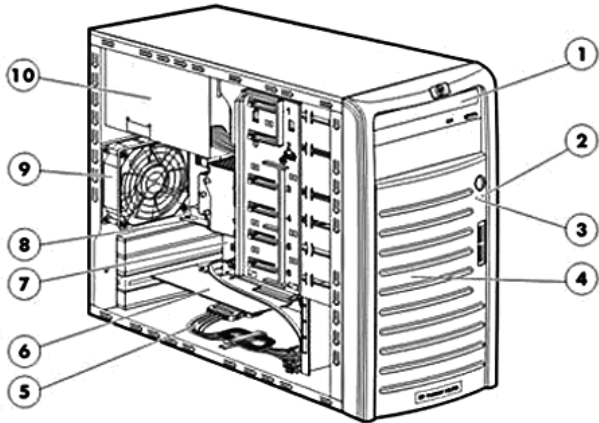


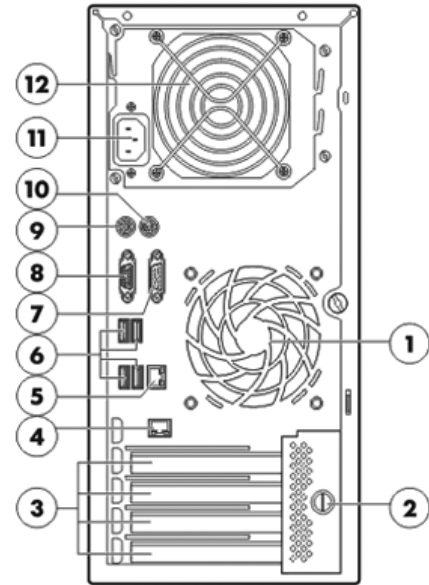
### Overview

From content kit



#### Front View:

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



#### 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)
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

### Overview

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

### What's New

- Create, migrate, manage, and protect shared storage without the need for storage expertise using All-in-One Storage Manager (HP ASM) Software, which is now included with ML110 G5 Storage Servers (except for the 320GB SATA model). HP ASM is designed for IT generalists and is like getting a storage expert in the box. It includes tools to quickly and easily migrate and manage data using automated best practice settings, and you can enable optional features within HP ASM by installing Microsoft iSCSI Software Target, HP Data Protector Express Software, and/or HP Storage Mirroring Software.

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

### 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 with HP All-in-One Storage Manager (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:**
  - HP All-in-One Storage Manager Software (not compatible with 320GB SATA model)
    - File share creation and scheduled snapshots included
    - iSCSI features require optional installation of Microsoft iSCSI Software Target
    - Data protection features require optional installation of HP Data Protector Express Software
    - Streamlined data replication features require optional installation of HP Storage Mirroring Software
  - Microsoft Management Console (MMC)-based user interface
  - Remote system management via Remote Desktop or Telnet
  - (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.

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

**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, and WebDAV protocols.

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

**New! All-in-One Storage Manager for ProLiant Storage Servers** Create, migrate, manage, and protect shared storage without the need for storage expertise using All-in-One Storage Manager (HP ASM) Software, which is now included with ML110 G5 Storage Servers (except for the 320GB SATA model). HP ASM is designed for IT generalists and is like getting a storage expert in the box. It includes tools to quickly and easily migrate and manage data using automated best practice settings, and you can enable optional features within HP ASM by installing Microsoft iSCSI Software Target, HP Data Protector Express Software, and/or HP Storage Mirroring Software

**Intelligent storage services** Make more efficient use of storage space using file de-duplicating Single-instance Storage (SIS) (except for 320GB SATA model) 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.

### Overview

- 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 optional Lights-Out 100c remote management).
- HP ProLiant industry-standard hardware** Relax-your investment is protected because you're not locked into a proprietary platform. The small tower platform supports up to four SATA or SAS 3.5" internal hard drives.
- Optional data services that integrate with HP All-in-One Storage Manager** Upgrade to host block-based storage for Exchange, SQL or other applications with Microsoft® iSCSI Software Target (except for 320GB SATA model); backup to disk, tape, or other removable media with HP Data Protector Express Software; and replicate data on a scheduled basis to another system using HP Storage Mirroring Software.

### 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, and AppleTalk
- 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

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#### HP All-in-One Storage Manager Software

This easy-to-use, integrated storage management tool works from an application point-of-view and can help you orchestrate the many aspects of your storage environment---even if you lack storage expertise.



### Standard Features

It's like having your own storage expert in the box.

**NOTE:** Not supported on ML110 G5 320GB SATA model with software RAID.

- Rapid startup tools for fast and easy installation and out-of-the box configuration
- File Share creation wizard for CIFS or NFS shares with storage allocation, directory quota management, and scheduled snapshots.
- Quota monitoring and alerting per share or application.
- Remote management via Microsoft Internet Explorer or Terminal Services
- Best practice and advanced dialog improvements to HP ASM wizards grant more control to those with more storage management experience
- Support for setup and management of both internal storage as well as supported direct attached MSA storage enclosures
- Supports management of tiered storage environments where both SAS and SATA hard drives are attached to the All-in-One Storage System either internally or in externally-attached HP StorageWorks MSA enclosures.
- You can use HP ASM to specify a dedicated, primary network--plus a secondary subnet--for your IP-based storage traffic
- Disaster recovery tools work in concert with backup applications to preserve storage subsystem settings in case they need restored after a system rebuild
- Provides end-to-end management and provisioning of iSCSI storage for non-clustered 32-bit and 64-bit Windows Server 2003 or Windows Server 2008 hosts (including derivatives like Windows Small Business Server 2008 and Windows Essential Business Server 2008) from the iSCSI Target all the way through to the host (Requires Microsoft iSCSI Software Target from HP)
- Provides management and provisioning of iSCSI storage for standards-compliant non-Windows iSCSI initiators such as VMWare, Linux, etc. (Requires Microsoft iSCSI Software Target from HP)
- Application data hosting and migration wizard using HP and Microsoft 'Best Practice' storage configurations for Microsoft Exchange 2003/2007 Storage Groups and Microsoft SQL Server 2000/2005/2008\* databases (\*SQL Server 2008 support requires installation of "SQL Server 2005 Backward Compatibility" option; file stream functionality not supported). (Requires Microsoft iSCSI Software Target from HP)
- Application-level capacity provisioning and online growth for shares, SQL Server and Exchange. SQL Server support includes data file and log directory provisioning and Exchange support includes Mailstore, Publicstore and log directory provisioning. (Requires Microsoft iSCSI Software Target from HP)
- Application data hosting and iSCSI Setup wizard for other 'User Defined' Application (Oracle, MySQL, VMware ESX, etc...) (Requires Microsoft iSCSI Software Target from HP)
- Data protection policy assignment (snapshots, backup, and HP StorageWorks Storage Mirroring replication) integrated into application migration and share creation wizards for data hosted on the system. (Requires HP Data Protector Express Software and/or HP StorageWorks Storage Mirroring Software)
- Data Protector Express Virtual Library (D2D) device provisioning and space management as well as support for Data Protector Express D2D2Any add-on option. (Requires HP Data Protector Express Software)
- Integration with HP StorageWorks Storage Mirroring Software to accommodate asynchronous replication of file and block data to another system. (Requires HP StorageWorks Storage Mirroring Software)
- HP ASM agents now support domain servers (including Windows Server 2008, Small Business Server 2003 and Small Business Server 2008) as application host machines

**HP ASM Agent Application & OS Support Matrix**

### Standard Features

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

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

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

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

### HP ASM Feature Support Matrix

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

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

### 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)

### Standard Features

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

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**Chipset**                    Intel® 3200

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**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)

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

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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

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

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

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### Standard Features

<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 (1 TB 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		
<b>Graphics</b>	Integrated Graphics Controller with 8MB video memory supporting 1600 x 1200 x 16 Bit Colors resolution		

### Standard Features

#### Management

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

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

**NOTE:** HP All-in-One Storage Manager Software is incompatible with software RAID and is not supported on the ML110 G5 320GB SATA Storage Server

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>.

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#### Form Factor

Micro ATX Tower

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#### 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

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#### Server Power Cords

Country-specific, lowline NEMA power cord

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#### Power Supply

365 Watts; non-redundant, non-hot-plug

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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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#### System Fans

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

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### 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.

Installing Microsoft iSCSI Software Target on a ProLiant Storage Server that supports HP All-in-One Storage Manager enables several features within HP ASM, including "Host an Exchange Storage Group" and "Host a SQL Server Database" wizards and the ability to provision and manage storage for standards-compliant non-Windows iSCSI initiators such as VMWare and Linux. Select ProLiant Storage Server models (including ML110 G5 Storage Servers except for the 320GB SATA model) are compatible with All-in-One Storage Manager; see <http://www.hp.com/go/simplestorage> for more information.

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

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

Installing HP Data Protector Express on a ProLiant Storage Server that supports HP All-in-One Storage Manager enables data protection features within HP ASM, including backup of file shares or application stores using application-aware snapshots to tape, disk, or other removable media target. All ProLiant Storage Servers support using Data Protector as a backup software solution and select models (including ML110 G5 Storage Servers except for the 320GB SATA model) are compatible with All-in-One Storage Manager; see <http://www.hp.com/go/simplestorage> for more information.

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

- **HP StorageWorks Storage Mirroring Software** - HP StorageWorks Storage Mirroring offers a host-based application that performs remote copy over an IP LAN/WAN. Key features include asynchronous replication that can be scheduled to a fine granular level, Logical Unit Number (LUN), file or byte level. Other features include multiple replication configuration options including peer-to-peer and many-to-one. In addition, Storage Mirroring is a very cost effective disaster recovery alternative from one host to another within a LAN, storage center, or between direct attached storage in metro offices and regional centers. Additional configurations allow replication from small office environments to ensure business continuity without an outside IT staff.

### Optional Software

Installing HP Storage Mirroring on a ProLiant Storage Server that supports HP All-in-One Storage Manager enables replication features within HP ASM including streamlined setup of near real-time replication of file shares or application stores to a remote target. All ProLiant Storage Servers support using HP Storage Mirroring as a host-based replication solution and select models (including ML110 G5 Storage Servers except for the 320GB SATA model) are compatible with All-in-One Storage Manager; see <http://www.hp.com/go/simplestorage> for more information.

For more information on HP Storage Mirroring Software:

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

- **HP Data Protector Software** - 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:

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

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

Installation

n/a

U7986E

HA113A1 - 5D6

#### HP Software Support

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

#### HP Software Support, 24 x 7

- Provides all the benefits of the regular Software Support, plus HP Services engineers are available around the clock 365 days per year.

#### HP Support Plus

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

#### HP Support Plus 24

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

#### HP Proactive 24

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

#### Software Product Services

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

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

#### Hardware Product Services

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

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

HP ProLiant ML110 G5 Storage Server Common Specifications	Number of Processors	1
	Memory Type	PC2-6400 unbuffered DDR2 ECC 800MHz
	Network Controller	Embedded NC105i PCIe Gigabit Server Adapter
	Expansion Slots	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>
	Optical Drive	HP 16X SATA DVD-ROM Half Height
	Remote Management	None standard (HP Lights-Out 100c Remote Management Card optional)
	Factory Racking	Micro ATX Tower
<hr/>		
HP ProLiant ML110 G5 320GB SATA Storage Server AK301A	Operating System	Microsoft Windows Storage Server 2003 Release 2, Workgroup x64 Edition
	Processor	Single-Core Intel® Celeron® 420 (1.6 GHz, 800 FSB, 512K)
	Cache Memory	512KB Level
	Memory	512 MB (1 x 512MB)
	Storage Controller	None (software RAID)
	Internal Storage	2 x 160GB SATA 7.2K 3.5" non-hot-plug HDDs
<hr/>		
HP ProLiant ML110 G5 320GB SATA Storage Server Smart Buy AK347A	Kit Contents	Part Number AK301A HP StorageWorks ProLiant ML110 G5 320GB SATA Storage Server. More info on HP Smart Buys go to: <a href="http://www.hp.com/go/smartbuy/storage">http://www.hp.com/go/smartbuy/storage</a>
<hr/>		
HP ProLiant ML110 G5 1TB SATA Storage Server AK306A	Operating System	Microsoft Windows Storage Server 2003 Release 2, Standard x64 Edition
	Processor	Dual-Core Intel® Pentium® E2160 (1.80 GHz, 800 FSB, 1M)
	Cache Memory	1 x 1MB Level 2
	Memory	1 GB (1 x 1GB)
	Storage Controller	Smart Array E200 Storage Controller with 128MB battery-backed write cache (BBWC); occupies one PCIe slot
	Internal Storage	4 x 250GB SATA 7.2K 3.5" non-hot-plug HDDs
<hr/>		
HP ProLiant ML110 G5 1TB SATA Storage Server Smart Buy AK348A	Kit Contents	Part Number AK306A HP StorageWorks ProLiant ML110 G5 1TB SATA Storage Server. More info on HP Smart Buys go to: <a href="http://www.hp.com/go/smartbuy/storage">http://www.hp.com/go/smartbuy/storage</a>

### Product Configuration Wizard

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<b>HP ProLiant ML110 G5 2TB SATA Storage Server</b> AK311A	<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 500GB SATA 7.2K 3.5" non-hot-plug HDDs
<b>HP ProLiant ML110 G5 2TB SATA Storage Server</b> Smart Buy AK349A	<b>Kit Contents</b>	Part Number AK311A HP StorageWorks ProLiant ML110 G5 2TB SATA Storage Server. More info on HP Smart Buys go to: <a href="http://www.hp.com/go/smartbuy/storage">http://www.hp.com/go/smartbuy/storage</a>

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<b>HP ProLiant ML110 G5 584GB SAS Storage Server</b> AK316A	<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
<b>HP ProLiant ML110 G5 584GB SAS Storage Server Smart Buy</b> AK350A	<b>Kit Contents</b>	Part Number AK316A HP StorageWorks ProLiant ML110 G5 584GB SAS Storage Server. More info on HP Smart Buys go to: <a href="http://www.hp.com/go/smartbuy/storage">http://www.hp.com/go/smartbuy/storage</a>

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## Step 2 - Add More Memory

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**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

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### Product Configuration Wizard

### 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 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

**NOTE:** For additional information on Lights-Out 100c Remote Management Card, please see the QuickSpecs at:  
[http://h18000.www1.hp.com/products/quickspecs/12468\\_na/12468\\_na.html](http://h18000.www1.hp.com/products/quickspecs/12468_na/12468_na.html)

### 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.

<b>Storage Controllers</b>	<b>SAS Controllers</b>	
	<b>Smart Array E200 Controller</b>	
	HP Smart Array E200/128 Controller	411508-B21
	HP Internal SAS/SATA 4-Port Cable	457692-B21
	<b>NOTE:</b> The purchase of a SAS Storage Controller requires the purchase of HP SAS/SATA 4-Port Cable	
	<b>SAS HBAs</b>	
	HP SC44Ge Host Bus Adapter	416096-B21
	HP Internal SAS/SATA 4-Port Cable	457692-B21
	<b>NOTE:</b> The purchase of a SAS Storage Controller requires the purchase of HP SAS/SATA 4-Port Cable	
	<b>NOTE:</b> Please see the HBA QuickSpecs for additional information: <a href="http://h18004.www1.hp.com/products/quickspecs/12617_na/12617_na.html">http://h18004.www1.hp.com/products/quickspecs/12617_na/12617_na.html</a> (SC44Ge HBA)	
	<b>SCSI HBAs</b>	
	HP SC11Xe Host Bus Adapter	412911-B21
	<b>NOTE:</b> Please see the following QuickSpecs for Technical Specifications and additional information: <a href="http://h18000.www1.hp.com/products/quickspecs/12566_na/12566_na.html">http://h18000.www1.hp.com/products/quickspecs/12566_na/12566_na.html</a> (SC11Xe HBA)	
<b>Hard Drives</b> (320GB SATA model internal expansion)	<b>Serial ATA (SATA) Hard Drives</b>	
	<b>Non-Hot-Plug 3.5" (LFF) SATA</b>	
	HP 160GB SATA 7.2K NHP 3.5" HDD	411275-B21
	HP 250GB SATA 7.2K NHP 3.5" HDD	411276-B21
	<b>SATA Non-Hot Plug 3.5" Midline (MDL) Drives</b>	

### Product Configuration Wizard

HP 750GB 3G SATA 7.2K NHP 3.5" MDL HDD	462595-B21
HP 500GB 3G SATA 7.2K NHP 3.5" MDL HDD	458941-B21
HP 250GB 3G SATA 7.2K NHP 3.5" MDL HDD	458939-B21
<b>SATA Non-Hot Plug 3.5" Entry (ETY) Drives</b>	
HP 160GB 3G SATA 7.2K NHP 3.5" ETY HDD	458947-B21
<b>SAS Enterprise (ENT) Drives 3.5" Drives, Non-Hot Plug</b>	
HP 400GB 3G SAS 10K 3.5" DP NHP ENT	508232-B21
HP 450GB 3G SAS 10K 3.5" DP NHP ENT	454234-B21
HP 300GB 3G SAS 10K 3.5" DP NHP ENT	417950-B21
HP 300GB 3G SAS 15K 3.5" SP NHP ENT	431950-B21
HP 146GB 3G SAS 15K 3.5" DP NHP ENT	417855-B21
HP 146GB 3G SAS 15K 3.5" SP NHP ENT	432093-B21
HP 72GB 3G SAS 15K 3.5" SP NHP ENT	432095-B21

## Step 5 - Add Optional Software

### Microsoft® iSCSI Software Target from HP

**NOTE:** Microsoft iSCSI Target Software is compatible only with ProLiant Storage Servers running Windows Storage Server 2003 R2, Standard x86 or x64 Edition (including the 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 Software Target adds block storage capability to ProLiant Storage Servers and creates a single platform that delivers file, print, and application storage services, all over existing Ethernet networks. It is a powerful iSCSI software solution that provides affordable application storage provisioning, protection, and availability for small and medium office environments. It helps administrators consolidate storage capacity, improve storage utilization, minimize system downtime, simplify backup operations, enable rapid recovery, and provides high availability for key applications and services.

Installing Microsoft iSCSI Software Target on a ProLiant Storage Server that supports HP All-in-One Storage Manager enables several features within HP ASM, including "Host an Exchange Storage Group" and "Host a SQL Server Database" wizards and the ability to provision and manage storage for standards-compliant non-Windows iSCSI initiators such as VMWare and Linux. Select ProLiant Storage Server models (including ML110 G5 Storage Servers except for the 320GB SATA model) are compatible with All-in-One Storage Manager; see:

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

Microsoft iSCSI Target Software 1 LTU

T4433A

**NOTE:** For more information on Microsoft® iSCSI Software Target from HP: [http://h18006.www1.hp.com/products/storageworks/ms\\_iscsi/index.html](http://h18006.www1.hp.com/products/storageworks/ms_iscsi/index.html)

**HP Data Protector Express Software** Data Protector Express has a very simple product structure yet easily enables powerful and robust data protection and disaster recovery. The base product is the Data



### Product Configuration Wizard

Protector Express Backup Server. Installing this creates the Data Protector Express Storage Domain. Options are installed to add other machines to the Data Protector Express Storage Domain for protection and to add additional functionality.

Installing HP Data Protector Express (Backup Server) on a ProLiant Storage Server that supports HP All-in-One Storage Manager enables data protection features within HP ASM, including backup of file shares or application stores using application-aware snapshots to tape, disk, or other removable media target. All ProLiant Storage Servers support using Data Protector as a backup software solution and select models (including ML110 G5 Storage Servers except for the 320GB SATA model) are compatible with All-in-One Storage Manager; see:

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

HP Data Protector Express 4.0 Backup Server (base product)

BB117BA

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

[http://h18000.www1.hp.com/products/quickspecs/12337\\_na/12337\\_na.html](http://h18000.www1.hp.com/products/quickspecs/12337_na/12337_na.html)

#### HP Data Protector Express Software Options

HP Data Protector Express 4.0 Network Server Agent

BB121BA

HP Data Protector Express 4.0 Network Server Agent 3 pack

BB122BA

HP Data Protector Express 4.0 Application Online Agent

BB125BA

HP Data Protector Express 4.0 Bare Metal Disaster Recovery Option

BB128BA

HP Data Protector Express 4.0 D2Any2Any Option

BB130BA

HP Data Protector Express 4.0 Drive Expansion Option

BB133BA

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

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

#### HP StorageWorks Storage Mirroring Software

HP 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.

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

Installing HP Storage Mirroring on a ProLiant Storage Server that supports HP All-in-One Storage Manager enables replication features within HP ASM including streamlined setup of near real-time replication of file shares or application stores to a remote target. All ProLiant Storage Servers support using HP Storage Mirroring as a host-based replication solution and select models (including ML110 G5 Storage Servers except for the 320GB SATA model) are compatible with All-in-One Storage

### Product Configuration Wizard

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

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

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

HP Storage Mirroring v5.1 Windows Media Kit

TA696A

HP Storage Mirroring NAS Edition Stock LTU

TA713A

HP Storage Mirroring NAS Edition E-LTU

TA701AAE

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

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## Step 6 - Add a Backup Solution

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

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## Step 7 - Order HPTS Service Care Packs

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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

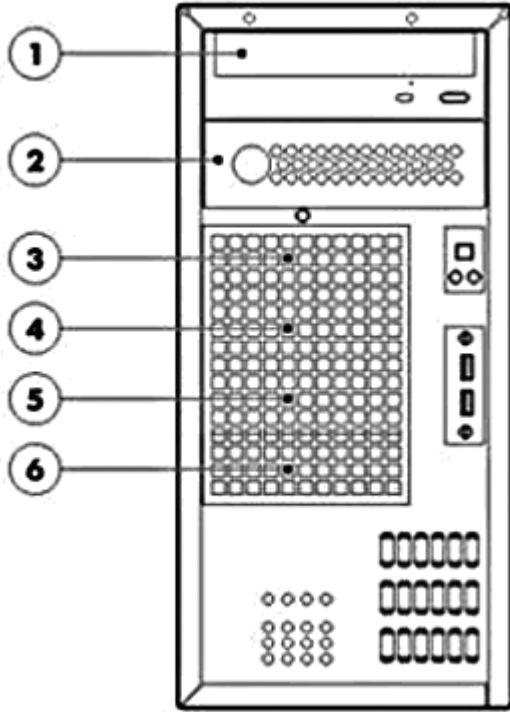
- 8 GB (4 x 2 GB)

	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)
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#### 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)
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## 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 **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.				

Power Cords (13 Cord Sets)

Power Cord Part Number

121565-001

### Technical Specifications

<b>System Unit</b>	<b>Dimensions</b> (HxWxD) (with feet)	14.5 x 6.9 x 16.8 in (36.7 x 17.5 x 42.6 cm)	
	<b>Weight</b> (approximate)	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)	<b>Rated Line Voltage</b>	90 to 132 VAC, 180 to 264 VAC	
	<b>Rated Input Current</b>	6 A (at 100 VAC), 3 A (at 200 VAC)	
	<b>Rated Input Frequency</b>	47 to 63 Hz	
	<b>Rated Input Power</b>	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)	<b>Rated Steady-State Power</b>	365 W (at 100 VAC), 365 W (at 200 VAC)	
	<b>Maximum Peak Power</b>	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

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<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.
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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.

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