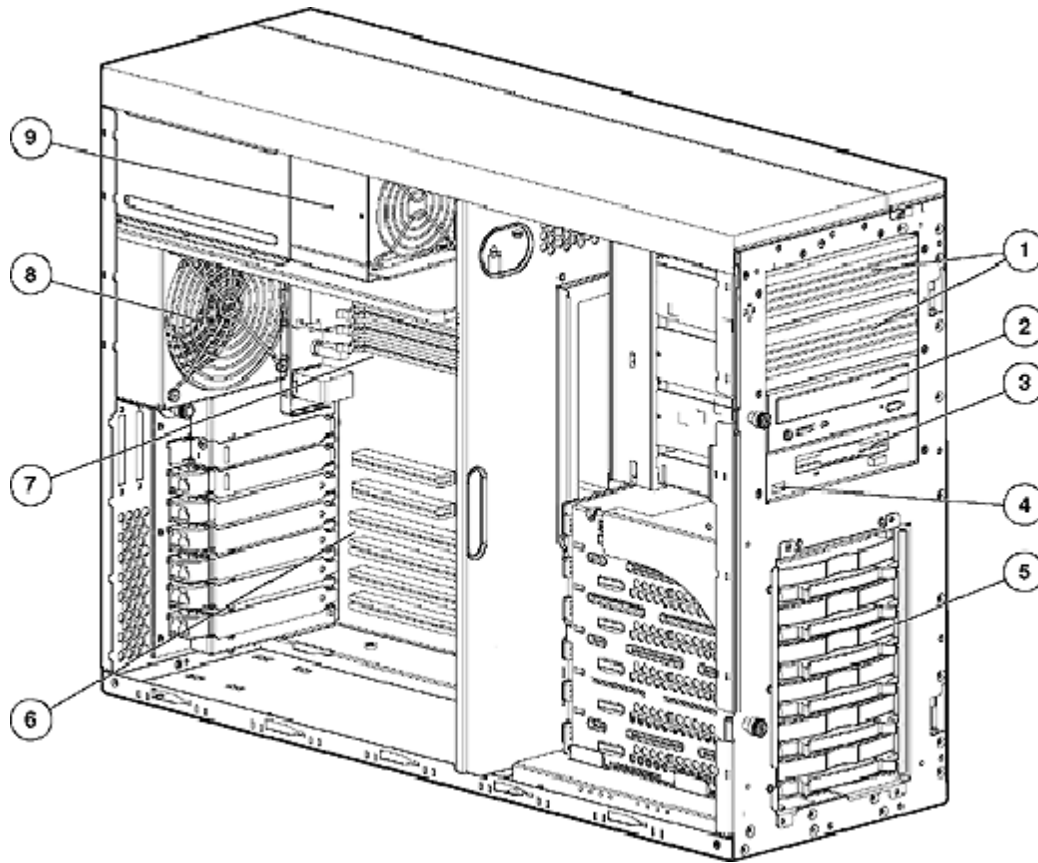


### Overview



1. Two Available Removable Media Bays
2. 48X Max IDE CD-ROM Drive
3. 1.44 Diskette Drive
4. USB Port
5. Six Hot Plug Drive Bays

6. Six Expansion Slots (four PCI-X, two PCI-Express)
7. Six DIMM sockets for up to 12 GB of DDR2 memory
8. System Fan (an optional redundant system fan is available)
9. Power Supply

**NOTE:** An optional 2nd power supply is available for hot-plug 1+1 redundancy

### What's New

The HP ProLiant ML350 G4p now supports several exciting new options:

- Serial Attached SCSI (SAS) hard drives and controllers
- USB DAT tape drives
- Intel Xeon 3.6 GHz processors with 2MB L2 cache

### Overview

### At A Glance

The HP ProLiant family now includes an HP ProLiant ML350 server that combines fourth generation features with top notch performance and remote management capabilities. To complement our popular G4 features, the HP ProLiant ML350 G4p packs the latest Intel Xeon processors with 2MB cache, DDR2 memory, Integrated Lights-Out management, and support for serial hard drives.

- 3.0 GHz, 3.2 GHz, 3.4 GHz or 3.6 GHz Intel® Xeon™ processors (dual processor capability) with 2MB level 2 cache. Processors include support for Hyper-Threading.
- Intel® E7520 chipset
- 800-MHz front side bus
- Integrated dual channel Ultra320 SCSI adapter
- HP integrated 2 Port SATA controller
- Smart Array 641 Controller (standard in Array Models only)
- Embedded NC7761 PCI 10/100/1000T Gigabit network adapter
- PC2-3200 400 MHz DDR2 SDRAM with Online Spare support (expandable to 12 GB)
- Six expansion slots: one 64-bit/133-MHz PCI-X, two 64-bit/100-MHz PCI-X, one 64-bit/66-MHz PCI-X, one x4 PCI Express, and one x8 PCI Express
- Two USB ports, including one front USB port (USB 2.0)
- Standard support for six hot plug SCSI or two SATA hard drives (SCSI models support Ultra320 drives. Serial models support SAS and SATA drives.)

**NOTE:** See the "Storage" section of this QuickSpecs for important information on controllers and cables required to support SAS or SATA hard drives as well as storage management software available for SATA hard drives.

- Internal storage capacity of up to 1.8 TB; 2.4 TB with optional 2-bay hot plug SCSI drive cage
- Support for optional duplex SCSI backplane, redundant system fan, and second serial port
- Integrated Lights-Out (iLO) Standard for remote management
- 725W Hot-Plug Power Supply; optional 725W Hot-Pluggable Redundant Power Supply (1 + 1) available.
- Tool-free chassis entry and component access
- Universal rail solution supporting both square and round hole rack environments
- Support for ROM based setup utility (RBSU) and redundant ROM
- Systems Insight Manager, SmartStart, and Automatic Server Recovery 2 (ASR-2)
- HP Power Regulator for ProLiant
- Protected by HP Services and a worldwide network of resellers and service providers. Three-year Next Business Day, on-site limited global warranty. Certain restrictions and exclusions apply. Pre-Failure Notification on processors, memory, and SCSI hard drives. SATA hard drives have a one-year warranty.

Standard Features

Processor	Intel Xeon Processor 3.4 GHz/800-2MB L2		
One of the following depending on Model	Intel Xeon Processor 3.2 GHz/800-2MB L2		
	Intel Xeon Processor 3.0 GHz/800-2MB L2		
<b>NOTE:</b> "Factory Integrated Models" are configured to order and require the selection of at least one processor.			
<hr/>			
Cache Memory	Integrated 2MB Level 2 cache		
<hr/>			
Processor Upgradeability	Upgradeable to dual processing		
<hr/>			
Chipset	Intel® E7520 Chipset with 800-MHz Front Side Bus		
<hr/>			
Memory Protection	Online Spare Advanced ECC		
<hr/>			
Memory	Type	PC2-3200 DDR2 SDRAM (400MHz)	
	Standard for Non-Array Models	512 MB (1 x 512 MB)	
	Standard for Array Models	1 GB (2 x 512 MB)	
	Maximum	12 GB	
One of the following depending on model			
<b>NOTE:</b> The standard memory information above does not apply to factory integrated models. The memory configuration in factory integrated models is set according to your specifications.			
<hr/>			
Network Controller	Embedded NC7761 PCI 10/100/1000T Gigabit network adapter		

Expansion Slots	Slot Number	Bus Speed	Maximum Card Length	Bus Number*	Device Number**	Hot Plug	PCI Voltage
	1	PCI Express x4 (half length)	6.6"	16	1	no	N/A
	2	PCI Express x8	12.28"	12	1	no	N/A
	3	64-bit/100MHz PCI-X	12.28"	9	2	no	3.3 Volt
	In HP ProLiant ML350 G4p Array Models, the Smart Array 641 is installed in Slot 3.						
	4	64-bit/100MHz PCI-X	12.28"	9	1	no	3.3 Volt
	5	64-bit/133MHz PCI-X	12.28"	6	1	no	3.3 Volt
	6	64-bit/66MHz PCI-X	12.28"	2	2	no	3.3 Volt

\*NOTE: Bus number listed reflects the default bus assignment. Inserting cards with PCI bridges may alter the actual bus assignment number.

\*\*NOTE: Slots are enumerated differently based on operating system. Microsoft's operating systems enumerate from lowest to highest Device ID by bus (starting with the lowest bus).

NOTE: All slots can accept universal keyed PCI cards

### Standard Features

Storage Controller	Integrated Dual Channel Ultra320 SCSI Adapter HP integrated 2 Port SATA controller Smart Array 641 Controller (Standard in Array Models only)		
Storage	Diskette Drives	1.44 MB Diskette Drive	
	Optical Drive	48x IDE CD-ROM Drive	
	Hard Drives	None included standard	
	External Storage	Two external SCSI port knockouts available; optional Internal-to-External SCSI Cable Option Kit required for external connections	
		<ul style="list-style-type: none"> <li>• HD68 Internal to External SCSI Cable Option Kit PN 159547-B22</li> <li>• VHDCI Internal to External SCSI Cable Option Kit PN 333370-B21</li> </ul>	
Maximum Internal Storage	Hot Plug SCSI	2.4 TB	6 x 300 GB with standard drive cage + 2 x 300 GB with optional ML3xx Two Bay Hot Plug SCSI Drive Cage
	Hot Plug SATA	1.5 TB	2 x 250 GB with standard controller + 4 x 250 GB with optional SATA array controller
	Hot Plug SAS (3.5")	880 GB	6 x 146 GB with optional Smart Array P600 Controller
Interfaces	Parallel	1	
	Serial	1 (optional 2nd serial port available)	
	Pointing Device (Mouse)	1	
	Graphics	1	
	Keyboard	1	
	Network RJ-45	2 (1 dedicated for iLO)	
	USB	2	NOTE: 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> .
	External SCSI knockouts	2	
Graphics	Integrated ATI RAGE XL Video Controller with 8-MB SDRAM Video Memory VGA connector; up to 1600 x 1200 resolution supported		
Form Factor	Tower or rack (5U) NOTE: Rack models (and rack conversion kit) support: <ul style="list-style-type: none"> <li>• Square or round hole racks 24"- 35" deep, including HP Rack System /E and HP Systems</li> <li>• Telco racks with 3rd part option kit from Rack Solutions <a href="http://www.racksolutions.com/hp">http://www.racksolutions.com/hp</a></li> </ul>		

### Standard Features

#### ProLiant Essentials Foundation Pack Software

##### HP Systems Insight Manager

HP Systems Insight Manager (HP SIM) helps maximize system uptime and performance and reduce system maintenance costs by providing proactive notification of problems before those problems result in unplanned downtime or reduced productivity. For more information on HP SIM visit:

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

##### Management Agents

The Management Agents provide direct, browser-based access to in-depth instrumentation built into HP servers, workstations, desktops, or portables, and send alerts to Systems Insight Manager or other enterprise management applications in case of subsystem or environmental failures. For additional information about the Management Agents and other management products from HP, visit: <http://www.hp.com/servers/manage>.

##### SmartStart

SmartStart simplifies server setup by providing a quick, easy way to deploy reliable and consistent server configurations. For more information, please visit the SmartStart Web site at <http://www.hp.com/servers/manage>.

Minimum SmartStart version supported: 7.2

Latest SmartStart version supported: 7.3

##### Subscriber's Choice

Subscriber's Choice Driver and Support Alerts/Notifications is a web-based email subscription service that provides automatic delivery of software and driver change notifications for ProLiant products. Sign up at

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

and customize your profile to receive alerts on updates as they become available.

##### ROMPaq, support software, and configuration utilities

The latest software, drivers, and firmware fully optimized and tested for your ProLiant server and options

Available in SmartStart or downloadable from the Software and Drivers download pages at <http://www.hp.com/go/support>.

##### Insight Diagnostics Online Edition

The most advanced configuration analysis, reporting and troubleshooting utilities used by HP at your fingertips.

Available in SmartStart.

##### Optional ProLiant Essentials Value Packs

Optional software offerings that extend the functionality of an Adaptive Infrastructure to address specific business problems and needs:

- Integrated Lights-Out Advanced Pack - upgrades the Integrated Lights-Out processor to full virtual presence and control with graphical console and virtual media.
- Rapid Deployment Pack - an automated solution for multi-server deployment and provisioning, enabling companies to quickly and easily adapt to changing business demands.
- Performance Management Pack - 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.
- Intelligent Networking Pack - detects and analyzes network bottlenecks or broken network linkages and steers traffic to the optimum route based on network conditions, plus it provides an extra layer of protection. The virus throttle feature of the solution slows the propagation of fast spreading virus
- Vulnerability and Patch Management Pack - identifies and remediates software security vulnerabilities due to missing patches as well operating system configurations that can be exploited by viruses,

### Standard Features

- worms, and other blended threats
- Virtual Machine Management Pack - provides central management and control of virtual machines from Microsoft and VMware. Integrated approach provides the ability to manage both physical and virtual resources from a single management console.

**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.

**NOTE:** For more information regarding ProLiant Essentials Software, please see the following URL: <http://www.hp.com/servers/proliantessentials>.

#### Industry Standard Compliance

ACPI V2.0 Compliant  
PCI 2.2 Compliant  
PXE Support  
WOL Support  
PCI-X 1.0 Compliant  
Novell Certified  
Microsoft® Logo certifications  
USB 2.0

#### Availability

Optional Hot Plug, Redundant Power supply  
Online Spare Memory  
Optional Redundant System Fan

#### Remote Management

Integrated Lights-Out Standard

- Virtual Text Remote Console
- Virtual Power Button Control
- Dedicated & shared LAN Connectivity
- Browser and command line access
- Automatic IP Configuration via DHCP/DNS/WINS
- Industry Standard 128-bit Secure Sockets Layer (SSL) and Secure Shell Security IML and iLO Event Logging
- Support for 12 user accounts with customizable access privilege

Integrated Lights Out Advanced Pack (optional)  
Remote Insight Lights-Out Edition II (optional)

#### System Management

HP Systems Insight Manager  
SmartStart  
Redundant ROM  
System Firmware Update  
ROMPaq  
ProLiant RBSU (ROM-Based Setup Utility)  
Automatic Server Recovery-2 (ASR-2)  
Dynamic Sector Repairing (with Smart Array Controller)  
Drive Parameter Tracking (with Smart Array Controller)  
Pre-Failure Warranty (covers processors, memory and SCSI hard drives)

### Standard Features

Security	<ul style="list-style-type: none"> <li>Power-on password</li> <li>Setup password</li> <li>Diskette boot control</li> <li>Parallel and serial interface control</li> <li>Disk configuration lock</li> <li>Power switch security</li> </ul>
Server Power Cords	<p>Tower models ship standard with a 12' country specific, lowline NEMA power cord. Rack models ship standard with a 10' IEC cable. Rack models for some countries also include a 12' NEMA cord.</p> <p>Most redundant power supply options ship with a 12' country specific power cord. The one exception is the IEC redundant power supply (P/N 384168-B21) which ships with a 10' IEC cable only.</p>
UPS and PDU Power Cord Matrix	<p>Please see the UPS and PDU cable matrix that lists cable descriptions, requirements, and specifications for UPS and PDU units:</p> <p><a href="ftp://ftp.compaq.com/pub/products/servers/ProLiantstorage/power-protection/powercordmatrix.pdf">ftp://ftp.compaq.com/pub/products/servers/ProLiantstorage/power-protection/powercordmatrix.pdf</a>.</p>
Power Supply	<p>Hot plug models: 725 Watt, Power Factor Correction (PFC), Hot Plug 100 to 240 VAC Rated Input Voltage (Auto-sensing), CE Mark Compliant</p> <p>Optional 2nd power supply for hot-pluggable 1 + 1 redundancy</p>
System Fans	<p>1 fan ships standard, 2 fans total supported (does not include power supply or processor heatsink fans)</p>
Required Cabling	<p>For required cabling information, refer to the HP ProLiant ML350 G4p cabling matrix at <a href="http://www.hp.com/servers/proliantML350">http://www.hp.com/servers/proliantML350</a>.</p> <p><b>NOTE:</b> Please see the "Storage" section of this QuickSpecs for important information on controllers and cables required to support SAS or SATA hard drives as well as storage management software available for SATA hard drives.</p>
OS Support	<ul style="list-style-type: none"> <li>Microsoft Windows Server 2003</li> <li>Microsoft Small Business Server 2003</li> <li>Microsoft Windows 2000 Server and Advanced Server</li> <li>Novell NetWare</li> <li>Novell NetWare Small Business Suite</li> <li>LINUX (Red Hat, SuSE)</li> <li>VMware Virtualization Software</li> </ul> <p><b>NOTE:</b> For a complete and up-to-date listing of supported operating systems please visit our OS Support Matrix at: <a href="http://www.hp.com/go/supportos">http://www.hp.com/go/supportos</a>.</p> <p><b>NOTE:</b> For a complete and up-to-date information on Linux support, please visit the HP Linux Web site at <a href="http://h18000.www1.hp.com/products/servers/linux/hpLinuxcert.html">http://h18000.www1.hp.com/products/servers/linux/hpLinuxcert.html</a></p> <p><b>NOTE:</b> Optional hardware may be required to support some operating systems.</p> <p><b>NOTE:</b> For information on how to buy server operating systems from HP please visit the OS product site at: <a href="http://h18004.www1.hp.com/products/servers/software/OEM.html">http://h18004.www1.hp.com/products/servers/software/OEM.html</a></p> <p><b>NOTE:</b> For an up-to-date listing of the latest drivers available for the HP ProLiant ML350, please see: <a href="http://www.compaq.com/support/files/server/us/index.html">http://www.compaq.com/support/files/server/us/index.html</a>.</p> <p><b>NOTE:</b> For more information on HP's Certified and Supported ProLiant Servers, please visit the VMware Server Support Matrix at: <a href="http://h18004.www1.hp.com/products/servers/software/vmware/hpvmwarecert.html">http://h18004.www1.hp.com/products/servers/software/vmware/hpvmwarecert.html</a>.</p>

### Standard Features

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#### Installation of Server into Telco Racks

Support for all 2-post Telco racks requires the use of the HP ProLiant ML350 G4 rack kit and an additional option kit from Rack Solutions. <http://www.racksolutions.com/hp>.

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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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#### Custom Builder

Please see the Enterprise Configurator for configuration assistance at: <http://www.hp.com/products/configurator>.

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#### HP ProLiant Smart Buys (NA only)

The HP Smart Buy program offers mainstream business solutions at competitive prices with excellent availability and superior HP quality. It offers a wide range of industry-leading HP products at compelling prices, allowing you to receive richer configurations with additional options.

**NOTE:** ProLiant Smart Buys are available in NA only. For detailed specification information on ProLiant Smart Buys please click on the following link: <ftp://ftp.compaq.com/pub/products/servers/smartbuys.pdf>

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#### Service and Support

This product is covered by a global limited warranty and supported by HP Services and a worldwide network of resellers and service providers. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Additional 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.

**NOTE:** Limited warranty includes 3 year parts, 3 year labor, 3-year on-site support.

**NOTE:** SATA drives have a 1 year warranty.

The warranty is fully supported by HP Services and a worldwide network of resellers and service providers. In addition, 90-day software telephone support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services.

Care Pack services provide a range of life cycle support options that let you choose the service levels that meet your business requirements, from basic to mission-critical.

A full range of HP Care Pack hardware and software services are available including:

- Installation and start up
- Education courses



### Standard Features

- Extended onsite hardware coverage hours from same business day 13 hours, 5 day to 24 hours, 7 days call window with options including 4-hour response or 6-hour Call To Repair
- Comprehensive range of software technical support for Microsoft, Linux, ProLiant Essentials and VMWare-based IT solutions helping to deliver high level of application availability. Response times range from 30 mins for critical problems to 2 hours.
- System Management, Performance Services and Mission Critical Support Solution

HP Care Pack services include coverage for the HP branded hardware options qualified for the server, purchased at the same time or afterward, internal to the enclosure, as well as 22" 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, 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.

**NOTE:** For more information on HP Care Pack services, contact any of our worldwide sales offices or resellers or visit our worldwide Web site on the internet at: <http://www.hp.com/hps/carepack>

**NOTE:** For more complete information on HP Services offerings, customers and resellers, please visit us at: <http://www.hp.com/hps>

**NOTE:** Additional information regarding worldwide limited warranty and technical support is available at: <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

### Models

**NOTE:** ProLiant Smart Buys are available in NA only. For detailed specification information on ProLiant Smart Buys please click on the following link: <ftp://ftp.compaq.com/pub/products/servers/smartbuys.pdf>.

### Models - Tower

<b>ML350T04p SCSI x3.0-2MB/800, 512 MB</b> 380165-xx1	<b>Processor(s)</b>	(1) Intel Xeon 3.0 GHz processor standard (up to 2 supported)
	<b>Cache Memory</b>	Integrated 2MB Level 2 cache
	<b>Standard Memory</b>	512 MB (1 x 512 MB)
	<b>Network Controller</b>	Embedded NC7761 PCI 10/100/1000T Gigabit network adapter
	<b>Storage Controller</b>	Integrated dual channel Ultra320 SCSI adapter
	<b>Hard Drive</b>	None ship standard (up to 6 supported)
	<b>Internal Storage</b>	2.4 TB maximum hot plug SCSI (with optional hard drives & drive cage)
	<b>Optical Drive</b>	48x IDE (ATAPI) CD-ROM Drive
	<b>Diskette Drive</b>	1.44 MB Diskette Drive
	<b>Form Factor</b>	Tower (5U)

<b>ML350T04p SCSI x3.0-2MB/800, 1 GB Array</b> 380173-xx1	<b>Processor(s)</b>	(1) Intel Xeon 3.0 GHz processor standard (up to 2 supported)
	<b>Cache Memory</b>	Integrated 2MB Level 2 cache
	<b>Standard Memory</b>	1 GB (2 x 512 MB)
	<b>Network Controller</b>	Embedded NC7761 PCI 10/100/1000T Gigabit network adapter
	<b>Storage Controller</b>	Integrated dual channel Ultra320 SCSI adapter
	<b>RAID Controller</b>	Smart Array 641 Controller
	<b>Hard Drive</b>	None ship standard (up to 6 supported)
	<b>Internal Storage</b>	2.4 TB maximum hot plug SCSI (with optional drive cage & hard drives)
	<b>Optical Drive</b>	48x IDE (ATAPI) CD-ROM Drive
	<b>Diskette Drive</b>	1.44 MB Diskette Drive
	<b>Form Factor</b>	Tower (5U)

<b>ML350T04p SATA/SAS x3.0-2MB/800, 512 MB</b> 331889-xx1	<b>Processor(s)</b>	(1) Intel Xeon 3.0 GHz processor standard (up to 2 supported)
	<b>Cache Memory</b>	Integrated 2MB Level 2 cache
	<b>Standard Memory</b>	512 MB (1 x 512 MB)
	<b>Network Controller</b>	Embedded NC7761 PCI 10/100/1000T Gigabit network adapter
	<b>Storage Controller</b>	Integrated two port SATA Integrated dual channel Ultra320 SCSI adapter
	<b>Hard Drive</b>	None ship standard (Up to 6 supported with optional SATA or SAS controller <b>NOTE:</b> Please see the "Storage" section of these QuickSpecs for important information on controllers and cables required to support SAS or SATA hard drives as well as storage management software available for SATA hard drives.

### Models

Internal Storage	Hot Plug SATA - 1.5 TB maximum (with optional SATA controller & 6 hard drives) <b>NOTE:</b> The optional SATA RAID controller is required to support hot plug of SATA hard drives. Hot Plug SAS - 880 GB maximum (with optional SAS controller & 6 hard drives)
Optical Drive	48x IDE (ATAPI) CD-ROM Drive
Diskette Drive	1.44 MB Diskette Drive
Form Factor	Tower (5U)

ML350T04p SCSI x3.2-2MB/800, 512 MB 380166-xx1	Processor(s)	(1) Intel Xeon 3.2 GHz processor standard (up to 2 supported)
	Cache Memory	Integrated 2MB Level 2 cache
	Standard Memory	512 MB (1 x 512 MB)
	Network Controller	Embedded NC7761 PCI 10/100/1000T Gigabit network adapter
	Storage Controller	Integrated dual channel Ultra320 SCSI adapter
	Hard Drive	None ship standard (up to 6 supported)
	Internal Storage	2.4 TB maximum hot plug SCSI (with optional drive cage & hard drives)
	Optical Drive	48x IDE (ATAPI) CD-ROM Drive
	Diskette Drive	1.44 MB Diskette Drive
	Form Factor	Tower (5U)

ML350T04p SCSI x3.2-2MB/800, 1 GB Array 380196-xx1	Processor(s)	(1) Intel Xeon 3.2 GHz processor standard (up to 2 supported)
	Cache Memory	Integrated 2MB Level 2 cache
	Standard Memory	1 GB (2 x 512 MB)
	Network Controller	Embedded NC7761 PCI 10/100/1000T Gigabit network adapter
	Storage Controller	Integrated dual channel Ultra320 SCSI adapter
	RAID Controller	Smart Array 641 Controller
	Hard Drive	None ship standard (up to 6 supported)
	Internal Storage	2.4 TB maximum hot plug SCSI (with optional drive cage & hard drives)
	Optical Drive	48x IDE (ATAPI) CD-ROM Drive
	Diskette Drive	1.44 MB Diskette Drive
	Form Factor	Tower (5U)

### Models

ML350T04p SATA/SAS x3.2-2MB/800, 512 MB 356816-xx1	Processor(s)	(1) Intel Xeon 3.2 GHz processor standard (up to 2 supported)
	Cache Memory	Integrated 2MB Level 2 cache
	Standard Memory	512 MB (1 x 512 MB)
	Network Controller	Embedded NC7761 PCI 10/100/1000T Gigabit network adapter
	Storage Controller	Integrated two port SATA Integrated dual channel Ultra320 SCSI adapter
	Hard Drive	None ship standard (up to 6 supported with optional SATA or SAS controller) <b>NOTE:</b> Please see the "Storage" section of these QuickSpecs for important information on controllers and cables required to support SAS or SATA hard drives as well as storage management software available for SATA hard drives.
	Internal Storage	Hot Plug SATA - 1.5 TB maximum (with optional SATA controller & 6 hard drives) <b>NOTE:</b> The optional SATA RAID controller is required to support hot plug of SATA hard drives. Hot Plug SAS - 880 GB maximum (with optional SAS controller & 6 hard drives)
	Optical Drive	48x IDE (ATAPI) CD-ROM Drive
	Diskette Drive	1.44 MB Diskette Drive
	Form Factor	Tower (5U)

ML350T04p SCSI x3.4-2MB/800, 512 MB 380172-xx1	Processor(s)	(1) Intel Xeon 3.4 GHz processor standard (up to 2 supported)
	Cache Memory	Integrated 2MB Level 2 cache
	Standard Memory	512 MB (1 x 512 MB)
	Network Controller	Embedded NC7761 PCI 10/100/1000T Gigabit network adapter
	Storage Controller	Integrated dual channel Ultra320 SCSI adapter
	Hard Drive	None ship standard (up to 6 supported)
	Internal Storage	2.4 TB maximum hot plug SCSI (with optional drive cage & hard drives)
	Optical Drive	48x IDE (ATAPI) CD-ROM Drive
	Diskette Drive	1.44 MB Diskette Drive
	Form Factor	Tower (5U)

ML350T04p SCSI x3.4-2MB/800, 1 GB Array 380197-xx1	Processor(s)	(1) Intel Xeon 3.4 GHz processor standard (up to 2 supported)
	Cache Memory	Integrated 2MB Level 2 cache
	Standard Memory	1 GB (2 x 512 MB)
	Network Controller	Embedded NC7761 PCI 10/100/1000T Gigabit network adapter
	Storage Controller	Integrated dual channel Ultra320 SCSI adapter
	RAID Controller	Smart Array 641 Controller
	Hard Drive	None ship standard (up to 6 supported)
	Internal Storage	2.4 TB maximum hot plug SCSI (with optional drive cage & hard drives)
	Optical Drive	48x IDE (ATAPI) CD-ROM Drive
	Diskette Drive	1.44 MB Diskette Drive
	Form Factor	Tower (5U)

### Models

ML350T04p SATA/SAS x3.4-2MB/800, 512 MB 370508-xx1	Processor(s)	(1) Intel Xeon 3.4 GHz processor standard (up to 2 supported)
	Cache Memory	Integrated 2MB Level 2 cache
	Standard Memory	512 MB (1 x 512 MB)
	Network Controller	Embedded NC7761 PCI 10/100/1000T Gigabit network adapter
	Storage Controller	Integrated two port SATA Integrated dual channel Ultra320 SCSI adapter
	Hard Drive	None ship standard (up to 6 supported with optional SATA or SAS controller) <b>NOTE:</b> Please see the "Storage" section of these QuickSpecs for important information on controllers and cables required to support SAS or SATA hard drives as well as storage management software available for SATA hard drives.
	Internal Storage	Hot Plug SATA - 1.5 TB maximum (with optional SATA controller & 6 hard drives) <b>NOTE:</b> The optional SATA RAID controller is required to support hot plug of SATA hard drives. Hot Plug SAS - 880 GB maximum (with optional SAS controller & 6 hard drives)
	Optical Drive	48x IDE (ATAPI) CD-ROM Drive
	Diskette Drive	1.44 MB Diskette Drive
	Form Factor	Tower (5U)

### Models - Rack

ML350R04p SCSI x3.0- 2MB/800, 512 MB 382174-xx1	Processor(s)	(1) Intel Xeon 3.0 GHz processor standard (up to 2 supported)
	Cache Memory	Integrated 2MB Level 2 cache
	Standard Memory	512 MB (1 x 512 MB)
	Network Controller	Embedded NC7761 PCI 10/100/1000T Gigabit network adapter
	Storage Controller	Integrated dual channel Ultra320 SCSI adapter
	Hard Drive	None ship standard (up to 6 supported)
	Internal Storage	2.4 TB maximum hot plug SCSI (with optional drive cage & hard drives)
	Optical Drive	48x IDE (ATAPI) CD-ROM Drive
	Diskette Drive	1.44 MB Diskette Drive
	Form Factor	Rack (5U)

### Models

<b>ML350R04p SCSI x3.0-2MB/800, 1 GB Array</b> 382195-xx1	<b>Processor(s)</b>	(1) Intel Xeon Processor 3.0 GHz standard (up to 2 supported)
	<b>Cache Memory</b>	Integrated 2MB Level 2 cache
	<b>Standard Memory</b>	1 GB (2 x 512 MB)
	<b>Network Controller</b>	Embedded NC7761 PCI 10/100/1000T Gigabit network adapter
	<b>Storage Controller</b>	Integrated dual channel Ultra320 SCSI adapter
	<b>RAID Controller</b>	Smart Array 641
	<b>Hard Drive</b>	None ship standard (up to 6 supported)
	<b>Internal Storage</b>	2.4 TB maximum hot plug SCSI (with optional drive cage & hard drives)
	<b>Optical Drive</b>	48x IDE (ATAPI) CD-ROM Drive
	<b>Diskette Drive</b>	1.44 MB Diskette Drive
	<b>Form Factor</b>	Rack (5U)

<b>ML350R04p SCSI x3.2-2MB/800, 512 MB</b> 382177-xx1	<b>Processor(s)</b>	(1) Intel Xeon Processor 3.2 GHz standard (up to 2 supported)
	<b>Cache Memory</b>	Integrated 2MB Level 2 cache
	<b>Standard Memory</b>	512 MB (1 x 512 MB)
	<b>Network Controller</b>	Embedded NC7761 PCI 10/100/1000T Gigabit network adapter
	<b>Storage Controller</b>	Integrated dual channel Ultra320 SCSI adapter
	<b>Hard Drive</b>	None ship standard (up to 6 supported)
	<b>Internal Storage</b>	2.4 TB maximum hot plug SCSI (with optional drive cage & hard drives)
	<b>Optical Drive</b>	48x IDE (ATAPI) CD-ROM Drive
	<b>Diskette Drive</b>	1.44 MB Diskette Drive
	<b>Form Factor</b>	Rack (5U)

<b>ML350R04p SCSI x3.2-2MB/800, 1 GB Array</b> 382196-xx1	<b>Processor(s)</b>	(1) Intel Xeon Processor 3.2 GHz standard (up to 2 supported)
	<b>Cache Memory</b>	Integrated 2MB Level 2 cache
	<b>Standard Memory</b>	1 GB (2 x 512 MB)
	<b>Network Controller</b>	Embedded NC7761 PCI 10/100/1000T Gigabit network adapter
	<b>Storage Controller</b>	Integrated dual channel Ultra320 SCSI adapter
	<b>RAID Controller</b>	Smart Array 641 Controller
	<b>Hard Drive</b>	None ship standard (up to 6 supported)
	<b>Internal Storage</b>	2.4 TB maximum hot plug SCSI (with optional drive cage & hard drives)
	<b>Optical Drive</b>	48x IDE (ATAPI) CD-ROM Drive
	<b>Diskette Drive</b>	1.44 MB Diskette Drive
	<b>Form Factor</b>	Rack (5U)

### Models

ML350R04p SCSI x3.4-2MB/800, 512 MB 382197-xx1	Processor(s)	(1) Intel Xeon Processor 3.4 GHz standard (up to 2 supported)
	Cache Memory	Integrated 2MB Level 2 cache
	Standard Memory	512 MB (1 x 512 MB)
	Network Controller	Embedded NC7761 PCI 10/100/1000T Gigabit network adapter
	Storage Controller	Integrated dual channel Ultra320 SCSI adapter
	Hard Drive	None ship standard (up to 6 supported)
	Internal Storage	2.4 TB maximum hot plug SCSI (with optional drive cage & hard drives)
	Optical Drive	48x IDE (ATAPI) CD-ROM Drive
	Diskette Drive	1.44 MB Diskette Drive
	Form Factor	Rack (5U)

ML350R04p SCSI x3.4-2MB/800, 1 GB Array 382178-xx1	Processor(s)	(1) Intel Xeon Processor 3.4 GHz standard (up to 2 supported)
	Cache Memory	Integrated 2MB Level 2 cache
	Standard Memory	1 GB (2 x 512 MB)
	Network Controller	Embedded NC7761 PCI 10/100/1000T Gigabit network adapter
	Storage Controller	Integrated dual channel Ultra320 SCSI adapter
	RAID Controller	Smart Array 641 Controller
	Hard Drive	None ship standard (up to 6 supported)
	Internal Storage	2.4 TB maximum hot plug SCSI (with optional drive cage & hard drives)
	Optical Drive	48x IDE (ATAPI) CD-ROM Drive
	Diskette Drive	1.44 MB Diskette Drive
	Form Factor	Rack (5U)

### Country Code Key

XX=00  
XX=01  
XX=03  
XX=04  
XX=05  
XX=20  
XX=29  
XX=37  
XX=42  
XX=AA

### Tower Code Key

U.S. English  
Australia  
UK  
Germany  
France  
Brazil  
Japan  
APD  
Europe  
PRC

### Rack Code Key

U.S. English  
N/A  
N/A  
N/A  
N/A  
N/A  
Japan  
APD  
Europe  
PRC

### Configuration Information - Factory Integrated Models (North America only)

**NOTE:** For Configure to Order requirements within EMEA region, please consult local Sales Contact.

**NOTE:** All configure-to-order servers must start with a CTO Chassis. Use the following section to order a server customized to your requirements with options integrated at the factory. The options you select in steps 2 and 3 will be integrated with the base configuration you select in step 1. Additional options selected in Step 4 will also be integrated when applicable.

**NOTE:** Standard models of this product offering (see previous section of this document) do not support HP Factory Express Server Configuration Level 1.

### Step 1: Base Configuration (choose one of the following configurable models)

Models	<p>HP ProLiant ML350G4p HP-SCSI Rack CTO Chassis (North America)</p> <p><b>Includes:</b></p> <p>Embedded NC7761 PCI 10/100/1000T Gigabit network adapter</p> <p>Integrated dual channel Ultra320 SCSI adapter</p> <p>Six Hot Plug SCSI Drive Bays</p> <p>Six expansion slots: one 64-bit/133-MHz PCI-X, two 64-bit/100-MHz PCI-X, one 64-bit/66-MHz PCI-X, one x4 PCI Express, and one x8 PCI Express</p> <p>Two USB ports</p> <p>725W Hot-Plug Power Supply</p> <p>5U Rack Form Factor</p>	382188-405
	<p>HP ProLiant ML350G4p HP-SCSI Tower CTO Chassis (North America)</p> <p><b>Includes:</b></p> <p>Embedded NC7761 PCI 10/100/1000T Gigabit network adapter</p> <p>Integrated dual channel Ultra320 SCSI adapter</p> <p>Six Hot Plug SCSI Drive Bays</p> <p>Six expansion slots: one 64-bit/133-MHz PCI-X, two 64-bit/100-MHz PCI-X, one 64-bit/66-MHz PCI-X, one x4 PCI Express, and one x8 PCI Express</p> <p>Two USB ports</p> <p>725W Hot-Plug Power Supply</p> <p>5U Tower form factor</p> <p>Keyboard</p> <p>2-button Mouse</p>	382187-405
	<p>HP ProLiant ML350G4p Serial Tower CTO Chassis (North America)</p> <p><b>Includes:</b></p> <p>Embedded NC7761 PCI 10/100/1000T Gigabit network adapter</p> <p>Integrated dual channel Ultra320 SCSI adapter</p> <p>Dual port SATA controller</p> <p>Six Hot Plug SATA Drive Bays</p> <p>Six expansion slots: one 64-bit/133-MHz PCI-X, two 64-bit/100-MHz PCI-X, one 64-bit/66-MHz PCI-X, one x4 PCI-Express, and one x8 PCI-Express</p> <p>Two USB ports</p> <p>725W Hot-Plug Power Supply</p> <p>5U Tower form factor</p> <p>Keyboard</p> <p>2-button Mouse</p>	372798-405



### Configuration Information - Factory Integrated Models (North America only)

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

Processors	Intel X3.0GHz/800-2MB ML350G4p FIO BASE	382184-L21
	Intel X3.2GHz/800-2MB ML350G4p FIO BASE	382182-L21
	Intel X3.4GHz/800-2MB ML350G4p FIO BASE	382180-L21
	Intel X3.6GHz/800-2MB ML350G4p FIO BASE	370515-L21
Base Memory	512 MB Advanced ECC PC2-3200 DDR SDRAM DIMM Kit (1 x 512 MB)	384163-B21
	1 GB Advanced ECC PC2-3200 DDR SDRAM DIMM Kit (2 x 512 MB)	343055-B21
	2 GB Advanced ECC PC2-3200 DDR SDRAM DIMM Kit (2 x 1024 MB)	343056-B21
	4 GB Single-Rank Adv. ECC PC2-3200 DDR SDRAM DIMM Kit (2 x 2048 MB)	343057-B21
Optical Drive	DVD-ROM Drive Option Kit	217053-B21
	CD-RW/DVD-ROM Combo Drive Option Kit	331346-B21
	HP DVD+R/RW 16X Half Height	383974-B21
	HP 48X CD-ROM ALL (no screws)	384758-B21

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

SAS Starter Kit	<b>NOTE:</b> The new HP ProLiant ML350 G4p SAS Starter Kit makes migration to SAS easy and affordable. The SAS Starter Kit includes the Smart Array P600 Controller, two 72 GB 15K rpm SAS hard drives, and two required SAS cables.	
	HP ProLiant ML350 G4p SAS Starter Kit	393684-B21
Controllers	Smart Array 641 Controller	291966-B21
	Smart Array 642 Controller	291967-B21
	Smart Array 6402/128 Controller	273915-B21
	Smart Array 6404/256 Controller	273914-B21
	HP Single Channel Ultra320 SCSI HBA	374654-B21
	64-Bit/133MHz Dual Channel Ultra320 SCSI Adapter	268351-B21
	HP Smart Array P600 Controller	337972-B21
Hard Drives	<b>Ultra320 Hot Plug (For use with HP-SCSI CTO Chassis)</b>	
	36.4-GB 15,000 rpm U320 Universal Hard Drive (1")	286776-B22
	72.8-GB 15,000 rpm U320 Universal Hard Drive (1")	286778-B22
	146.8-GB 15,000 rpm U320 Universal Hard Drive (1")	347708-B22
	72.8-GB 10,000 rpm U320 Universal Hard Drive (1")	286714-B22
	146.8-GB 10,000 rpm U320 Universal Hard Drive (1")	286716-B22
	300-GB 10,000 rpm U320 Universal Hard Drive (1")	350964-B22
	<b>SATA Hot Plug (For use with Serial CTO Chassis)</b>	
	80-GB SATA 1.5 Gb 7,200 rpm Hard Drive (3.5")	349237-B21
	160-GB SATA 1.5 Gb 7,200 rpm Hard Drive (3.5")	349238-B21
	250-GB SATA 1.5 Gb 7,200 rpm Hard Drive (3.5")	349239-B21
	500-GB SATA 1.5 Gb 7,200 rpm Hard Drive (3.5")	395473-B21
	<b>SAS 3.5" Hot Plug (For use with Serial CTO Chassis)</b>	
	HP 36 GB SAS 15,000 rpm Hard Drive (3.5")	375868-B21

Configuration Information - Factory Integrated Models (North America only)

Hard Drive Cable	HP 72 GB SAS 15,000 rpm Hard Drive (3.5")	375870-B21
	HP 146 GB SAS 15,000 rpm Hard Drive (3.5")	375872-B21
	HP Internal SAS/SATA Cable, 30 inch multi-lane	389662-B21
	<b>NOTE:</b> The SAS cable above supports four drives. Two cables are required when more than four drives are installed. These cables and HP Smart Array P600 RAID controller are required to support Serial Attached SCSI (SAS) hard drives. Refer to the ML350 G4p Cable Matrix for detailed information ( <a href="http://www.hp.com/servers/proliantML350">http://www.hp.com/servers/proliantML350</a> ).	

Step 4: Choose Additional Options for Factory Integration

**NOTE:** For additional options, please refer to the "Options" section below. Some options may not be available for factory integration. Please contact an HP sales representative for additional information.

### Options

<b>HP ProLiant ML350 G4p Unique Options</b> <b>NOTE:</b> Several options are shared between the HP ProLiant ML350 G4 and G4p	Hot Plug Redundant Power Supply Option Kit (NA, LA)	384168-001
	Hot Plug Redundant Power Supply Option Kit (AUST)	384168-011
	Hot Plug Redundant Power Supply Option Kit (EURO)	384168-021
	Hot Plug Redundant Power Supply Option Kit (UK)	384168-031
	Hot Plug Redundant Power Supply Option Kit (Japan)	384168-291
	Hot Plug Redundant Power Supply Option Kit (IEC)	384168-B21
	<b>NOTE:</b> PN 384168-B21 contains the redundant power supply with an IEC power cable. Purchase this kit only when connecting to a PDU or UPS that supports IEC cables. All other kits contain country specific power cables.	
	ProLiant ML350 G4 Tower to Rack Conversion Kit	358350-B21
	ML350 G4 Redundant System Fan Kit	365866-B21
	ProLiant ML350 G4p Second Serial Port Option Kit	390390-B21

### ProLiant Essentials Value Pack Software

#### ProLiant Essentials Integrated Lights-Out Advanced Pack

ProLiant Essentials Integrated Lights-Out Advanced Pack, 1 server  
**Featuring:** sophisticated virtual administration features for ultimate control of servers in the data centers and remote sites.

**NOTE:** For additional ProLiant Integrated Light-Out Advanced Pack License Kits please see the QuickSpecs at:  
[http://h18000.www1.hp.com/products/quickspecs/11052\\_div/11052\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/11052_div/11052_div.HTML)

#### ProLiant Essentials Intelligent Networking Pack

ProLiant Essentials Intelligent Networking Pack - Windows Edition, Single Server License  
 372906-B21

**NOTE:** For use with a single server. Contains one license with a unique license activation key and documentation.

**NOTE:** For additional ProLiant Intelligent Networking Pack - Windows License Kits please see the QuickSpecs at:  
[http://h18000.www1.hp.com/products/quickspecs/12062\\_div/12062\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/12062_div/12062_div.HTML)

ProLiant Essentials Intelligent Networking Pack - Linux Edition, Single Server License  
 397004-B21

**NOTE:** For additional ProLiant Intelligent Networking Pack - Linux License Kits please see the QuickSpecs at:

[http://h18000.www1.hp.com/products/quickspecs/12327\\_div/12327\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/12327_div/12327_div.HTML)

#### ProLiant Essentials Performance Management Pack

ProLiant Essentials Performance Management Pack, Single-Server License  
 306696-B21

**NOTE:** For use with a single server. Contains one license with a unique license activation key, HP Management CD and documentation.

**NOTE:** The most recent version of the software can always be downloaded at  
<http://www.hp.com/products/pmp>.

**NOTE:** For additional ProLiant Performance Management Pack License Kits please see the QuickSpecs at:

[http://h18000.www1.hp.com/products/quickspecs/11925\\_div/11925\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/11925_div/11925_div.HTML)

#### ProLiant Essentials Rapid Deployment Pack Windows Edition and Linux Edition Release

Rapid Deployment Pack, Single-Server License  
 267196-B21

**NOTE:** This license allows 1 server to be deployed and managed via RDP.

Rapid Deployment Pack, Single-Server License (Japan)  
 267196-291

**NOTE:** This license allows 1 server to be deployed and managed via RDP.

## Options

**NOTE:** For additional ProLiant Essentials Rapid Deployment Pack License Kits please see the QuickSpecs at:

[http://h18000.www1.hp.com/products/quickspecs/11053\\_div/11053\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/11053_div/11053_div.HTML)

[http://h18000.www1.hp.com/products/quickspecs/11713\\_div/11713\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/11713_div/11713_div.HTML)

### ProLiant Essentials Workload Management Pack

ProLiant Essentials Workload Management Pack, Single Server License 303284-B21

**NOTE:** For additional ProLiant Workload Management Pack License Kits please see the QuickSpecs at:

[http://h18000.www1.hp.com/products/quickspecs/11452\\_div/11452\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/11452_div/11452_div.HTML)

### ProLiant Essentials Virtualization Management Software

ProLiant Essentials Virtual Machine Management Pack, Single-Server License 372214-B21

**NOTE:** For use with a single server. Contains one license with a unique license activation key and documentation.

ProLiant Essentials Server Migration Pack, Single-Migration License 375345-B21

**NOTE:** Contains one license, enabling 1 server migration, with a unique license activation key and documentation.

**NOTE:** This license allows 1 server to be migrated from a physical server to a virtual machine. Or this license can be used to migrate a virtual machine from one virtualization layer i.e. VMware GSX to a different virtualization layer such as VMware ESX or Microsoft Virtual Server 2005.

**NOTE:** For additional ProLiant Essentials Virtualization Management Software License Kits please see the QuickSpecs at:

[http://h18000.www1.hp.com/products/quickspecs/12328\\_div/12328\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/12328_div/12328_div.HTML)

### ProLiant Essentials Vulnerability and Patch Management Pack

ProLiant Essentials Vulnerability and Patch Management Pack, Single-Server License 371645-B21

**NOTE:** For use with a single server. Contains one license with a unique license activation key and documentation.

**NOTE:** For additional ProLiant Vulnerability and Patch Management Pack License Kits, please see the QuickSpecs at:

[http://h18000.www1.hp.com/products/quickspecs/12111\\_div/12111\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/12111_div/12111_div.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 Value Pack product QuickSpecs for more information.

**NOTE:** For more information regarding ProLiant Essentials Software, please see the following URL: <http://www.hp.com/servers/proliantessentials>.

ProLiant Software Maintenance Subscription	ProLiant Software Maintenance Subscription	355060-B21
	ProLiant Software Maintenance Single Release	356573-B21
	ProLiant Foundation Pack Single Release	356604-B21

**NOTE:** Please see the SmartStart QuickSpecs for additional information regarding the subscription purchase:

<http://h18000.www1.hp.com/products/quickspecs/Division/11073.html>  
(Worldwide)

[http://h18000.www1.hp.com/products/quickspecs/North\\_America/11073.html](http://h18000.www1.hp.com/products/quickspecs/North_America/11073.html)  
(North America)

### Options

Processors	Intel Xeon 3.6 GHz-2MB Processor Option Kit	370515-B21
	Intel Xeon 3.4 GHz-2MB Processor Option Kit	382180-B21
	Intel Xeon 3.2 GHz-2MB Processor Option Kit	382182-B21
	Intel Xeon 3.0 GHz-2MB Processor Option Kit	382184-B21
	Intel Xeon 3.0 GHz-1MB Processor Option Kit	358344-B21
	Intel Xeon 2.8 GHz-1MB Processor Option Kit	383118-B21
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Memory (DIMMs)	<b>NOTE:</b> The HP ProLiant ML350 G4p requires interleaved memory configurations when more than one DIMM is installed. Non-array models of the ML350 G4p ship standard with a single DIMM. Note that when upgrading system memory, DIMMs must be configured in identical pairs.	
	512 MB Advanced ECC PC2-3200 DDR2 SDRAM DIMM Kit (1 x 512 MB)	384163-B21
	1 GB Advanced ECC PC2-3200 DDR2 SDRAM DIMM Kit (2 x 512 MB)	343055-B21
	2 GB Advanced ECC PC2-3200 DDR2 SDRAM DIMM Kit (2 x 1024 MB)	343056-B21
	4 GB Single-Rank Adv. ECC PC2-3200 DDR2 SDRAM DIMM Kit (2 x 2048 MB)	343057-B21
	4 GB Dual-Rank Adv. ECC PC2-3200 DDR2 SDRAM DIMM Kit (2 x 2048 MB)	375004-B21
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Internal Storage Upgrades	Duplex SCSI Backplane Option Kit	339323-B21
	ML3xx Two Bay Hot Plug SCSI Drive Cage	244059-B21
	<b>NOTE:</b> The drive cage option kit (PN 244059-B21) has one 1" drive bay and one 1.6" drive bay. It installs in two removable media bays.	
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Optical Drives	CD-RW/DVD-ROM Combo Drive Option Kit	331346-B21
	<b>NOTE:</b> The DVD-ROM drive is supported in either the CD-ROM bay or a removable media bay. If placed in a removable media bay, it requires the 2-Device IDE cable (PN 305381-B21).	
	DVD-ROM Drive Option Kit	217053-B21
	HP DVD+R/RW 16X Half Height	383974-B21
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Hard Drives	<b>Ultra320 – Universal Hot Plug</b>	
	300-GB 10,000 rpm U320 Universal Hard Drive (1")	350964-B22
	146.8-GB 10,000 rpm U320 Universal Hard Drive (1")	286716-B22
	72.8-GB 10,000 rpm U320 Universal Hard Drive (1")	286714-B22
	146.8-GB 15,000 rpm U320 Universal Hard Drive (1")	347708-B22
	72.8-GB 15,000 rpm U320 Universal Hard Drive (1")	286778-B22
	36.4-GB 15,000 rpm U320 Universal Hard Drive (1")	286776-B22
	<b>NOTE:</b> Please see the Ultra320 Universal Hot Plug Hard Drive QuickSpecs for additional technical information on the hard drives Support details, please see the following: <a href="http://h18000.www1.hp.com/products/quickspecs/11531_div/11531_div.HTML">http://h18000.www1.hp.com/products/quickspecs/11531_div/11531_div.HTML</a> (Worldwide) <a href="http://h18000.www1.hp.com/products/quickspecs/11531_na/11531_na.HTML">http://h18000.www1.hp.com/products/quickspecs/11531_na/11531_na.HTML</a> (North America)	
	<b>Serial ATA (SATA) Hot Plug</b>	

### Options

80-GB SATA 1.5 Gb 7,200 rpm Hard Drive (3.5")	349237-B21
160-GB SATA 1.5 Gb 7,200 rpm Hard Drive (3.5")	349238-B21
250-GB SATA 1.5 Gb 7,200 rpm Hard Drive (3.5")	349239-B21
500-GB SATA 1.5 Gb 7,200 rpm Hard Drive (3.5")	395473-B21

**NOTE:** Please see the [SATA Hard Drive QuickSpecs](#) for additional technical information on the hard drives. Support details, please see the following:  
[http://h18000.www1.hp.com/products/quickspecs/11940\\_div/11940\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/11940_div/11940_div.HTML)  
 (Worldwide)  
[http://h18000.www1.hp.com/products/quickspecs/11940\\_na/11940\\_na.HTML](http://h18000.www1.hp.com/products/quickspecs/11940_na/11940_na.HTML)  
 (North America)

#### SAS 3.5" Hot Plug (For use with Serial CTO Chassis)

HP 36 GB SAS 15,000 rpm Hard Drive (3.5")	375868-B21
HP 72 GB SAS 15,000 rpm Hard Drive (3.5")	375870-B21
HP 146 GB SAS 15,000 rpm Hard Drive (3.5")	375872-B21

**NOTE:** Please see the [SAS Hard Drive QuickSpecs](#) for additional technical information on the hard drives and support details:  
[http://h18000.www1.hp.com/products/quickspecs/12244\\_div/12244\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.HTML)  
 (Worldwide)  
[http://h18000.www1.hp.com/products/quickspecs/12244\\_na/12244\\_na.HTML](http://h18000.www1.hp.com/products/quickspecs/12244_na/12244_na.HTML)  
 (North America)

### Hard Drive Cables

HP Internal SAS/SATA Cable, 30 inch multi-lane	389662-B21
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**NOTE:** The SAS cable above supports four hard drives. Two cables are required to support more than 4 hard drives. These cables and HP Smart Array P600 RAID controller are required to support Serial Attached SCSI (SAS) hard drives. Refer to the ML350 G4p Cable Matrix for detailed information (<http://www.hp.com/servers/proliantML350>).

### Storage Controllers

#### Ultra320 SCSI Storage Controllers

Smart Array 6402/128 Controller	273915-B21
Smart Array 6404/256 Controller	273914-B21
Smart Array 641 Controller	291966-B21
Smart Array 642 Controller	291967-B21
128MB Battery-Backed Cache Enabler	351580-B21
<b>NOTE:</b> This 128MB BBWC supports the Smart Array 641 Controller and Smart Array 642 Controller.	
256MB DDR, Battery-Backed Cache Upgrade Kit for SA-6400	273913-B21
<b>NOTE:</b> This 256-MB DDR, Battery-Backed Cache upgrade kit supports the Smart Array 6400 series controller only.	
Ultra320 Expansion Module for SA-6402	273911-B21
64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS	284688-B21
64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
64-Bit/133MHz Dual Channel Ultra320 SCSI Adapter	268351-B21

## Options

**NOTE:** Please see the following Controller or SCSI Adapter QuickSpecs for Technical Specifications such as PCI Bus, PCI Peak Data Transfer Rate, SCSI Protocols supported, SCSI Peak Data Transfer Rate, Channels, SCSI Ports, Drives supported, Cache, RAID support, and additional information:

[http://h18000.www1.hp.com/products/quickspecs/11587\\_div/11587\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/11587_div/11587_div.HTML)  
(Smart Array 6400 Series)

[http://h18000.www1.hp.com/products/quickspecs/12067\\_div/12067\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/12067_div/12067_div.HTML)  
(Smart Array 641)

[http://h18000.www1.hp.com/products/quickspecs/12069\\_div/12069\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/12069_div/12069_div.HTML)  
(Smart Array 642)

[http://h18000.www1.hp.com/products/quickspecs/10429\\_div/10429\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/10429_div/10429_div.HTML)  
(SCSI Adapter)

[http://h18000.www1.hp.com/products/quickspecs/11555\\_div/11555\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/11555_div/11555_div.HTML)  
(U320 Adapter)

### Serial ATA (SATA) Controller

HP 6-port SATA RAID Controller

372953-B21

**NOTE:** Please see the following Controller or SCSI Adapter QuickSpecs for Technical Specifications

[http://h18000.www1.hp.com/products/quickspecs/12091\\_div/12091\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/12091_div/12091_div.HTML)  
(SATA RAID Controller)

### SAS Controller

HP Smart Array P600 Controller

337972-B21

512MB DDR BBWC Upgrade

372538-B21

**NOTE:** For Smart Array P600 Controller only.

**NOTE:** Please see the following Controller QuickSpecs for Technical Specifications such as PCI Bus, PCI Peak Data Transfer Rate, SCSI Protocols supported, SCSI Peak Data Transfer Rate, Channels, SCSI Ports, Drives supported, Cache, RAID support, and additional information:

[http://h18000.www1.hp.com/products/quickspecs/12247\\_div/12247\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/12247_div/12247_div.HTML)  
(Smart Array P600 Controller)

### SAS HBA

HP 8 Internal Port SAS HBA with RAID

347786-B21

[http://h18000.www1.hp.com/products/quickspecs/12332\\_div/12332\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/12332_div/12332_div.HTML)  
(SAS HBA)

### Options

Communications	HP NC150T PCI 4-port Gigabit 1000T Combo Switch Adapter	367132-B21
	HP NC310F PCI-X 1000SX Gigabit Server Adapter	368169-B21
	HP NC320T PCI Express 1000T Gigabit Server Adapter	367047-B21
	HP NC370F PCI-X Multifunction 1000SX Gigabit Server Adapter	374193-B22
	HP NC370T PCI-X Multifunction 1000T Gigabit Server Adapter	374191-B22
	HP NC1020 PCI 1000T Gigabit Server Adapter	353377-B21
	HP NC7170 PCI-X Dual Port 1000T Gigabit Server Adapter	313881-B21
	HP NC7771 PCI-X 1000T Gigabit Server Adapter	290563-B21
<p><b>NOTE:</b> A minimum of 1 GB of memory is required for NC370x adapters, with a maximum of two NC370x adapters permitted in a server.</p> <p><b>NOTE:</b> NC61XX, NC71XX, NC77XX, or NC1020 network adapter (NIC) can be used for redundancy with the embedded NC7761 NIC. When either the embedded NC7761 or the NC1020 is teamed with other HP Ethernet adapters, Jumbo Frames and LSO features are automatically disabled.</p>		
	HP High-speed PCI soft modem	DC132D

Management Options	Remote Insight Lights-Out Edition II (NA, LA)	227251-001
	Remote Insight Lights-Out Edition II (EMEA)	227251-021
	Remote Insight Lights-Out Edition II (ROW)	227251-371

### Tape Drives

**NOTE:** The following tape drives are recommended for use with the HP ProLiant ML350 G4p. Additional HP tape drives are supported.

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

**USB Tape Drives** **NOTE:** When using the USB internal tape connector, the front USB port will be deactivated

HP StorageWorks DAT 72 USB External Tape Drive (Carbonite)	DW027A
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#### Internal, Rack-Mount, and Array Module Ultrium Tape Drives

HP StorageWorks Ultrium 232 Internal Tape Drive (Carbonite)	DW064A
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HP StorageWorks Ultrium 448 Internal Tape Drive (Carbonite)	DW016A
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HP StorageWorks Ultrium 215 Array Module (Carbon)	C7492B
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**NOTE:** Single drive installed in a 1U Rack-mount kit.

#### Internal, Rack-Mount, and Array Module DAT Drives

HP StorageWorks DAT 72 SCSI Internal Tape Drive (Carbon)	Q1522B
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HP StorageWorks 1U Rack-mount kit with one DAT 72 (Carbon)	A7443A
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**NOTE:** Single drive installed in a 1U Rack-mount kit.

#### Rack-Mount Tape Drive Enclosures

HP StorageWorks 1U Rack-Mount Kit	A7445B
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**NOTE:** The 1U Rack-mount Kit can support up to (2) half-height tape drives and compatible with multiple Single-Ended and LVD SCSI tape drives including the DAT 24, DAT 40, DAT 72, DLT VS80, DLT VS160, Ultrium 215, Ultrium 232 and Ultrium 448 tape drives.

HP StorageWorks 1U USB Rack-Mount Kit	A8007A
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## Options

1U USB Cable Option Kit

396114-B21

**NOTE:** Converts a 1U SCSI rack-mount kit to a USB interface to support the USB tape drives.

### Tape Autoloaders

#### DAT Autoloader

HP StorageWorks DAT 72x6 Autoloader (Internal)

Q1566A

HP StorageWorks DAT 72x6 Autoloader (External)

Q1567A

**NOTE:** Please see the DAT 72x6 Tape Autoloader QuickSpecs for additional options such as host bus adapters, controllers and media:

[http://h18006.www1.hp.com/products/quickspecs/11905\\_div/11905\\_div.html](http://h18006.www1.hp.com/products/quickspecs/11905_div/11905_div.html)  
(Worldwide)

[http://h18006.www1.hp.com/products/quickspecs/11905\\_na/11905\\_na.html](http://h18006.www1.hp.com/products/quickspecs/11905_na/11905_na.html)  
(North America)

#### HP StorageWorks 1/8 Tape Autoloader

HP StorageWorks 1/8 Ultrium 960 Tape Autoloader

AF204A

HP StorageWorks 1/8 Ultrium 448 Tape Autoloader

AF203A

HP StorageWorks 1/8 SDLT 320 Tape Autoloader

AA926A

HP StorageWorks 1/8 Ultrium 232 Tape Autoloader

AF202A

1/8 Tape Autoloader Rackmount Kit

C9268R

**NOTE:** Required to install the unit in a standard 19-inch rack; includes rails and rackmount instructions

**NOTE:** Please reference the 1/8 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>

#### HP StorageWorks SSL1016 Tape Autoloader

HP StorageWorks SSL1016 Ultrium 460 Tape Autoloader

330821-B21

HP StorageWorks SSL1016 SDLT 320 Tape Autoloader

330816-B21

**NOTE:** Please reference the SSL1016 Tape Autoloader QuickSpecs at <http://www.hp.com/go/automation> for additional information needed to create a complete solution.

## Options

### Tape Libraries

#### HP StorageWorks MSL2024 Tape Library

HP StorageWorks MSL2024 1 Ultrium 960 Drive Library AG115A

HP StorageWorks MSL2024 1 Ultrium 448 Drive Library AG116A

HP StorageWorks MSL2024 2 Ultrium 448 Drive Library AG117A

#### HP StorageWorks MSL6000 Tape Library

##### Ultrium 960 technology

HP StorageWorks MSL6030 1 Ultrium 960 Dr LVDS Library AD606A

HP StorageWorks MSL6030 1 Ultrium 960 Dr FC Library AD608A

HP StorageWorks MSL6030 2 Ultrium 960 Dr LVDS Library AD607A

HP StorageWorks MSL6030 2 Ultrium 960 Dr FC Library AD609A

##### Ultrium 460 technology

HP StorageWorks MSL6030 1 Ultrium 460 Dr LVDS Library AD598A

HP StorageWorks MSL6030 1 Ultrium 460 Dr FC Library AD600A

HP StorageWorks MSL6030 2 Ultrium 460 Dr LVDS Library AD599A

HP StorageWorks MSL6030 2 Ultrium 460 Dr FC Library AD601A

**NOTE:** Please reference the MSL2024 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>

### Magneto-Optical Jukeboxes

#### HP StorageWorks 9.1 GB Optical Jukeboxes

600mx, 4 drive, 64 slot jukebox C1160M

1200mx, 4 drive, up to 128 slots C1104M

2200mx, 6 drive, up to 238 slots C1107M

**NOTE:** Please see the HP StorageWorks Magneto-Optical Products data sheet for a complete listing of available jukeboxes at: [http://www.hp.com/products1/storage/products/archivalprod/brochures/MO\\_family\\_pb.pdf](http://www.hp.com/products1/storage/products/archivalprod/brochures/MO_family_pb.pdf)

**NOTE:** Please reference the Magneto-Optical Jukebox data sheets at <http://www.hp.com/go/optical> for additional information needed to create a complete solution.

### Ultra Density Optical Jukeboxes

1900ux, 4 drive, 64 slot jukebox AA966A

3800ux, 4 drive, 128 slot jukebox AA969A

7100ux, 6 drive, 238 slot jukebox AA971A

**NOTE:** Please see the HP StorageWorks Ultra Density Optical Jukeboxes QuickSpecs for a complete listing of available jukeboxes at:

[http://h18006.www1.hp.com/products/quickspecs/11944\\_div/11944\\_div.html](http://h18006.www1.hp.com/products/quickspecs/11944_div/11944_div.html)

**NOTE:** Please reference the Ultra Density Optical Jukebox QuickSpecs at <http://www.hp.com/go/optical> for additional information needed to create a complete solution

### Options

HP StorageWorks Modular Smart Array 20	HP StorageWorks Modular Smart Array 20	335921-B21
	<b>NOTE:</b> Rack-mountable 12 (SATA) drive enclosure with U320 Host connectivity, redundant power supplies.	
HP StorageWorks Modular Smart Array 20	HP StorageWorks Modular Smart Array 20 Starter Kit	366172-B21
	<b>NOTE:</b> Rack-mountable 12 (SATA) drive enclosure with U320 Host connectivity, redundant power supplies. Includes Smart Array 6402/128 Controller.	
	<b>NOTE:</b> The Modular Smart Array Enclosure 20 Family supports the SATA 1.5Gb/s 1" Hot Plug Hard Drives.	
HP StorageWorks Modular Smart Array 30	HP StorageWorks Modular Smart Array 30 SB	302969-B21
	<b>NOTE:</b> Rack-mountable 14 drive enclosure with single bus, redundant power supplies	
	HP StorageWorks Modular Smart Array 30 DB	302970-B21
HP StorageWorks Modular Smart Array 30	<b>NOTE:</b> Rack-mountable 14 drive enclosure with dual bus, redundant power supplies	
	<b>NOTE:</b> The Modular Smart Array Enclosure 30 Family supports the Wide Ultra3, Ultra320 1" Hot Plug Hard Drives.	
HP StorageWorks Modular Smart Array 50	HP StorageWorks Modular Smart Array 50 Enclosure	364430-B21
	<b>NOTE:</b> Please see the Modular Smart Array 50 QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at:	
	<a href="http://h18000.www1.hp.com/products/quickspecs/12245_na/12245_na.HTML">http://h18000.www1.hp.com/products/quickspecs/12245_na/12245_na.HTML</a>	
	(North America)	
HP StorageWorks Modular Smart Array 50	<a href="http://h18000.www1.hp.com/products/quickspecs/12245_div/12245_div.HTML">http://h18000.www1.hp.com/products/quickspecs/12245_div/12245_div.HTML</a>	
	(Worldwide)	
HP StorageWorks Modular Smart Array 500	HP StorageWorks Modular Smart Array 500 Generation 2	335880-B21
	<b>NOTE:</b> Please see the Modular Smart Array 500 Generation 2 QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at:	
	<a href="http://h18000.www1.hp.com/products/quickspecs/11956_na/11956_na.HTML">http://h18000.www1.hp.com/products/quickspecs/11956_na/11956_na.HTML</a>	
	(North America)	
HP StorageWorks Modular Smart Array 500	<a href="http://h18000.www1.hp.com/products/quickspecs/11956_div/11956_div.HTML">http://h18000.www1.hp.com/products/quickspecs/11956_div/11956_div.HTML</a>	
	(Worldwide)	
HP StorageWorks Modular Smart Array 1000	HP StorageWorks Modular Smart Array 1000	201723-B22
	<b>NOTE:</b> Please see the Modular Smart Array 1000 QuickSpecs for additional options and configuration information at	
	<a href="http://h18000.www1.hp.com/products/quickspecs/11033_na/11033_na.HTML">http://h18000.www1.hp.com/products/quickspecs/11033_na/11033_na.HTML</a>	
	(North America)	
HP StorageWorks Modular Smart Array 1000	<a href="http://h18000.www1.hp.com/products/quickspecs/11033_div/11033_div.HTML">http://h18000.www1.hp.com/products/quickspecs/11033_div/11033_div.HTML</a>	
	(Worldwide)	

### Options

HP StorageWorks Modular Smart Array 1500 cs	Modular Smart Array 1500 Controller Shelf <b>NOTE:</b> Please see the StorageWorks Modular SAN Array 1500 cs QuickSpecs for additional options and configuration information at: <a href="http://www.hp.com/go/MSA1500cs">http://www.hp.com/go/MSA1500cs</a>	AA986A
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Cluster Options	ProLiant Cluster Starter Kit <b>NOTE:</b> For additional information regarding the ProLiant Cluster Starter Kit please see the following QuickSpecs at: <a href="http://h18000.www1.hp.com/products/quickspecs/11935_na/11935_na.html">http://h18000.www1.hp.com/products/quickspecs/11935_na/11935_na.html</a> (North America) <a href="http://h18000.www1.hp.com/products/quickspecs/11935_div/11935_div.html">http://h18000.www1.hp.com/products/quickspecs/11935_div/11935_div.html</a> (Worldwide)	364023-B21
	ProLiant Cluster Kit with OpenView Storage Mirroring <b>NOTE:</b> For additional information regarding the ProLiant Cluster Kit with OpenView Storage Mirroring please see the following QuickSpecs at: <a href="http://h18000.www1.hp.com/products/quickspecs/11934_na/11934_na.html">http://h18000.www1.hp.com/products/quickspecs/11934_na/11934_na.html</a> (North America) <a href="http://h18000.www1.hp.com/products/quickspecs/11934_div/11934_div.html">http://h18000.www1.hp.com/products/quickspecs/11934_div/11934_div.html</a> (Worldwide)	364025-B21
	HP HA/F200 for Entry SAN Cluster	364026-B22
	HP HA/F200 for Entry SAN Cluster (Japan)	364026-292
	<b>NOTE:</b> For additional information regarding the ProLiant Cluster for Entry Level SAN please see the following QuickSpecs at: <a href="http://h18000.www1.hp.com/products/quickspecs/11932_na/11932_na.html">http://h18000.www1.hp.com/products/quickspecs/11932_na/11932_na.html</a> (North America) <a href="http://h18000.www1.hp.com/products/quickspecs/11932_div/11932_div.html">http://h18000.www1.hp.com/products/quickspecs/11932_div/11932_div.html</a> (Worldwide)	
	ProLiant Cluster HA/F500 for the Enterprise SAN <b>NOTE:</b> For additional information regarding the ProLiant Cluster HA/F500 for Enterprise SAN please see the following QuickSpecs at: <a href="http://h18000.www1.hp.com/products/quickspecs/11933_na/11933_na.html">http://h18000.www1.hp.com/products/quickspecs/11933_na/11933_na.html</a> (North America) <a href="http://h18000.www1.hp.com/products/quickspecs/11933_div/11933_div.html">http://h18000.www1.hp.com/products/quickspecs/11933_div/11933_div.html</a> (Worldwide)	364024-B21
	HP Serviceguard for Linux ProLiant Cluster A.11.15 for SUSE SLES 8 / UnitedLinux 1.0 and Red Hat EL 3 (2 node license cluster kit)	305199-B24
	HP Serviceguard for Linux ProLiant Cluster A.11.16 for SUSE SLES 9 and Red Hat EL & 4 (2 node license cluster kit)	305199-B26
	HP Serviceguard for Linux License A.11.15 for SUSE SLES 8 / UnitedLinux 1.0 and Red Hat EL 3 (single license version)	307754-B24
	HP Serviceguard for Linux A.11.16 for SUSE SLES9 and Red Hat EL 3 & 4 (single license version)	307754-B26
	<b>NOTE:</b> For additional information regarding HP Serviceguard for Linux, please see the following QuickSpecs at: <a href="http://h18000.www1.hp.com/products/quickspecs/11518_na/11518_na.html">http://h18000.www1.hp.com/products/quickspecs/11518_na/11518_na.html</a> (North America) <a href="http://h18000.www1.hp.com/products/quickspecs/11518_div/11518_div.html">http://h18000.www1.hp.com/products/quickspecs/11518_div/11518_div.html</a> (Worldwide)	

### Options

<b>Uninterruptible Power Systems – Tower UPS</b>	HP UPS T1000 XR (1000 VA, 700 Watts), Low Voltage (NA)	204155-001
	HP UPS T1000 XR (1000 VA, 700 Watts), High Voltage (Int'l)	204155-B31
	HP UPS T1000 XR (1000VA, 700Watts) 100 VAC (JPN)	312803-291
	HP UPS T1500 XR (1440 VA, 1050 Watts) (NA)	204155-002
	HP UPS T1500 XR (1500 VA, 1050 Watts) (Int'l)	204155-B32
	HP UPS T1500 XR (1500 VA, 1050 Watts) (Japan)	204155-291
	HP UPS T2200 XR (1920 VA, 1600 Watts) Low Voltage (NA)	204451-001
	HP UPS T2200 XR (2200 VA, 1600 Watts) High Voltage (NA)	204451-002
	HP UPS T2200 XR (2200 VA, 1600 Watts) (Int'l)	204451-B31
	HP UPS T2200 XR (2200 VA, 1600 Watts) (Japan)	204451-291
<b>Uninterruptible Power Systems – HP Rack UPS</b>	HP UPS R1500 XR (100 to 127) (NA)	204404-001
	HP UPS R1500 XR (208 to 480) (Int'l)	204404-B31
	HP UPS R1500 XR (100 to 127) (Japan)	204404-291
	HP UPS R3000 XR (120V) (NA)	192186-001
	HP UPS R3000 XR (208V) (NA)	192186-002
	HP UPS R3000 XR (100V) (Japan)	192186-291
	HP UPS R3000 XR (208V) (Japan) HP UPS R3000 XR (200V) (Japan)	192186-292
	HP UPS R3000 XR (230V) (Int'l - detachable cord)	192186-B31
	HP UPS R3000 XR (230V) (16A IEC309 Plug)	192186-B32
	HP UPS R3000 XR (230V) (16A CEE 7/7 SCHUKO Plug)	192186-B33
	HP UPS R3000 XR (230V) (16A BS-546 Plug)	192186-AR1
	HP UPS R5500 XR, (5000VA, 4500 Watt), High Voltage (NA/Jpn)	326529-D71
	HP UPS R5500 XR, (6000VA, 5400 Watt), High Voltage (Int'l)	326529-B31
<b>HP Monitored Power Distribution Unit (PDU)</b>	<b>HP Monitored Power Distribution Unit: Full Rack Version</b>	
	HP PDU with Power Monitoring, Model S2324 - dual input, 3-phase, 24A (NA/JPN)	370959-D71
	HP Power Distribution Unit with Power Monitoring Model S1324 - single input, 3 phase, 24A (NA/JPN)	370960-D71
	HP Power Distribution Unit with Power Monitoring Model S2140 - dual input, 1 phase, 40A (NA/JPN)	370961-D71
	HP Power Distribution Unit with Power Monitoring Model S1140 - single input, 1 phase, 40A (NA/JPN)	370962-D71
	HP Power Distribution Unit with Power Monitoring Model S2316 - dual input, 3 phase, 16A (INTL)	370963-B31
	HP Power Distribution Unit with Power Monitoring Model S1316 - single input, 3 phase, 16A (INTL)	370964-B31
	HP Power Distribution Unit with Power Monitoring Model S2132 - dual input, 1 phase, 32A (INTL)	370965-B31
	HP Power Distribution Unit with Power Monitoring Model S1132 - single input, 1 phase, 32A (INTL)	370966-B31

### Options

<b>Modular PDUs 1U/0U</b> (Up to 32 outlets) <b>NOTE:</b> 1U/0U mounting brackets shipped with the unit (optimized for 10000 and 9000 series racks).	HP Modular Power Distribution Units (mPDU), Low Volt Model, 24A (100-127 VAC) (NA, Japan)	252663-D71
	<b>NOTE:</b> This mPDU (252663-D71) may also be used to connect the low volt model of the UPS R3000 XR.	
	HP Modular Power Distribution Units (mPDU), High Volt Model, 24A (200-240 VAC) (NA, Japan)	252663-D72
	HP Modular Power Distribution Units (mPDU), High Volt Model, 32A (200-240 VAC) (Int'l)	252663-B31
	HP Modular Power Distribution Units (mPDU), High Volt Model, 40A (200-240 VAC) (WW)	252663-B21
	<b>NOTE:</b> This mPDU (252663-B21), 40A model has a hardwired input.	
	HP Modular Power Distribution Units (mPDU), High Volt Model, 16A (200-240 VAC) (WW)	252663-B24
	<b>NOTE:</b> This PDU has a detachable input power cord and allows for adaptability to country specific power requirements. This model may also be used with the high volt UPSs R3000 XR and R6000 For North America, need to order cable PN 340653-001.	
	HP Modular Power Distribution Unit (mPDU), High Volt Model, 40A, Attached Cord, (NA/JPN)	252663-D73
	HP Modular Power Distribution Unit (mPDU), High Volt Model, 40A, Attached Cord, (Int'l)	252663-B32
	<b>NOTE:</b> Please see the following Modular Power Distribution Unit (Zero-U/1U Modular PDUs) QuickSpecs for additional options including shorter jumper cables and country specific power cords: <a href="http://h18000.www1.hp.com/products/quickspecs/11041_na/11041_na.HTML">http://h18000.www1.hp.com/products/quickspecs/11041_na/11041_na.HTML</a> (North America) <a href="http://h18000.www1.hp.com/products/quickspecs/11041_div/11041_div.HTML">http://h18000.www1.hp.com/products/quickspecs/11041_div/11041_div.HTML</a> (Worldwide)	
<b>USB Options</b>	HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver)	DC172B
	USB 1.44-MB External Diskette Drive (Carbonite)	DC141B
	256MB HP Drive Key II (USB 2.0)	PH657A
<b>Other</b>	ProLiant ML3xx Internal to External SCSI Cable Option Kit (HD68)	159547-B22
	ProLiant ML3xx Internal to External SCSI Cable Option Kit (VHDCI)	333370-B21
	<b>NOTE:</b> The ProLiant ML3xx Internal to External SCSI Cable Option Kits (PN 159547-B22 and 333370-B21) are supported by the HP ProLiant ML330, ML350, and ML370 products.	
<b>Rack Conversion Kit</b>	ProLiant ML350 G4 Tower to Rack Conversion Kit	358350-B21
	Rack Adapter Kit	332815-B21
	<b>NOTE:</b> This kit allows HP rack servers to fit in racks that are 24" wide.	
	ProLiant DL380 G4, ML370 G4, ML350 G4 Shipping Bracket for Round Hole Racks <b>NOTE:</b> This kit is required if the server will be configured and shipped within a round hole rack.	371482-B21

### Options

HP Rack 5000 Series (Graphite Metallic)	HP 5642 Rack-Unassembled	358254-B21
Rack Options for Rack 5000 Series	Stabilizer Kit for 5642 Rack (Graphite Carbon)	374493-B21
	<b>NOTE:</b> The stabilizing kit is used to prevent rack from tipping over.	
	Baying Kit for 5642 Rack (Graphite Carbon)	374499-B21
	<b>NOTE:</b> The baying kit is used to join two or more HP 5642 racks.	
HP Rack 10000 Series (Graphite Metallic)	10642 (42U) Infrastructure Rack (Low Voltage)	379006-001
	10642 (42U) Infrastructure Rack (High Voltage)	379005-001
	HP S10614 (14U) Rack Cabinet - Shock Pallet	292302-B22
	HP 10842 (42U) Rack Cabinet - Pallet	257415-B21
	HP 10842 (42U) Rack Cabinet - Shock Pallet	257415-B22
	HP 10647 (47U) Rack Cabinet - Pallet	245160-B21
	HP 10647 (47U) Rack Cabinet - Crated	245160-B23
	HP 10642 (42U) Rack Cabinet - Pallet	245161-B21
	HP 10642 (42U) Rack Cabinet - Shock Pallet	245161-B22
	HP 10642 (42U) Rack Cabinet - Crated	245161-B23
	HP 10636 (36U) Rack Cabinet - Pallet	245162-B21
	HP 10636 (36U) Rack Cabinet - Shock Pallet	245162-B22
	HP 10636 (36U) Rack Cabinet - Crated	245162-B23
	HP 10622 (22U) Rack Cabinet - Pallet	245163-B21
	HP 10622 (22U) Rack Cabinet - Shock Pallet	245163-B22
	HP 10622 (22U) Rack Cabinet - Crated	245163-B23
	<b>NOTE:</b> -B21 (pallet) used to ship empty racks shipped on a truck	
	-B22 (shock pallet) used to ship racks with equipment installed (by custom systems, VARs and Channels)	
	-B23 (crated) used for air shipments of empty racks	
	<b>NOTE:</b> It is mandatory to use a shock pallet in order to ship racks with equipment installed. Not all Compaq equipment is qualified to be shipped in the Rack 10000 series.	
	<b>NOTE:</b> Please see the Rack 10000 QuickSpecs for Technical Specifications such as height, width, depth, weight, and color:	
	<a href="http://h18000.www1.hp.com/products/quickspecs/10995_div/10995_div.HTML">http://h18000.www1.hp.com/products/quickspecs/10995_div/10995_div.HTML</a> (Worldwide)	
	<a href="http://h18000.www1.hp.com/products/quickspecs/10995_na/10995_na.HTML">http://h18000.www1.hp.com/products/quickspecs/10995_na/10995_na.HTML</a> (North America)	
	<b>NOTE:</b> For additional information regarding Rack Cabinets, please see the following URL: <a href="http://h18000.www1.hp.com/products/servers/proliantstorage/rack-options/index.html">http://h18000.www1.hp.com/products/servers/proliantstorage/rack-options/index.html</a> .	

### Options

#### Rack Options for HP Rack 10000 Series

HP Rack Light Kit (Neon)	361589-B21
HP Rack Plinth Kit (Carbon)	251960-B21
42U Side Panel – Graphite Metallic	246099-B21
36U Side Panel – Graphite Metallic	246102-B21
47U Side Panel – Graphite Metallic	255486-B21
TFT7210R Rack Mounted 17" Monitor	348373-B21

**NOTE:** For a complete list of Monitors please view the following URL:  
<http://h18004.www1.hp.com/products/monitors/>.

TFT5600 Rack Keyboard Monitor	221546-xx1
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**NOTE:** For a complete list of Monitors please view the following URL:  
<http://h18004.www1.hp.com/products/monitors/>.

1U Rack Keyboard & Drawer (Carbon)	257054-xx1
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**Country Code Key** (for TFT5600 Rack Keyboard Monitor (PN 221546-xx1 and for 1U Rack Keyboard & Drawer (PN 257054-xx1)

XX = 001	US	XX = 091	Norway
XX = 031	UK	XX = 101	Sweden/Finland
XX = 041	Germany	XX = 111	Switzerland
XX = 051	France	XX = 131	Portugal
XX = 061	Italy	XX = 181	Belgium
XX = 071	Spain	XX = 291	Japan
XX = 081	Denmark	XX = B31	International

**NOTE:** For additional information regarding Rack Options, please see the following URL: <http://h18000.www1.hp.com/products/servers/proliantstorage/rack-options/index.html>.

#### HP KVM Switch Options

IP Console Switch Box (KVM/IP), 3 x 1 x 16	262586-B21
IP Console Switch Box (KVM/IP), 1 x 1 x 16	262585-B21
Server Console Switch (KVM), 0 x 1 x 8 port	336044-B21
Server Console Switch (KVM), 0 x 2 x 16 port	336045-B21
PS/2 Interface Adapter, 1 pack	262588-B21
PS/2 Interface Adapter, 8 pack	262587-B21
USB Interface Adapter, 1 pack	336047-B21
Serial Interface adapter - 1 Pack with power supply	373035-B21

**NOTE:** Cat5e cables are required to connect Interface Adapters to Console Switches. Cat5e cables can be found at the following URL: <http://www.hp.com/go/kvm>.

HP 1x 4 USB/PS2 KVM Switch, TT (NA/JPN)	371301-D71
HP 1x 4 USB/PS2 KVM Switch, TT (AU/NZ)	371301-011
HP 1x 4 USB/PS2 KVM Switch, TT (UK)	371301-031
HP 1x 4 USB/PS2 KVM Switch, TT (EU)	371301-A21
HP 1x 4 USB/PS2 KVM Switch, RM (ALL)	371302-B21
HP PS2 KVM Cable with audio, 6', 2-pack	371730-B21
HP USB KVM Cable with audio, 6', 2-pack	371729-B21

**NOTE:** 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>.



### Options

<b>HP Serial Console Server Options</b>	HP 16 Port Serial Console Server (worldwide)	AF101A
	HP 48 Port Serial Console Server (worldwide)	AF102A
	Serial Adapter, RJ45-DB9 DCE Female, 1 Pack	AF103A
	Serial Adapter, RJ45-DB9 DCE Female, 8 Pack	AF110A

**NOTE:** Cat5e cables are required to connect Serial Adapters to Serial Console Servers. Additional Serial Adapters and Cat5e cables can be found at the following URL: <http://www.hp.com/go/kvm>.

**NOTE:** 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>.

<b>Service and Support Offerings (HP Care Pack Services)</b>	<b>Hardware Services On-site Service</b>	
	4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years (Electronic)	U4512E
	4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years (Electronic)	U4513E
	6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years (Electronic)	U4514E

#### O/S and Hardware Installation

Hardware Installation (Electronic)	U4522E
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)	U4523E

#### Support Plus

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)	U4524E
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#### Support Plus 24

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	U4525E
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	U6308E
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	U8330E

**NOTE:** For more information, customer/resellers can contact <http://www.hp.com/services/carepack>

### Memory

#### HP ProLiant ML350 G4p Memory Configuration

The HP ProLiant ML350 G4p requires memory interleaving when more than one DIMM is installed. For interleaving, DIMMs must be configured in identical pairs. The system will not boot properly if multiple DIMMs of varying density or type are installed in the system.

#### Standard Memory

All HP ProLiant ML350 G4p models ship with Advanced ECC PC2-3200 DDR2 SDRAM (running at 400 MHz).

Non-array models include a single 512 MB DIMM.

Array models include two 512 GB DIMMs.

Factory Integrated Models include the memory capacity of your choice.

#### Common Memory Upgrades from Base Memory

**NOTE:** Charts do not represent all possible memory configurations.

	Pair 1		Pair 2		Pair 3	
Total Capacity Required	Base Memory (Non-Array Models)	DIMM Upgrade #1	DIMM Upgrade #2		DIMM Upgrade #3	
512 MB	512 MB	Empty	Empty	Empty	Empty	Empty
1 GB	512 MB	512 MB	Empty	Empty	Empty	Empty
2 GB	512 MB	512 MB	512 MB	512 MB	Empty	Empty
4 GB	512 MB	512 MB	512 MB	512 MB	1 GB	1 GB

	Pair 1		Pair 2		Pair 3	
Total Capacity Required	Base Memory (Array Models)		DIMM Upgrade #1		DIMM Upgrade #2	
1 GB	512 MB	512 MB	Empty	Empty	Empty	Empty
2 GB	512 MB	512 MB	512 MB	512 MB	Empty	Empty
4 GB	512 MB	512 MB	512 MB	512 MB	1 GB	1 GB

#### Installing maximum memory

Maximum Capacity	Pair 1		Pair 2		Pair 3	
12 GB	2 GB Single Rank	2 GB Single Rank	2 GB Single Rank	2 GB Single Rank	2 GB Single Rank	2 GB Single Rank

Following are memory options available from HP:

- 512 MB of Advanced ECC PC2-3200 DDR2 SDRAM DIMM Memory Kit (1 x 512 MB) 384163-B21
- 1 GB of Advanced ECC PC2-3200 DDR2 SDRAM DIMM Memory Kit (2 x 512 MB) 343055-B21
- 2 GB of Advanced ECC PC2-3200 DDR2 SDRAM DIMM Memory Kit (2 x 1024 MB) 343056-B21
- 4 GB Single-Rank Adv. ECC PC2-3200 DDR2 SDRAM DIMM Kit (2 x 2048 MB) 343057-B21
- 4 GB Dual-Rank Adv. ECC PC2-3200 DDR2 SDRAM DIMM Kit (2 x 2048 MB) 375004-B21

## Memory

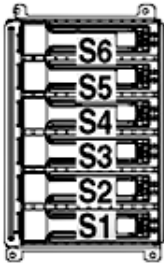
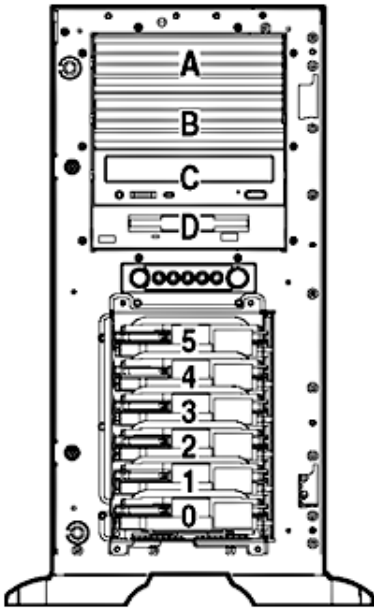
**NOTE:** Online Spare Memory is not supported when using 2-rank DIMMs. A total of 8 ranks are supported on the HP ProLiant ML350 G4p, A maximum of 4, 2-rank DIMMs can be populated. If you plan to mix DIMM types, 2-rank DIMMs must be installed in the first bank, 1 rank DIMMs can then be installed in subsequent banks.

The following is the memory population rules for the HP ProLiant ML350 G4p.

**Key:** S denotes single rank kit, D denotes Dual rank kit, and X denotes no install.

Bank A	Bank B	Bank C	NOTES:
S	X	X	
S	S	X	
S	S	S	
D	X	X	Online spare not supported
D	S	X	Online spare not supported
D	S	S	Online spare not supported
D	D	X	Online spare not supported

Storage



- 0 - 5            6 x 1" Hot Plug SCSI Hard Drive Bays
- or
- S1-S6           6 x 1" Hot plug SATA Hard Drive Bays
- D                1.44 MB Diskette Drive
- C                48x CD-ROM
- A,B             Available half height bay

Drive Support

	Quantity Supported	Position Supported	Controller
Removable Media			
1.44-MB Diskette Drive	Up to 1	D	Integrated
IDE (ATAPI) CD-ROM Drive	Up to 2	A, B, C	Integrated IDE
HP DVD+R/RW 16X Half Height	Up to 2	A, B, C	Integrated IDE
DVD-ROM Drive Option Kit	Up to 2	A, B, C	Integrated IDE
ML3xx Two Bay Hot Plug SCSI Drive Cage	Up to 1	A + B*	Integrated SCSI

\*NOTE: The Two Bay Hot Plug SCSI Drive Cage requires the use of both available removable media bays (A+B). In most cases, it is not possible to install both a non hot plug tape drive and the two bay hot pug SCSI drive cage option.

Storage

Hard Drives

Ultra320 SCSI - Hot Plug Drives

	Quantity Supported	Position Supported	Controller
1-inch	Up to 8	0-5, A+B	Integrated Dual Channel Ultra320 SCSI Adapter
300-GB 10,000 rpm			Smart Array 641 Controller
146.8-GB 10,000 rpm			Smart Array 6402/128 Controller
72.8-GB 10,000 rpm			Smart Array 6404/256 Controller
146.8-GB 15,000 rpm			Smart Array 642 Controller
72.8-GB 15,000 rpm			64-Bit/133MHz Dual Channel Ultra320 SCSI Adapter
36.4-GB 15,000 rpm			

**NOTE:** Use of hot plug SCSI hard drives in positions A and B requires an optional two-bay drive cage (PN 244059-B21). With Serial models, a SCSI HBA is also required.

SATA - Hot Plug

	Quantity Supported	Position Supported	Controller
3.5-inch	Up to 6	S1-S6	HP integrated 2 Port SATA controller
500-GB 7,200 rpm			HP 6-Port SATA RAID Controller
250-GB 7,200 rpm			
160-GB 7,200 rpm			
80-GB 7,200 rpm			

**NOTE:** Full hot plug capability and drive LED status support requires installation of a SATA RAID controller. The With the HP 6-Port SATA RAID Controller, hard drive configurations can be setup, monitored and managed using HP Storage Manager. HP Systems Insight Manager should not be used to view the status of SATA hard drives and SATA RAID configurations. After installing the 6-Port SATA RAID Controller, ensure that the latest firmware, drivers, and management software are downloaded from <http://www.hp.com/go/support>.

SAS- Hot Plug

	Quantity Supported	Position Supported	Controller
36-GB 15,000 rpm	6	S1-S6	HP Smart Array P600 Controller
72-GB 15,000 rpm			
146-GB 15,000 rpm			

## Storage

### External Storage

	Quantity Supported	Position Supported	Host Controller or Adapter
Modular Smart Array 20 Family	Up to 2	External	Smart Array 6402/128 Controller Smart Array 6404/256 Controller
Modular Smart Array 30 Family	Up to 2	External	Integrated Dual Channel Ultra320 SCSI Adapter <b>NOTE:</b> Connection of an external device to the embedded SCSI controller requires an internal-to-external cable (PN 159547-B22 or 333370-B21) Smart Array 6402/128 Controller Smart Array 6404/256 Controller Smart Array 642 Controller 64-Bit/133-MHz Dual Channel Ultra320 SCSI Adapter 64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS
Modular Smart Array 50 Enclosure	Up to 2	External	HP Smart Array P600 Controller
Modular Smart Array 500 G2	1	External	Please see the Modular Smart Array 500 G2 QuickSpecs for the latest list of supported HBAs: <a href="http://www.hp.com/go/msa500">http://www.hp.com/go/msa500</a> .
Modular Smart Array 1500 cs or 1000	Please see the Modular Smart Array 1500 cs or Modular Smart Array 1000 QuickSpecs links below to determine configuration requirements		Please see the Modular Smart Array 1500 cs or Modular Smart Array 1000 QuickSpecs (URL below) for the latest list of supported HBAs.
Modular Smart Array 1000: <a href="http://h18000.www1.hp.com/products/quickspecs/11033_div/11033_div.HTML">http://h18000.www1.hp.com/products/quickspecs/11033_div/11033_div.HTML</a> (Worldwide) <a href="http://h18000.www1.hp.com/products/quickspecs/11033_na/11033_na.HTML">http://h18000.www1.hp.com/products/quickspecs/11033_na/11033_na.HTML</a> (North America)			
Modular Smart Array 1500 cs: <a href="http://www.hp.com/go/MSA1500cs">http://www.hp.com/go/MSA1500cs</a>			

### Tape Drives, Tape Autoloaders, & Tape Libraries

**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) (North America)  
<http://h18000.www1.hp.com/products/quickspecs/Division/10233.html> (Worldwide)

**NOTE:** For an up-to-date listing of the latest O/S Support details for each of the Tape Autoloaders & 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) (North America)  
<http://h18000.www1.hp.com/products/quickspecs/Division/10809.html> (Worldwide)

	Quantity Supported	Position Supported	Controller
HP StorageWorks Tape Drives, Hot plug	1	0-5	Integrated Dual Channel Ultra320 SCSI Adapter 64-Bit/133-MHz Dual Channel Ultra320 SCSI Adapter 64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2 64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS
DAT 40 Hot Plug			
DAT 72 Hot Plug			

## Storage

<b>HP StorageWorks Tape Drives, Internal</b> Ultrium 215 Ultrium 232 Ultrium 448 DAT 40 DAT 72 DLT VS80 DLT VS160 SDLT 320	Up to 2	A, B	Integrated Dual Channel Ultra320 SCSI Adapter Smart Array 641 Controller 64-Bit/133MHz Dual Channel Ultra320 SCSI 64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2
<b>HP StorageWorks Tape Drives, External</b> Ultrium 215 Ultrium 230 Ultrium 232 Ultrium 448 Ultrium 460 DAT 40 DAT 72 DLT VS80 DLT VS160 SDLT 320	Up to 2	External	64-Bit/133MHz Dual Channel Ultra320 SCSI Adapter 64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2 64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS
<b>HP StorageWorks Tape Drives, External</b> Ultrium 960 SDLT 600	1 per SCSI Channel	External	64-Bit/133MHz Dual Channel Ultra320 SCSI Adapter 64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2 64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS
<b>HP StorageWorks Tape Drives, USB External</b> DAT 24 USB DAT 40 USB DAT 72 USB	1 per USB port	External	USB port
<b>HP StorageWorks Rack-mount Tape Drive Enclosures</b> 1U Rack-Mount Kit 3U Rack-Mount Kit 5U Rack-Mount Kit	1 per SCSI channel	External	64-Bit/133MHz Dual Channel Ultra320 SCSI Adapter 64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2 64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS
<b>HP StorageWorks Tape Autoloaders, External</b> DAT 72x6 Tape Autoloader 1/8 Tape Autoloader SSL1016 Tape Autoloader	1 autoloader per SCSI channel	External	64-Bit/133MHz Dual Channel Ultra320 SCSI Adapter 64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2 64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS

Storage

HP StorageWorks Tape Libraries

- MSL2024 (Ultrium 960-based)
- MSL2024 (Ultrium 448-based)
- MSL6000 (Ultrium 960 -based)
- MSL6000 (SDLT 600-based)
- MSL6000 (Ultrium 460-based)
- MSL5026S2 (SDLT 320-based)
- MSL5052S2 (SDLT 320-based)

Please reference the relevant MSL or Tape Library QuickSpecs to determine configuration requirements

External

Please consult the EBS connectivity matrix at <http://www.hp.com/go/ebs> for detailed connectivity information.



## Power Specifications

Part Number	382175-001
Spare Kit	390394-001
Operational Input Voltage Range (V rms)	90 - 264
Frequency Range (Nominal) (Hz)	47 - 63 (50 / 60)

Nominal Input Voltage (Vrms)	100	115	208	220	230	240
Max Rated Output Wattage Rating	725	725	725	725	725	725
Nominal Input Current (A rms)	9.2	7.9	4.2	4.0	3.8	3.6
Max Rated Input Wattage Rating (Watts)	906	895	873	863	863	863
Max. Rated VA (Volt-Amp)	915	904	910	899	909	909
Efficiency (%)	80	81	83	84	84	84
Power Factor	0.99	0.99	0.96	0.96	0.95	0.95
Leakage Current (mA)	0.31	0.36	0.65	0.69	0.72	0.75
Maximum Inrush Current (A peak)	15	17	30	32	34	35
Maximum Inrush Current duration (milliseconds)	3					

### NOTES:

ActiveAnswers Power Calculation

Power calculator is LIVE on ActiveAnswers Web site. This is an external link.

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

To drill down to calculators:

- Click on: "ProLiant Servers"
- Click on the Server of interest. Example: ML350 G4p
- Click on: "Power Calculator" link. (You may need to scroll down to see it)

Technical Specifications

System Unit - Tower	Dimensions (HxWxD) (with feet/bezel)	18.43 x 8.66 x 25.2 in (46.8 x 22 x 64 cm)	
	Weight (approximate)	60 lb (27.24 kg) (without hard drives)	
	Input Requirements (per power supply)	Rated Line Voltage	100 to 120 VAC
		Rated Input Frequency	50 Hz to 60 Hz
		Input Power	906W @ 100VAC
		Rated Input Current	9.2A(100VAC),4.3A(200VAC)
	Rated Line Frequency	50 to 60 Hz	
	BTU Rating	3,125 BTU/hr	
	SCSI Connectors	Two internal HD68 connectors	
		(Support for either two internal, two external, or a mix of internal/external is available. This is achieved using an internal to external SCSI cable option kit (PN 159547-B22) and either of the two SCSI knockouts.)	
	Power Supply Output Power (per power supply)	Rated Steady-State Power 725W	
	Temperature Range	Operating	50° to 95° F (10° to 35° C) (No direct sustaining sunlight)
		Storage (up to one year)	-40° to 158° F (-40° to 70° C)
	Maximum Wet Bulb Temperature	82.4° F (28° C)	

Relative Humidity (non-condensing)	Operating	10% to 90%	
	Non-operating	5% to 90%	
Acoustic Noise	Idle (Fixed Disk Drives Spinning)	L WAd (BELS)	6.0
		L pAm (dBA)	43
	Operating (Random Seeks to Fixed Disks)	L WAd (BELS)	6.0
		L pAm (dBA)	43
		L WAd (BELS)	6.0
		L pAm (dBA)	43

Technical Specifications

System Unit - Rack	Dimensions (HxWxD)	8.61 x 19 x 24 in (21.87 x 48.26 x 60.96 cm)		
	Weight(approximate)	60 lb (27.24 kg) (without hard drives)		
	Input Requirements (per power supply)	Rated Line Voltage	100 to 120 VAC	
		Rated Input Frequency	50 Hz to 60 Hz	
		Input Power	906W @ 100VAC	
		Rated Input Current	9.2A(100VAC), 4.3A(200VAC)	
	Rated Line Frequency	50 to 60 Hz		
	BTU Rating	3,125 BTU/hr		
	SCSI Connectors	Two internal HD68 connectors		
		NOTE: Support for either two internal, two external, or a mix of internal/external is available. This is achieved using an internal to external SCSI cable option kit, PN 159547-B22 or 333370-B21, and either of the two SCSI knockouts.		
	Power Supply Output Power (per power supply)	Rated Steady-State Power	725W	
	Temperature Range	Operating	50° to 95° F (10° to 35° C) (No direct sustaining sunlight)	
		Storage (up to one year)	-40° to 158° F (-40° to 70° C)	
Maximum Wet Bulb Temperature	82.4° F (28° C)			
Relative Humidity (non-condensing)	Operating	10% to 90%		
	Non-operating	5% to 90%		
Acoustic Noise	Idle (Fixed Disk Drives Spinning)	L WAd (BELS)	6.0	
		L pAm (dBA)	43	
	Operating (Random Seeks to Fixed Disks)	L WAd (BELS)	6.0	
		L pAm (dBA)	43	

### Technical Specifications

Embedded NC7761 PCI 10/100/1000T Gigabit network 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	32-bit bus-master PCI	
	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)

Integrated Serial ATA Controller	Simultaneous drive transfer channels	Support for up to 2 hard drives	
	Transfer rate synchronous (maximum theoretical)	150 MB/s per channel; 300MB/s	
	Protocol	Serial ATA	
	Drive support	HP Universal Serial ATA	
	Feature	Supports Pre-Failure Warranty of SATA Hard Drives	
		Support for Systems Insight Manager	
	OS Support	Microsoft Windows 2000 Server Microsoft Windows Server 2003 Novell NetWare Linux (Red Hat, SuSE, UnitedLinux)	

**NOTE:** This controller does not support LED functions. This controller does not support Hot Plug functions.

Integrated Dual Channel Ultra320 SCSI Adapter	Drives Supported	Up to 28 SCSI devices (14 per channel)	
	Data Transfer Method	64-bit PCI bus-master	
	SCSI Channel Transfer Rate	320 MB/s per channel	
	Maximum Transfer Rate per PCI Bus (peak)	400 MB/s per channel	
	SCSI Protocols	Wide Ultra2 SCSI	
		Wide-Ultra SCSI-3	
		Ultra320 SCSI	
	Electrical Protocol	Low Voltage Differential (LVD)	
	SCSI Termination	Active Termination	
	External SCSI Connectors	Optional VHDCI and HD68 internal-to-external connectors	
	Internal SCSI Connectors	Two 68-Pin Wide-Ultra SCSI-3 connectors	

## Technical Specifications

### Smart Array 641

#### Controller

**NOTE:** The Smart Array 641 Controller ships standard with the Array Models only.

Protocol	Ultra320 SCSI
SCSI Electrical Interface	Low Voltage Differential (LVD)
Drives Supported	Up to 6 Ultra320, Ultra3 and Ultra2 SCSI hard drives
SCSI Port Connectors SA-641	One internal SCSI port
Data Transfer Method	64-Bit PCI bus-master
PCI Bus Speed	64-bit, 133-MHz PCI-X (1 GB/s maximum bandwidth)
PCI	3.3 volt PCI slot compatibility only
Simultaneous Drive Transfer Channels	One
Channel Transfer Rate	320-MB/s total; 320-MB/s per channel
Software upgradeable Firmware	Yes
Cache Memory	64-MB DRAM used for code, transfer buffers, and non-battery backed read cache
Logical Drives Supported	32
Maximum Capacity	1.80 TB (6 X 300 GB)
Memory Addressing	64-bit, supporting servers memory greater than 4 GB
RAID Support	RAID 5 (Distributed Data Guarding) RAID 1+0 (Striping & Mirroring) RAID 1 (Mirroring) RAID 0 (Striping)
Upgradeable Firmware	2-MB Flashable ROM
Disk Drive and Enclosure Protocol Support	Ultra320, Ultra2 and Ultra3
Warranty	Maximum: The remaining warranty of the HP server product in which it is installed (to a maximum three-year limited warranty) Minimum: One-year, on-site limited warranty Pre-Failure Warranty: Drives attached to the Smart Array Controller and monitored under Insight Manager are supported by a Pre-Failure (replacement) Warranty. For complete details, consult the HP Support Center or refer to your HP Server Documentation.

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