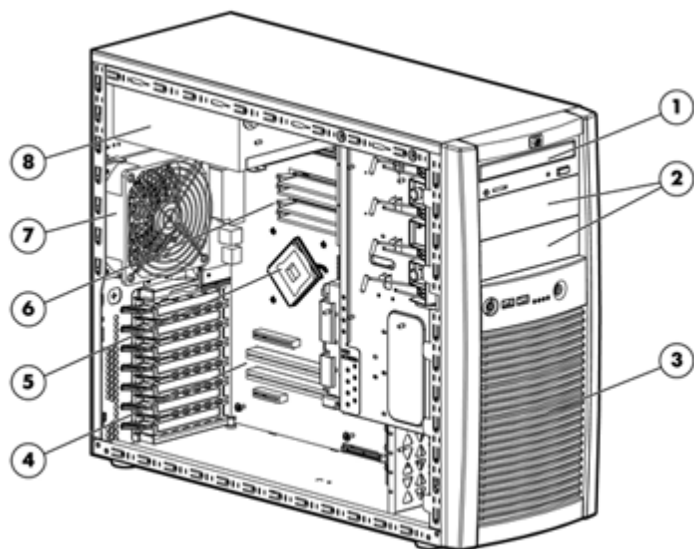
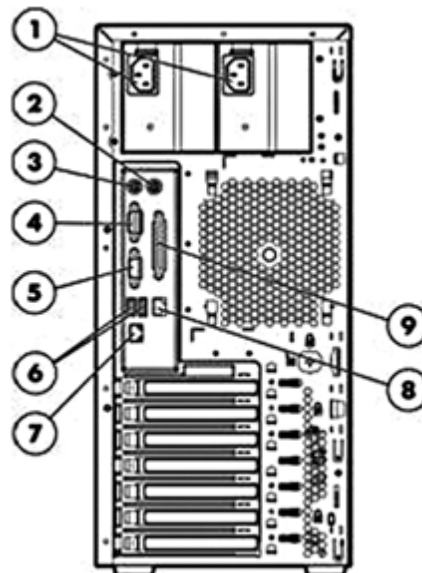


### Overview



#### Front View:

1. 48x IDE (ATAPI) CD-ROM
2. Removable Media Bays
3. Four Hot-Plug Drive Bays
4. Four Expansion Slots (Two PCI-X, Two PCI Express)
5. Processor Socket (Intel® Xeon®, Pentium® D or Celeron® D)
6. Four DIMM Sockets for up to 8GB DDR2 memory
7. System Fan
8. 410W Non-Hot Plug Non-Redundant Power Supply or 430W Hot Plug Redundant Power Supplies



#### Rear View:

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

### What's New

- Intel® Xeon® 3070 (2.66 GHz/1066 - 4MB L2) DC, Factory Installed Only

### Overview

### At A Glance

The HP ProLiant ML310 G4 is an affordable, single processor tower server designed to provide the solid network foundation essential to fuel thriving small offices. Dual-Core Intel Xeon, Dual-Core Pentium D or single-core Celeron D processing power combines with industry-leading management and essential data protection features for a secure, affordable platform that helps you run your business efficiently.

- **Processors:**
  - Dual-Core Intel® Xeon® processor 3000 Sequence
  - Dual-Core Pentium® D 800 or 900 Series processor
  - Single-core Celeron D® 300 Sequence processor
  - 1066 MHz or 800 MHz Front Side Bus (FSB)
  - Intel® 3000 Chipset
- **Memory:**
  - Up to 8GB of PC2-5300 667MHz unbuffered DDR2 SDRAM with ECC capabilities and optional interleaving
- **Storage Controller:**
  - SAS Models: HP 8 Internal Port SAS HBA with RAID 0,1 in a PCI-X slot
  - SATA Models: Embedded SATA with integrated SATA RAID 0,1
- **Internal Drive Support:**
  - Supports up to four hot plug SAS or SATA hard drives for up to 3TB internal storage
  - Models support SAS and SATA hard drives
- **Network Controller:**
  - Embedded NC320i PCIe Gigabit Server Adapter
- **Expansion Slots:**
  - 4 Total: (2) PCI-X 64-bit/100MHz; (2) PCI Express
- **USB 2.0 Ports:**
  - 5 Total: (2) front; (2) rear; (1) internal; (1) dedicated internal
- **Management:**
  - Integrated Lights-Out 2 featuring Integrated Remote Console
  - ROM Based Setup Utility (RBSU) and PXE support
- **Form Factor:**
  - Tower
  - Optional Tower-to-Rack Enabling Kit available
- **Warranty:**
  - This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for one year from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Expanded support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. SATA hard drives have a one-year warranty.  
**NOTE:** Server Warranty includes one year parts, one year labor, and one year on-site support with next business day response. Additional information regarding worldwide limited warranty and technical support is available at: <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

### Standard Features

**NOTE:** For a brief, printer friendly data sheet that describes this product and informs you of the essential capabilities and specifications, please visit: <http://h71028.www7.hp.com/erc/downloads/4aa0-8146enw.pdf>.

**NOTE:** For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.

<b>Processor</b>	Dual-Core Intel® Xeon® 3070 (2.66 GHz, 65 Watts, 1066 FSB, 4MB L2 Cache)
One of the following depending on Model	Dual-Core Intel® Xeon® 3060 (2.4 GHz, 65Watts, 1066 FSB, 4MB L2 Cache)
	Dual-Core Intel® Xeon® 3040 (1.86 GHz, 65Watts, 1066 FSB, 2x1MB L2 Cache)
	Dual-Core Intel® Pentium® D 820 (2.8 GHz, 95 Watts, 800 FSB, 2 x 1MB L2 Cache)
	Dual-Core Intel® Pentium® D 925 (3.0 GHz, 95 Watts, 800 FSB, 2x2MB L2 Cache)
	Intel® Celeron D® 352 (3.2 GHz, 86 Watts, 533 FSB, 512KB L2 Cache)

**NOTE:** The processors listed above available via Configure to Order only. Please see "Configuration Information - Factory Integrated Models" section of this QuickSpecs.

	Dual-Core Intel® Xeon® 3050 (2.13 GHz, 65 Watts, 1066 FSB, 2MB L2 Cache)
	Dual-Core Intel® Pentium® D 945 (3.4 GHz, 95 Watts, 800 FSB, 2 x 2MB L2 Cache)

<b>Cache Memory</b>	Integrated 4MB (3060 and 3070 Series) level 2 ECC cache (Intel® Xeon® processor 3000 Sequence)
One of the following depending on Model	Integrated 2MB (3040 and 3050 Series) level 2 ECC cache (Intel® Xeon® processor 3000 Sequence)
	Integrated 2 x 2MB level 2 ECC cache (Pentium D 900 Series)
	Integrated 2 x 1MB level 2 ECC cache (Pentium D 800 Series)
	Integrated 512KB level 2 ECC cache (Celeron D 300 Series)

<b>Memory Protection</b>	ECC
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<b>Memory</b>	Type	PC2-5300 unbuffered DDR2 SDRAM (667MHz)
One of the following depending on Model	Standard (Model dependent)	512 MB (1 x 512 MB) 1 GB (1 x 1 GB)
	Maximum	8 GB

<b>Network Controller</b>	Embedded NC320i PCIe Gigabit Server Adapter
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Expansion Slots	Slot Number	Bus Speed	Maximum Card Length	Hot Plug	Connector Type
	4	PCI Express x4	12.3	No	x8
	3	64-bit/100MHz PCI-X	12.3	No	3.3V
	2	64-bit/100MHz PCI-X	12.3	No	3.3V
	1	PCI Express x1	12.3	No	x8

### Standard Features

#### Storage Controllers

The HP ProLiant ML310 G4 supports Serial ATA (SATA) and Serial Attached SCSI (SAS) hard drives. Models described as SAS models include an 8 port HBA that supports both SATA and SAS hard drives in non-RAID, RAID 0, or RAID 1 configurations. Models described as SATA/SAS support SATA hard drives standard and require the installation of an HBA or controller to support SAS.

HP 8 Internal Port SAS HBA with RAID (in PCI-X slot) (SAS Models)

Embedded SATA with integrated SATA RAID 0,1 (SATA/SAS Models)

**NOTE:** Use of the embedded SATA RAID feature with a Linux operating system requires installation of a driver from a floppy drive. The supported floppy drive can be a USB drive key, USB floppy drive, half-height internal floppy drive, or virtual floppy via Integrated Lights-Out 2 (iLO 2).

**NOTE:** See the "Storage" section of these QuickSpecs for information on required to support SATA and SAS hard drive configurations

#### Storage

Optical Drive 48x IDE (ATAPI) CD-ROM Drive

Diskette Drive Optional 1.44 MB Diskette Drive

**NOTE:** Use of the embedded SATA RAID feature with a Linux operating system requires installation of a driver from a floppy drive. The supported floppy drive can be a USB drive key, USB floppy drive, half-height internal floppy drive, or virtual floppy via Integrated Lights-Out 2 (iLO 2).

#### Maximum Internal Storage

Hot Plug SAS (3.5")	1.2TB	4 x 300GB SAS
Hot Plug SATA (3.5")	3.0TB	4 x 750GB SATA

**NOTE:** See the "Storage" section of these QuickSpecs for information on controllers required to support SATA and SAS hard drive configurations

#### Interfaces

Parallel	1
Serial	1 (Optional second serial port available)
Pointing Device (Mouse)	1
Graphics	1
Keyboard	1
USB Ports	5 (2 front; 2 rear; 1 internal)

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

Dedicated USB Port	1 (available for USB tape connectivity)
Network RJ-45 (Ethernet)	1
iLO 2 Remote Management port	1

#### Graphics

Integrated ATI ES1000 Video Controller with 16-MB SDRAM Video Memory

#### Form Factor

Tower (5U)  
 Optional Tower-to-Rack Enabling Kit available (system & tray occupy 6U)

### Standard Features

#### HP Insight Control Management Suites

HP Insight Control Environment delivers foundation management, including remote monitoring, hardware resource deployment, health monitoring, software version control, performance monitoring, vulnerability scanning and patch management, and power management. HP Insight Control Environment installs and licenses the following components by default using a wizard-based integrated installer:

- HP Systems Insight Manager
- HP iLO Advanced Pack
- HP Rapid Deployment Pack
- HP Insight Power Manager
- HP Performance Management Pack
- HP Vulnerability and Patch Management Pack

Additional ProLiant Essentials software and management tools included on the Insight Control Management kit can be installed manually

- HP Server Migration Pack - Universal Edition
- HP Open Service Event Manager
- HP Instant Support Enterprise Edition

**NOTE:** Server Migration Pack - Universal Edition can be installed from the SMP Universal CD included in the Insight Control Management media kit.

**NOTE:** For additional product and licensing information about HP Insight Control Environment, visit: <http://www.hp.com/go/ice>.

HP Insight Control management suites and most HP ProLiant Essentials include a one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit:

<http://www.hp.com/services/insight>.

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#### Server Management Stand Alone Software Product - ProLiant Essentials

HP Systems Insight Manager

HP Systems Insight Manager (HP SIM) provides a unified, secure and extensible standards-based environment to centrally manage servers, storage and other infrastructure devices, (both HP and non-HP) across multiple operating system platforms.

ProLiant Essentials Server Migration Pack - Universal Edition

Upgrading, replacing, or virtualizing your existing server? Effortlessly transition to new virtual or physical HP ProLiant servers or BladeSystem with automated, accurate and affordable migration of OS, application and data. SMP Universal automates the manual processes required for migrating servers between physical or virtual platforms, whether migrating to VMware or Microsoft virtual machines. SMP Universal allows all of the following migrations:

- physical to ProLiant
- physical to virtual
- virtual to virtual
- virtual to ProLiant

**NOTE:** For more information, visit: <http://www.hp.com/go/migrate>.

ProLiant Essentials Performance Management Pack

Performance Management Pack (offered exclusively through the Insight Control suites) - a performance management solution that identifies and explains hardware performance bottlenecks on ProLiant servers and attached options enabling users to better utilize their valuable resources

### Standard Features

Integrated Lights-Out Advanced Pack Upgrades the iLO 2 processor with comprehensive remote control including Virtual KVM remote graphical console, enhanced console sharing and replay, virtual media (floppy, CD/DVD, USB key), virtual folders, and enterprise security (directory services and two-factor authentication).

**NOTE:** Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to: <http://www.hp.com/servers/proliantessentials> or the various ProLiant Essentials Value Pack product QuickSpecs for more information.

### Core Infrastructure Management

**SmartStart** SmartStart is a tool that simplifies server setup, providing a rapid way to deploy reliable and consistent server configurations. For more information, please visit the SmartStart Web site at: <http://www.hp.com/servers/smartstart>. SmartStart version supported (minimum): SmartStart 7.51.

**Insight Management Agents** The Insight Management Agents should be installed on all HP servers to present system instrumentation, health and configuration information into HP Systems Insight Manager and the HP System Management Homepage. The HP System Management Homepage aggregates systems data from Insight Management Agents and other HP management tools, providing a consolidated browser-based interface for managing individual servers.

Insight Management Agents and The HP System Management Homepage are included on ProLiant Support Packs, and can also be installed using the server profiles provided with the ProLiant Essentials Rapid Deployment Pack.

For additional information about the Management Agents and the HP System Management Homepage please visit the management Web site at: <http://www.hp.com/servers/manage>.

**Subscriber's Choice** Subscriber's Choice Driver and Support Alerts/Notifications is a web-based email subscription service that provides software and driver change notifications for ProLiant products. Sign up at: <http://www.hp.com/go/subscriberschoice> and customize your profile to receive various new alerts as they become available, on a weekly or monthly basis.

**ProLiant Support Packs and ROMPaq, software** The latest software, drivers, and firmware fully optimized and tested for your ProLiant server and options, available through ProLiant Support Packs the ProLiant Essentials Rapid Deployment Pack, SmartStart or downloaded from software and drivers download pages website at: <http://www.hp.com/go/support>.

### Industry Standard Compliance

ACPI V1.0b and 2.0 Compliant  
PCI 3.0 Compliant  
PCI-X 3.0 Compliant  
PCI-Express 3.0 Compliant  
PXE Support  
WOL Support  
Microsoft Logo certifications  
Novell Logo certifications  
USB 2.0

### Standard Features

#### Remote Management

Integrated Lights-Out (iLO 2) Management 2

- Virtual Text Remote Console (pre-OS only)
- Remote Serial Console
- Virtual Power Button Control
- Virtual Unit ID control
- Integrated Remote Console (ActiveX Control client)
- Embedded system health
- Present power consumption
- Browser, command line and scripted access
- Automatic IP Configuration via DHCP/DNS/WINS
- Industry Standard 128-bit Secure Sockets Layer (SSL) and Secure Shell security (SSH)
- Advanced Encryption Standard (AES)/Triple Data Encryption Standard (3DES)
- OS independent hardware health status
- IML and iLO Event Logging
- Support for 12 user accounts with customizable access privilege

#### Manageability

HP Systems Insight Manager  
Online ROM Flash Utility  
Drive Parameter Tracking (with Smart Array Controller)  
Dynamic Sector Repairing (with Smart Array Controller)  
Pre-Failure Warranty (covers processors, memory and SAS hard drives)  
BIOS Serial Console

#### Security

Power-on password  
Setup password  
Diskette boot control  
Power switch security

#### Server Power Cords

All models ship with one 1.8m (6 foot) standard low-line, power cord.

**NOTE:** HP ProLiant ML310 a C13 to C14 2.8M jumper cord ships standard. If customers require a local power cord, they can check the power cord matrix for the appropriate country specific sku. Please see the following power cord matrix: <http://www.hp.com/go/powercordmatrix>.

#### Power Specifications

To review typical system power ratings use the Active Answers Power Calculator at:

<http://h30099.www3.hp.com/configurator/powercalcs.asp>

#### Power Supply

410 Watt PFC (Power Factor Correcting) non-hot plug non-redundant power supply or 430 Watt PFC hot plug redundant power supplies (ships with two power supplies)

#### 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>

### Standard Features

#### System Fans

1 - Non-hot plug, Non-redundant system fan

**NOTE:** Does not include fans in CPU heatsink or power supply.

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#### OS Support

Microsoft Windows Server 2003  
Microsoft Small Business Server 2003  
Novell NetWare  
Red Hat Enterprise Linux  
SUSE Enterprise Linux Server  
SCO OpenServer

**NOTE:** The ML310 Embedded SATA RAID feature is not available for use with Netware or SCO operating systems.

**NOTE:** For a more complete and up-to-date listing of supported OSs and versions, please visit our OS Support Matrix at: <http://www.hp.com/go/supportos>

**NOTE:** For an up-to-date listing of the latest software and drivers available for your server, please select your server: <http://h20000.www2.hp.com/bizsupport/TechSupport/Product.jsp?lang=en&cc=us&taskId=135&prodTypeId=15351&prodCatId=241435>.

**NOTE:** For more Linux OS support & certification information, please visit our the ProLiant & BladeSystem Server Linux matrix <http://h18004.www1.hp.com/products/servers/linux/hpLinuxcert.html>

**NOTE:** For more complete and up-to-date information on how to buy server operating systems from HP please visit the OS product site at: <http://h18004.www1.hp.com/products/servers/software/OEM.html>

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#### Factory Express Portfolio for Servers and Storage

HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.

Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSA1000, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches.

For more information on Factory Express services for your specific server model please contact your sales representative or go to <http://www.hp.com/go/factory-express>.

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#### Rack and Rack Options

##### Rack Cabinets:

- For information regarding Rack Cabinets, please see the following URL: <http://www.hp.com/go/rackandpower>

##### KVM Switches, Serial Console Servers, Rackmount Monitors, Keyboards:

- For additional information regarding KVM switches, Serial Console servers, rack mount monitors, keyboards and all related options please see the following URL: <http://www.hp.com/go/kvm>.
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### Standard Features

#### HP Enterprise Configurator

The HP eCo-Enterprise Configurator now provides factory default racking for our HP hardware portfolio. This approach is aligned with our strategic direction to meet the needs and expectations of our valued customers. If you require "custom" rack configuration, please contact HP's Customer Business Center or an Authorized Partner for assistance.

<http://www.hp.com/products/configurator>.

#### Service and Support

HP Care Pack Services provide total care and support expertise with committed response times designed to meet your IT and business needs.

HP Care Pack services include coverage for the HP branded hardware options qualified for the server that are purchased at the same time or afterward and internal to the enclosure. It also includes the 22-inch and smaller external monitors and tower UPS options up to 3kVA. These items will be covered at the same service level and for the same coverage period as the server. Coverage of UPS Battery is not included and standard warranty terms & conditions apply. For servers or storage systems installed within a rack, service also covers all HP qualified rack options installed within the same rack.

To fully capitalizing on your HP ProLiant servers' capabilities requires a service partner who thoroughly understands your server technology and systems environment. HP Services, an industry leader in provision of support solutions provides a range of support services designed to meet the varying needs of your business. Whether an SMB, or large global corporation, HP has ProLiant server support offers to help you speedily deploy and maximize system uptime.

**Recommended Service** - simplify ProLiant solution implementation, maintenance, and management.

- **Support** - 3-Year 9x5 Next Business Day coverage, excluding HP holidays only
- **Deployment Service** - HW Installation only

**Enhanced Service** - optimize service level to increase IT performance and availability.

- **Support** - 3-Year 13x5 Same Business Day, 4-Hour response coverage only
- **Deployment Service** - Installation and Start up only

Refer to the information on the Installation of a ProLiant on the ProLiant Data Sheet; to be delivered on a scheduled basis 8am-5pm, M-F, excluding HP holidays.

**NOTE:** For a complete listing of service offerings and information visit:

<http://www.hp.com/services/proliantservices>

<http://www.hp.com/go/proliant/carepack>

### Models

**NOTE:** For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.

### Models with SAS Support Standard

ML310T04 3050 HP SAS/SATA 418038-001	Processor(s)	Dual-Core Intel® Xeon® 3050 (2.13 GHz, 65 Watts, 1066 FSB, 2MB L2 Cache)
	Cache Memory	1 x 2MB L2
	Memory	1 GB (1 x 1GB)
	Network Controller	Embedded NC320i PCIe Gigabit Server Adapter
	Storage Controller	HP 8 Internal Port SAS HBA with RAID 0, 1 in a PCI-X slot
	Hard Drives	None ship standard (up to 4 hot plug SAS or SATA 3.5" drives supported)
	Internal Storage	SAS: 584GB maximum; SATA: 3TB maximum
	Optical Drive	48x IDE (ATAPI) CD-ROM Drive
	Diskette Drive	None ship standard (Optional 1.44 MB Diskette Drive available)
	Power Supply	410W non-hot plug non-redundant power supplies
	Form Factor	Tower (5U) (Tower to Rack Enabling Kit available)

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ML310T04 3050 HP SAS RPS 418039-001	Processor(s)	Dual-Core Intel® Xeon® 3050 (2.13 GHz, 65 Watts, 1066 FSB, 2MB L2 Cache)
	Cache Memory	1 x 2MB L2
	Memory	1 GB (1 x 1GB)
	Network Controller	Embedded NC320i PCIe Gigabit Server Adapter
	Storage Controller	HP 8 Internal Port SAS HBA with RAID 0, 1 in a PCI-X slot
	Hard Drives	None ship standard (up to 4 hot plug SAS or SATA 3.5" drives supported)
	Internal Storage	SAS: 584GB maximum; SATA: 3TB maximum
	Optical Drive	48x IDE (ATAPI) CD-ROM Drive
	Diskette Drive	None ship standard (Optional 1.44 MB Diskette Drive available)
	Power Supply	430W hot plug redundant power supplies
	Form Factor	Tower (5U) (Tower to Rack Enabling Kit available)

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### Models

#### Models with SATA Support Standard

<b>ML310T04 3050 HP SATA</b> 418040-001	<b>Processor(s)</b>	Dual-Core Intel® Xeon® 3050 (2.13 GHz, 65 Watts, 1066 FSB, 2MB L2 Cache)
	<b>Cache Memory</b>	1 x 2MB L2
	<b>Memory</b>	512 MB (1 x 512 MB)
	<b>Network Controller</b>	Embedded NC320i PCIe Gigabit Server Adapter
	<b>Storage Controller</b>	Embedded SATA with integrated SATA RAID 0, 1
	<b>Hard Drives</b>	None ship standard (Up to 4 hot plug SATA 3.5" drives supported standard. SAS 3.5" drives supported with optional HBA or controller)
	<b>Internal Storage</b>	SATA: 2 TB maximum; SAS: 1.2TB maximum
	<b>Optical Drive</b>	48x IDE (ATAPI) CD-ROM Drive
	<b>Diskette Drive</b>	None ship standard (Optional 1.44 MB Diskette Drive)
	<b>Power Supply</b>	410W non-hot plug non-redundant power supplies
	<b>Form Factor</b>	Tower (5U) (Tower to Rack Enabling Kit available)

<b>ML310T04 3050 HP SATA/SAS RPS</b> 418041-001	<b>Processor(s)</b>	Dual-Core Intel® Xeon® 3050 (2.13 GHz, 65 Watts, 1066 FSB, 2MB L2 Cache)
	<b>Cache Memory</b>	1 x 2MB L2
	<b>Memory</b>	512 MB (1 x 512 MB)
	<b>Network Controller</b>	Embedded NC320i PCIe Gigabit Server Adapter
	<b>Storage Controller</b>	Embedded SATA with integrated SATA RAID 0, 1
	<b>Hard Drives</b>	None ship standard (Up to 4 hot plug SATA 3.5" drives supported standard. SAS 3.5" drives supported with optional HBA or controller)
	<b>Internal Storage</b>	SATA: 3 TB maximum; SAS: 1.2TB maximum
	<b>Optical Drive</b>	48x IDE (ATAPI) CD-ROM Drive
	<b>Diskette Drive</b>	None ship standard (Optional 1.44 MB Diskette Drive available)
	<b>Power Supply</b>	430W hot plug redundant power supplies
	<b>Form Factor</b>	Tower (5U) (Tower to Rack Enabling Kit available)

<b>ML310T04 p945 HP SATA/SAS</b> 418042-001	<b>Processor(s)</b>	Dual-Core Intel® Pentium® D 945 (3.4 GHz, 95 Watts, 800 FSB, 2 x 2MB L2 Cache)
	<b>Cache Memory</b>	2 x 2MB L2
	<b>Memory</b>	512 MB (1 x 512 MB)
	<b>Network Controller</b>	Embedded NC320i PCIe Gigabit Server Adapter
	<b>Storage Controller</b>	Embedded SATA with integrated SATA RAID 0, 1
	<b>Hard Drives</b>	None ship standard (Up to 4 hot plug SATA 3.5" drives supported standard. SAS 3.5" drives supported with optional HBA or controller)
	<b>Internal Storage</b>	SATA: 3 TB maximum; SAS: 1.2TB maximum
	<b>Optical Drive</b>	48x IDE (ATAPI) CD-ROM Drive
	<b>Diskette Drive</b>	None ship standard (Optional 1.44 MB Diskette Drive available)
	<b>Power Supply</b>	410W non-hot plug non-redundant power supplies
	<b>Form Factor</b>	Tower (5U) (Tower to Rack Enabling Kit available)

### Configuration Information - Factory Integrated Models

**NOTE:** This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on CTO product offerings and requirements.

**NOTE:** HP does not allow factory integration of options into standard models listed above. Configure-to-order servers must start with a CTO Chassis.

**NOTE:** This product offering does not support HP Factory Express Server Configuration Level 1.

**NOTE:** FIO indicates that this option only available as a Factory Installable Option.

### Step 1: Base Configuration

Models	HP ProLiant ML310 G4 CTO Chassis	419278-B21
	<b>Factory Integrated Models ship with:</b>	
	Embedded NC320i PCIe Gigabit Server Adapter	
	Integrated Four Channel SATA Controller (HP-SATA/SAS chassis only)	
	Keyboard and Mouse	

### Step 2: Choose Required Options (only one of the following from each list unless otherwise noted)

Processors	Intel® Celeron D 352 (3.2 GHz/533 - 512KB L2), FIO	431702-L21
	Intel® Pentium D 820 (2.8 GHz/800 - 2 x 1MB L2) DC, FIO	432406-L21
	Intel® Pentium D 945 (3.4 GHz/800 - 2 x 2MB L2) DC, FIO	433972-L21
	Intel® Pentium D 925 (3.0 GHz/800 - 2x2MB L2) DC, FIO	433971-L21
	Intel® Xeon® 3040 (1.86 GHz,/1066 - 2MB L2), DC, FIO	433376-L21
	Intel® Xeon® 3050 (2.13 GHz/1066 - 2MB L2) DC, FIO	419275-L21
	Intel® Xeon® 3060 (2.4 GHz/1066 - 4MB L2) DC, FIO	419276-L21
	Intel® Xeon® 3070 (2.66 GHz/1066 - 4MB L2) DC, FIO	441621-L21
Base Memory	2 GB Unbuffered PC2-5300 ECC DIMM (1 x 2 GB)	432806-B21
	1 GB Unbuffered PC2-5300 ECC DIMM (1 x 1 GB)	432804-B21
	512 MB Unbuffered PC2-5300 ECC DIMM (1 x 512 MB)	432803-B21
Optical Drive	48x IDE (ATAPI) CD-ROM	398972-B21
	CD-RW/DVD-ROM Combo Drive Option Kit	331346-B21
	16X DVD-ROM Drive Option Kit (Carbon)	217053-B21
	HP DVD±R/RW 16X Half Height	383974-B21
Power Supply	410W Non-Redundant Power Supply, FIO	431653-B21
	430W Hot-plug Redundant Power Supply, FIO	431652-B21
	<b>NOTE:</b> Hot plug redundant power supply (PN 431652-B21) ships with two power supplies.	

### Configuration Information - Factory Integrated Models

#### Step 3: Choose Additional Factory Integratable Options

##### Controllers

**NOTE:** When SATA hard drives are installed, SATA LED functionality and full SATA hot-plug capability are not supported with the embedded controller. For full LED and hot-plug support, an optional SAS RAID controller must be installed.

**NOTE:** When hot-plug SATA hard drives are installed, SATA LED functionality and full SATA hot-plug capability are not supported with the embedded controller. For full LED and hot-plug support, an optional SATA RAID or SAS controller must be installed. A SAS HBA or Controller is required if SAS hard drives are selected. SAS HBAs and Controllers support both SAS and SATA hard drives. Some SAS HBAs and Controllers also have SAS tape support. Please refer to the "Tape Drives, Tape Autoloader & Tape Libraries" table in the Storage section for a list of SAS HBAs and Controllers with tape support.

HP 8 Internal Port SAS HBA with RAID 347786-B21

**NOTE:** RAID 0, 1.

HP Smart Array E200/128 BBWC Controller 411508-B21

**NOTE:** RAID 0, 1, 1+0, 5.

HP Smart Array P400/256MB Controller 405132-B21

**NOTE:** RAID 0, 1, 1+0, 5.

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

**NOTE:** RAID 0, 1, 1+0, 5, 6.

##### Modems

Agere 06 PCI Hi-Speed 56K SftMd 440519-B21

**NOTE:** This part number must be used for factory integration. For field integration (or as an additional "ship along" option) choose EK694AA.

#### Step 4: Choose Additional Options for Factory Integration

**NOTE:** For additional options, please refer to the "Options" section below.

### Options

#### HP Insight Control Management Suites

**NOTE:** Electronic licensing options are available for Insight Control suites software products. Please see the appropriate Insight Control QuickSpecs for additional information.

##### HP Insight Control Environment

HP Insight Control Environment, No Media 1-Server License including 1 year of 24x7 Technical Support and Updates 452148-B21

HP Insight Control Management Software Media Kit 436222-B21

**NOTE:** Insight Control Management DVD media without licenses. Contains Insight Manager and Essentials software products and components licensed by Insight Control Management suites. Uses an integrated installer to perform quick and accurate software installation and updates.

**NOTE:** For additional License Kits, please see the QuickSpecs at:  
[http://h18000.www1.hp.com/products/quickspecs/12631\\_na/12631\\_na.html](http://h18000.www1.hp.com/products/quickspecs/12631_na/12631_na.html)

#### Server Management Stand Alone Software Product - ProLiant Essentials

**NOTE:** Electronic licensing options are available for select ProLiant Essentials software products. Please see the appropriate ProLiant Essentials QuickSpecs for additional information.

##### Deploy

##### HP Server Migration Pack - Universal Edition

HP Server Migration Pack - Universal Edition, No Media, Physical / Virtual to ProLiant Single Migration License, including 1 year of 24x7 Technical Support and Updates 460750-B21

**NOTE:** This license allows 1 physical to ProLiant or virtual to ProLiant migration. Customer will receive a printed license entitlement certificate and documentation via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.

HP Server Migration Pack - Universal Edition, No Media, Physical / Virtual to Virtual Single Migration License, including 1 year of 24x7 Technical Support and Updates 460753-B21

**NOTE:** This license allows 1 physical to virtual or virtual to virtual migration. Customer will receive a printed license entitlement certificate and documentation via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.

HP Server Migration Pack - Universal Edition, No Media, 1-Year Unlimited Migration License, including 1 year of 24x7 Technical Support 460756-B21

**NOTE:** This license allows unlimited migrations (physical to ProLiant, physical to virtual, virtual to virtual, and virtual to ProLiant) for one year. Customer will receive a printed license entitlement certificate and documentation via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service.

**NOTE:** For additional License Kits, please see the QuickSpecs at:  
[http://h18000.www1.hp.com/products/quickspecs/12855\\_na/12855\\_na.html](http://h18000.www1.hp.com/products/quickspecs/12855_na/12855_na.html)

##### Control

##### Integrated Lights-Out Select Pack

ProLiant Essentials Integrated Lights-Out Select Pack, No Media, 1-Server License 452158-B21

**NOTE:** For additional License Kits, please see the QuickSpecs at:  
[http://h18000.www1.hp.com/products/quickspecs/12362\\_na/12362\\_na.html](http://h18000.www1.hp.com/products/quickspecs/12362_na/12362_na.html)

### Options

#### Integrated Lights-Out Advanced Pack

Integrated Lights-Out Advanced Pack, No Media ,1 Server License 452141-B21

**NOTE:** For additional License Kits, please see the QuickSpecs at:

[http://h18000.www1.hp.com/products/quickspecs/10861\\_na/10861\\_na.html](http://h18000.www1.hp.com/products/quickspecs/10861_na/10861_na.html)

**NOTE:** Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to: <http://www.hp.com/servers/proliantessentials> or the various ProLiant Essentials QuickSpecs for more information.

Memory (DIMMs)	2 GB Unbuffered PC2-5300 ECC DIMM (1 x 2 GB)	432806-B21
	1 GB Unbuffered PC2-5300 ECC DIMM (1 x 1 GB)	432804-B21
	512 MB Unbuffered PC2-5300 ECC DIMM (1 x 512 MB)	432803-B21

Smart Buy Memory (SDRAM DIMMs)	1024 MB Unbuffered ECC PC2-5300 DDR2 (1 x 1024 MB)	432804-S21
	512 MB Unbuffered ECC PC2-5300 DDR2 (1 x 512 MB)	432803-S21

Optical Drives	16X DVD-ROM Drive Option Kit (Carbon)	217053-B21
	CD-RW/DVD-ROM Combo Drive Option Kit	331346-B21
	HP DVD±R/RW 16X Half Height	383974-B21

Diskette Drives	1.44MB Diskette Drive Option Kit	379257-B21
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Serial Port Kit	HP ProLiant Second Serial port option kit	390390-B21
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Hard Drives	<b>Serial-Attached SCSI (SAS) Hot Plug Hard Drive</b>	
	<b>NOTE:</b> SAS HBA or array controller is required.	
	HP 36GB 3G SAS 15K 3.5" SP HDD	375868-B21
	HP 72GB 3G SAS 15K 3.5" SP HDD	375870-B21
	HP 72GB 3G SAS 15K 3.5" DP HDD	384852-B21
	HP 146GB 3G SAS 15K 3.5" SP HDD	375872-B21
	HP 146GB 3G SAS 15K 3.5" DP HDD	384854-B21
	HP 300GB 3G SAS 15K 3.5" SP HDD	431944-B21
	HP 300GB 3G SAS 15K 3.5" DP HDD	416127-B21
	<b>Serial-ATA (SATA) Hot Plug Hard Drive</b>	
	HP 80GB 1.5G SATA 7.2K 3.5" HDD	349237-B21
	HP 160GB 1.5G SATA 7.2K 3.5" HDD	349238-B21
	HP 250GB 1.5G SATA 7.2K 3.5" HDD	349239-B21
	HP 500GB 1.5G SATA 7.2K 3.5" HDD	395473-B21
	HP 750GB 1.5G SATA 7.2K 3.5" HDD	432341-B21

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

[http://h18000.www1.hp.com/products/quickspecs/11940\\_na/11940\\_na.html](http://h18000.www1.hp.com/products/quickspecs/11940_na/11940_na.html)

## Options

<b>Storage Controllers</b>	<b>SAS Controllers</b>	
	<b>Smart Array E200 Controller</b>	
	HP Smart Array E200/128 BBWC Controller	411508-B21
	128-MB BBWC (Battery-Backed Write Cache) Enabler	351580-B21
	<b>NOTE:</b> Supports the Smart Array E200 Controller.	
	<b>Smart Array E500 Controller</b>	
	HP Smart Array E500/256MB Controller	435129-B21
	<b>Smart Array P400 Controller</b>	
	HP Smart Array P400/256MB Controller	405132-B21
	HP Smart Array P400/512MB BBWC Controller	411064-B21
	Battery-backed write cache upgrade	383280-B21
	<b>NOTE:</b> For Smart Array P400 Controller only.	
	512MB Battery-backed cache upgrade	405148-B21
	<b>NOTE:</b> For Smart Array P400 Controller only.	
	<b>Smart Array P800 Controller</b>	
	HP Smart Array P800/512 BBWC Controller	381513-B21
	<b>NOTE:</b> Please see the following QuickSpecs for Technical Specifications and additional information:	
	<a href="http://h18000.www1.hp.com/products/quickspecs/12460_na/12460_na.html">http://h18000.www1.hp.com/products/quickspecs/12460_na/12460_na.html</a>	
	(Smart Array E200 Controller)	
	<a href="http://h18000.www1.hp.com/products/quickspecs/12700_na/12700_na.html">http://h18000.www1.hp.com/products/quickspecs/12700_na/12700_na.html</a>	
	(Smart Array E500 Controller)	
	<a href="http://h18000.www1.hp.com/products/quickspecs/12400_na/12400_na.html">http://h18000.www1.hp.com/products/quickspecs/12400_na/12400_na.html</a>	
	(Smart Array P400 Controller)	
	<a href="http://h18000.www1.hp.com/products/quickspecs/12616_na/12616_na.html">http://h18000.www1.hp.com/products/quickspecs/12616_na/12616_na.html</a>	
	(Smart Array P800 Controller)	
	<b>SAS HBA</b>	
	HP SC44Ge Host Bus Adapter	416096-B21
	HP 8 Internal Port SAS HBA with RAID	347786-B21
	<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)	
	<a href="http://h18004.www1.hp.com/products/quickspecs/12332_na/12332_na.html">http://h18004.www1.hp.com/products/quickspecs/12332_na/12332_na.html</a>	
	(8 Internal Port SAS HBA)	
	<b>SCSI Controllers for External Drive/Storage Support</b>	
	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
	<b>NOTE:</b> If a Non-Hot Plug SCSI Tape Drive is selected in any model, then customer must add either 374654-B21 or 412911-B21.	
	<b>SCSI HBA</b>	
	HP SC11Xe Host Bus Adapter	412911-B21
	<b>NOTE:</b> If a Non-Hot Plug SCSI Tape Drive is selected in any model, then customer must add either 374654-B21 or 412911-B21.	
	<b>NOTE:</b> Please see the following QuickSpecs for additional information:	
	<a href="http://h18004.www1.hp.com/products/quickspecs/11943_na/11943_na.html">http://h18004.www1.hp.com/products/quickspecs/11943_na/11943_na.html</a>	
	(SCSI HBA)	
	<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)	



### Options

Communications	HP NC110T PCI Express Gigabit Server Adapter	434905-B21
	HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
	HP NC364T PCI Express Quad Port Gigabit Server Adapter	435508-B21
	HP NC373F PCI Express Multifunction Gigabit Server Adapter	394793-B21
	HP NC373T PCI Express Multifunction Gigabit Server Adapter	394791-B21
	HP NC380T PCI Express Dual Port Multifunction Gigabit Server Adapter	394795-B21
	2006 Agere PCI high-speed international soft modem	EK694AA

### Tape Drives

**NOTE:** For the complete listing of Tape Drive offerings, please see:  
<http://www.hp.com/products1/storage/compatibility/tapebackup/ISS/index.html>

For recommended tape drive offerings for this ProLiant server see the following:

#### USB Tape Drives

HP StorageWorks DAT 160 USB Internal Tape Drive Q1580A

#### SAS Tape Drives

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

HP StorageWorks DAT 160 SAS Internal Tape Drive Q1587A

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

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

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

#### SCSI Tape Drives

**NOTE:** For the ML310 G4, HP recommends purchasing the HP SC11Xe HBA (412911-B21) for a dedicated SCSI HBA for tape.

HP StorageWorks LTO-1 Ultrium 232 Internal Tape Drive (Carbonite) DW064A

HP StorageWorks LTO-2 Ultrium 448 SCSI Internal Tape Drive (Carbonite) DW016A

HP StorageWorks LTO-3 Ultrium 920 SCSI Internal Tape Drive EH841A

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

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

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

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

#### Rack-Mount Tape Drive Enclosures

HP StorageWorks 1U SCSI Rack-Mount kit A7445B

**NOTE:** The 1U Rack-Mount Kit can support up to (2) half-height tape drives and is compatible with multiple Single-Ended and LVD SCSI tape drives including the DAT 40, DAT 72, DAT 160, DLT VS160, LTO-1 Ultrium 232, LTO-2 Ultrium 448 and LTO-3 Ultrium 920 tape drives.

HP StorageWorks 1U USB Rack-Mount Kit A8007A

**NOTE:** The 1U USB Rack-Mount Kit can support up to (2) half-height tape drives and is compatible with the DAT 40 USB, DAT 72 USB and DAT 160 USB tape drives.

### Options

HP StorageWorks 1U SAS Rack-Mount Kit AE459A

**NOTE:** The 1U SAS Rack-Mount Kit can support up to (2) half-height tape drives and is compatible with the LTO-2 Ultrium 448 SAS and LTO-3 Ultrium 920 SAS tape drives.

**NOTE:** Please see the Rack-Mount Tape Drive Kits QuickSpecs for additional information regarding these kits:

[http://h18000.www1.hp.com/products/quickspecs/10854\\_na/10854\\_na.html](http://h18000.www1.hp.com/products/quickspecs/10854_na/10854_na.html)

**HP D2D Backup System** HP StorageWorks D2D110 Backup System EH880A

**NOTE:** 1TB of Disk Storage

HP StorageWorks D2D110 Backup System with Data Protector Express Software Kit EH923A

**NOTE:** 1TB of Disk Storage

HP StorageWorks D2D120 Backup System EH884A

**NOTE:** 2TB of Disk Storage

HP StorageWorks D2D120 Backup System with Data Protector Express Software Kit EH924A

**NOTE:** 2TB of Disk Storage

**NOTE:** Please see the HP D2D Backup Systems QuickSpecs for additional information:

[http://h18000.www1.hp.com/products/quickspecs/12651\\_na/12651\\_na.html](http://h18000.www1.hp.com/products/quickspecs/12651_na/12651_na.html)

### Tape Autoloaders

#### HP StorageWorks DAT Autoloader

HP StorageWorks DAT 72x10 tape autoloader AE313B

#### HP StorageWorks 1/8 Tape Autoloader

HP StorageWorks 1/8 LTO-3 Ultrium 920 G2 Tape Autoloader AH165A

HP StorageWorks 1/8 G2 LTO-3 Ultrium 920 SAS Autoloader AH558A

HP StorageWorks 1/8 LTO-2 Ultrium 448 G2 Tape Autoloader AH164A

HP StorageWorks 1/8 LTO-1 Ultrium 232 G2 Tape Autoloader AH163A

HP StorageWorks 1/8 G2 Tape Autoloader Rack Kit AH166A

**NOTE:** Required to install the 1/8 G2 Autoloaders in a standard 19-inch rack; includes rails and rackmount instructions.

**NOTE:** Please reference the Tape Autoloader QuickSpecs at

<http://www.hp.com/go/automation> for additional information needed to create a complete solution; reference current compatibility information at:

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

### Options

#### Tape Libraries

##### HP StorageWorks MSL2024 Tape Library

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

##### HP StorageWorks MSL4048 Tape Library

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

##### HP StorageWorks MSL8096 Tape Library

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

##### HP StorageWorks MSL6000 Tape Library

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

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

###### Ultrium 960 technology

HP StorageWorks MSL6030 1 LTO-3 Ultrium 960 SCSI Drive Library	AD606B
HP StorageWorks MSL6030 1 LTO-3 Ultrium 960 4GB FC Library	AD608B
HP StorageWorks MSL6030 2 LTO-3 Ultrium 960 SCSI Drive Library	AD607B
HP StorageWorks MSL6030 2 LTO-3 Ultrium 960 4GB FC Library	AD609B

**NOTE:** Please reference the MSL2024, MSL4048 and MSL6000 Tape Library QuickSpecs at: <http://www.hp.com/go/automation> for additional information needed to create a complete solution; reference current compatibility information at: <http://www.hp.com/go/ebs>.

### Options

Uninterruptible Power Systems – Tower Supply	HP T500 UPS 120 V	361475-001
	HP T750 UPS, Low Voltage	378439-D71
	HP, T1000 UPS	AF403A
	HP, T1500 UPS	AF406A
	HP, R/T 2200 UPS	AF409A

Rack Kits	ProLiant Rack Enabling Kit (RoHS Compliant)	417705-B21
	<b>NOTE:</b> The system and optional Tower-to-Rack tray occupy 6U.	
	<b>NOTE:</b> Support for racks with round or square mounting holes (including all Compaq and HP Rack System /E and HP Systems), with an adjustment range of 24" - 36".	

USB Options	HP USB-P/S2 Optical Mouse	DC369A
	USB 1.44-MB External Diskette Drive (Carbonite)	DC141B
	HP 1GB USB 2.0 Floppy Drive Key	442085-B21
	HP 256MB USB 2.0 Floppy Drive Key	442084-B21
	HP USB 04 Standard Keyboard	DT528A#ABA

Service and Support Offerings (HP Care Pack Services)	<b>Hardware Services On-site Service</b>	
	Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 3 Years, Electronic	U4445E
	4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	U4446E
	4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	U4447E
	6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	U4448E
	<b>Installation &amp; Start-up Services</b>	
	Hardware Installation, Electronic	U4456E
	Installation & Start-Up of a ProLiant server and Microsoft or Linux O/S per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excl. HP holidays, Electronic	U4457E
	<b>Support Plus</b>	
	Onsite HW support, 8am-9pm, M-F, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 8am-9pm, M-F 2hr response time excl. HP holidays, Electronic	U4458E
	<b>Support Plus 24</b>	
	Onsite HW support 24x7, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic	U4459E
	Onsite HW support 24x7, 4hr response and SuSE Linux SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic	U6306E
	Onsite HW support 24x7, 4hr response and Red Hat ES Linux SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic	U8328E
	<b>NOTE:</b> For more information, customer/resellers can contact <a href="http://www.hp.com/services/carepack">http://www.hp.com/services/carepack</a> .	

### Memory

**NOTE:** Memory configurations listed do not apply to "Factory Integrated Models".

#### HP ProLiant ML310 G4 Memory Configuration

##### Standard Memory

All HP ProLiant ML310 G4 models ship with unbuffered, ECC PC2-5300 DDR2 SDRAM running at 667MHz.

SATA/SAS models include a single 512 MB DIMM. SAS models include a single 1 GB DIMM.

Factory Integrated Models include the memory capacity of your choice.

##### Standard Memory Replaced with Optional Memory

Up to 8 GB memory is available with the optional installation of four 2 GB PC2-5300 Unbuffered ECC DDR2 SDRAM DIMM kits.

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

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

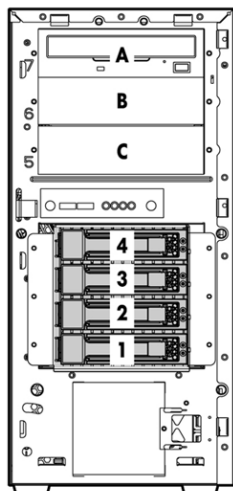
The first DIMM should be installed in Socket 1. A DIMM should not be installed in Socket 2 without a DIMM in Socket 1. Likewise a DIMM should not be installed in Socket 4 without a DIMM in Socket 3. A DIMM need not be installed in Socket 2 in order to install a DIMM in Socket 3.

Table 3-1 shows some of the suggested memory configurations for these systems.

**NOTE:** Table 3-1 does not list all possible configurations. Balanced-capacity, dual-channel loading yields best performance.

Channel A		Channel B		Total	Mode
Socket 1	Socket 2	Socket 3	Socket 4		
512 MB	none	none	none	512 MB	Single-channel
512 MB	none	512 MB	none	1 GB	Dual-channel interleaved
1 GB	none	none	none	1 GB	Single-channel
1 GB	none	1 GB	none	2 GB	Dual-channel interleaved
1 GB	1 GB	1 GB	none	3 GB	Dual-channel asymmetric
1 GB	1 GB	1 GB	1 GB	4 GB	Dual-channel interleaved
1 GB	2 GB	1 GB	2 GB	6 GB	Dual-channel interleaved
2 GB	2 GB	2 GB	2 GB	8 GB	Dual-channel interleaved

## Storage



- B, C Removable Media Bays (1.6" each)
- A 48x IDE (ATAPI) CD-ROM
- 1 - 4 Four Hot Plug Hard Drive Bays

## Drive Support

	Quantity Supported	Position Supported	Controller
<b>Removable Media</b>			
1.44-MB Diskette Drive	Up to 1	A, B, or C	Integrated
IDE (ATAPI) CD-ROM Drive	Up to 2	A, B, or C	Integrated IDE (ATAPI)
DVD-ROM Drive Option Kit	Up to 2	A, B, or C	Integrated IDE (ATAPI)

## Hard Drives

### Hot Plug SAS

	Quantity Supported	Position Supported	Controller
300GB 3G SAS 15K SP	Up to 4	1-4	HP 8 Internal Port SAS HBA with RAID Smart Array E200/128 BBWC Controller Smart Array E500/256MB Controller Smart Array P400/256MB Controller Smart Array P400/512MB BBWC Controller
300GB 3G SAS 15K DP			
146GB 3G SAS 15K SP			
146GB 3G SAS 15K DP			
72GB 3G SAS 10K SP			
72GB 3G SAS 15K DP			
36GB 3G SAS 10K SP			

**NOTE:** Use of SAS hard drives in SATA/SAS models requires installation of one of the controllers or HBAs listed above.

## Storage

### Hot Plug SATA

	Quantity Supported	Position Supported	Controller
750GB 1.5G SATA 7.2K	Up to 4	1-4	Embedded SATA with integrated SATA RAID 0,1
500GB 1.5G SATA 7.2K			HP 8 Internal Port SAS HBA with RAID
250GB 1.5G SATA 7.2K			Smart Array E200/128 BBWC Controller
160GB 1.5G SATA 7.2K			Smart Array E500/256MB Controller
80GB 1.5G SATA 7.2K			Smart Array P400/256MB Controller
			Smart Array P400/512MB BBWC Controller

**NOTE:** Hot plug capability and drive LED status support requires installation of one of the controllers or HBAs listed above.

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

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

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

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

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

	Position Supported	Controller	Controller Part Number
<b>Internal USB Tape Drives</b> DAT 40 USB DAT 72 USB DAT 160 USB	B or C	USB 2.0 Port	N/A
<b>USB Tape Drives, External</b> DAT 40 USB DAT 72 USB DAT 160 USB 1U Rack-Mount Kit	External	USB 2.0 Port	N/A
<b>SCSI Tape Drives, Internal</b> LTO-1 Ultrium 232 LTO-2 Ultrium 448 LTO-3 Ultrium 920 DAT 40 DAT 72 DAT 160 DLT VS160	B or C	HP SC11Xe Host Bus Adapter	412911-B21

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<b>SCSI Tape Drives, Internal</b>	Rackmount only	HP SC11Xe Host Bus Adapter	412911-B21
LTO-3 Ultrium 960			
LTO-4 Ultrium 1840			
SDLT 600			
<b>SCSI Tape Drives, External</b>	External	HP SC11Xe Host Bus Adapter	412911-B21
LTO-1 Ultrium 232			
LTO-2 Ultrium 448			
LTO-2 Ultrium 460			
LTO-3 Ultrium 960			
LTO-3 Ultrium 920			
LTO-4 Ultrium 1840			
DAT 40			
DAT 72			
DAT 160			
DLT VS160			
SDLT 600			
1U Rack-Mount Kit			
3U Rack-Mount Kit			
<b>SAS Tape Drives, Internal</b>	B or C	HP SC44Ge Host Bus Adapter	416096-B21
DAT 160 SAS			
LTO-2 Ultrium 448 SAS			
LTO-3 Ultrium 920 SAS			
HP 8 Internal Port SAS HBA with RAID			
HP Smart Array E500 Controller			
<b>NOTE:</b> The following SAS Smart Array controllers require ROM Flash version 2.04 or higher for SAS tape support:			
HP Smart Array P400/256MB Controller			
HP Smart Array P400/512MB Controller			
<b>NOTE:</b> Please visit: <a href="http://www.hp.com/go/connect">http://www.hp.com/go/connect</a> for details about minimum SAS controller firmware version and SAS cabling requirements.			
<b>SAS Tape Drives, Internal</b>	Rackmount only	HP SC44Ge Host Bus Adapter	416096-B21
LTO-4 Ultrium 1840 SAS			
HP 8 Internal Port SAS HBA with RAID			
HP Smart Array E500 Controller			
<b>NOTE:</b> The following SAS Smart Array controllers require ROM Flash version 2.04 or higher for SAS tape support:			
HP Smart Array P400/256MB Controller			
HP Smart Array P400/512MB Controller			
<b>NOTE:</b> Please visit: <a href="http://www.hp.com/go/connect">http://www.hp.com/go/connect</a> for details about minimum SAS controller firmware version and SAS cabling requirements.			



### Storage

<b>SAS Tape Drives, External</b> DAT 160 SAS LTO-2 Ultrium 448 SAS LTO-3 Ultrium 920 SAS LTO-4 Ultrium 1840 SAS 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP SC44Ge Host Bus Adapter <b>NOTE: Recommended.</b>	416096-B21
		HP Smart Array E500 Controller	435129-B21
<b>SCSI Tape Automation, External</b> DAT 72x10 Autoloader 1/8 G2 Autoloader MSL2024 MSL4048 MSL8096 MSL6000	External	HP SC11Xe Host Bus Adapter  HP U320e SCSI Host Bus Adapter <b>NOTE: Only valid for MSL tape libraries.</b>	412911-B21  AH627A
<b>SAS Tape Automation, External</b> 1/8 G2 Autoloader MSL2024 MSL4048 MSL8096	External	HP SC44Ge Host Bus Adapter  <b>NOTE: Please visit: <a href="http://www.hp.com/go/connect">http://www.hp.com/go/connect</a> for details about minimum SAS controller firmware version and SAS cabling requirements.</b>	416096-B21
<b>Fibre Tape Automation, External</b> MSL2024 MSL4048 MSL8096 MSL6000	External	Please consult the EBS connectivity matrix at: <a href="http://www.hp.com/go/ebs">http://www.hp.com/go/ebs</a> for detailed connectivity information.	N/A
<b>HP StorageWorks D2D Backup Systems</b> D2D110 D2D120	External	Embedded Network Controller	N/A

### Technical Specifications

<b>System Unit</b>	<b>Dimensions (HxWxD)</b>	17.0 x 7-7/8 x 22 in (43.0 x 20.0 x 55.0 cm)
	<b>Weight</b> (no drives installed)	17.9 kg (39.5 lbs)
	<b>Ready steady state power</b>	3.3 V/ 5V 110W 12 V CPU 300W
	<b>Maximum peak power</b>	410W (non-redundant non-hot plug) 430W (redundant hot-plug)
	<b>Input Requirements</b> (per power supply)	Range Line Voltage      88-269VAC Normal Line Voltage      100 to 240 VAC
	<b>Line Frequency</b>	47 to 66 Hz
	<b>Rated Input Current</b>	6.4A RMS max at 100VAC with maximum load; 3.2A RMS max at 230V with maximum load
	<b>BTU Rating</b>	1,560 BTU
	<b>Ultra 320 SCSI Connectors</b>	None <b>NOTE:</b> Support for either one internal or one external SCSI channel is available. To use the channel for external connection, order an internal-to-external SCSI cable option kit (PN 159547-B22 or 333370-B21).
	<b>Power Supply Output Power</b>	Rated Steady-State Power    350W Maximum Peak Power        410W
	<b>Power Supply Output Power - RPS</b>	Rated Steady-State Power    350W Maximum Peak Power        430W
	<b>Temperature Range</b>	Operating                      50° to 95° F (10° to 35° C) Shipping                        -40° to 160° F (-40° to 71° C)
	<b>Relative Humidity</b> (non-condensing)	Operating                      20% to 80% Non-operating                5% to 95%
	<b>Acoustic Noise</b>	Idle (Fixed Disk Drives Spinning) L WAd (BELS)            5.4 L pAm (dBA)             34 Operating (Random Seeks to Fixed Disks) L WAd (BELS)            5.4 L pAm (dBA)             34

### Technical Specifications

Acoustic Noise - RPS	Idle (Fixed Disk Drives Spinning)	L WAd (BELS)	5.2
		L pAm (dBA)	37.8
	Operating (Random Seeks to Fixed Disks)	L WAd (BELS)	5.3
			L pAm (dBA)

48X Max IDE (ATAPI) CD-ROM Drive	Disk	Applicable Disk	CD-ROM, CD-XA, CD-DA (Mode 1, Mode 2, Form 1 and 2) Photo CD (Single and Multi-session) Mixed Mode (Audio and Data combined) CD-R
		Capacity	540 MB (Mode 1, 12 cm) 650 MB (Mode 2, 12 cm)
	Block Size	Mode 1	2,048 bytes
		Mode 2	2,340 bytes, 2,336 bytes
		CD-DA	2,352 bytes
		CD-XA	2,328 bytes
	Interface	IDE (ATAPI)	
	Access Times (typical)	Random	<100 ms
		Full-Stroke	<150 ms
	Data Transfer Rate	Sustained	3000 to 7200 KB/s (20X to 48X)
		Burst	150 KBps to 7,200 KBps
		Bus Rate	16.7 MBps
	Cache Buffer	128 KB	
	Start-up Time (typical)	< 7seconds	
	Stop Time	< 4seconds	
	Laser Parameters	Type	Semiconductor Laser GaAlAs
		Wave Length	780 ± 25 nm
	Operating Conditions	Temperature	41° to 113° F (5° to 45° C)
		Humidity	10% to 80%
	Dimensions	(HxWxD, maximum)	1.7 x 5.85 x 8.11 in (4.29 x 14.86 x 20.60 cm)
		Weight	2.09 lb (0.95 kg)

### Technical Specifications

HP 8 Internal Port SAS Host Bus Adapter with RAID	RAID Support	RAID 1 (Mirroring) RAID 0 (Striping)		
	Logical Drives Supported	Up to 2 Logical Volumes Up to 10 drives total in all RAID volumes Up to 2 Drives per RAID 1 Up to 8 Drives per RAID 0		
	Maximum Capacity	576GB (8 x 72GB)		
	Data Transfer Method	64-bit wide, PCI-X 133 MHz (1 GB/s maximum bandwidth)		
	Port Transfer Rate	12 Gb/s per x4 Wide SAS Port (4 x 3 Gb/s)		
	Simultaneous Drive Transfer Ports	2 x4 Wide SAS Connectors		
	Protocols	3 Gbps SAS (Serial Attached SCSI) 1.5 Gbps SATA (Serial Advanced Technology Attachment)		
	External SAS Connectors	None		
	Internal SAS Connectors	2 internal SFF8484 x4 SAS Connectors		
	Upgradeable Firmware	4MB flashable ROM		
	<hr/>			
Embedded NC320i PCIe Gigabit Server Adapter	Network Interface	10Base-T/100Base-TX/1000Base-TX		
	Compatibility	IEEE 802.3 10Base-T		
		IEEE 802.3ab 1000Base-T		
		IEEE 802.3u 100Base-TX		
	Data Transfer Method	Single lane (x1), 100MHz PCI Express Reference Clock		
	Network Transfer Rate	10Base-T (Half-Duplex)	10 Mb/s	
		10Base-T (Full-Duplex)	20 Mb/s	
		100Base-TX (Half-Duplex)	100 Mb/s	
100Base-TX (Full-Duplex)		200 Mb/s		
1000Base-TX (Half and Full-Duplex)		2000Mb/s		
Connector	RJ-45			
Cable Support	10Base-T	Categories 3, 4 or 5 UTP; up to 328 ft (100 m)		
	10/100/1000Base-TX	Category 5 UTP; up to 328 ft (100 m)		
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Environment-friendly Products and Approach	End-of-life Management and Recycling	<p>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.</p> <p>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: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a>. 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.</p>		

## *Technical Specifications*

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