support up to (2) half-height tape drives and is compatible with the DAT 24 USB, DAT 40 USB and DAT 72 USB tape drives.</p>	A8007A
<p>HP StorageWorks 1U SAS Rack-Mount Kit  <b>NOTE:</b> The 1U SAS Rack-Mount Kit can support up to (2) half-height tape drives and is compatible with the Ultrium 448 SAS and Ultrium 920 SAS tape drives.</p>	AE459A
<p>HP StorageWorks 3U Rack-mount kit  <b>NOTE:</b> The 3U Rack-mount Kit can support up to (2) full-height or (4) half-height tape drives and compatible with multiple LVD SCSI tape drives including DAT 40, DAT 72, DLT VS160, SDLT 600, LTO-1 Ultrium 232, LTO-2 Ultrium 460, LTO-2 Ultrium 448, LTO-3 Ultrium 920, LTO-3 Ultrium 960 and LTO-4 Ultrium 1840 tape drives.  <b>NOTE:</b> Please see the Rack-Mount Tape Drive Kits QuickSpecs for additional information regarding these kits:  <a href="http://h18000.www1.hp.com/products/quickspecs/10854_na/10854_na.html">http://h18000.www1.hp.com/products/quickspecs/10854_na/10854_na.html</a></p>	274338-B22

<b>HP D2D Backup System</b>	<p>HP StorageWorks D2D110 Backup System  <b>NOTE:</b> 1TB of Disk Storage</p> <p>HP StorageWorks D2D110 Backup System with Data Protector Express Software Kit  <b>NOTE:</b> 1TB of Disk Storage</p> <p>HP StorageWorks D2D120 Backup System  <b>NOTE:</b> 2TB of Disk Storage</p> <p>HP StorageWorks D2D120 Backup System with Data Protector Express Software Kit  <b>NOTE:</b> 2TB of Disk Storage  <b>NOTE:</b> Please see the HP D2D Backup Systems QuickSpecs for additional information:  <a href="http://h18000.www1.hp.com/products/quickspecs/12651_na/12651_na.html">http://h18000.www1.hp.com/products/quickspecs/12651_na/12651_na.html</a></p>	<p>EH880A</p> <p>EH923A</p> <p>EH884A</p> <p>EH924A</p>
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<b>Tape Autoloaders</b>	<p><b>HP StorageWorks DAT Autoloader</b></p> <p>HP StorageWorks DAT 72x10 tape autoloader</p> <p><b>HP StorageWorks 1/8 Tape Autoloader</b></p> <p>HP StorageWorks 1/8 LTO-3 Ultrium 920 G2 Tape Autoloader</p> <p>HP StorageWorks 1/8 G2 LTO-3 Ultrium 920 SAS Autoloader</p> <p>HP StorageWorks 1/8 LTO-2 Ultrium 448 G2 Tape Autoloader</p> <p>HP StorageWorks 1/8 LTO-1 Ultrium 232 G2 Tape Autoloader</p> <p>HP StorageWorks 1/8 G2 Tape Autoloader Rack Kit  <b>NOTE:</b> Required to install the 1/8 G2 Autoloaders in a standard 19-inch rack; includes rails and rackmount instructions  <b>NOTE:</b> Please reference the Tape Autoloader QuickSpecs at <a href="http://www.hp.com/go/automation">http://www.hp.com/go/automation</a> for additional information needed to create a complete solution; reference current compatibility information at <a href="http://www.hp.com/go/ebs">http://www.hp.com/go/ebs</a></p>	<p>AE313A</p> <p>AH165A</p> <p>AH558A</p> <p>AH164A</p> <p>AH163A</p> <p>AH166A</p>
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### Product Configuration Wizard

#### Tape Libraries

##### HP StorageWorks MSL2024 Tape Library

HP StorageWorks MSL2024 1 LTO-4 Ultrium 1840 SCSI Drive Library	AJ033A
HP StorageWorks MSL2024 1 LTO-4 Ultrium 1840 4GB FC Library	AJ034A
HP StorageWorks MSL2024 1 LTO-3 Ultrium 960 SCSI Drive Library	AG115A
HP StorageWorks MSL2024 1 LTO-3 Ultrium 960 4GB FC Library	AG326B
HP StorageWorks MSL2024 1 LTO-3 Ultrium 920 SAS Drive Library	AH559A
HP StorageWorks MSL2024 1 LTO-3 Ultrium 920 SCSI Drive Library	AH169A
HP StorageWorks MSL2024 1 LTO-2 Ultrium 448 SCSI Drive Library	AG116A

##### HP StorageWorks MSL4048 Tape Library

HP StorageWorks MSL4048 1 LTO-2 Ultrium 448 SCSI Drive Library	AG320A
HP StorageWorks MSL4048 1 LTO-3 Ultrium 920 SAS Drive Library	AH560A
HP StorageWorks MSL4048 1 LTO-3 Ultrium 920 SCSI Drive Library	AH171A
HP StorageWorks MSL4048 1 LTO-3 Ultrium 960 SCSI Drive Library	AG322A
HP StorageWorks MSL4048 1 LTO-3 Ultrium 960 4GB FC Library	AG324B
HP StorageWorks MSL4048 1 LTO-4 Ultrium 1840 SCSI Drive Library	AJ035A
HP StorageWorks MSL4048 1 LTO-4 Ultrium 1840 4GB FC Library	AJ036A

##### HP StorageWorks MSL8096 Tape Library

HP StorageWorks MSL8096 2 LTO-3 Ultrium 920 SAS Drive Library	AH561A
HP StorageWorks MSL8096 2 LTO-3 Ultrium 960 4GB FC Library	AH218A
HP StorageWorks MSL8096 2 LTO-3 Ultrium 960 SCSI Drive Library	AH219A
HP StorageWorks MSL8096 2 LTO-4 Ultrium 1840 SCSI Drive Library	AJ039A
HP StorageWorks MSL8096 2 LTO-4 Ultrium 1840 4GB FC Library	AJ040A

##### HP StorageWorks MSL6000 Tape Library

###### LTO-4 Ultrium 1840 technology

HP StorageWorks MSL6030 1 LTO-4 Ultrium 1840 SCSI Drive Library	AJ029A
HP StorageWorks MSL6030 1 LTO-4 Ultrium 1840 4GB FC Library	AJ030A
HP StorageWorks MSL6060 2 LTO-4 Ultrium 1840 SCSI Drive Library	AJ031A
HP StorageWorks MSL6060 2 LTO-4 Ultrium 1840 4GB FC Library	AJ032A

###### LTO-3 Ultrium 960 technology

HP StorageWorks MSL6030 1 LTO-3 Ultrium 960 Dr LVDS Library	AD606B
HP StorageWorks MSL6030 1 LTO-3 Ultrium 960 Dr FC Library	AD608B
HP StorageWorks MSL6030 2 LTO-3 Ultrium 960 Dr LVDS Library	AD607B
HP StorageWorks MSL6030 2 LTO-3 Ultrium 960 Dr FC Library	AD609B

#### HP Data Protector Express Software

HP DP Express Backup Server Upgrade for ProLiant Software	BB117EP
HP DP Express Package for Microsoft Small Business Server	BB118EA

**NOTE:** To obtain a free licensed copy of HP Data Protector Express for ProLiant edition software, please visit the "Protect Your Data" link accessible from your ProLiant server's System Management Homepage (SMH) software (SmartStart 7.5 or later).

**NOTE:** Please see the HP Data Protector Express QuickSpecs for additional information regarding the purchase of HP Data Protector Express software:  
[http://h18000.www1.hp.com/products/quickspecs/12337\\_na/12337\\_na.html](http://h18000.www1.hp.com/products/quickspecs/12337_na/12337_na.html)

### Product Configuration Wizard

#### Step 7 - Add UPS, Power and Rack Options

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<b>Rack Conversion Kit</b>	ProLiant Rack Enabling Kit (RoHS Compliant) <b>NOTE:</b> This is a 5U Rack Enabling Kit that supports the HP ProLiant ML110 and HP ProLiant ML310 servers. <b>NOTE:</b> Support for racks with round or square mounting holes (including all Compaq and HP Rack System /E and HP Systems), with an adjustment range of 24" - 36".	417705-B21
<b>Uninterruptible Power Systems - Tower</b>	HP T500 UPS 120 V HP T750 UPS, Low Voltage HP T1000 UPS HP T1500 UPS HP R/T 2200 UPS	361475-001 378439-D71 AF403A AF406A AF409A
<b>USB Options</b>	HP USB-P/S2 Optical Mouse USB 1.44-MB External Diskette Drive (Carbonite) HP USB 04 Standard Keyboard	DC369A DC141B DT528A#ABA

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#### Step 8 - Order HPTS Service Care Packs

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

Note that the standard HP warranty ensures software media will be free of physical defect for a period of 90 days from delivery. However the HP ProLiant ML310 G4 Storage Server products all come with a full year of 9 hours by 5 days software advisory and remedial software telephone support, new version license rights, and media and documentation distribution service. Extended hours of coverage and additional years of service are available should the customer require more support.

See Service and Support section for more information on available Care Packs for the ML310 G4 Storage Server.

### Memory

#### Standard Memory

PC2-5300 (667MHz) Unbuffered ECC DDR2 SDRAM

- 1 GB (1 x 1GB): 640GB, 1TB, 2TB, and 3TB SATA models
- 2 GB (2 x 1GB): 584GB SAS model

#### Maximum Memory

- 4 GB (4 x 1GB or 2 x 2GB): Limited by operating system license.

DIMM upgrades do not need to be installed in pairs although installation of pairs (an equal size DIMM for each channel) provides the best performance. The BIOS will detect the DIMM population and initialize the system accordingly as follows:

- Single-channel mode – DIMMs installed for one channel only
- Dual-channel asymmetric mode – DIMMs installed for both channels but of unequal channel capacities.
- Dual-channel interleaved mode (recommended) – DIMMs installed for both channels and offering equal channel capacities, providing the highest performance.

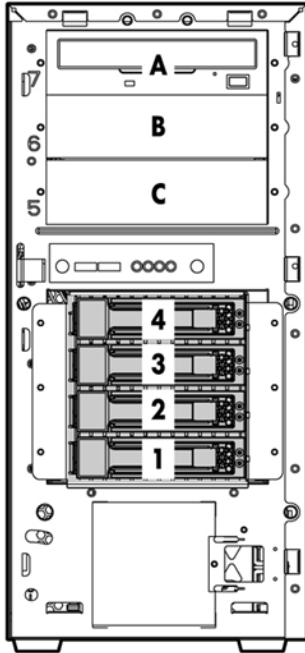
The first DIMM should be installed in Socket 1. A DIMM should not be installed in Socket 2 without a DIMM in Socket 1. Likewise a DIMM should not be installed in Socket 4 without a DIMM in Socket 3. A DIMM need not be installed in Socket 2 in order to install a DIMM in Socket 3.

The table below shows some memory configurations for these systems.

**NOTE:** The table below does not list all possible configurations. Balanced-capacity, dual-channel loading yields best performance.

Channel A		Channel B		Total	Mode
Socket 1	Socket 2	Socket 3	Socket 4		
1 GB	none	none	none	1 GB (640GB, 1TB, 2TB, and 3TB SATA models)	Single-channel
1 GB	none	1 GB	none	2 GB (584GB SAS model)	Dual-channel interleaved
1 GB	1 GB	1 GB	1 GB	4 GB (maximum configuration)	Dual-channel interleaved
2 GB	none	2 GB	none	4 GB (maximum configuration; requires removal of included 1GB DIMMs)	Dual-channel interleaved

### Storage



A, B Removable Media Bays (1.6" each)

C 16x DVD+RW

0, 1, 2, 3 Four Hot Plug Hard Drive Bays (3.5" LFF SATA or SAS)

### Drive Support

	Quantity Supported	Position Supported	Controller
<b>Removable Media</b>			
DVD+RW Drive	1	C	Integrated IDE (ATAPI)

#### Hard Drives

##### Hot Plug 3.5" (LFF) Serial Attached SCSI – SAS

146GB 3G SAS 15K SP	4	1 – 4	Integrated Smart Array E200/128MB Controller
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##### Hot Plug 3.5" (LFF) Serial ATA – SATA

	Quantity Supported	Position Supported	Controller
750GB 1.5G SATA 7.2K	4	1 – 4	Integrated Smart Array E200/128MB Controller
500GB 1.5G SATA 7.2K			
250GB 1.5G SATA 7.2K			
160GB 1.5G SATA 7.2K			



### Storage

#### External Storage

	Quantity Supported	Position Supported	Host Controller or Adapter
HP StorageWorks Modular Smart Array 50 Enclosure	Up to 2	External	Smart Array E500 Controller
HP StorageWorks 60 Modular Smart Array	Up to 8 per SA E500	External	Smart Array E500 Controller
HP StorageWorks 70 Modular Smart Array	Up to 8 per SA E500	External	Smart Array E500 Controller

#### Maximum Raw Storage Capacity

Internal	3TB raw (4 x 750GB SATA LFF)
External	9TB raw (12 x 750 GB SATA) [1 x SA E500 connected to MSA60 full of 750 GB SATA HDDs]
Total	12TB raw (4 x 750GB int. + 12 x 750GB ext.)

#### Factory RAID Configuration

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

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

#### Tape Drives, Tape Autoloaders, Tape Libraries & D2D Backup

**NOTE:** For an up-to-date listing of the latest O/S Support details for each of the Tape Drives listed below, please see the following: [http://h18000.www1.hp.com/products/quickspecs/north\\_america/10233.html](http://h18000.www1.hp.com/products/quickspecs/north_america/10233.html)

**NOTE:** For an up-to-date listing of the latest O/S Support details for each of the Tape Autoloaders and Tape Libraries listed below, please see the following: [http://h18000.www1.hp.com/products/quickspecs/north\\_america/10809.html](http://h18000.www1.hp.com/products/quickspecs/north_america/10809.html)

**NOTE:** For complete listing of tape drive offerings see <http://www.hp.com/products1/storage/compatibility/tapebackup/ISS/index.html>

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

Position Supported	Controller	Controller/HBA Option Kit Part Number
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### Storage

<b>HP StorageWorks SCSI Tape Drives, Internal</b>	Internal	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
LTO-1 Ultrium 232			
LTO-2 Ultrium 448			
LTO-2 Ultrium 460			
LTO-3 Ultrium 920			
LTO-3 Ultrium 960			
LTO-4 Ultrium 1840			
DAT 40			
DAT 72			
DAT 160			
DLT VS160			
SDLT 600			
<b>HP StorageWorks SCSI Tape Drives, External</b>	External	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
LTO-1 Ultrium 232			
LTO-2 Ultrium 448			
LTO-2 Ultrium 460			
LTO-3 Ultrium 920			
LTO-3 Ultrium 960			
LTO-4 Ultrium 1840			
DAT 40			
DAT 72			
DAT 160			
DLT VS160			
SDLT 600			
1U Rack-Mount Kit			
3U Rack-Mount Kit			
<b>HP StorageWorks USB Tape Drives, Internal</b>	Internal	USB 2.0 Port on motherboard	N/A
DAT 40 USB			
DAT 72 USB			
DAT 160 USB			
<b>HP StorageWorks USB Tape Drives, External</b>	External	USB 2.0 Port	N/A
DAT 40 USB			
DAT 72 USB			
DAT 160 USB			
1U USB Rack-Mount Kit			

### Storage

<b>HP StorageWorks SAS Tape Drives, Internal</b> LTO-2 Ultrium 448 SAS LTO-3 Ultrium 920 SAS	Internal	HP SC44Ge Host Bus Adapter	416096-B21
		<b>NOTE: Recommended.</b>	
		HP 8 Internal Port SAS HBA with RAID	347786-B21
		HP Smart Array E500 Controller	435129-B21
		<b>NOTE: The following SAS Smart Array controllers require ROM Flash version 2.04 or higher for SAS tape support:</b>	
		HP Smart Array P400/256MB Controller	405132-B21
		HP Smart Array P400/512MB Controller	411064-B21
		<b>NOTE: Please visit <a href="http://www.hp.com/go/connect">http://www.hp.com/go/connect</a> for details about minimum SAS controller firmware version and SAS cabling requirements.</b>	
<b>HP StorageWorks SAS Tape Drives, External</b> LTO-2 Ultrium 448 SAS LTO-3 Ultrium 920 SAS 1U Rack-Mount Kit	External	HP SC44Ge Host Bus Adapter	416096-B21
		<b>NOTE: Recommended.</b>	
		HP 8 Internal Port SAS HBA with RAID	347786-B21
		HP Smart Array E500 Controller	435129-B21
		<b>NOTE: The following SAS Smart Array controllers require ROM Flash version 2.04 or higher for SAS tape support:</b>	
		HP Smart Array P400/256MB Controller	405132-B21
		HP Smart Array P400/512MB Controller	411064-B21
		<b>NOTE: Please visit <a href="http://www.hp.com/go/connect">http://www.hp.com/go/connect</a> for details about minimum SAS controller firmware version and SAS cabling requirements.</b>	
<b>HP StorageWorks SCSI Tape Automation, External</b> DAT 72x10 Autoloader 1/8 G2 Tape Autoloader MSL2024 MSL4048 MSL8096 MSL6000	External	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
		HP U320e SCSI Host Bus Adapter	AH627A
		<b>NOTE: Only valid for MSL tape libraries.</b>	
<b>HP StorageWorks SAS Tape Automation, External</b> 1/8 G2 Autoloader MSL2024 MSL4048 MSL8096	External	HP SC44Ge Host Bus Adapter	416096-B21
		<b>NOTE: Please visit <a href="http://www.hp.com/go/connect">http://www.hp.com/go/connect</a> for details about minimum SAS controller firmware version and SAS cabling requirements.</b>	
<b>HP StorageWorks Fibre Tape Automation, External</b> MSL2024 MSL4048 MSL6000	External	Please consult the EBS connectivity matrix at <a href="http://www.hp.com/go/ebs">http://www.hp.com/go/ebs</a> for detailed connectivity information.	

## Storage

HP StorageWorks D2D Backup  
Systems  
D2D110  
D2D120

External

Embedded Network Controller

N/A

### Technical Specifications

<b>System Unit</b>	<b>Dimensions (HxWxD)</b>	17.0 x 7-7/8 x 22 in (43.0 x 20.0 x 55.0 cm)
	<b>Weight</b> (no drives installed)	17.9 kg (39.5 lbs)
	<b>Ready steady state power</b>	3.3 V/ 5V 110W 12 V CPU 300W
	<b>Maximum peak power</b>	410W (non-redundant non-hot plug) – SATA models 430W (redundant hot-plug) – SAS model
	<b>Input Requirements</b> (per power supply)	Range Line Voltage      88-269VAC Normal Line Voltage      100 to 240 VAC
	<b>Line Frequency</b>	47 to 66 Hz
	<b>Rated Input Current</b>	6.4A RMS max at 100VAC with maximum load 3.2A RMS max at 230V with maximum load
	<b>BTU Rating</b>	1,560 BTU
	<b>Power Supply Output Power</b>	Rated Steady-State Power    350W Maximum Peak Power        410W
	<b>Power Supply Output Power - RPS</b>	Rated Steady-State Power    350W Maximum Peak Power        430W
	<b>Temperature Range</b>	Operating                      50° to 95° F (10° to 35° C) Shipping                        -40° to 160° F (-40° to 71° C)
	<b>Relative Humidity</b> (non-condensing)	Operating                      20% to 80% Non-operating                5% to 95%
	<b>Acoustic Noise</b>	Idle (Fixed Disk Drives Spinning) L WAd (BELS)      5.4 L pAm (dBA)        34
		Operating (Random Seeks to Fixed Disks) L WAd (BELS)      5.4 L pAm (dBA)        34
	<b>Acoustic Noise - RPS</b>	Idle (Fixed Disk Drives Spinning) L WAd (BELS)      5.2 L pAm (dBA)        37.8
		Operating (Random Seeks to Fixed Disks) L WAd (BELS)      5.3 L pAm (dBA)        39.6

### Technical Specifications

Embedded NC320i PCIe 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	Single lane (x1), 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)	2000Mb/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)		

HP Smart Array E200 Controller	Disk Drive and Enclosure Interface	3G SAS (Serial Attached SCSI) 1.5G SATA (Serial ATA)	
	SAS Connectors	2 internal (SFF8484) x4 wide port connectors	
	Cache Memory Speed	DDR-1/266 MHz provides up to 4.2 GB/s maximum bandwidth.	
	Server Interface	x4 2.5G PCIe provides 2GB/s maximum bandwidth	
	SATA Protocols	SATA-1a	
	Internal SATA Connectors	One 4-lane connector (all four channels)	
	RAID levels supported	RAID 0, RAID 1	

Environment-friendly Products and Approach	End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a> . To recycle your product, please go to: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.
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The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/green>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

### *Technical Specifications*

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