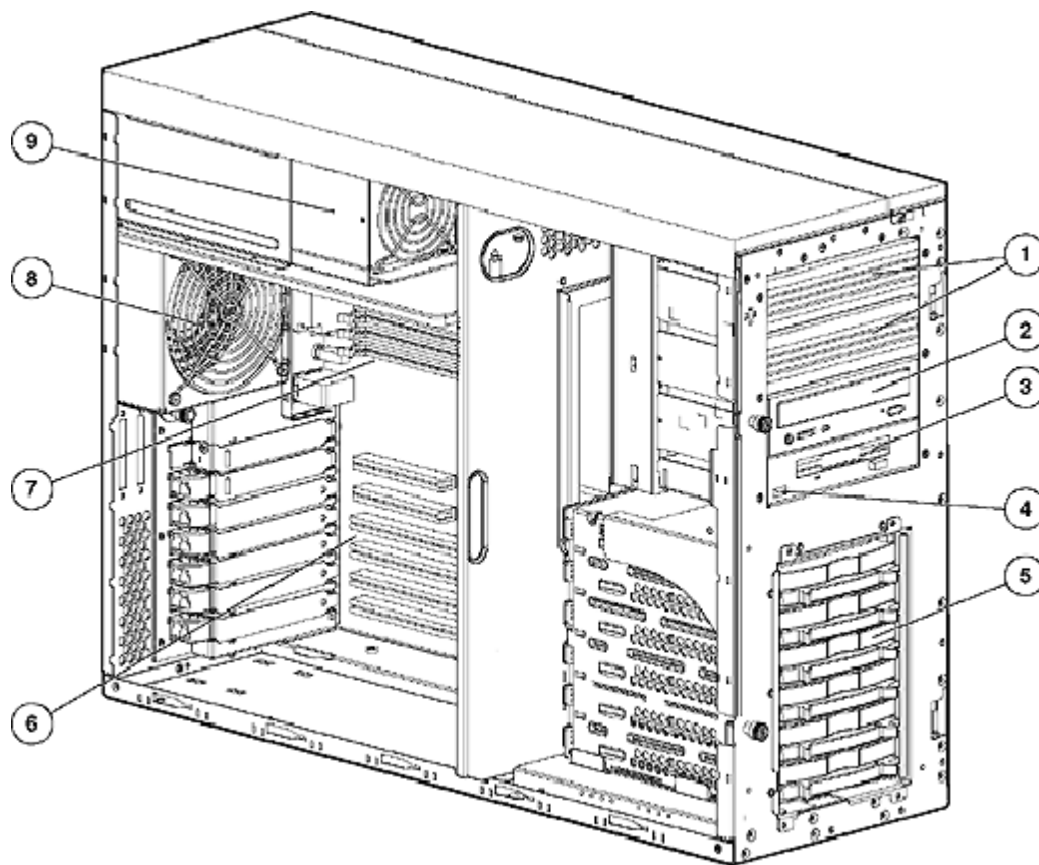


Overview



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:

- New Serial Attached SCSI (SAS) and SATA hard drives
- Support for up to 4.5TB of internal storage with the new 750GB SATA HDD

Overview

At A Glance

The HP ProLiant ML350 G4p is a traditional server refined with essential availability features to form a versatile, dependable backbone for expanding businesses and dedicated workgroups.

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.

- **Processors:**
 - Intel® Xeon™ processors up to 3.6 GHz (dual processor capability) with 2MB level 2 cache; processors include support for Hyper-Threading
 - Intel® E7520 chipset
 - 800-MHz front side bus
- **Memory:**
 - PC2-3200 400 MHz DDR2 SDRAM with Online Spare support (expandable to 12 GB)
- **Storage Controller:**
 - Integrated Dual Channel Ultra320 SCSI Adapter
 - HP integrated 2 Port SATA controller
 - Smart Array 641 Controller (standard in Array Models only)
- **Internal Drive Support:**
 - 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 4.5TB (SATA HDD)
 - Up to 2.4TB with optional 2-bay hot plug SCSI drive cage
 - Support for optional duplex SCSI backplane and second serial port
- **Network Controller:**
 - Embedded NC7761 Gigabit Server Adapter
- **Expansion Slots:**
 - 6 Total: (1) 64-bit/133-MHz PCI-X; (2) 64-bit/100-MHz PCI-X; (1) 64-bit/66-MHz PCI-X; (1) x4 PCI Express; (1) x8 PCI Express
- **USB 2.0 Ports:**
 - 3 Total: (1) front; (1) internal; (1) rear accessible port
- **Redundancy:**
 - 725W Hot-Plug Power Supply
 - Optional 725W Hot-Pluggable Redundant Power Supply (1+1) available
- **Management:**
 - Integrated Lights-Out (iLO) Standard for remote management
 - 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, delivering server level, policy based power management with industry leading energy efficiency and savings on system power and cooling costs
- **Form Factor:**
 - Tower or rack (5U)
- **Deployment/Serviceability:**
 - Tool-free chassis entry and component access
 - Universal rail solution supporting both square and round hole rack environments
- **Warranty:**
 - 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/SAS hard drives. SATA hard drives have a one-year warranty.

Standard Features

Processor One of the following depending on Model	Intel Xeon Processor 3.4 GHz/800-2MB L2 Intel Xeon Processor 3.2 GHz/800-2MB L2 Intel Xeon Processor 3.0 GHz/800-2MB L2 NOTE: "Factory Integrated Models" are configured to order and require the selection of at least one processor.
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Cache Memory	Integrated 2MB Level 2 cache
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Processor Upgradeability	Upgradeable to dual processing
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Chipset	Intel® E7520 Chipset with 800-MHz Front Side Bus
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Memory Protection	Online Spare Advanced ECC
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Memory One of the following depending on model	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
	NOTE: 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.	

Network Controller	Embedded NC7761 Gigabit Server Adapter
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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
One of the following depending on model	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

- HD68 Internal to External SCSI Cable Option Kit (PN 159547-B22)
- VHDCI Internal to External SCSI Cable Option Kit (PN 333370-B21)

Maximum Internal Storage	Hot Plug SCSI	2.40TB	6 x 300GB with standard drive cage + 2 x 300GB with optional ML3xx Two Bay Hot Plug SCSI Drive Cage
	Hot Plug SATA	4.50TB	2 x 7GB with standard controller + 4 x 750GB with optional SATA array controller
	Hot Plug SAS (3.5")	876GB	6 x 146GB 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 2.0 Ports	3 total: 1 front, 1 internal, 1 rear
	External SCSI knockouts	2

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

Graphics	Integrated ATI RAGE XL Video Controller with 8-MB SDRAM Video Memory VGA connector; up to 1600 x 1200 resolution supported
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Standard Features

Form Factor

Tower or rack (5U)

NOTE: Rack models (and rack conversion kit) support:

- Square or round hole racks 24"- 35" deep, including HP Rack System /E and HP Systems
- Telco racks with 3rd part option kit from Rack Solutions

<http://www.racksolutions.com/hp>

ProLiant Essentials Foundation Pack Software

HP Systems Insight Manager

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

Through a single management view, HP SIM provides core management services that include device discovery and identification, event views, health monitoring, inventory data collection, software version control and reporting. HP SIM is built on industry standards and is extensible with value-added ProLiant Essentials, Integrity Essentials and Storage Essentials software to meet individual management needs. For more details on HP SIM visit <http://www.hp.com/go/hpsim>.

HP SIM provides organizations with the following benefits:

- Simplifies and consolidates infrastructure lifecycle management using task and query based functionality
- Provides the foundation for infrastructure automation and virtualization
- Enables IT management based on business processes not hardware platforms
- Lowers infrastructure maintenance cost and frees resources for innovation
- Maximizes resource utilization with virtualization technologies
- Provides a central point of integration between infrastructure and Enterprise management tools such as HP OpenView

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

Insight Management Agents

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

Insight Management Agents and The HP System Management Homepage are included on ProLiant Support Packs, and can also be installed using the server profiles provided with the ProLiant Essentials Rapid Deployment Pack. For additional information about the Management Agents and the HP System Management Homepage please visit the management Web site at <http://www.hp.com/servers/manage>.

Standard Features

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: <ul style="list-style-type: none">• Rapid Deployment Pack (RDP) is an automated deployment and provisioning solution for all ProLiant servers. RDP includes the ProLiant Integration Module featuring ProLiant server pre-configured events for OS installation, and optimized software drivers, firmware and management agents. Every RDP disc includes 10-node trial licenses for evaluation purposes. RDP requires a license for each server deployed and is available for purchase with HP servers. For more information, visit: http://www.hp.com/servers/rdp.• 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, 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.• Server Migration Pack - The Server Migration Pack automates the manual processes required for migrating servers between physical or virtual platforms (P2V, V2P, and V2V).
Optional Remote Management Packs	<ul style="list-style-type: none">• Integrated Lights-Out Advanced Pack - upgrades the Integrated Lights-Out processor to full virtual presence and control with graphical console and virtual media.

Standard Features

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/SAS hard drives)

Standard Features

Security	Power-on password Setup password Diskette boot control Parallel and serial interface control Disk configuration lock Power switch security
Server Power Cords	Tower models ship standard with a 12', lowline NEMA power cord. Rack models ship standard with a 10' IEC cable. Rack models also include a 12' NEMA cord. Most redundant power supply options ship with a 12' power cord. The one exception is the IEC redundant power supply (P/N 384168-B21) which ships with a 10' IEC cable only.
UPS and PDU Power Cord Matrix	Please see the UPS and PDU cable matrix that lists cable descriptions, requirements, and specifications for UPS and PDU units: ftp://ftp.compaq.com/pub/products/servers/ProLiantstorage/power-protection/powercordmatrix.pdf .
Power Supply	Hot plug models: 725 Watt, Power Factor Correction (PFC), Hot Plug 100 to 240 VAC Rated Input Voltage (Auto-sensing), CE Mark Compliant Optional 2nd power supply for hot-pluggable 1 + 1 redundancy
System Fans	1 fan ships standard, 2 fans total supported (does not include power supply or processor heatsink fans)
Required Cabling	For required cabling information, refer to the HP ProLiant ML350 G4p cabling matrix at http://www.hp.com/servers/proliantML350 . NOTE: 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.
OS Support	Microsoft Windows Server 2003 Microsoft Small Business Server 2003 Microsoft Windows 2000 Server and Advanced Server Novell NetWare Novell NetWare Small Business Suite LINUX (Red Hat, SuSE) VMware Virtualization Software NOTE: For a complete and up-to-date listing of supported operating systems please visit our OS Support Matrix at: http://www.hp.com/go/supportos NOTE: For a complete and up-to-date information on Linux support, please visit the HP Linux Web site at http://h18000.www1.hp.com/products/servers/linux/hpLinuxcert.html NOTE: Optional hardware may be required to support some operating systems. NOTE: For information on how to buy server operating systems from HP please visit the OS product site at: http://h18004.www1.hp.com/products/servers/software/OEM.html NOTE: For an up-to-date listing of the latest drivers available for the HP ProLiant ML350, please see: http://www.compaq.com/support/files/server/us/index.html NOTE: For more information on HP's Certified and Supported ProLiant Servers, please visit the VMware Server Support Matrix at: http://h18004.www1.hp.com/products/servers/software/vmware/hpvmwarecert.html

Standard Features

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>.

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>.

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

HP ProLiant Smart Buys 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: For detailed specification information on ProLiant Smart Buys please click on the following link: <ftp://ftp.compaq.com/pub/products/servers/smartbuys.pdf>

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: Server Warranty includes 3 year Parts, 3 year Labor, 3-year on-site support. Additional information regarding worldwide limited warranty and technical support is available at: <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

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.

HP services provide continuous care and support expertise with committed response designed to meet

Standard Features

your IT and business needs.

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

Enhanced Care - Minimum recommended service support offer designed to ensure customers have access to expert assistance, whenever they need it.

- *4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years*

Continuance Care - Recommended service delivering cost-effective support options designed to extend HP Services committed response and guaranteed fix times, designed to speed problem identification and resolution.

- *6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years*

Total Care - Highest HP Support service level recommend to help increase IT performance and availability with comprehensive, integrated hardware and software services

- *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*

Deployment Services - HP Installation and Start Up services designed to take time, risk, and worry out of the deployment of ProLiant servers - and free customers IT support staff to focus on what they do best, their business.

- *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*

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

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

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

Models

NOTE: 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

ML350T04p SCSI x3.0-2MB/800, 512 MB 380165-001	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 Gigabit Server Adapter
	Storage Controller	Integrated dual channel Ultra320 SCSI adapter
	Hard Drive	None ship standard (up to 6 supported)
	Internal Storage	2.4TB maximum hot plug SCSI (with optional hard drives & drive cage)
	Optical Drive	48x IDE (ATAPI) CD-ROM Drive
	Diskette Drive	1.44 MB Diskette Drive
	Form Factor	Tower (5U)

ML350T04p SCSI x3.0-2MB/800, 1 GB Array 380173-001	Processor(s)	(1) Intel Xeon 3.0 GHz processor standard (up to 2 supported)
	Cache Memory	Integrated 2MB Level 2 cache
	Standard Memory	1 GB (2 x 512MB)
	Network Controller	Embedded NC7761 Gigabit Server 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	2.4TB 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 SATA/SAS x3.0-2MB/800, 512 MB 331889-001	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 Gigabit Server 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 NOTE: Please see the "Storage" section of the 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 - 4.5TB maximum (with optional SATA controller & 6 hard drives) NOTE: The optional SATA RAID controller is required to support hot plug of SATA hard drives. Hot Plug SAS - 876GB 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 380166-001	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 Gigabit Server Adapter
	Storage Controller	Integrated dual channel Ultra320 SCSI adapter
	Hard Drive	None ship standard (up to 6 supported)
	Internal Storage	2.4TB 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 380196-001	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 Gigabit Server 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	2.4TB 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 356816-001	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 Gigabit Server 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) NOTE: Please see the "Storage" section of the 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 - 4.5TB maximum (with optional SATA controller & 6 hard drives) NOTE: The optional SATA RAID controller is required to support hot plug of SATA hard drives. Hot Plug SAS - 876GB 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 380172-001	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 Gigabit Server Adapter
	Storage Controller	Integrated dual channel Ultra320 SCSI adapter
	Hard Drive	None ship standard (up to 6 supported)
	Internal Storage	2.4TB 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 380197-001	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 Gigabit Server 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	2.4TB 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 370508-001	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 Gigabit Server 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) NOTE: 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 - 4.5TB maximum (with optional SATA controller & 6 hard drives) NOTE: The optional SATA RAID controller is required to support hot plug of SATA hard drives. Hot Plug SAS - 876GB 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 382174-001	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 Gigabit Server Adapter
	Storage Controller	Integrated dual channel Ultra320 SCSI adapter
	Hard Drive	None ship standard (up to 6 supported)
	Internal Storage	2.4TB 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

ML350R04p SCSI x3.0-2MB/800, 1 GB Array 382195-001	Processor(s)	(1) Intel Xeon Processor 3.0 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 Gigabit Server Adapter
	Storage Controller	Integrated dual channel Ultra320 SCSI adapter
	RAID Controller	Smart Array 641
	Hard Drive	None ship standard (up to 6 supported)
	Internal Storage	2.4TB 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 x3.2-2MB/800, 512 MB 382177-001	Processor(s)	(1) Intel Xeon Processor 3.2 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 Gigabit Server Adapter
	Storage Controller	Integrated dual channel Ultra320 SCSI adapter
	Hard Drive	None ship standard (up to 6 supported)
	Internal Storage	2.4TB 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 x3.2-2MB/800, 1 GB Array 382196-001	Processor(s)	(1) Intel Xeon Processor 3.2 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 Gigabit Server 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	2.4TB 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

ML350R04p SCSI x3.4-2MB/800, 512 MB 382197-001	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 Gigabit Server Adapter
	Storage Controller	Integrated dual channel Ultra320 SCSI adapter
	Hard Drive	None ship standard (up to 6 supported)
	Internal Storage	2.4TB 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 382178-001	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 Gigabit Server 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	2.4TB 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)	

Configuration Information - Factory Integrated Models

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.

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

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

Models	HP ProLiant ML350G4p HP-SCSI Rack CTO Chassis	382188-405
	Includes: Embedded NC7761 Gigabit Server Adapter Integrated dual channel Ultra320 SCSI adapter Six Hot Plug SCSI Drive Bays 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 725W Hot-Plug Power Supply 5U Rack Form Factor	
	HP ProLiant ML350G4p HP-SCSI Tower CTO Chassis	382187-405
	Includes: Embedded NC7761 Gigabit Server Adapter Integrated dual channel Ultra320 SCSI adapter Six Hot Plug SCSI Drive Bays 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 725W Hot-Plug Power Supply 5U Tower form factor Keyboard 2-button Mouse	
	HP ProLiant ML350G4p Serial Tower CTO Chassis	372798-405
	Includes: Embedded NC7761 Gigabit Server Adapter Integrated dual channel Ultra320 SCSI adapter Dual port SATA controller Six Hot Plug SATA Drive Bays 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 725W Hot-Plug Power Supply 5U Tower form factor Keyboard 2-button Mouse	

Configuration Information - Factory Integrated Models

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	NOTE: 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 72GB 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
	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
	HP Smart Array P600 Controller	337972-B21
Hard Drives	Ultra320 Hot Plug (For use with HP-SCSI CTO Chassis)	
	HP 300GB U320 10K Universal HDD	350964-B22
	HP 146GB U320 10K Universal HDD	286716-B22
	HP 72GB U320 10K Universal HDD	286714-B22
	HP 300GB U320 15K Universal HDD	411089-B22
	HP 146GB U320 15K Universal HDD	347708-B22
	HP 72GB U320 15K Universal HDD	286778-B22
	HP 36GB U320 15K Universal HDD	286776-B22
	SATA Hot Plug (For use with Serial CTO Chassis)	
	HP 750GB 1.5G SATA 7.2K 3.5" HDD	432341-B21
	HP 500GB 1.5G SATA 7.2K 3.5" HDD	395473-B21
	HP 250GB 1.5G SATA 7.2K 3.5" HDD	349239-B21
	HP 160GB 1.5G SATA 7.2K 3.5" HDD	349238-B21
	HP 80GB 1.5G SATA 7.2K 3.5" HDD	349237-B21
	SAS 3.5" Hot Plug (For use with Serial CTO Chassis)	

Configuration Information - Factory Integrated Models

	HP 146GB 3G SAS 15K 3.5" SP HDD	375872-B21
	HP 72GB 3G SAS 15K 3.5" SP HDD	375870-B21
	HP 36GB 3G SAS 15K 3.5" SP HDD	375868-B21
Hard Drive Cable	HP Internal SAS/SATA Cable, 30 inch multi-lane NOTE: 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 (http://www.hp.com/servers/proliantML350).	389662-B21
Modems	Agere 2006 PCI Hi-Speed 56K Sof FIO NOTE: This part number must be used for factory integration. For field integration (or as an additional "ship along" option) choose EK694AA.	440519-B21

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

NOTE: Some options may not be factory integratable. Please contact your local sales representative for additional information.

HP ProLiant ML350 G4p Unique Options	Hot Plug Redundant Power Supply Option Kit	384168-001
	Hot Plug Redundant Power Supply Option Kit (IEC)	384168-B21
	NOTE: 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 Essentials Value Pack Software	ProLiant Essentials Intelligent Networking Pack	
	ProLiant Essentials Intelligent Networking Pack - Windows Edition, Single Server License	436225-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_na/12062_na.HTML	
	ProLiant Essentials Intelligent Networking Pack - Linux Edition, Single Server License	436229-B21
	NOTE: For additional ProLiant Intelligent Networking Pack - Linux License Kits please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12327_na/12327_na.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_na/11925_na.HTML	
	ProLiant Essentials Rapid Deployment Pack Windows Edition Release	
	Rapid Deployment Pack, Single-Server License	267196-B21
	NOTE: This license allows 1 server to be deployed and managed via RDP.	
	NOTE: For additional ProLiant Essentials Rapid Deployment Pack License Kits please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11053_na/11053_na.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_na/11452_na.HTML	
	ProLiant Essentials Virtualization Management Software	
	ProLiant Essentials Virtual Machine Management Pack, Single-Server License	435661-B21
	NOTE: For use with a single server. Contains one license with a unique license activation key and documentation.	

Options

ProLiant Essentials Server Migration Pack, Single-Migration License 435663-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_na/12328_na.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_na/12111_na.HTML

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

Remote Management

Integrated Lights-Out Advanced Pack

Integrated Lights-Out Advanced Pack, 1 server 263825-B21

Featuring: Sophisticated virtual administration features for ultimate control of servers in the data centers and remote sites.

NOTE: For additional Integrated Light-Out Advanced Pack License Kits please see the QuickSpecs at:

http://h18000.www1.hp.com/products/quickspecs/11052_na/11052_na.HTML

ProLiant Software

ProLiant Software Maintenance Subscription 355060-B21

Maintenance Subscription

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/North_America/11073.html

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

Options

Memory (DIMMs)	NOTE: 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
Internal Storage Upgrades	Duplex Ultra320 SCSI Backplane Option Kit	339323-B21
	ML3xx Two Bay Hot Plug SCSI Drive Cage	244059-B21
	NOTE: 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.	
Optical Drives	CD-RW/DVD-ROM Combo Drive Option Kit	331346-B21
	NOTE: 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
Serial Port Kit	ProLiant Second Serial Port Option Kit	390390-B21
Hard Drives	Ultra320 – Universal Hot Plug	
	HP 300GB U320 10K Universal HDD	350964-B22
	HP 146GB U320 10K Universal HDD	286716-B22
	HP 72GB U320 10K Universal HDD	286714-B22
	HP 300GB U320 15K Universal HDD	411089-B22
	HP 146GB U320 15K Universal HDD	347708-B22
	HP 72GB U320 15K Universal HDD	286778-B22
	HP 36GB U320 15K Universal HDD	286776-B22
	NOTE: Please see the Ultra320 Universal Hot Plug Hard Drive QuickSpecs for additional technical information on the hard drives Support details, please see the following: http://h18000.www1.hp.com/products/quickspecs/11531_na/11531_na.HTML	
	Serial ATA (SATA) Hot Plug	
	HP 750GB 1.5G SATA 7.2K 3.5" HDD	432341-B21
	HP 500GB 1.5G SATA 7.2K 3.5" HDD	395473-B21
	HP 250GB 1.5G SATA 7.2K 3.5" HDD	349239-B21
HP 160GB 1.5G SATA 7.2K 3.5" HDD	349238-B21	
HP 80GB 1.5G SATA 7.2K 3.5" HDD	349237-B21	

Options

NOTE: SATA drives have a 1-year warranty. 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_na/11940_na.HTML

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

HP 146GB 3G SAS 15K 3.5" SP HDD 375872-B21

HP 72GB 3G SAS 15K 3.5" SP HDD 375870-B21

HP 36GB 3G SAS 15K 3.5" SP HDD 375868-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_na/12244_na.HTML

Hard Drive Cables

HP Internal SAS/SATA Cable, 30 inch multi-lane 389662-B21

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

SCSI 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

128-MB BBWC (Battery-Backed Write Cache) Enabler 351580-B21

NOTE: This 128MB BBWC supports the Smart Array 641 Controller and Smart Array 642 Controller.

Ultra320 Expansion Module for SA-6402 273911-B21

64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2 374654-B21

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

http://h18000.www1.hp.com/products/quickspecs/11587_na/11587_na.HTML
(Smart Array 6400 Series)

http://h18000.www1.hp.com/products/quickspecs/12067_na/12067_na.HTML
(Smart Array 641)

http://h18000.www1.hp.com/products/quickspecs/12069_na/12069_na.HTML
(Smart Array 642)

http://h18000.www1.hp.com/products/quickspecs/11943_na/11943_na.HTML
(Single Channel U320 SCSI G2 HBA)

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_na/12091_na.HTML
(6-Port SATA RAID Controller)

SAS Controller

Smart Array P600 Controller

Options

HP Smart Array P600/256 BBWC Controller	337972-B21
512MB DDR BBWC Upgrade	372538-B21

NOTE: For Smart Array P600 Controller only.

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

http://h18000.www1.hp.com/products/quickspecs/12247_na/12247_na.HTML
(Smart Array P600 Controller)

SAS HBA

HP 8 Internal Port SAS HBA with RAID	347786-B21
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NOTE: Please see the following QuickSpecs for additional information:

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

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 NC340T PCI-X 4-port 1000T Gigabit Server Adapter	391661-B21
HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
HP NC373F PCI Express Multifunction Gigabit Server Adapter	394793-B21
HP NC373T PCI Express Multifunction Gigabit Server Adapter	394791-B21
HP NC380T PCI Express Dual Port Multifunction Gigabit Server Adapter	394795-B21
HP NC1020 PCI 1000T Gigabit Server Adapter	353377-B21
HP NC7771 PCI-X 1000T Gigabit Server Adapter	290563-B21

NOTE: 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.

2006 Agere PCI high-speed international soft modem	EK694AA
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Management Options

Remote Insight Lights-Out Edition II	227251-001
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Options

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

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

Ultrium Tape Drives

HP StorageWorks Ultrium 232 Internal Tape Drive (Carbonite) DW064A

HP StorageWorks Ultrium 460 Internal Tape Drive (Carbon) Q1518B

HP StorageWorks Ultrium 448 Internal Tape Drive (Carbonite) DW016A

HP StorageWorks Ultrium 960 Internal Tape Drive (Carbonite) Q1538A

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

http://h18006.www1.hp.com/products/quickspecs/11739_na/11739_na.html

http://h18006.www1.hp.com/products/quickspecs/12128_na/12128_na.html

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

Internal, Rack-Mount, and Array Module DAT Drives

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

NOTE: Please see the DAT Tape Drive QuickSpecs for controllers, media, and other options:

http://h18000.www1.hp.com/products/quickspecs/11883_na/11883_na.HTML

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

Rack-Mount Tape Drive Enclosures

HP StorageWorks 1U Rack-Mount Kit A7445B

NOTE: The 1U Rack-Mount Kit can support up to (2) half-height tape drives and is compatible with multiple Single-Ended and LVD SCSI tape drives including the DAT 24, DAT 40, DAT 72, DLT VS80, DLT VS160, Ultrium 215, Ultrium 232, Ultrium 448 and Ultrium 920 tape drives.

HP StorageWorks 1U USB Rack-Mount Kit A8007A

NOTE: The 1U USB Rack-Mount Kit can support up to (2) half-height tape drives and is compatible with the DAT 24 USB, DAT 40 USB and DAT 72 USB tape drives.

HP StorageWorks 3U Rack-mount kit 274338-B22

NOTE: The 3U Rack-mount Kit can support up to (2) full-height or (4) half-height tape drives and compatible with multiple LVD SCSI tape drives including DAT 40, DAT 72, DLT VS160, SDLT 320, SDLT 600, Ultrium 232, Ultrium 460, Ultrium 448, Ultrium 920 and Ultrium 960 tape drives.

Options

Tape Autoloaders	HP StorageWorks DAT Autoloader	
	HP StorageWorks DAT 72x10 tape autoloader	AE313A
	HP StorageWorks 1/8 Tape Autoloader	
	HP StorageWorks 1/8 Ultrium 920 G2 Tape Autoloader	AH165A
	HP StorageWorks 1/8 Ultrium 448 G2 Tape Autoloader	AH164A
	HP StorageWorks 1/8 Ultrium 232 G2 Tape Autoloader	AH163A
	HP StorageWorks 1/8 G2 Tape Autoloader Rack Kit	AH166A
	NOTE: Required to install the 1/8 G2 Autoloaders in a standard 19-inch rack; includes rails and rackmount instructions	
	NOTE: Please reference the 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	
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Tape Libraries	HP StorageWorks MSL2024 Tape Library	
	HP StorageWorks MSL2024 1 Ultrium 960 Drive Library	AG115A
	HP StorageWorks MSL2024 1 Ultrium 960 4GB FC Drive Library	AG326B
	HP StorageWorks MSL2024 1 Ultrium 920 Drive Library	AH169A
	HP StorageWorks MSL2024 2 Ultrium 920 Drive Library	AH170A
	HP StorageWorks MSL2024 1 Ultrium 448 Drive Library	AG116A
	HP StorageWorks MSL2024 2 Ultrium 448 Drive Library	AG117A
	HP StorageWorks MSL4048 Tape Library	
	HP StorageWorks MSL4048 1 Ultrium 448 Drive Library	AG320A
	HP StorageWorks MSL4048 2 Ultrium 448 Drive Library	AG321A
	HP StorageWorks MSL4048 1 Ultrium 920 Drive Library	AH171A
	HP StorageWorks MSL4048 2 Ultrium 920 Drive Library	AH172A
	HP StorageWorks MSL4048 1 Ultrium 960 Drive Library	AG322A
	HP StorageWorks MSL4048 1 Ultrium 960 4GB FC Drive Library	AG324B
	HP StorageWorks MSL4048 2 Ultrium 960 Drive Library	AG323A
	HP StorageWorks MSL4048 2 Ultrium 960 4GB FC Drive Library	AG325B
	HP StorageWorks MSL6000 Tape Library	
	Ultrium 960 technology	
	HP StorageWorks MSL6030 1 Ultrium 960 Dr LVDS Library	AD606B
	HP StorageWorks MSL6030 1 Ultrium 960 Dr FC Library	AD608B
	HP StorageWorks MSL6030 2 Ultrium 960 Dr LVDS Library	AD607B
	HP StorageWorks MSL6030 2 Ultrium 960 Dr FC Library	AD609B
	Ultrium 460 technology	
	HP StorageWorks MSL6030 1 Ultrium 460 Dr LVDS Library	AD598B
	HP StorageWorks MSL6030 1 Ultrium 460 Dr FC Library	AD600B
	HP StorageWorks MSL6030 2 Ultrium 460 Dr LVDS Library	AD599B
	HP StorageWorks MSL6030 2 Ultrium 460 Dr FC Library	AD601B

Options

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

HP Data Protector Express Software	HP DP Express Backup Server Upgrade for ProLiant Software	BB117AP
	HP DP Express Package for Microsoft Small Business Server	BB118AA

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

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

HP StorageWorks Modular Smart Array 20	HP StorageWorks Modular Smart Array 20 NOTE: Rack-mountable 12 (SATA) drive enclosure with U320 Host connectivity, redundant power supplies.	335921-B21
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	HP StorageWorks Modular Smart Array 20 Starter Kit NOTE: Rack-mountable 12 (SATA) drive enclosure with U320 Host connectivity, redundant power supplies. Includes Smart Array 6402/128 Controller.	366172-B21
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NOTE: The Modular Smart Array Enclosure 20 Family supports the SATA 1.5Gb/s 3.5" Hot Plug Hard Drives.

HP StorageWorks Modular Smart Array 30	HP StorageWorks Modular Smart Array 30 SB NOTE: Rack-mountable 14 drive enclosure with single bus, redundant power supplies	302969-B21
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	HP StorageWorks Modular Smart Array 30 DB NOTE: Rack-mountable 14 drive enclosure with dual bus, redundant power supplies	302970-B21
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NOTE: The Modular Smart Array Enclosure 30 Family supports the Wide Ultra3, Ultra320 Hot Plug Hard Drives.

HP StorageWorks Modular Smart Array 50	HP StorageWorks Modular Smart Array 50 Enclosure	364430-B21
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NOTE: Please see the Modular Smart Array 50 QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at: http://h18000.www1.hp.com/products/quickspecs/12245_na/12245_na.HTML

HP StorageWorks Modular Smart Array 500	HP StorageWorks Modular Smart Array 500 Generation 2	335880-B21
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NOTE: 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: http://h18000.www1.hp.com/products/quickspecs/11956_na/11956_na.HTML

Options

HP StorageWorks Modular Smart Array 1000	HP StorageWorks Modular Smart Array 1000 NOTE: Please see the Modular Smart Array 1000 QuickSpecs for additional options and configuration information at http://h18000.www1.hp.com/products/quickspecs/11033_na/11033_na.HTML	201723-B22
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HP StorageWorks Modular Smart Array 1500 cs	Modular Smart Array 1500 Controller Shelf NOTE: Please see the StorageWorks Modular SAN Array 1500 cs QuickSpecs for additional options and configuration information at: http://www.hp.com/go/MSA1500cs	AA986A
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Cluster Options	ProLiant Cluster Starter Kit NOTE: For additional information regarding the ProLiant Cluster Starter Kit please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11935_na/11935_na.html	364023-B22
	HP HA/F200 for Entry SAN Cluster NOTE: For additional information regarding the ProLiant Cluster for Entry Level SAN please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11932_na/11932_na.html	364026-B22
	ProLiant Cluster HA/F500 for the Enterprise SAN NOTE: For additional information regarding the ProLiant Cluster HA/F500 for Enterprise SAN please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11933_na/11933_na.html	364024-B21
	HP Serviceguard for Linux ProLiant Cluster A.11.16 for SUSE SLES 9 & 10 and Red Hat EL 3 & 4 (2 node license cluster kit)	305199-B26
	HP Serviceguard for Linux A.11.16 for SUSE SLES 9 & 10 and Red Hat EL 3 & 4 (single license version)	307754-B26
	HP Serviceguard for Linux and Red Hat Global File System - 1 year subscription	T2798AA#001
	HP Serviceguard for Linux and Red Hat Global File System - 3 years subscription NOTE: For additional information regarding HP Serviceguard for Linux, please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11518_na/11518_na.html	T2798AA#003

StorageWorks Options	NOTE: The following is a list of all Fibre Channel Host Bus Adapters for Windows and Linux. For detailed compatibility information please see: http://h18006.www1.hp.com/storage/saninfrastructure/hba.html	
	HP StorageWorks FC2142SR 4Gb PCI-e HBA	A8002A
	HP StorageWorks FC2242SR Dual Channel 4 Gb PCI-e HBA	A8003A
	HP StorageWorks FC1142SR 4Gb PCI-e HBA	AE311A
	HP StorageWorks FC1242SR Dual Channel 4 Gb PCI-e HBA	AE312A
	HP StorageWorks FC2143 4Gb PCI-X 2.0 -to-Fibre Channel HBA	AD167A
	HP StorageWorks FC2243 Dual Channel 4Gb PCI-X 2.0 HBA	AD168A
	HP StorageWorks FC1143 4Gb PCI-X 2.0 HBA	AB429A
	HP StorageWorks FC1243 Dual Channel 4Gb PCI-X 2.0 HBA	AE369A

Options

Uninterruptible Power Systems – Tower UPS	HP, T1000 UPS	AF403A
	HP, T1500 UPS	AF406A
	HP, R/T 2200 UPS	AF409A

Uninterruptible Power Systems – Rack UPS	HP, R1.5kVA UPS, 1U	AF419A
	HP R3000 VA UPS, 2U, L5-30 NOTE: Replaces non-RoHs compliant part number 192186-001.	AF422A
	HP R3000 VA UPS, 2U, L6-20 NOTE: Replaces non-RoHs compliant part number 192186-002.	AF423A
	HP R5500 VA UPS NOTE: Replaces non-RoHs compliant part number 326529-D71.	AF426A

HP Monitored Power Distribution Unit (PDU)	HP Monitored Power Distribution Unit: Full Rack Version	
	HP 17.3 kVA S2324 Monitored PDU- dual input, 3U, 24A NOTE: Replaces non-RoHs compliant part number 370959-D71.	AF503A
	HP 8.3 kVA S1324 Monitored PDU- single input, 3U, 24A NOTE: Replaces non-RoHs compliant part number 370960-D71.	AF504A
	HP 16.6 kVA S2140 Monitored PDU- dual input, 1U, 40A NOTE: Replaces non-RoHs compliant part number 37061-D71.	AF505A
	HP 8.6 S1140 Monitored PDU- single input, 1U, 40A NOTE: Replaces non-RoHs compliant part number 370962-D71.	AF506A

Modular PDUs 1U/0U (Up to 32 outlets) NOTE: 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) NOTE: This mPDU (252663-D71) may also be used to connect the low volt model of the UPS R3000 XR.	252663-D71
	HP Modular Power Distribution Units (mPDU), High Volt Model, 24A (200-240 VAC)	252663-D72
	HP Modular Power Distribution Units (mPDU), High Volt Model, 40A (200-240 VAC) NOTE: This mPDU (252663-B21), 40A model has a hardwired input.	252663-B21
	HP Modular Power Distribution Units (mPDU), High Volt Model, 16A (200-240 VAC) NOTE: 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, need to order cable PN 340653-001.	252663-B24
	HP Modular Power Distribution Unit (mPDU), High Volt Model, 40A, Attached Cord NOTE: 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: http://h18000.www1.hp.com/products/quickspecs/11041_na/11041_na.HTML	252663-D73

Options

USB Options	HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver)	DC172B
	USB 1.44-MB External Diskette Drive (Carbonite)	DC141B
	HP USB 04 Standard Keyboard	DT528A#ABA
	USB 2.0 4-port HUB	DG954A
	HP 1GB Drive Key II- USB 2.0 Flash Drive	AG382AA
	HP 512MB DriveKey II- USB Flash Drive	ED516AA

Other	ProLiant ML3xx Internal to External SCSI Cable Option Kit (HD68)	159547-B22
	ProLiant ML3xx Internal to External SCSI Cable Option Kit (VHDCI)	333370-B21

Rack Conversion Kit	ProLiant ML350 G4 Tower to Rack Conversion Kit	358350-B21
	Shipping Bracket for Round Hole Racks	371482-B21

NOTE: Required when shipping the server pre-installed in round hole rack. Square hole pre-configured rack shipping hardware included with server mounting rails.

HP Rack 5000 Series (Graphite Metallic)	HP 5642 Rack-Unassembled	358254-B21
	<p>NOTE: Please see the HP Rack 5642 QuickSpecs for additional part numbers and Technical Specifications such as height, width, depth, weight, and color: http://h18000.www1.hp.com/products/quickspecs/12074_na/12074_na.HTML</p> <p>NOTE: For additional information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower.</p>	

HP Rack 10000 G2 Series (Carbon/Graphite Metallic)	10642 G2 (42U) Rack Cabinet - Pallet	AF001A
	10642 G2 (42U) Rack Cabinet - Shock Pallet	AF002A
	10642 G2 (42U) Rack Cabinet - Crated	AF003A
	10642 G2 (42U) Rack Cabinet, with Extension - Shock Pallet	AF004A
	10636 G2 (36U) Rack Cabinet - Pallet	AF011A
	10636 G2 (36U) Rack Cabinet - Shock Pallet	AF012A
	10636 G2 (36U) Rack Cabinet - Crated	AF013A
	10636 G2 (36U) Rack Cabinet, with Extension - Shock Pallet	AF014A

NOTE: It is mandatory to use a shock pallet when shipping racks with equipment installed.

NOTE: Please see the Rack 10000 G2 QuickSpecs for Technical Specifications such as height, width, depth, weight, and color:
http://h18000.www1.hp.com/products/quickspecs/12402_na/12402_na.HTML

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

Options

HP Rack 10000 Series (Graphite Metallic)	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 10622 (22U) Rack Cabinet - Pallet	245163-B21
	HP 10622 (22U) Rack Cabinet - Shock Pallet	245163-B22
	HP 10622 (22U) Rack Cabinet - Crated	245163-B23

NOTE: xxxxx-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). xxxxx-B23 (crated) used for air shipments of empty racks.

NOTE: 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.

NOTE: Please see the Rack 10000 QuickSpecs for Technical Specifications such as height, width, depth, weight, and color:

http://h18000.www1.hp.com/products/quickspecs/10995_na/10995_na.HTML

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

Keyboards and Monitors	TFT7210R Rack Mounted 17" Monitor	348373-B21
	NOTE: For a complete list of Monitors please view the following URL: http://www.hp.com/go/kvm	
	TFT7600 Rackmount Keyboard Monitor	AG052A
	1U Rackmount Keyboard with USB	AG072A
NOTE: For additional information regarding Rack Options, please see the following URL: http://www.hp.com/go/rackandpower		

HP KVM Switch Options	2x1x16 IP Console Switch with Virtual Media	AF601A
	4x1x16 IP Console Switch with Virtual Media	AF602A
	2x16 Server Console Switch with Virtual Media	AF600A
	PS/2 Virtual Media Interface Adapter, 1 pack	AF604A
	NOTE: Requires PS/2 and one USB port on server.	
	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	371301-D71
	HP 1x 4 USB/PS2 KVM Switch, RM	371302-B21
HP PS2 KVM Cable with audio, 6', 2-pack	371730-B21	

Options

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>.

HP Serial Console Server Options	HP 16 Port Serial Console Server	AF101A
	HP 48 Port Serial Console Server	AF102A
	Serial Adapter, RJ45-DB9 DCE Female, 1 Pack	AF103A
	Serial Adapter, RJ45-DB9 DCE Female, 8 Pack	AF104A

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>.

Service and Support Offerings (HP Care Pack Services)

Hardware Services On-site Service

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.

Total Capacity Required	Pair 1		Pair 2		Pair 3	
	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

Total Capacity Required	Pair 1		Pair 2		Pair 3	
	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

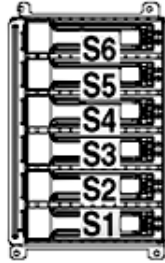
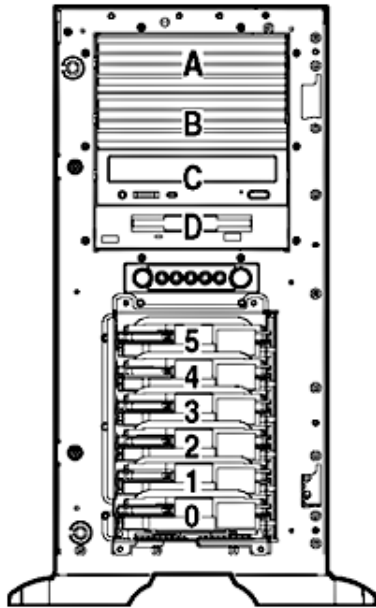
NOTE: Online Spare Memory is not supported when using 2-rank DIMMs. A total of 8 ranks are supported on the HP ProLiant ML350 G4p, A maximum of 4, 2-rank DIMMs can be populated. If you plan to mix DIMM types, 2-rank DIMMs must be installed in the first bank, 1 rank DIMMs can then be installed in subsequent 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 Hot Plug SCSI Hard Drive Bays
or	
S1-S6	6 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 plug SCSI drive cage option.

Storage

Hard Drives

Ultra320 SCSI - Hot Plug Drives

	Quantity Supported	Position Supported	Controller
300GB U320 10K	Up to 8	0-5, A+B	Integrated Dual Channel Ultra320 SCSI Adapter Smart Array 641 Controller Smart Array 6402/128 Controller Smart Array 6404/256 Controller Smart Array 642 Controller
146GB U320 10K			
72GB U320 10K			
300GB U320 15K			
146GB U320 15K			
72GB U320 15K			
36GB U320 15K			

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
80GB 1.5G SATA 7.2K	Up to 6	S1-S6	HP integrated 2 Port SATA controller HP 6-Port SATA RAID Controller
160GB 1.5G SATA 7.2K			
250GB 1.5G SATA 7.2K			
500GB 1.5G SATA 7.2K			
750GB 1.5G SATA 7.2K			

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 (3.5")

	Quantity Supported	Position Supported	Controller
36GB 3G SAS 15K SP	6	S1-S6	HP Smart Array P600 Controller
72GB 3G SAS 15K SP			
146GB 3G SAS 15K SP			

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 NOTE: 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
Modular Smart Array 50 Enclosure	Up to 2	External	HP Smart Array P600/256 BBWC Controller
Modular Smart Array 500 G2	1	External	Please see the Modular Smart Array 500 G2 QuickSpecs for the latest list of supported HBAs: http://www.hp.com/go/msa500 .
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:	http://h18000.www1.hp.com/products/quickspecs/11033_na/11033_na.HTML		
Modular Smart Array 1500 cs:	http://www.hp.com/go/MSA1500cs		

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

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

NOTE: For complete listing of tape drive offerings see <http://www.hp.com/products1/storage/compatibility/tapebackup/ISS/index.html>
For recommended tape drive offerings for this ProLiant server see the following:

	Position Supported	Controller	Controller Part Numbers
HP StorageWorks Tape Drives, Internal	A or B	USB 2.0 Port	N/A
DAT 24 USB			
DAT 40 USB			
DAT 72 USB			

Storage

HP StorageWorks Tape Drives, External DAT 24 USB DAT 40 USB DAT 72 USB	External	USB 2.0 Port	N/A
HP StorageWorks Tape Drives, Internal Ultrium 232 Ultrium 448 Ultrium 920 DAT 40 DAT 72 DLT VS160	A or B	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
HP StorageWorks Tape Drives, Internal Ultrium 460 Ultrium 960 SDLT 600	A and B	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
HP StorageWorks Tape Drives, External Ultrium 232 Ultrium 448 Ultrium 460 Ultrium 920 Ultrium 960 DAT 40 DAT 72 DLT VS160 SDLT 600	External	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
HP StorageWorks Autoloaders, External DAT 72x10 Autoloader 1/8 G2 Tape Autoloader	External	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
HP StorageWorks SCSI Rack-Mount Tape Drive Enclosures 1U Rack-Mount Kit 3U Rack-Mount Kit	External	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
HP StorageWorks USB Rack-Mount Tape Drive Enclosures 1U Rack-Mount Kit	External	USB 2.0 Port	N/A

Storage

HP StorageWorks Tape Libraries, External

MSL2024 (Ultrium 448, Ultrium 920 and 960-based)

MSL4048 (Ultrium 448, Ultrium 920 and 960-based)

MSL6000 (Ultrium 960 and 460-based)

MSL6000 (SDLT 600-based)

External

Please consult the [EBS connectivity matrix at http://www.hp.com/go/ebs](http://www.hp.com/go/ebs) for detailed connectivity information.

N/A

Power Specifications

Part Number	382175-001
Spare Kit	390394-001
Operational Input Voltage Range (Vrms)	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	

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 Gigabit Server Adapter	Network Interface	10Base-T/100Base-TX/1000Base-TX		
	Compatibility	IEEE 802.3 10Base-T		
		IEEE 802.3ab 1000Base-T		
		IEEE 802.3u 100Base-TX		
	Data Transfer Method	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

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