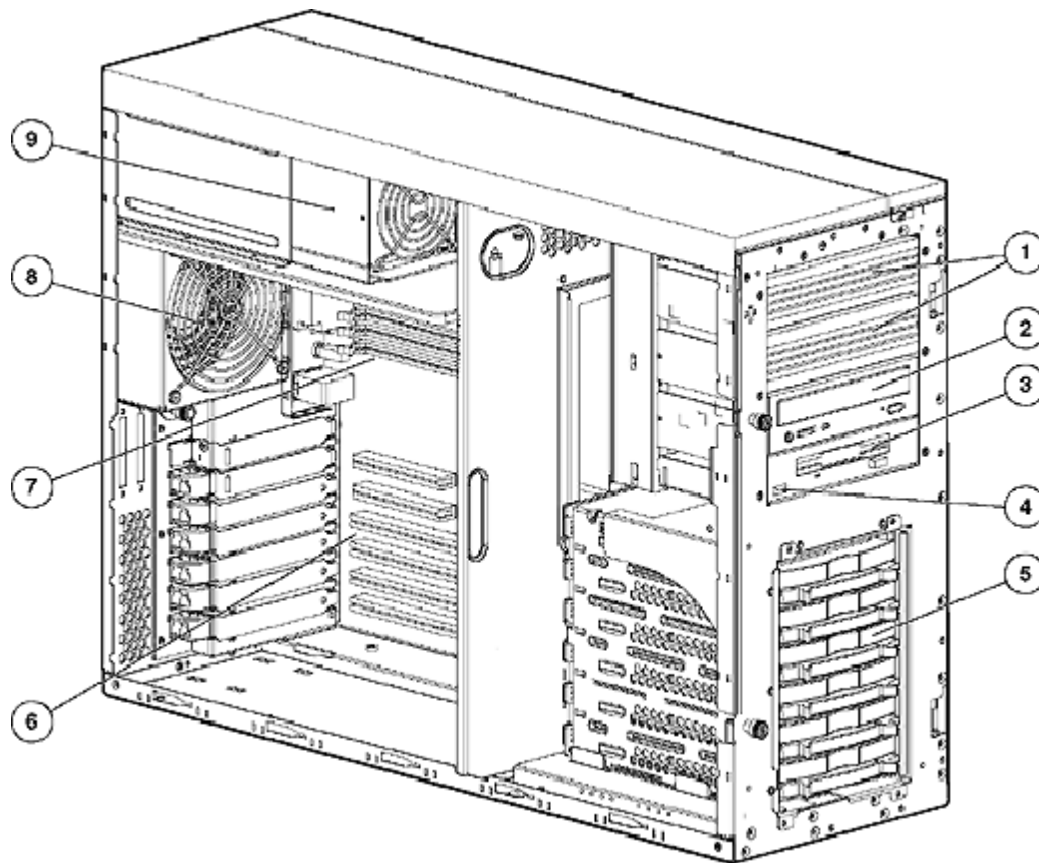


Overview



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 (shown above) or Four Non Hot Plug SCSI Drive Bays (not shown)

6. Six Expansion Slots (four PCI-X, two PCI-Express)

7. Four DIMM sockets for up to 8GB of memory

8. System Fan (an optional redundant system fan is available)

9. Power Supply

NOTE: In hot plug models, an optional 2nd power supply is available for hot-plug 1+1 redundancy

Overview

At A Glance

- Intel Xeon 3.0 GHz, 3.2 GHz, or 3.4 GHz processors (dual processor capability) with 1MB level 2 cache standard. Processors include support for Hyper-Threading and Extended Memory 64 Technology (EM64T)
- Intel® E7520 chipset
- 800-MHz Front Side Bus
- Integrated Dual Channel Ultra320 SCSI Adapter
- Smart Array 641 Controller (standard in Array Models only)
- NC7761 PCI Gigabit NIC (embedded)
- Up to 1 GB of PC2700 DDR SDRAM with Advanced ECC capabilities (Expandable to 8 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
- New 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
- Three USB ports
- Support for Ultra320 SCSI hard drives (six hot plug or four non-hot plug drives supported standard, model dependent)
- Internal storage capacity of up to 1.8 TB; 2.4 TB with optional 2-bay hot plug SCSI drive
- 725W Hot-Plug Power Supply (standard, most models); optional 725W Hot-Pluggable Redundant Power Supply (1 + 1) available. Non hot plug SCSI models include a 460W non-hot plug power supply.
- Tool-free chassis entry and component access
- Support for ROM based setup utility (RBSU) and redundant ROM
- Systems Insight Manager, SmartStart, and Automatic Server Recovery 2 (ASR-2) included
- 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.

Standard Features

Processor
[One of the following depending on Model](#)
 Intel Xeon Processor 3.4 GHz/800-1MB L2
 Intel Xeon Processor 3.2 GHz/800-1MB L2
 Intel Xeon Processor 3.0 GHz/800-1MB L2

Cache Memory Integrated 1MB Level 2 cache

Upgradeability Upgradeable to dual processing

Chipset Intel® E7520 Chipset with 800-MHz Front Side Bus

Memory Protection Advanced ECC

Memory
[One of the following depending on model](#)
 Type PC2700 DDR SDRAM (333MHz)
 Standard for Non-Array Models 512 MB
 Standard for Array Models 1 GB
 Maximum 8 GB

Network Controller NC7761 Gigabit NIC (embedded)

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 G4 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

Storage Controller Integrated Dual Channel Ultra320 SCSI Adapter
 Smart Array 641 Controller (Standard in Array Models only)

Standard Features

Storage	Diskette Drives	1.44 MB Diskette Drive
	Optical Drive	48x IDE CD-ROM Drive
	Hard Drives	36.4 GB 15,000 rpm hard drive included in non hot plug SCSI models only

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
	Non hot plug SCSI	891.2 GB	4 x 72.8 GB with standard drive cage + 2 x 300 GB with optional ML3xx Two Bay Hot Plug SCSI Drive Cage
	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

Interfaces	Parallel	1
	Serial	1 (optional 2nd serial port available)
	Pointing Device (Mouse)	1
	Graphics	1
	Keyboard	1
	Network RJ-45	1
	USB	3
	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 1200 x 1600 resolution supported
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Form Factor	Tower or rack (5U)
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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) 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
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Standard Features

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: 7.1 Latest SmartStart version supported: 7.2
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 - an automated solution for multi-server deployment and provisioning, enabling companies to quickly and easily adapt to changing business demands.• Workload Management Pack - provides easier management of complex environments, improving overall server utilization and enabling Windows® 2000 customers for the first time to confidently deploy multiple applications on a single multiprocessor ProLiant Server.• Integrated Lights-Out Advanced Pack - upgrades the Integrated Lights-Out processor to full virtual presence and control with graphical console and virtual media.• 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

Standard Features

- 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 Redundant System Fan
Optional Hot Plug, Redundant Power supply (most models)

Remote Management

Remote Insight Lights-Out Edition II (optional)

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)

Security

Power-on password
Setup password
Diskette boot control
Parallel and serial interface control
Disk configuration lock
Power switch security

Standard Features

Server Power Cords	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. Most redundant power supply options ship with a 12' country specific power cord. The one exception is the IEC redundant power supply (P/N 358352-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.
	Non hot plug models	460 Watt, Power Factor Correction (PFC), Non hot plug 100 to 240 VAC Rated Input Voltage (Auto-sensing), CE Mark Compliant
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 G4 cabling matrix at http://www.hp.com/servers/proliantML350 .	
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, and UnitedLinux) 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 G4, 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 .	
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 .	

Standard Features

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>.

Custom Builder

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

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.

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
- 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.

Standard Features

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

ML350T04 HPSCSI x3.0-1MB/800, 512 MB 331890-xx1	Processor(s)	(1) Intel Xeon 3.0 GHz processor standard (up to 2 supported)
	Cache Memory	Integrated 1MB Level 2 cache
	Standard Memory	512 MB (1 x 512 MB)
	Network Controller	NC7761 PCI Gigabit NIC (Embedded)
	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 hard drives & drive cage)
	Optical Drive	48x IDE (ATAPI) CD-ROM Drive
	Diskette Drive	1.44 MB Diskette Drive
	Form Factor	Tower (5U)

ML350R04 HPSCSI x3.0-1MB/800, 512 MB 331891-xx1	Processor(s)	(1) Intel Xeon 3.0 GHz processor standard (up to 2 supported)
	Cache Memory	Integrated 1MB Level 2 cache
	Standard Memory	512 MB (1 x 512 MB)
	Network Controller	NC7761 PCI Gigabit NIC (Embedded)
	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)

ML350T04 HPSCSI x3.2-1MB/800, 512 MB 356003-xx1	Processor(s)	(1) Intel Xeon 3.2 GHz processor standard (up to 2 supported)
	Cache Memory	Integrated 1MB Level 2 cache
	Standard Memory	512 MB (1 x 512 MB)
	Network Controller	NC7761 PCI Gigabit NIC (Embedded)
	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)

Models

ML350R04 HPSCSI x3.2-1MB/800, 512 MB 356004-xx1	Processor(s)	(1) Intel Xeon 3.2 GHz processor standard (up to 2 supported)
	Cache Memory	Integrated 1MB Level 2 cache
	Standard Memory	512 MB (1 x 512 MB)
	Network Controller	NC7761 PCI Gigabit NIC (Embedded)
	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)

ML350T04 HPSCSI x3.2-1MB/800, 1 GB Array 356005-xx1	Processor(s)	(1) Intel Xeon 3.2 GHz processor standard (up to 2 supported)
	Cache Memory	Integrated 1MB Level 2 cache
	Standard Memory	1 GB (1 x 1024 MB)
	Network Controller	NC7761 PCI Gigabit NIC (Embedded)
	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)	

ML350R04 HPSCSI x3.2-1MB/800, 1 GB Array 356006-xx1	Processor(s)	(1) Intel Xeon 3.2 GHz processor standard (up to 2 supported)
	Cache Memory	Integrated 1MB Level 2 cache
	Standard Memory	1 GB (1 x 1024 MB)
	Network Controller	NC7761 PCI Gigabit NIC (Embedded)
	Storage Controller	Integrated dual channel Ultra320 SCSI adapter
	RAID Controller	Smart Array 641
	Hard Drive	None ship standard (up to 6 supported)
	Internal Storage	2.4 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

ML350T04 HPSCSI x3.4-1MB/800, 512 MB 370506-xx1	Processor(s)	(1) Intel Xeon 3.4 GHz processor standard (up to 2 supported)
	Cache Memory	Integrated 1MB Level 2 cache
	Standard Memory	512 MB (1 x 512 MB)
	Network Controller	NC7761 PCI Gigabit NIC (Embedded)
	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)

ML350R04 HPSCSI x3.4-1MB/800, 512 MB 370507-xx1	Processor(s)	(1) Intel Xeon 3.4 GHz processor standard (up to 2 supported)
	Cache Memory	Integrated 1MB Level 2 cache
	Standard Memory	512 MB (1 x 512 MB)
	Network Controller	NC7761 PCI Gigabit NIC (Embedded)
	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)

ML350T04 HPSCSI x3.4-1MB/800, 1 GB Array 370511-xx1	Processor(s)	(1) Intel Xeon 3.4 GHz processor standard (up to 2 supported)
	Cache Memory	Integrated 1MB Level 2 cache
	Standard Memory	1 GB (1 x 1024 MB)
	Network Controller	NC7761 PCI Gigabit NIC (Embedded)
	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

ML350R04 HPSCSI x3.4-1MB/800, 1 GB Array 370509-xx1	Processor(s)	(1) Intel Xeon 3.4 GHz processor standard (up to 2 supported)
	Cache Memory	Integrated 1MB Level 2 cache
	Standard Memory	1 GB (1 x 1024 MB)
	Network Controller	NC7761 PCI Gigabit NIC (Embedded)
	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)	

ML350T04 NHP SCSI x3.0-1 MB/800, 512 MB 354611-xx2	Processor(s)	(1) Intel Xeon Processor 3.0 GHz standard (up to 2 supported)
	Cache Memory	Integrated 1MB Level 2 cache
	Standard Memory	512 MB (1 x 512 MB)
	Network Controller	NC7761 PCI Gigabit NIC (Embedded)
	Storage Controller	Integrated dual channel Ultra320 SCSI adapter
	Hard Drive	(1) 36.4 GB Ultra320 SCSI 15,000 rpm 1" Drive (up to 4 supported)
	Internal Storage	891.2 GB maximum non hot plug and hot plug SCSI (with optional hot plug SCSI drive cage & hard drives)
	Optical Drive	48x IDE (ATAPI) CD-ROM Drive
	Diskette Drive	1.44 MB Diskette Drive
	Form Factor	Tower (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	HP ProLiant ML350G4 HP-SCSI Rack CTO Chassis (North America)	372508-405
	Includes: NC7761 PCI Gigabit NIC (Embedded) Integrated dual channel Ultra320 SCSI adapter Six Hot Plug 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 Three USB ports 725W Hot-Plug Power Supply 5U Rack Form Factor	
	HP ProLiant ML350G4 HP-SCSI Tower CTO Chassis (North America)	372507-405
	Includes: NC7761 PCI Gigabit NIC (Embedded) Integrated dual channel Ultra320 SCSI adapter Six Hot Plug 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 Three USB ports 725W Hot-Plug Power Supply 5U Tower form factor Keyboard 2-button Mouse	
	HP ProLiant ML350G4 NHP-SCSI Tower CTO Chassis (North America)	372799-405
	Includes: NC7761 PCI Gigabit NIC (Embedded) Integrated dual channel Ultra320 SCSI adapter Four Non 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 Three USB ports 460 W non hot plug power supply 5U Tower form factor Keyboard 2-button Mouse	

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/800-1MB ML350G4 FIO BASE	358344-L21
	Intel X3.2GHz/800-1MB ML350G4 FIO BASE	358345-L21
	Intel X3.4GHz/800-1MB ML350G4 FIO BASE	370513-L21
Base Memory	256 MB Advanced ECC PC2700 DDR SDRAM DIMM Kit (1 x 256 MB)	358346-B21
	512 MB Advanced ECC PC2700 DDR SDRAM DIMM Kit (1 x 512 MB)	358347-B21
	1 GB Advanced ECC PC2700 DDR SDRAM DIMM Kit (1 x 1024 MB)	358348-B21
	2 GB Advanced ECC PC2700 DDR SDRAM DIMM Kit (1 x 2048 MB)	358349-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

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/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS	284688-B21
	64-Bit/133MHz Dual Channel Ultra320 SCSI Adapter	268351-B21
Hard Drives	Ultra320 Non-Hot Plug	
	NOTE: Ultra320 NHP Drives are for use with HP ProLiant ML350 G4 NHP-SCSI Tower CTO Chassis (North America) (PN 372499-405) configurable models only.	
	36.4-GB Ultra320 SCSI 15,000 rpm Universal Hard Drive (1")	357012-B21
	72.8-GB Ultra320 SCSI 10,000 rpm Universal Hard Drive (1")	332751-B21
	146.8-GB Ultra320 SCSI 10,000 rpm Universal Hard Drive (1")	356990-B21
	Ultra320 Hot Plug	
	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

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

HP ProLiant ML350 G4 Unique Options	Hot Plug Redundant Power Supply Option Kit (NA, LA)	358352-001
	Hot Plug Redundant Power Supply Option Kit (AUST)	358352-011
	Hot Plug Redundant Power Supply Option Kit (EURO)	358352-021
	Hot Plug Redundant Power Supply Option Kit (UK)	358352-031
	Hot Plug Redundant Power Supply Option Kit (Japan)	358352-291
	Hot Plug Redundant Power Supply Option Kit (IEC)	358352-B21
	NOTE: PN 358352-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 G4 Second Serial Port Option Kit	338288-B21

ProLiant Essentials Value Pack Software	ProLiant Essentials Integrated Lights-Out Advanced Pack	
	ProLiant Essentials 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 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	
	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	
	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	
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		
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/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

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

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

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
(North America)

Options

Processors	Intel Xeon 3.4 GHz-1MB Processor Option Kit	370513-B21
	Intel Xeon 3.2 GHz-1MB Processor Option Kit	358345-B21
	Intel Xeon 3.0 GHz-1MB Processor Option Kit	358344-B21

Memory (DIMMs)	NOTE: The HP ProLiant ML350 G4 requires interleaved memory configurations when more than one DIMM is installed. Base models ship standard with a single DIMM. To upgrade system memory, DIMMs must be installed in identical pairs.	
	NOTE: Each SDRAM Memory kit contains one (1) DIMM.	
	256 MB Advanced ECC PC2700 DDR SDRAM DIMM Kit (1 x 256 MB)	358346-B21
	512 MB Advanced ECC PC2700 DDR SDRAM DIMM Kit (1 x 512 MB)	358347-B21
	1 GB Advanced ECC PC2700 DDR SDRAM DIMM Kit (1 x 1024 MB)	358348-B21
	2 GB Advanced ECC PC2700 DDR SDRAM DIMM Kit (1 x 2048 MB)	358349-B21

Internal Storage Upgrades	Duplex 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).	
	16X DVD-ROM Drive Option Kit (Carbon)	217053-B21
	HP DVD+R/RW 16X Half Height	383974-B21

Serial Port Kit	HP ProLiant 2nd Serial port option kit	390390-B21
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Hard Drives	Ultra320 – Universal Hot Plug	
	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
	Ultra320 - Non-Hot Plug	
	36.4-GB Ultra320 SCSI 15,000 rpm Universal Hard Drive (1")	357012-B21
	72.8-GB Ultra320 SCSI 10,000 rpm Universal Hard Drive (1")	332751-B21
	146.8-GB Ultra320 SCSI 10,000 rpm Universal Hard Drive (1")	356990-B21
	NOTE: Please see the Wide Ultra320 Universal Hot Plug QuickSpecs for additional technical information on the hard drives Support details, please see the following: http://h18000.www1.hp.com/products/quickspecs/11531_div/11531_div.HTML (Worldwide) http://h18000.www1.hp.com/products/quickspecs/11531_na/11531_na.HTML (North America)	

Options

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
	NOTE: 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
	NOTE: 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
	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 (Smart Array 6400 Series)	
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 (Smart Array 642)		
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 (U320 Adapter)		
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 NC6170 PCI-X Dual Port 1000SX Gigabit Server Adapter	313879-B21
	HP NC7170 PCI-X Dual Port 1000T Gigabit Server Adapter	313881-B21
	HP NC7771 PCI-X 1000T Gigabit Server Adapter	290563-B21
	NOTE: A minimum of 1 GB of memory is required for NC370x adapters, with a maximum of two NC370x adapters permitted in a server.	
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.		
HP High-speed PCI soft modem	DC132D	

Options

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 G4. 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 internal tape drive (Carbonite) DW026A

HP StorageWorks DAT 72 USB external tape drive (Carbonite) DW027A

Internal, Rack-Mount, and Array Module Ultrium Tape Drives

HP StorageWorks Ultrium 232 Internal Tape Drive (Carbonite) DW064A

HP StorageWorks Ultrium 448 Internal Tape Drive (Carbonite) DW016A

HP StorageWorks Ultrium 448 Rack-mount module (carbon) C7492B

NOTE: Single drive installed in a 1U Rack-mount kit.

Internal, Rack-Mount, and Array Module DAT Drives

HP StorageWorks DAT 72 Internal Tape Drive (Carbon) Q1522B

HP StorageWorks DAT 72 Rack-mount module (carbon) A7443A

NOTE: Single drive installed in a 1U Rack-mount kit.

Rack-Mount Tape Drive Enclosures

HP StorageWorks 1U Rack-Mount Kit A7445A

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 DAT 24, DAT 40, DAT 72, DLT VS80, DLT VS160, Ultrium 215, Ultrium 232 and Ultrium 448 tape drives.

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.

Options

Tape Autoloaders

DAT Autoloader

HP StorageWorks DAT 72x6 Tape Autoloader, Internal (Carbon) Q1566A

HP StorageWorks DAT 72x6 Tape Autoloader, External (Carbon) 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
(Worldwide)

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

HP StorageWorks 1/8 Tape Autoloader

1/8 Ultrium 232 Tape Autoloader, Tabletop AF202A

1/8 Ultrium 460 Tape Autoloader, Tabletop AA927A

1/8 Ultrium 960 Tape Autoloader, Tabletop AF204A

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

SSL1016 Ultrium 460 Tape Autoloader 330821-B21

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.

Tape Libraries

HP StorageWorks MSL6000 Tape Library

Ultrium 960 technology

MSL6030, 1 drive, 30 slots, Ultrium 960 AD606A

MSL6030, 1 drive, 30 slots, Ultrium 960, with embedded FC router AD608A

MSL6030, 2 drive, 60 slots, Ultrium 960 AD607A

MSL6030, 2 drive, 60 slots, Ultrium 960, with embedded FC router AD609A

Ultrium 460 technology

MSL6030, 1 drive, 30 slots, Ultrium 460 AD598A

MSL6030, 1 drive, 30 slots, Ultrium 460, with embedded FC router AD600A

MSL6030, 2 drive, 60 slot Ultrium 460 AD599A

MSL6030, 2 drive, 60 slot Ultrium 460, with embedded FC router AD601A

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

Options

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
	<p>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</p> <p>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.</p>	
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
		<p>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</p> <p>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</p>
HP StorageWorks Modular Smart Array 20	HP StorageWorks Modular Smart Array 20	335921-B21
	NOTE: Rack-mountable 12 (SATA) drive enclosure with U320 Host connectivity, redundant power supplies.	
	HP StorageWorks Modular Smart Array 20 Starter Kit	366172-B21
	NOTE: Rack-mountable 12 (SATA) drive enclosure with U320 Host connectivity, redundant power supplies. Includes Smart Array 6402/128 Controller. NOTE: 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
	NOTE: Rack-mountable 14 drive enclosure with single bus, redundant power supplies	
	HP StorageWorks Modular Smart Array 30 DB	302970-B21
	NOTE: Rack-mountable 14 drive enclosure with dual bus, redundant power supplies NOTE: The Modular Smart Array Enclosure 30 Family supports the Wide Ultra3, Ultra320 1" Hot Plug Hard Drives.	

Options

HP StorageWorks Modular Smart Array 500	HP StorageWorks Modular Smart Array 500 Generation 2 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 (North America) http://h18000.www1.hp.com/products/quickspecs/11956_div/11956_div.HTML (Worldwide)	335880-B21
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 (North America) http://h18000.www1.hp.com/products/quickspecs/11033_div/11033_div.HTML (Worldwide)	201723-B22
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
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 (North America) http://h18000.www1.hp.com/products/quickspecs/11935_div/11935_div.html (Worldwide)	364023-B21
	ProLiant Cluster Kit with OpenView Storage Mirroring NOTE: For additional information regarding the ProLiant Cluster Kit with OpenView Storage Mirroring please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11934_na/11934_na.html (North America) http://h18000.www1.hp.com/products/quickspecs/11934_div/11934_div.html (Worldwide)	364025-B21
	HP HA/F200 for Entry SAN Cluster HP HA/F200 for Entry SAN Cluster (Japan) 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 (North America) http://h18000.www1.hp.com/products/quickspecs/11932_div/11932_div.html (Worldwide)	364026-B22 364026-292
	ProLiant Cluster HA/F500 for the Enterprise SAN	364024-B21

Options

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
(North America)

http://h18000.www1.hp.com/products/quickspecs/11933_div/11933_div.html
(Worldwide)

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

Uninterruptible Power Systems – Tower UPS	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	

Uninterruptible Power Systems – HP Rack UPS	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

Options

HP Power Distribution Unit with Power Monitoring	HP Power Distribution Unit 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

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) (NA, Japan) 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) (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) 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) (WW) 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 For North America, need to order cable PN 340653-001.	252663-B24
	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) 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 (North America) http://h18000.www1.hp.com/products/quickspecs/11041_div/11041_div.HTML (Worldwide)	252663-B32

Options

USB Options	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
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
	NOTE: The ProLiant ML3xx Internal to External SCSI Cable Option Kits (PN 159547-B21 and 333370-B21) are supported by the HP ProLiant ML330, HP ProLiant ML350, and HP ProLiant ML370 products.	
Rack Conversion Kit	ProLiant ML350 G4 Tower to Rack Conversion Kit	358350-B21
	Rack Adapter Kit	332815-B21
	NOTE: This kit allows HP rack servers to fit in racks that are 24" wide.	
	Shipping Kit for Round Hole Racks	371482-B21
NOTE: This kit is required if the server will be configured and shipped within a round hole rack.		
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
	NOTE: The stabilizing kit is used to prevent rack from tipping over.	
	Baying Kit for 5642 rack (Graphite Carbon)	374499-B21
NOTE: 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	

Options

NOTE: -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

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_div/10995_div.HTML
 (Worldwide)

http://h18000.www1.hp.com/products/quickspecs/10995_na/10995_na.HTML
 (North America)

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

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
	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

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>.

Options

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>.

HP Serial Console Server Options	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>.

Options

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

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 G4 Memory Configuration

The HP ProLiant ML350 G4 requires memory interleaving when more than one DIMM is installed. For interleaving, DIMMs must be populated 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 ML350 G4 models ship with Advanced ECC** PC2700 DDR SDRAM (running at 333 MHz).

Non-array models include a single 512 MB DIMM.

Array models include a single 1 GB DIMM.

Factory Integrated Models include the memory capacity of your choice.

****NOTE:** Advanced ECC Memory - ECC protection provides the ability to detect and correct single bit memory errors while Advanced ECC extends this coverage to include protection against multiple simultaneous errors on a DIMM. Advanced ECC detects and corrects 4bit memory errors that occur within a single DRAM chip on a DIMM. Advanced ECC algorithms work in combination with industry standard ECC DIMMS.

Common Memory Upgrades from Base Memory

NOTE: Charts do not represent all possible memory configurations.

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

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

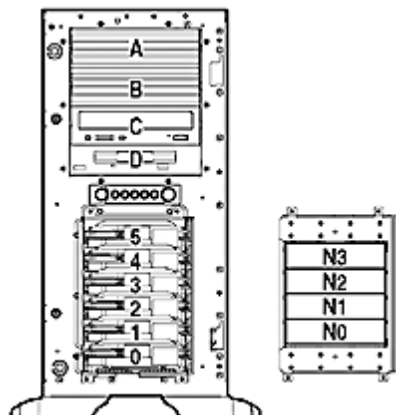
Following are memory options available from HP:

NOTE: All memory kits are single DIMM kits

- 256 MB Advanced ECC PC2700 DDR SDRAM DIMM Memory Kit (1 x 256 MB) 358346-B21
- 512 MB Advanced ECC PC2700 DDR SDRAM DIMM Memory Kit (1 x 512 MB) 358347-B21
- 1 GB Advanced ECC PC2700 DDR SDRAM DIMM Memory Kit (1 x 1024 MB) 358348-B21
- 2 GB Advanced ECC PC2700 DDR SDRAM DIMM Memory Kit (1 x 2048 MB) 358349-B21

NOTE: 2 GB DIMMs are supported in memory slots 1 and 2 only when slots 3 and 4 are also populated with 2 GB DIMMs. In all other instances, 2 GB DIMMs should be installed in slots 3 and 4.

Storage



0 - 5	6 x 1" Hot Plug SCSI Hard Drive Bays
or	
N0 - N3	4 x 1" Non-hot plug SCSI 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
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.

NOTE: Non hot plug SCSI models support a maximum of 4 total drive devices in bays 0-5, A or B.

Storage

Hard Drives

Ultra320 SCSI - Hot Plug Drives

	Quantity Supported	Position Supported	Controller
1-inch	Up to 6	0-5	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: All U320 Universal Hard Drives are backward compatible to U2 or U3 speeds.

Ultra320 SCSI - Non-Hot Plug

	Quantity Supported	Position Supported	Controller
1-inch	Up to 4	N0-N4, A, B	Integrated Dual Channel Ultra320 SCSI Adapter
146.8-GB 10,000 rpm			Smart Array 641 Controller
72.8-GB 10,000 rpm			(NOTE: The Smart Array 641 Controller ships standard with Array models.)
36.4-GB 10,000 rpm			Smart Array 6402/128 Controller
			Smart Array 6404/256 Controller
			Smart Array 642 Controller
			64-Bit/133MHz Dual Channel Ultra320 SCSI Adapter

NOTE: Installation of Non hot plug SCSI drives in the removable media bays (position C or D) requires the purchase of an additional SCSI cable.

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 64-Bit/133-MHz Dual Channel Ultra320 SCSI Adapter 64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS
Modular Smart Array 500 G2	1	External	Please see the Modular Smart Array 500 or 500 G2 QuickSpecs for the latest list of supported HBAs: http://www.hp.com/go/msa500 .

Storage

Modular Smart Array 1500 cs or Modular Smart Array 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_div/11033_div.HTML (Worldwide)
http://h18000.www1.hp.com/products/quickspecs/11033_na/11033_na.HTML (North America)

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 (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 (North America)
<http://h18000.www1.hp.com/products/quickspecs/Division/10809.html> (Worldwide)

	Quantity Supported	Position Supported	Controller
HP StorageWorks Tape Drives, Hot plug DAT 40 Hot Plug DAT 72 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
HP StorageWorks Tape Drives, Internal 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

Storage

HP StorageWorks Tape Drives, External 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
HP StorageWorks Tape Drives, External 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
HP StorageWorks Tape Drives, USB External DAT 24 USB DAT 40 USB DAT 72 USB	1 per USB port	External	USB port
HP StorageWorks Tape Autoloaders, External 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
HP StorageWorks Rack-mount Tape Drive Enclosures 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
HP StorageWorks Tape Libraries, External MSL6000 (Ultrium 960-based) MSL6000 (SDLT 600-based) MSL6000 (Ultrium 460-based) MSL5026S2 (SDLT 320-based) MSL5052S2 (SDLT 320-based)	Please reference the MSL 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	345875-001
Operational Input Voltage Range (V rms)	90 to 264
Frequency Range (Nominal) (Hz)	47 to 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 G4
- Click on: "Power Calculator" link. (You may need to scroll down to see it)

Technical Specifications

System Unit - Hot Plug SCSI Tower	Dimensions (HxWxD) (with feet/bezel)	18.5 x 10.25 x 26 in (46.99 x 26.04 x 66.04 cm)	
	Dimensions (HxWxD) (without feet/bezel)	17.5 x 8.5 x 24 in (44.50 x 21.59 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 (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)	6.5	
	L pAm (dBA)	48	
	Operating (Random Seeks to Fixed Disks)		
	L WAd (BELS)	6.5	
	L pAm (dBA)	48	

Technical Specifications

System Unit - Hot Plug SCSI Rack	Dimensions (HxWxD)	8.61 x19 x 24 in (21.87 x48.26 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)	6.5	
	L pAm (dBA)	48	
	Operating (Random Seeks to Fixed Disks)		
L WAd (BELS)	6.5		
L pAm (dBA)	48		

Technical Specifications

System Unit - Non Hot Plug SCSI Tower	Dimensions (HxWxD) (with feet/bezel)	18.5 x 10.25 x 25.75 in (46.99 x 26.04 x 65.4 cm)	
	Dimensions (HxWxD) (without feet/bezel)	17.5 x 8.5 x 24 in (44.50 x 21.59 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	676W @ 100 VAC
		Rated Input Current	6.9A(100VAC)/3.3A(200VAC)
	Rated Line Frequency	50 to 60 Hz	
	BTU Rating	2,360 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 or 333370-B21, and either of the two SCSI knockouts.)	
	Power Supply Output Power (per power supply)	Rated Steady-State Power 460W	
	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)	46.3	
	Operating (Random Seeks to Fixed Disks)		
	L WAd (BELS)	6.0	
	L pAm (dBA)	46.5	

Technical Specifications

NC7761 PCI Gigabit Server Adapter (embedded)	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 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	Protocol	Ultra320 SCSI
<i>(NOTE: The Smart Array 641 Controller ships standard with the Array Models only.)</i>	SCSI Electrical Interface	Low Voltage Differential (LVD)
	Drives Supported	Up to 6 Ultra 320, 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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