

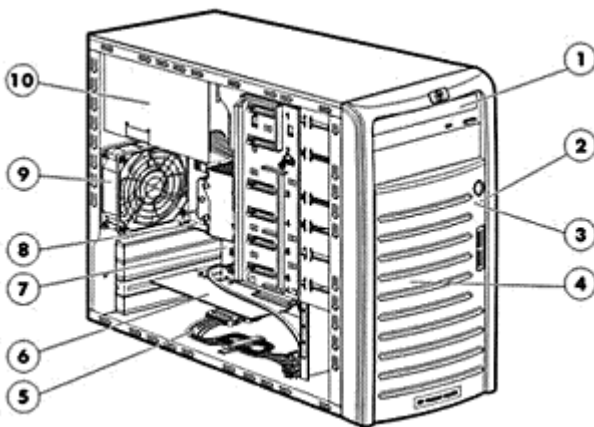
### Overview

You have better things to do than worry about file storage in your small or remote office. But your users continue to demand more space for their data, and data protection and security are become more of a concern. You need to add file storage that's powerful and easy to install and manage, and you need to do it fast.

The HP ProLiant ML110 G5 Storage Server is a fast, easy, and affordable way to add tower-based file storage to your small or remote office network. The Microsoft Windows-powered operating system is pre-installed and internal storage is pre-configured, so you're up and serving files in minutes. It supports multiple file sharing protocols, so you can consolidate and make a single centralized platform to manage and protect, or you can create a scalable disk-based backup/replication target.

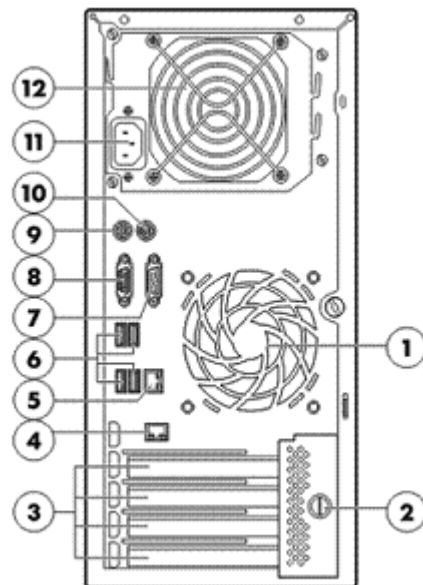
Once your solution is installed, you'll find that you spend less time and effort on file management and maintenance. You can manage and troubleshoot from outside the office anywhere with either remote desktop or optional Lights-Out 100c remote management. Since it's running Windows, it integrates seamlessly into your Active Directory and DFS environments, runs your favorite antivirus and backup software, and has a familiar management look and feel. And don't forget that you can use an ML110 G5 Storage Server as a print server, too.

All ML110 G5 Storage Servers are built on industry standards and include features that protect and optimize your investment. The micro ATX tower platform delivers the flexibility you need with both SATA and SAS drive support, and the operating system includes intelligent tools like Quotas, File Screening, Storage Reporting, and Replication. Select models support the optional Microsoft® iSCSI Software Target, so you can add block-based Exchange, SQL or other application storage capability to your network storage solution.



#### Front View:

1. SATA DVD-ROM Drive
2. Power LED
3. Drive Activity LED
4. Front Bezel
5. SAS cable



#### Rear View:

1. System fan
2. PCI slot cover retainer
3. PCI slot covers (one slot occupied by Smart Array E200 controller on all models except 320GB SATA model)
4. HP LO 100c Management Port (Optional)
5. LAN Port (RJ-45)

### Overview

6. Smart Array E200 controller (all models except 320GB SATA model)
7. System Board
8. HP LO 100c Management Card (Optional)
9. System Fan
10. 365W Power Supply
6. Rear USB 2.0 Ports
7. Serial Ports
8. VGA Port
9. PS/2 Keyboard Port
10. PS/2 Mouse Port
11. Power Supply Outlet
12. Power supply unit (PSU) fan

**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 ML110 G5 Storage Servers deliver affordability, fast deployment, and ease of use in a tower form factor for small and remote file serving environments.

- **Operating System:**
  - Microsoft Windows Storage Server 2003 Release 2, Workgroup x64 Edition (320GB SATA model)
  - Microsoft Windows Storage Server 2003 Release 2, Standard x64 Edition (1TB SATA, 2TB SATA, and 584GB SAS models)
- **Processor:**
  - Single-Core Intel® Celeron® 420 1.6 GHz (320GB SATA model)
  - Dual-Core Intel® Pentium® E2160 1.8 GHz (1TB SATA, 2TB SATA, and 584GB SAS models)
- **Memory:**
  - 512MB (1 x 512MB) standard (320GB SATA model)
  - 1GB (1 x 1GB) standard (1TB SATA, 2TB SATA, and 584GB SAS models)
- **Storage Controller:**
  - None-SW RAID (320GB SATA model)
  - Smart Array E200/128MB Controller with BBWC (1TB SATA, 2TB SATA, and 584GB SAS models)
- **Drive Support:**
  - Four internal bays (3.5" large form factor) that support non-hot-plug SAS or SATA HDDs
    - 2 x 160GB SATA LFF (320GB SATA model)
    - 4 x 250GB SATA LFF (1TB SATA model)
    - 4 x 500GB SATA LFF (2TB SATA model)
    - 4 x 146GB SAS LFF (584GB SAS model)
  - Half-height SATA DVD-ROM drive to support System Restore
- **Network Controller:**
  - Embedded NC105i PCIe Gigabit Ethernet Server Adapter
- **Expansion Slots:**
  - (1) Full-height, half-length 32-bit/33MHz PCI at 3.3V slot
  - (1) Full-height, half-length PCIe x1 slot (x8 connector)
  - (1) Full-height, full-length PCIe x1 slot (x8 connector)

### Overview

- (1) Full-height, full-length PCIe x8 slot (occupied by Smart Array E200/128MB controller on 1TB SATA, 2TB SATA, and 584GB SAS models)
- (1) Lights-out 100c option slot
- **Management:**
  - Microsoft Management Console (MMC)-based user interface
  - Remote system management via Remote Desktop or Telnet
  - (Optional) HP Lights-Out 100c Remote Management Card
- **Form Factor:**
  - Micro ATX Tower
- **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.

---

**The fast and easy way to add file storage 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 small/remote office network. Go from out-of-the-box to file serving in minutes, not hours.

**A single centralized file server platform to manage and protect** Consolidate islands of direct-attached storage (DAS) or low-capacity network attached storage (NAS) devices to one easy-to-use Windows platform, or create a scalable disk-based backup or replication target.

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

**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 and backup applications, and limits your learning curve with the familiar 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 almost anywhere at both the operating system level (with Remote Desktop or HTTPS) and at the hardware component level (using Lights-Out 100i remote management).

**HP ProLiant industry-standard hardware** Relax-your investment is protected because you're not locked into a proprietary platform. The compact 1U rack-mount platform features quad-core processing (with an option for a second processor) and supports four SATA or SAS 3.5" internal hard drives.

**Print server support** Don't forget that a DL160 G5 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.

**NOTE:** The 320GB SATA model is ineligible for upgrade.

### Standard Features

#### Operating System

##### **320GB SATA model**

Microsoft Windows Storage Server 2003 R2, Workgroup x64 Edition

- 64-bit processing (compatible with 32-bit applications)
- Optimized for File Serving: Up to 20% faster file serving performance than a general-purpose Windows Server 2003 R2 installation on the same hardware.
- HP-enhanced File Server Management Console: Features the familiar look and feel of the Microsoft Management Console (MMC).
- HP Rapid Start-up Wizard: Simplifies and accelerates new device deployment by walking you through basic system settings step-by-step.
- 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)
- Support for multiple file serving protocols, including SMB/CIFS, NFS, HTTP, FTP, WebDAV, AppleTalk, and NetWare
- Print Management Console: Manage multiple printers (license for support of five networked printers) from a single console, whether locally or over the WAN
- Support for up to 4 SATA disk drives and one network port

##### **1TB SATA, 2TB SATA, and 584GB SAS models**

Microsoft Windows Storage Server 2003 R2, Standard x64 Edition

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

- 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.
- 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
- Unlimited networked printer support
- Support for any number of SATA or SAS drives and multiple network ports
- Support for Microsoft iSCSI Software Target upgrade

### Standard Features

**Processors**                    **320GB SATA model**  
 1 x Single-Core Intel® Celeron® 420 (1.6 GHz, 800 FSB, 512K)  
**1TB SATA, 2TB SATA, 584GB SAS models**  
 1 x Dual-Core Intel® Pentium® E2160 (1.80 GHz, 800 FSB, 1M)

**Cache Memory**            **320GB SATA model**  
 512KB Level 2  
**1TB SATA, 2TB SATA, 584GB SAS models**  
 1x1 MB Level 2

**Chipset**                      Intel® 3200

**Memory**                    Type                            PC2-6400 unbuffered DDR2 ECC 800MHz  
 Memory Protection        Unbuffered ECC  
 DIMM Sockets              4  
 Maximum Memory         8 GB  
**320GB SATA model**  
 Standard                    512 MB (1 x 512MB)  
**1TB SATA, 2TB SATA, 584GB SAS models**  
 Standard                    1 GB (1 x 1 GB)

**Network Controller**      Embedded NC105i PCIe Gigabit Server Adapter

Expansion Slots	Slot Number	Bus Speed	Hot Plug Y/N	PCI Voltage	Notes
	4	x8 PCI Express	No	n/a	Full-height / full-length (occupied by SA E200 on select models)
	3	x1 PCI Express	No	n/a	x8 Connector Full-height / full-length
	2	x1 PCI Express	No	n/a	x8 Connector Full-height / half-length
	1	32bit/33MHz PCI	No	3.3V	Full-height / half-length

### Standard Features

**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>• 2 x 160GB SATA 7.2K LFF NHP HDDs (320GB SATA model)</li> <li>• 4 x 250GB SATA 7.2K LFF NHP HDDs (1TB SATA model)</li> <li>• 4 x 500GB SATA 7.2K LFF NHP HDDs (2TB SATA model)</li> <li>• 4 x 146GB 3G SAS 15K LFF NHP HDDs (584GB SAS model)</li> </ul>
	Optical Drive	HP 16X SATA DVD-ROM Half-height

<b>Maximum Storage Capacity (raw)</b>	Internal non-hot-plug LFF SATA	2 TB	4 x 500GB SATA
	Internal non-hot-plug LFF SAS	584GB	4 x 146GB SAS

<b>Interfaces</b>	Parallel	None
	Serial	1
	Pointing Device Device (Mouse, PS2)	1
	Graphics	1
	Keyboard (PS2)	1
	USB 2.0 Ports	8 total (4 rear, 2 front panel, 2 internal (one for USB Tape connectivity))
		<p><b>NOTE:</b> Internal USB ports are optimal for the attachment of HP USB DAT Tape Drives</p> <p><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></p>
Network RJ-45 (Ethernet)	NC105i PCIe Gigabit Server Adapter	
Remote Management	(Optional) Lights-Out 100c Remote Management Card	

**Graphics** Integrated Graphics Controller with 8MB video memory supporting 1600 x 1200 x 16 Bit Colors resolution

**Management** Microsoft Management Console (MMC)-based user interface (also accessible via HTTPS)  
 Remote system management via Remote Desktop or Telnet  
 (Optional) HP Lights-Out 100c Remote Management Card

**NOTE:** For more information on Lights-Out 100c, please visit: <http://www.hp.com/servers/lightsout>.

### Standard Features

**Form Factor**                      Micro ATX Tower

---

**Industry Standard Compliance**                      ACPI V3.0a Compliant  
PCI 2.3 Compliant  
PXE Support  
WOL Support  
IPMI 2.0 compliance  
Microsoft Logo certifications  
USB 2.0

---

**Server Power Cords**                      Country-specific, lowline NEMA power cord

---

**Power Supply**                      365 Watts; non-redundant, non-hot-plug

---

**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>

---

**System Fans**                      One non-redundant system fan, one non-redundant power supply fan, and one non-redundant CPU heatsink fan standard

---

### 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.

**NOTE:** Microsoft iSCSI Target Software is compatible only with ProLiant Storage Servers running Windows Storage Server 2003 R2, Standard x86 or x64 Edition (including the ML110 G5 1TB SATA, 2TB SATA, and 584GB SAS models). The ML110 G5 320GB SATA model includes Windows Storage Server 2003 R2, Workgroup x64 Edition, which is ineligible for upgrade.

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 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 ProLiant Storage Servers 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>

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

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

## Optional 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>

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

**Warranty** HP ProLiant ML110 G5 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
AK301A	HP Software	1 year	Bundled	Bundled
AK302A	Support for Storage, 9 x 5	3 years	n/a	HA106A3 - 6Z3
AK303A		4 years	n/a	HA106A4 - 6Z3
AK304A		5 years	n/a	HA106A5 - 6Z3
AK305A				
AK306A	HP Software	1 year	n/a	HA107A1 - 6Z3
AK307A	Support for Storage, 24 x 7	3 years	n/a	HA107A3 - 6Z3
AK308A		4 years	n/a	HA107A4 - 6Z3
AK309A		5 years	n/a	HA107A5 - 6Z3
AK310A				
AK311A	Support Plus for Storage	1 year	UH159E	HA109A1 - 6Z3
AK312A		3 years	UH161E	HA109A3 - 6Z3
AK313A		4 years	n/a	HA109A4 - 6Z3
AK314A		5 years	n/a	HA109A5 - 6Z3
AK315A				
AK316A		Post Warranty	UH163PE	n/a
AK317A	Support Plus 24 for Storage	1 year	UH160E	HA110A1 - 6Z3
AK318A		3 years	UH162E	HA110A3 - 6Z3
AK319A		4 years	n/a	HA110A4 - 6Z3
AK320A		5 years	n/a	HA110A5 - 6Z3
		Post Warranty	UH164PE	n/a
	Proactive 24 (P24)	1 year	n/a	HA111A1 - 6Z3
		3 years	n/a	HA111A3 - 6Z3
		4 years	n/a	HA111A4 - 6Z3
		5 years	n/a	HA111A5 - 6Z3
	6 hour CTR	1 year	n/a	HA105A1 - 6Z3
		3 years	n/a	HA105A3 - 6Z3
		4 years	n/a	HA105A4 - 6Z3
		5 years	n/a	HA105A5 - 6Z3
	Installation	n/a	U7986E	HA113A1 - 5D6

- |                             |   |
|-----------------------------|---|
| HP Software Support         | <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>  |
| HP Software Support, 24 x 7 | <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>   |
| HP Support Plus             | <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> |
| HP Support Plus 24          | <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>  |
| HP Proactive 24             | <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>  |
- 

- |                           |  |
|---------------------------|--|
| Software Product Services | <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> |
|---------------------------|--|
-

### 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 four available ML110 G5 Storage Server models.

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

<b>HP ProLiant ML110 G5 Storage Server Common Specifications</b>	<b>Number of Processors</b> <b>Memory Type</b> <b>Network Controller</b> <b>Expansion Slots</b>	1 PC2-6400 unbuffered DDR2 ECC 800MHz Embedded NC105i PCIe Gigabit Server Adapter Five expansion slots: <ul style="list-style-type: none"> <li>● One full-height, half-length 32-bit/33MHz PCI at 3.3V slot</li> <li>● One full-height, half-length PCIe x1 slot (x8 connector)</li> <li>● One full-height, full-length PCIe x1 slot (x8 connector)</li> <li>● One full-height, full-length PCIe x8 slot (occupied by SA E200 on select models)</li> <li>● One Lights-out 100c option slot</li> </ul> <b>Optical Drive</b> <b>Remote Management</b> <b>Factory Racking</b>
<b>HP ProLiant ML110 G5 320GB SATA Storage Server</b> AK301A - Americas AK302A - Asia Pacific AK303A - Europe AK304A - Australia AK305A - China	<b>Operating System</b> <b>Processor</b> <b>Cache Memory</b> <b>Memory</b> <b>Storage Controller</b> <b>Internal Storage</b>	Microsoft Windows Storage Server 2003 Release 2, Workgroup x64 Edition Single-Core Intel® Celeron® 420 (1.6 GHz, 800 FSB, 512K) 512KB Level 512 MB (1 x 512MB) None (software RAID) 2 x 160GB SATA 7.2K 3.5" non-hot-plug HDDs
<b>HP ProLiant ML110 G5 1TB SATA Storage Server</b> AK306A - Americas AK307A - Asia Pacific AK308A - Europe AK309A - Australia AK310A - China	<b>Operating System</b> <b>Processor</b> <b>Cache Memory</b> <b>Memory</b> <b>Storage Controller</b> <b>Internal Storage</b>	Microsoft Windows Storage Server 2003 Release 2, Standard x64 Edition Dual-Core Intel® Pentium® E2160 (1.80 GHz, 800 FSB, 1M) 1 x 1MB Level 2 1 GB (1 x 1GB) Smart Array E200 Storage Controller with 128MB battery-backed write cache (BBWC); occupies one PCIe slot 4 x 250GB SATA 7.2K 3.5" non-hot-plug HDDs
<b>HP ProLiant ML110 G5 2TB SATA Storage Server</b> AK311A - Americas AK312A - Asia Pacific AK313A - Europe AK314A - Australia AK315A - China	<b>Operating System</b> <b>Processor</b> <b>Cache Memory</b> <b>Memory</b> <b>Storage Controller</b> <b>Internal Storage</b>	Microsoft Windows Storage Server 2003 Release 2, Standard x64 Edition Dual-Core Intel® Pentium® E2160 (1.80 GHz, 800 FSB, 1M) 1 x 1MB Level 2 1 GB (1 x 1GB) Smart Array E200 Storage Controller with 128MB battery-backed write cache (BBWC); occupies one PCIe slot 4 x 500GB SATA 7.2K 3.5" non-hot-plug HDDs

### Product Configuration Wizard

<b>HP ProLiant ML110 G5 584GB SAS Storage Server</b> AK316A - Americas AK317A - Asia Pacific AK318A - Europe AK319A - Australia AK320A - China	<b>Operating System</b>	Microsoft Windows Storage Server 2003 Release 2, Standard x64 Edition
	<b>Processor</b>	Dual-Core Intel® Pentium® E2160 (1.80 GHz, 800 FSB, 1M)
	<b>Cache Memory</b>	1 x 1MB Level 2
	<b>Memory</b>	1 GB (1 x 1GB)
	<b>Storage Controller</b>	Smart Array E200 Storage Controller with 128MB battery-backed write cache (BBWC); occupies one PCIe slot
	<b>Internal Storage</b>	4 x 146 GB 3G SAS 15K 3.5" non-hot-plug HDDs

### Step 2 - Add More Memory

**NOTE:** The 320GB SATA model includes 512MB (1 x 512MB) of SDRAM standard while the 1TB SATA, 2TB SATA, and 584GB SAS models include 1GB (1 x 1GB) standard. All models are expandable to 8GB.

**NOTE:** All models have a total of four DIMM sockets. See 'Memory' section of QuickSpecs below for more information on memory configuration.

<b>Memory</b>	2048 MB Unbuffered ECC PC2-6400 DDR2 (1x2048 MB)	450260-B21
	1024 MB Unbuffered ECC PC2-6400 DDR2 (1x1024 MB)	450259-B21
	512 MB Unbuffered ECC PC2-6400 DDR2 (1x512 MB)	450258-B21

### Step 3 - Add Network Adapters

An embedded NC105i PCIe Gigabit Server Adapter is standard. Select additional cards if required for higher performance or redundancy.

**NOTE:** The 320GB model does not support additional NIC ports (by operating system license restriction)

<b>Network Adapters</b>	HP NC110T PCI Express Gigabit Server Adapter	434905-B21
	HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
	HP NC364T PCI Express Quad Port Gigabit Server Adapter	435508-B21
	HP NC373F PCI Express Multifunction Gigabit Server Adapter	394793-B21
	HP NC373T PCI Express MFN Gigabit Server Adapter	394791-B21
<b>Lights Out Management Card</b>	HP ProLiant ML110 G5 Lights-Out 100c Remote Management Card	445513-B21
	<b>NOTE:</b> For additional information on Lights-Out 100c Remote Management Card, please see the QuickSpecs at: <a href="http://h18000.www1.hp.com/products/quickspecs/12468_div/12468_div.html">http://h18000.www1.hp.com/products/quickspecs/12468_div/12468_div.html</a>	

### Product Configuration Wizard

#### Step 4 - Add More Storage

ML110 G5 Storage Servers (except the 320GB SATA model) include a Smart Array E200/128MB controller standard. Select additional controllers from the list below to accommodate backup needs or to add a Smart Array capability (i.e. hardware RAID) to the 320GB SATA model.

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

##### Storage Controllers

##### SAS Controllers

##### Smart Array E200 Controller

HP Smart Array E200/128 Controller 411508-B21

HP Internal SAS/SATA 4-Port Cable 457692-B21

**NOTE:** The purchase of a SAS Storage Controller requires the purchase of HP SAS/SATA 4-Port Cable

##### SAS HBAs

HP SC44Ge Host Bus Adapter 416096-B21

HP Internal SAS/SATA 4-Port Cable 457692-B21

**NOTE:** The purchase of a SAS Storage Controller requires the purchase of HP SAS/SATA 4-Port Cable

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

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

##### SCSI HBAs

HP SC11Xe Host Bus Adapter 412911-B21

HP U320e SCSI Host Bus Adapter AH627A

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

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

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

##### Hard Drives

(320GB SATA model  
internal expansion)

##### Serial ATA (SATA) Hard Drives

##### Non-Hot-Plug 3.5" (LFF) SATA

HP 160GB SATA 7.2K NHP 3.5" HDD 411275-B21

HP 250GB SATA 7.2K NHP 3.5" HDD 411276-B21

#### 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.

### Product Configuration Wizard

**NOTE:** Microsoft iSCSI Target Software is compatible only with ProLiant Storage Servers running Windows Storage Server 2003 R2, Standard x86 or x64 Edition (including the ML110 G5 1TB SATA, 2TB SATA, and 584GB SAS models). The ML110 G5 320GB SATA model includes Windows Storage Server 2003 R2, Workgroup x64 Edition, which is ineligible for upgrade.

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 Storage Mirroring Software provides host-based replication and failover to IP-based networks. 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. Advanced features allow a customer to control bandwidth usage and queue data for replication during off-peak times if desired. The software does not need special hardware to run and utilizes existing LAN or WAN infrastructure that already exists in their environment - saving time, additional investment, and maintenance. Storage Mirroring Software is storage independent and is a great complement to ProLiant Storage Servers. The flexibility, resource optimization, and application-specific protection enable customers to solidify their data and disaster protection strategies using Storage Mirroring Software.

#### 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
- Introducing a new software option (Server Recovery Option) that captures a server's configuration information including OS, patches, drivers, and Service Packs. The IT department can respond to a server failure and use the Server Recover Option to re-create the boot sequence on a new server plus all of the data captured during the replication and send that data to the production site for replacement.
- Introducing a new software feature (Full Server Failover) that creates a one-to-one relationship between two servers. Should a production server fail, the server running Full Server Failover would assume the identity of the production server. The failover can occur over any distance and does not require "Enterprise" versions of the operating system or applications.

**NOTE:** ML110 G5 Storage Servers include a trial version of StorageWorks Storage

### Product Configuration Wizard

Mirroring software.

**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.

StorageWorks Storage Mirroring Media Kit v5 T5437A

StorageWorks Storage Mirroring NAS Edition 1 LTU T5442A

StorageWorks Storage Mirroring NAS Edition 10 LTU T5443A

**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:** Installation of SCSI tape drives in an ML110 G5 Storage Server requires addition of a SCSI HBA.

**NOTE:** For complete listing of tape drive offerings see:

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

#### DAT USB Tape Drives

HP StorageWorks DAT 40 USB Internal Tape Drive (Carbonite) DW022A

HP StorageWorks DAT 72 USB Internal Tape Drive (Carbonite) DW026A

HP StorageWorks DAT 160 USB Internal Tape Drive Q1580A

#### DAT SAS Tape Drives

HP StorageWorks DAT 160 SAS Internal Tape Drive Q1587A

#### DAT SCSI Tape Drives

HP StorageWorks DAT 40 SCSI Internal Tape Drive (Carbon) C5686C

HP StorageWorks DAT 72 SCSI Internal Tape Drive (Carbon) Q1522B

HP StorageWorks DAT 160 SCSI Internal Tape Drive Q1573A

---

### Product Configuration Wizard

HP D2D Backup System	HP StorageWorks D2D110 Backup System	EH880A
	<b>NOTE:</b> 1TB of Disk Storage.	
	HP StorageWorks D2D110 Backup System with Data Protector Express Software Kit	EH923A
	<b>NOTE:</b> 1TB of Disk Storage.	
	HP StorageWorks D2D120 Backup System	EH884A
	<b>NOTE:</b> 2TB of Disk Storage.	
	HP StorageWorks D2D120 Backup System with Data Protector Express Software Kit	EH924A
	<b>NOTE:</b> 2TB of Disk Storage.	
HP StorageWorks D2D130 Backup System	EH950A	
<b>NOTE:</b> 3TB of Disk Storage.		
HP StorageWorks D2D130 Backup System with Data Protector Express Software Kit	EH951A	
<b>NOTE:</b> 3TB of Disk Storage.		
HP StorageWorks D2D130 Backup System with LTO-3 Ultrium 920 SAS Tape Drive	EH952A	
<b>NOTE:</b> 3TB of Disk Storage.		
<b>NOTE:</b> Please see the <a href="http://h18000.www1.hp.com/products/quickspecs/12651_div/12651_div.html">HP D2D Backup Systems QuickSpecs</a> for additional information: <a href="http://h18000.www1.hp.com/products/quickspecs/12651_div/12651_div.html">http://h18000.www1.hp.com/products/quickspecs/12651_div/12651_div.html</a> (Worldwide)		

HP Data Protector Express Software	HP Data Protector Express Backup Server Software Media & LTU	BB117EA
	HP Data Protector Express Backup Server Upgrade from Data Protector Express Single Server Edition Media & LTU	BB117ET
<b>NOTE:</b> 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).		
<b>NOTE:</b> Please see the <a href="http://h18000.www1.hp.com/products/quickspecs/12337_div/12337_div.html">HP Data Protector Express QuickSpecs</a> for additional information regarding the purchase of HP Data Protector Express software: <a href="http://h18000.www1.hp.com/products/quickspecs/12337_div/12337_div.html">http://h18000.www1.hp.com/products/quickspecs/12337_div/12337_div.html</a> (Worldwide)		

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

**NOTE:** All ProLiant DL380 G5 Storage Server models include a standard rail kit for HP racks and two high voltage (220V/10A) power cords (6 foot IEC C13 to C14) standard

Uninterruptible Power Systems - Tower	HP T1000 UPS, JPN/TWN	AF404A
	HP T1000 UPS, NA	AF403A
	HP T1000 UPS, INTL	AF405A
	HP T750 UPS, Low Voltage (NA/JPN)	378439-D71
	HP T750 UPS, High Voltage (INTL)	378439-B31
	HP T750 UPS, High Voltage (INTL)	378439-B31
	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 10A C13 UK Power Cord	AF570A

### Product Configuration Wizard

HP 1.83m C13 IT/CL Power Cord	AF571A
HP 2m C13 JPN Power Cord	AF572A
HP PWR CRD 2.5m 10A C13-ARGENTINA	AF558A
HP PWR CRD 1.83m 10A C13-BRAZIL	AF559A
HP PWR CRD 1.83m 10A C13-CHINA	AF557A
HP PWR CRD 1.83m 10A C13-UL DOM	AF556A

USB Options	HP USB 04 Standard Keyboard	DT528A#xxx
	USB Floppy Drive	DC361B
	HP 1GB USB 2.0 Floppy Drive Key	442085-B21
	HP 256MB USB 2.0 Floppy Drive Key	442084-B21
	1.44MB External USB Floppy Drive ALL	DC141B
	HP USB 2-Button Optical Mouse ALL	DC172B

HP KVM Switch Options	HP 1x4 Console Switch	AF611A
	HP PS2 Server Console Cable, 6 foot, 2-Pack	AF612A
	HP USB Server Console Cable, 6 foot, 2-Pack	AF613A
	<b>NOTE:</b> required for supporting USB peripherals.	
<b>NOTE:</b> For additional information regarding KVM Switches, Serial Console servers, rack mount monitors, keyboards and all related options please see the following URL: <a href="http://www.hp.com/go/kvm">http://www.hp.com/go/kvm</a> .		

## Step 8 - Order HPTS Service Care Packs

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

Note that the standard HP warranty ensures software media will be free of physical defect for a period of 90 days from delivery. However, HP ProLiant Storage Servers 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 ML110 G5 Storage Server.

### Memory

#### Standard Memory

##### PC2-6400 unbuffered DDR2 ECC 800MHz

- 512 MB (1 x 512 MB): 320 GB SATA model
- 1 GB (1 x 1 GB): 1TB SATA, 2TB SATA, and 584 GB SAS models

#### Maximum Memory

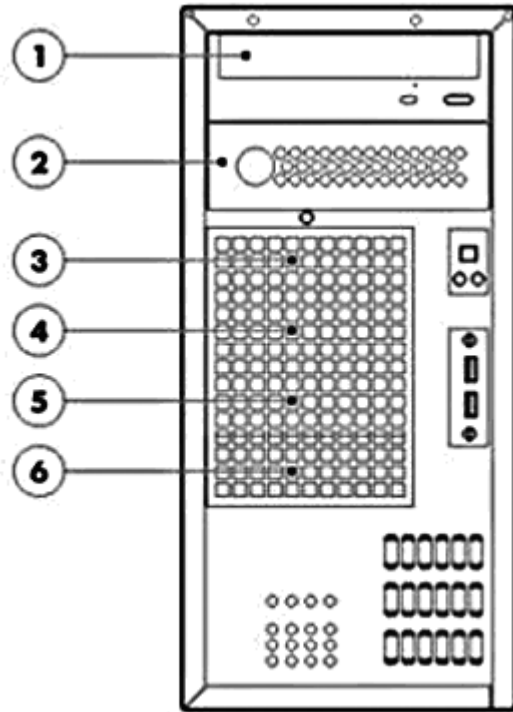
- 8 GB (4 x 2 GB)

	Memory	4	3	2	1
<b>Standard</b> (320 GB model)	512 MB	Empty	Empty	Empty	512 MB
<b>Standard</b> (1TB, 2TB, and 584 GB models)	1 GB	Empty	Empty	Empty	1GB
<b>Maximum</b>	8 GB	2 GB	2 GB	2 GB	2 GB

#### Memory options:

2048 MB Unbuffered ECC PC2-6400 DDR2 (1x2048 MB)	450260-B21
1024 MB Unbuffered ECC PC2-6400 DDR2 (1x1024 MB)	450259-B21
512 MB Unbuffered ECC PC2-6400 DDR2 (1x512 MB)	450259-B21

## Storage



1 SATA DVD-ROM

2 Removable Media Bay (5.25")

3, 4, 5, 6 Four Non-Hot Plug Drive Bays

## Drive Support

	Quantity Supported	Position Supported	
Removable Media	1 Standard	1	Half-height 16x SATA DVD-ROM Drive

### Hard Drives

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

146GB 3G SAS 15K SP	4	3 - 6	Integrated Smart Array E200/128MB Controller (584GB SAS model)
---------------------	---	-------	--

#### Non Hot Plug 3.5" (LFF) Serial ATA - SATA

500GB SATA 7.2K	4	3 - 6	Integrated Smart Array E200/128MB Controller (1TB SATA and 2TB SATA model)
250GB SATA 7.2K			
160GB SATA 7.2K	2	3 - 4	Embedded SATA controller (320GB SATA model)

### Maximum Raw Storage Capacity

Internal	2TB raw (4 x 500GB SATA)
----------	--------------------------

### Storage

#### Factory RAID Configuration

##### 1TB SATA, 2TB SATA, and 584 SAS models

	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

##### 320GB SATA model

	Volume	RAID level	Physical Drives
Logical Disk 1	Operating System	RAID 1 (software)	0-1
Logical Disk 2	User Data	RAID 1 (software)	0-1

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

**NOTE:** Installation of SCSI tape drives requires addition of a SCSI controller.

	Position Supported	Controller	Controller/HBA Option Kit Part Number
<b>Internal USB Tape Drives</b> DAT 40 USB DAT 72 USB DAT 160 USB	2	USB 2.0 port	N/A
<b>External USB Tape Drives</b> DAT 40 USB DAT 72 USB DAT 160 USB	External	USB 2.0 port	N/A
<b>Internal SAS Tape Drives</b> DAT 160 SAS	2	HP SC44Ge Host Bus Adapter	416096-B21
<b>Internal SAS Tape Drives</b> DAT 160 SAS	External	HP SC44Ge Host Bus Adapter	416096-B21
<b>Internal SCSI Tape Drives</b> DAT 40 DAT 72 DAT 160	2	HP SC11Xe Host Bus Adapter	412911-B21
<b>External SCSI Tape Drives</b> DAT 40 DAT 72 DAT 160	External	HP SC11Xe Host Bus Adapter	412911-B21

## Storage

HP StorageWorks D2D Backup Systems	External	Embedded Network Controller	N/A
D2D110			
D2D120			
D2D130			

### Power Specifications

Part Number	380622-001				
Spare Kit	403781-001				
Operational Input Voltage Range(Vrms)	100 to 127 and 200 to 240 V auto ranging				
Frequency Range (Nominal) (Hz)	50 to 60 Hz				
Nominal Input Voltage (Vrms)	100	120	200	230	240
Max Rated Output Wattage Rating	365	365	365	365	365
Nominal Input Current (A rms)	6	N/A	3	N/A	N/A
Max Rated Input Wattage Rating (Watts)	N/A	N/A	N/A	N/A	N/A
Max. Rated VA (Volt-Amp)	600	N/A	N/A	N/A	N/A
Efficiency (%)	>65%	>65%	>65%	>65%	>65%
Power Factor	N/A	N/A	N/A	N/A	N/A
Leakage Current (mA)	N/A	<0.45mA	N/A	N/A	N/A
Maximum Inrush Current (A peak)	N/A	No component was damaged and input fuse shall not blow	N/A	No component was damaged and input fuse shall not blow	N/A
Maximum Inrush Current duration (mS)	N/A	N/A	N/A	N/A	N/A
Fully Loaded System output Wattage (W)	365W				
Fully Loaded System Input Current (A rms)	6A @ 100V, 3A @ 200V				
Fully Loaded System Thermal (BTU- Hr)	1915BTU				
Fully Loaded System VA (Volt-Amp)	600 VA				
System Leakage with all power supplies loaded (mA)	0.45mA@120V				
System Inrush Current with all power supplies loaded (A)	<150A@ 240Vac				
Power cord requirements	Nema 5-15P to IEC320-C13 IEC320-C13 to IEC320-C14 <b>**Power shown is for a fully configured system consisting of (1) CPU, (4) double-sided DIMMs, (4) HDDs, (2) DVD-ROM, (4) PCI cards, and (1) power supply.</b>				

#### Power Cords (13 Cord Sets)

Country	Power Cord Part Number
APD	100614-009, 100613-008, 139867-005, 187487-001 (India)
Brazil	285052-001
Australia	100661-001
Euro	100614-009
France	100614-009
Germany	100614-009
Japan	139867-005
PRC	286496-001
UK	100613-008
US, Taiwan	121565-001

### Technical Specifications

<b>System Unit</b>	<b>Dimensions (HxWxD)</b> (with feet)	14.5 x 6.9 x 16.8 in (36.7 x 17.5 x 42.6 cm)	
	<b>Weight (approximate)</b>	Maximum	39 lb (17.5 kg) (all hard drives, power supplies, and processors installed)
Minimum		23.81 lb (10.8 kg) (one hard drive, power supply, and processor installed)	
<b>Input Requirements</b> (per power supply)	Rated Line Voltage	90 to 132 VAC, 180 to 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	600 W (at 100 VAC), 600 W (at 200 VAC)	
<b>Power Specifications</b>	To review typical system power ratings use the Power Calculator which is available via the online tool located at URL: <a href="http://h30099.www3.hp.com/configurator/calc/Power%20Calculator%20Catalog.xls">http://h30099.www3.hp.com/configurator/calc/Power%20Calculator%20Catalog.xls</a>		
	<ul style="list-style-type: none"> <li>- Click on the system of interest. Example: DL380 G5</li> <li>- Follow the instructions of the next screens.</li> </ul>		
<b>Power Supply Output</b> (per power supply)	Rated Steady-State Power	365 W (at 100 VAC), 365 W (at 200 VAC)	
	Maximum Peak Power	385 W (at 100 VAC), 385 W (at 200 VAC)	
<b>System Inlet Temperature</b>	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).	
<b>Relative Humidity</b> (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.	
<b>Altitude</b>	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).	

### Technical Specifications

#### 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).

#### SATA Model

Idle

L WAd 4.18 Bels

L pAm 26 dBA

Operating

L WAd 5.1 Bels

L pAm 33.6 dBA

#### SAS Model

Idle

L WAd 5.15 Bels

L pAm 33.83 dBA

Operating

L WAd 5.64 Bels

L pAm 39.27 dBA

---

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

---

### Technical Specifications

<b>Embedded NC105i PCIe Gigabit Server Adapter</b>	<b>Network Interface</b>	Integrated 10/100/1000BASE-T Transceiver Combines a triple-speed IEEE 802.3TM - Compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver.
	<b>Data Transfer Method</b>	Compliant to x1 PCIe Specification
	<b>Network Transfer Rate</b>	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
	<b>Connector</b>	RJ-45 connector
	<b>Cable Support</b>	Performs all the physical layer functions for 10BASE-T, 100BASE-T, and 1000BASE-T Ethernet on standard Category 5 UTP

---

<b>Environment-friendly Products and Approach</b>	<b>End-of-life Management and Recycling</b>	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.
---	---	--

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.

---

© Copyright 2008 Hewlett-Packard Development Company, L.P.

The information contained herein is subject to change without notice.

Microsoft and Windows are US registered trademarks of Microsoft Corporation. Intel is a US registered trademark of Intel Corporation.

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.