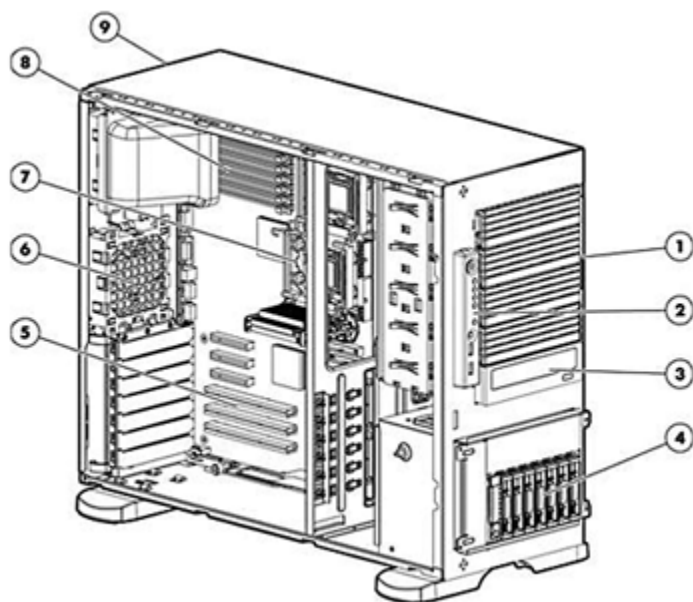
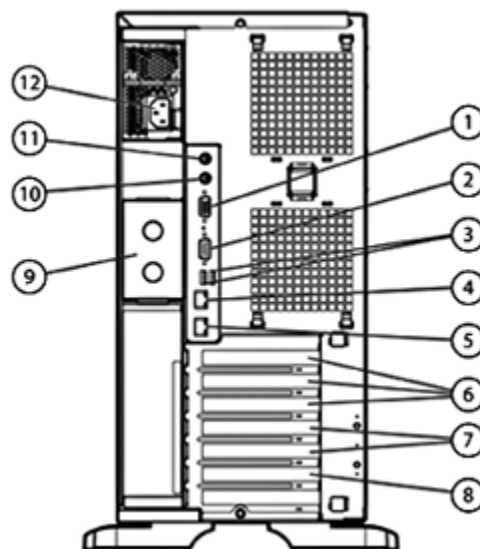


Overview



Front View:

1. Five removable media bays
2. Front display panel; includes power button, UID, two USB 2.0 ports, and system status LED's
3. CD-ROM Drive (Dual-Core models), DVD-ROM Drive (Quad-Core models)
4. Eight SFF (2.5") (shown) or six LFF (3.5") SAS or SATA Hot Plug drive bays
5. Six expansion slots (three PCI Express, three PCI-X)
6. Two system fans standard with support for optional redundant system fans
7. Support for two Intel® Dual-Core or Quad-Core Xeon® 5000 sequence processors
8. Eight PC2-5300 FB-DIMM (DDR2 667) memory sockets
9. Single Hot-Plug power supply standard, optional second redundant supply for availability



Rear View:

1. Monitor port
2. Serial port
3. USB ports
4. Integrated Lights-Out 2 (iLO2) port
5. Network port
6. PCI Express x4
7. PCI-X 64/100
8. PCI-X 64/133
9. Access to add 2nd redundant power supply
10. Mouse port
11. Keyboard port
12. Power

What's New

- Intel higher speed Quad-Core Xeon X5460, low power Quad-Core L5420 and higher speed Dual-Core X5260 Processors

At A Glance

Building on a tradition of excellence, the HP ProLiant family introduces the fifth generation HP ProLiant ML350 server. The HP ProLiant ML350 G5 server provides Multi-Core performance, enterprise level management, and highly available redundant options in a modular server form factor. New for this generation is a smaller and quieter chassis, embedded Smart Array E200i Controller and 5 media bays.

• Processors:

- Quad-Core and Dual-Core Intel® Xeon® processors for blazing performance; systems support up to 2 processors
- 1333/1066/667 MHz front side bus (FSB)



Overview

- Intel® 5000Z chipset
- **Memory:**
 - Eight PC2-5300 Fully Buffered DIMMs (DDR2 667) sockets with online-spare support for cost-effective memory configuration and expansion and 2:1 interleaving
 - Up to 16 GB of memory supported on Dual-Core 5000 and 5100 series
 - Up to 32 GB of memory supported on Dual-Core 5200 series, Quad-Core 5300 and 5400 series
- **Storage Controllers:**
 - Entry Models: HP Smart Array E200i/64MB Controller (integrated SAS/SATA Hot-Plug Controller with RAID 0/1/1+0 support)
 - 128MB BBWC optional upgrade kit for RAID 5 support also available
 - Base Models: HP Smart Array E200i/128 BBWC Controller (RAID 0/1/1+0/5)
- **Internal Drive Support:**
 - Up to eight SFF (2.5") or six LFF (3.5") Hot Plug Serial Attached SCSI (SAS) or Serial-ATA (SATA) hard drives
 - Maximum of 6TB of internal storage capacity (using Hot-Plug SATA drives)
- **Network Controller:**
 - Embedded NC373i Multifunction Gigabit Network Adapter with TCP/IP Offload Engine, including support for Accelerated iSCSI through an optional Licensing Kit
- **Expansion Slots:**
 - Six total expansion slots
 - One 64-bit/133-MHz PCI-X; two 64-bit/100-MHz PCI-X; three x8 PCI Express (x4 speed)
 - Optional PCI-X Expander provides additional two 64-bit/100-MHz PCI-X slots by converting a single PCI Express slot
 - A single x8 PCI Express slot with x8 bus speed can be achieved by attaching the x4/x8 PCIE Bus Expander option kit. (Please see the chart and notes in the Expansion Slots under Standard Features below for more details)
- **USB Ports:**
 - Six USB 2.0 ports: (2) front; (2) rear; (2) internal
- **Integrated Hypervisors:** (Optional)
 - Citrix XenServer virtualization technology
- **Redundancy:**
 - Optional Hot plug redundant power supplies
 - Support for optional redundant system fans
- **Management:**
 - HP Insight Control Environment server management software
 - Integrated Lights-Out 2 featuring Integrated Remote Console with KVM over IP performance over shared network access
 - Support for ROM-Based Setup Utility (RBSU) and redundant ROM
 - Systems Insight Manager, SmartStart, and Automatic Server Recovery 2 (ASR-2)
 - HP Power Meter and Power Regulator for ProLiant, delivering integrated power consumption monitoring and server level, policy based power management for industry leading energy efficiency and savings on system power and cooling costs
- **Deployment/Serviceability:**
 - Optional parallel and second serial port available without using a PCI slot
 - Tool-free chassis entry and component access
 - Tool-free motherboard removal
 - Universal rail solution supporting both square and round hole rack environments
 - Customer Self Repair (CSR): HP products are designed with many CSR parts to minimize repair time and allow for greater flexibility in performing defective parts replacement
- **Warranty:**
 - This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners resellers. 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. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. SATA hard drives have a one-year warranty.
 - **NOTE:** Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also

Overview

designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at: <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.htm>

Standard Features

NOTE: For a brief, printer friendly data sheet that describes this product and informs you of the essential capabilities and specifications, please visit: <http://h71028.www7.hp.com/ERC/downloads/4AA0-6362ENW.pdf>.

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

Processor

One of the following depending on Model

Quad-Core Processors

- Quad-Core Intel® Xeon® Processor X5460 (3.16 GHz, 120 Watts, 1333 FSB)*
- Quad-Core Intel® Xeon® Processor E5440 (2.83 GHz, 80 Watts, 1333 FSB)*
- Quad-Core Intel® Xeon® Processor L5420 (2.50 GHz, 50 Watts, 1333 FSB)*
- Quad-Core Intel® Xeon® Processor E5405 (2.00 GHz, 80 Watts, 1333 FSB)*
- Quad-Core Intel® Xeon® Processor X5355 (2.66 GHz, 120 Watts, 1333 FSB)*
- Quad-Core Intel® Xeon® Processor E5345 (2.33 GHz, 80 Watts, 1333 FSB)*
- Quad-Core Intel® Xeon® Processor E5335 (2.00 GHz, 80 Watts, 1333 FSB)*
- Quad-Core Intel® Xeon® Processor E5430 (2.66 GHz, 80 Watts, 1333 FSB)
- Quad-Core Intel® Xeon® Processor E5420 (2.50 GHz, 80 Watts, 1333 FSB)
- Quad-Core Intel® Xeon® Processor E5410 (2.33 GHz, 80 Watts, 1333 FSB)
- Quad-Core Intel® Xeon® Processor E5320 (1.86 GHz, 80 Watts, 1066 FSB)
- Quad-Core Intel® Xeon® Processor E5310 (1.60 GHz, 80 Watts, 1066 FSB)

Dual-Core Processors

- Dual-Core Intel® Xeon® Processor X5260 (3.33 GHz, 80 Watts, 1333 FSB)*
- Dual-Core Intel® Xeon® Processor E5205 (1.86 GHz, 65 Watts, 1066 FSB)*
- Dual-Core Intel® Xeon® Processor 5160 (3.0 GHz, 80 Watts, 1333 FSB)
- Dual-Core Intel® Xeon® Processor 5150 (2.66 GHz, 65 Watts, 1333 FSB)*
- Dual-Core Intel® Xeon® Processor 5140 (2.33 GHz, 65 Watts, 1333 FSB)
- Dual-Core Intel® Xeon® Processor 5130 (2.00 GHz, 65 Watts, 1333 FSB)
- Dual-Core Intel® Xeon® Processor 5120 (1.86 GHz, 65 Watts, 1066 FSB)
- Dual-Core Intel® Xeon® Processor 5080 (3.73 GHz, 130 Watts, 1066 FSB)
- Dual-Core Intel® Xeon® Processor 5060 (3.2 GHz, 130 Watts, 1066 FSB)
- Dual-Core Intel® Xeon® Processor 5050 (3.0 GHz, 95 Watts, 667 FSB)

* Available via Configure-To-Order only. See Factory Integrated Models section for more information.

Cache Memory

One of the following depending on Model

- 12MB (2 x 6MB) Level 2 cache (5400 series)
- 8MB (2 x 4MB) Level 2 cache (5300 series)
- 6MB (1 x 6MB) Level 2 cache (5200 series)
- 4MB (1 x 4MB) Level 2 cache (5100 series)
- 4MB (2 x 2MB) Level 2 cache (5000 series)

Upgradeability

Upgradeable to 2 processors (4 or 8 cores)

NOTE: Future upgradeable to Xeon® Series 5400/5300 Quad-Core processors (Please contact your regional sales support to determine quad core upgradeability. Some of the earlier shipping models may not support this upgrade). 5100 Dual-Core models are not upgradeable to the 5200 Dual-Core processors.

Standard Features

Chipset Intel® 5000Z Chipset
NOTE: For more information regarding Intel® chipsets, please see the following URL:
<http://www.intel.com/products/server/chipsets/>.

Memory Protection Online spare
 Advanced ECC

Memory Type PC2-5300 Fully Buffered DIMMs (DDR2-667)
 One of the following depending on model
 Standard (Entry Models) 512 MB (1 x 512 MB) on Dual-Core Models
 1 GB (2 x 512 MB) on Quad-Core 5300 series
 1 GB (2 x 512 MB) on Quad-Core 5400 series
 Standard (Base Models) 1 GB (2 x 512 MB) on Dual-Core Models
 1 GB (2 x 512 MB) on Quad-Core 5300 series
 2 GB (2 x 1 GB) on Quad-Core 5400 series
 Maximum (Dual-Core 5000 & 5100 series) 16 GB (8 x 2 GB)
 Maximum (Dual-Core 5200, Quad-Core 5300 & 5400 series) 32 GB (8 x 4 GB)

Network Controller Embedded NC373i Multifunction Gigabit Network Adapter with TCP/IP Offload Engine, including support for Accelerated iSCSI through an optional Licensing Kit

Expansion Slots

Expansion Slot #	Technology	Bus Width	Connector Width*	Bus Number**	Form Factor	Notes
6	PCI Express	x4	x8	15	Standard Height/Length	
5	PCI Express	x4	x8	6	Standard Height/Length	
4	PCI Express	x4	x8	9	Standard Height/Length	
3	64-bit / 100MHz PCI-X	NA	NA	12	Standard Height/Length	PCI-X 100MHz
2	64-bit / 100MHz PCI-X	NA	NA	12	Standard Height/Length	PCI-X 100MHz
1	64-bit / 133MHz PCI-X	NA	NA	20	Standard Height/Length	PCI-X 133MHz

NOTES:

* Default bus assignment. Inserting cards with PCI bridges may alter the actual bus assignment number.

** Slots are enumerated differently based on OS. MS OS's enumerate from lowest to highest Device ID by bus (starting with the lowest bus).



Standard Features

Storage Controller	Entry Models	HP Smart Array E200i/64MB Controller
	Base Models	HP Smart Array E200i/128 BBWC Controller

NOTE: Supports RAID 0/1/1+0 with 64MB of Cache, upgradeable to 128MB with BBWC for RAID 5 support.

Storage	Diskette Drives	None included standard
	Optical Drive <i>One of the following depending on model</i>	Quad-Core 5400 series: 16x SATA DVD-ROM drive Quad-Core 5300 series: 16x PATA DVD-ROM drive Dual-Core: 48x IDE CD-ROM drive NOTE: Quad-Core 5400 series BTO Models are configured with SATA optical drive.
	Hard Drives	None included standard

Maximum Internal Storage <i>One of the following depending on model</i>	Hot Plug LFF (3.5") Serial ATA (SATA)	6TB	6 x 1TB
	Hot Plug LFF (3.5") Serial Attached SCSI (SAS)	6TB	6 x 1TB
	Hot Plug SFF (2.5") SATA	960GB	8 x 120GB
	Hot Plug SFF (2.5") SAS	1.168TB	8 x 146GB

Interfaces	Parallel	Optional parallel port available
	Serial	1 (optional 2nd serial port available)
	Pointing Device (Mouse)	1
	Graphics	1
	Keyboard	1
	Network RJ-45	2 (1 dedicated for iLO 2)
	USB 2.0 Ports	6 (2 front, 2 rear, 2 internal) 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 ES1000, 32MB video standard <ul style="list-style-type: none"> 16 bit color: maximum resolution of 1600 x 1200 32 bit color: maximum resolution of 1280 x 1024 <p>NOTE: Maximum resolution available via iLO 2 remote console is 1280 x 1024.</p>
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Form Factor	Tower or Rack (5U) NOTE: Rack models (and rack conversion kit) support: <ul style="list-style-type: none"> Square or round hole racks 24"- 36" deep, including HP Rack System /E and HP Systems Telco racks with 3rd part option kit from Rack Solutions http://www.racksolutions.com/hp
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Standard Features

HP Insight Control Environment

HP Insight Control Environment delivers foundation management, including remote monitoring, hardware resource deployment, health monitoring, software version control, performance monitoring, vulnerability scanning and patch management, and power management.

HP Insight Control Environment installs and licenses the following components by default using a wizard-based integrated installer:

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

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

- HP Server Migration Pack - Universal Edition
NOTE: HP Server Migration Pack - Universal Edition is licensed separately from the Insight Control Environment Suite.
- HP Open Service Event Manager
- HP Instant Support Enterprise Edition

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

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

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

Server Management Stand Alone Software Product – ProLiant Essentials

HP Systems Insight Manager	HP Systems Insight Manager (HP SIM) provides a unified, secure and extensible standards-based environment to centrally manage servers, storage and other infrastructure devices, (both HP and non-HP) across multiple operating system platforms.
ProLiant Essentials Rapid Deployment Pack	Rapid Deployment Pack (RDP) extends HP Systems Insight Manager with a complete deployment solution for HP ProLiant servers. RDP provides a central location to configure server hardware, deploy Windows, Linux and VMware ESX operating environments and install HP ProLiant Support Pack drivers using images and scripted profiles. For more information, visit: http://www.hp.com/go/rdp .
ProLiant Essentials Server Migration Pack - Universal Edition	Upgrading, replacing, or virtualizing your existing server? Effortlessly transition to new virtual or physical HP ProLiant servers or BladeSystem with automated, accurate and affordable migration of OS, application and data. SMP Universal automates the manual processes required for migrating servers between physical or virtual platforms, whether migrating to VMware or Microsoft virtual machines. SMP Universal allows all of the following migrations: <ul style="list-style-type: none"> ● physical to ProLiant ● physical to virtual ● virtual to virtual ● virtual to ProLiant

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



Standard Features

ProLiant Essentials Performance Management Pack	Performance Management Pack (offered exclusively through the Insight Control suites) – a performance management solution that identifies and explains hardware performance bottlenecks on ProLiant servers and attached options enabling users to better utilize their valuable resources
Integrated Lights-Out Advanced Pack	Upgrades the iLO 2 processor with comprehensive remote control including Virtual KVM remote graphical console, enhanced console sharing and replay, virtual media (floppy, CD/DVD, USB key), virtual folders, and enterprise security (directory services and two-factor authentication).
iLO Power Management Pack	Energy-efficient management software that delivers centralized control, reliable security, and energy savings for your BladeSystem infrastructure. iPMP combines the total control of iLO 2 Advanced in the area of remote management with the energy monitoring and control of the Insight Power Manager to deliver a robust solution capable of full remote control and power management of ProLiant servers through a unified interface within HP Systems Insight Manager.
ProLiant Essentials Accelerated iSCSI Pack	Enables the embedded Multifunction network controller to serve as both a NIC and an iSCSI HBA providing access to SAN storage over the same connection used for networking. Processing of the protocol stack is offloaded to the NIC reducing CPU utilization and greatly improving the speed with which the requests are processed and sent to the network.

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

Core Infrastructure Management

SmartStart	SmartStart is a tool that simplifies server setup, providing a rapid way to deploy reliable and consistent server configurations. For more information, please visit the SmartStart Web site at http://www.hp.com/servers/smartstart . SmartStart version supported (minimum): SmartStart 7.60.
Insight Management Agents	The Insight Management Agents should be installed on all HP servers to present system instrumentation, health and configuration information into HP Systems Insight Manager and the HP System Management Homepage. The HP System Management Homepage aggregates systems data from Insight Management Agents and other HP management tools, providing a consolidated browser-based interface for managing individual servers. Insight Management Agents and The HP System Management Homepage are included on ProLiant Support Packs, and can also be installed using the server profiles provided with the ProLiant Essentials Rapid Deployment Pack For additional information about the Management Agents and the HP System Management Homepage please visit the management Web site at http://www.hp.com/servers/manage .
Subscriber's Choice	Subscriber's Choice Driver and Support Alerts/Notifications is a web-based email subscription service that provides software and driver change notifications for ProLiant products. Sign up at: http://www.hp.com/go/subscriberschoice and customize your profile to receive various new alerts as they become available, on a weekly or monthly basis.

Standard Features

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

HP Serviceguard for Linux (SGLX)

HP Serviceguard for Linux is a high availability clustering solution designed to protect applications and services from a wide variety of software and hardware failures, monitoring the health of each server (node) and quickly responding to failures such as those that affect system processes, system memory, LAN media and adapters, and application processes.

The following is a quick summary of HP Serviceguard for Linux features and support. For the most recent list of Linux distributions & kernels, servers and storage supported with Serviceguard for Linux, see the Serviceguard for Linux Datasheet, available at: <http://www.hp.com/go/sglx/info>.

- Supported Linux Distributions:
 - Red Hat EL 4
 - Red Hat EL 5
 - SUSE SLES10
- Supported Server Platforms
 - HP Integrity BladeSystem to Superdome
 - HP ProLiant BladeSystem p-Class & c-Class
 - HP ProLiant DL
 - HP ProLiant ML
 - IBM System x
 - Dell PowerEdge
 - Sun x64
 - Fujitsu Siemens PRIMERGY
- Hypervisors
 - HP Integrity Virtual Machines
 - VMware ESX
- Application Integration Toolkits
 - HP Serviceguard for Linux Oracle Database Toolkit
 - HP Serviceguard Extension for SAP on Linux (SGeSAP/LX)
 - Free Application Integration Toolkits:
 - Apache
 - MySQL
 - NFS
 - PostgreSQL
 - Samba
 - Tomcat
 - Sendmail
 - Disaster Tolerant Solutions
 - HP Serviceguard for Linux Extended Distance Cluster (XDC) extends cluster distances up to 100 km, utilizes software RAID mirroring for data replication and is storage array independent
 - HP StorageWorks XP/EVA Cluster Extension Software for Linux (CLX) works seamlessly with HP Serviceguard for Linux, HP StorageWorks Continuous Access, and HP Disk Arrays to automate failover and failback between sites
- Software updates are distributed by HP Services to customers with support contracts

NOTE: For additional information on HP Serviceguard for Linux, visit: <http://www.hp.com/go/sglx> or see the HP Serviceguard for Linux QuickSpecs.

NOTE: HP Serviceguard for Linux products for HP ProLiant and select 3rd party x86 class servers include one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: <http://www.hp.com/services/swsupport>.

Standard Features

Industry Standard Compliance	ACPI V2.0 Compliant PCI 2.2 Compliant PXE Support WOL Support PCI-X 1.0a Compliant Novell Certified Microsoft® Logo certifications USB 2.0
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Availability	Optional Hot-Plug, Redundant Power supply Online-Spare Memory Optional Dual Redundant System Fans
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Remote Management	Integrated Lights-Out (iLO 2) Management 2 <ul style="list-style-type: none">• Virtual Text Remote Console (pre-OS only)• Remote Serial Console• Virtual Power Button Control• Virtual Unit ID control• Integrated Remote Console (ActiveX Control client)• Dedicated & full function shared network connectivity with VLAN• Embedded system health• Present power consumption• Browser, command line and scripted access• Automatic IP Configuration via DHCP/DNS/WINS• Industry Standard 128-bit Secure Sockets Layer (SSL) and Secure Shell security (SSH)• Advanced Encryption Standard (AES)/Triple Data Encryption Standard (3DES)• OS independent hardware health status• IML and iLO Event Logging• Support for 12 user accounts with customizable access privilege
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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 SAS hard drives)
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Security	Power-on password Setup password Diskette boot control Parallel and serial interface control Disk configuration lock Power switch security
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Standard Features

Server Power Cords	ProLiant ML servers in a rack-mount configuration no longer ship standard with NEMA power cords that allow connection to 110V US wall outlets in a home or office. These servers are primarily connected to PDU's in data center racks so they now ship standard with only a PDU power cord (416151-B21). If a user wishes to power a ProLiant ML rack-mount server using a 110V receptacle (NEMA-15), the NEMA power cord must be ordered separately. The 12' cord (AF556A) or 6' cord (187335-001) can be purchased online at HP.COM. In a tower configuration, the servers ship standard with a 6' country specific NEMA power cord. If customers require a local power cord, they can check the power cord matrix for the appropriate country specific sku. Please see the following power cord matrix: http://www.hp.com/go/powercordmatrix .
UPS and PDU Power Cord Matrix	Please see the UPS and PDU cable matrix that lists cable descriptions, requirements, and specifications for UPS and PDU units: http://h18004.www1.hp.com/products/servers/proliantstorage/power-protection/index.html
Power Supply	800 Watt-CE Mark Compliant Hot Plug Power Supply (1000 Watt high line) Optional second Power Supply provides redundant capability NOTE: Please see the "Power Specifications" section later in this document for low line and high line requirements.
System Fans	2 fans ship standard, dual redundant fans are optional, 4 fans total supported (does not include power supply or processor heat sink fans)
Required Cabling	For required cabling information, refer to the HP ProLiant ML350 G5 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 2000 Server and Advanced Server Microsoft Windows Server 2003/R2 (Standard, Web, and Enterprise Editions) Microsoft Windows Small Business Server 2003 Microsoft Windows Small Business Server 2003, R2 Microsoft Windows Server 2008 Novell NetWare 6.5/Open Enterprise Server Red Hat Enterprise Linux SUSE Linux Enterprise Server SCO OpenServer 5.0.7/6.0 SCO UnixWare 7.1.3/7.1.4 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 more Linux OS support & certification information, please visit the ProLiant & BladeSystem Server Linux matrix: http://h18004.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 software and drivers available for your server, please select your server: http://www.hp.com/servers/proliantML350 NOTE: For more information on VMware support, 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 G5 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 MSAxxxx, 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.

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

HP Care Pack services include coverage for the HP branded hardware options qualified for the server and purchased at the same time or afterward that are internal to the enclosure. This also includes the 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, and standard warranty terms & conditions apply. For servers or storage systems installed within a rack, service also covers all HP qualified rack options installed within the same rack.

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

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

- **Support** - 3-Year 4-Hour response 24x7 Same Business Day Coverage only
- **Deployment Service** - Installation and Start up only

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

- **Support** - 3-Year Support Plus 24 only

Refer to the information on "Installation & Start-Up" for service on 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, excluding HP holidays.

NOTE: For a complete listing of service offerings and information visit: <http://www.hp.com/services/proliantservices>



Standard Features

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

Models

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

NOTE: Please note that SFF tower or rack models can only be configured with SFF 2.5" SAS or SATA hard drives and LFF tower or rack models can be only configured with LFF 3.5" SAS or SATA hard drives.

<p>HP ML350 G5 Entry Models</p> <p>Tower</p> <p>Quad-Core Models</p> <p>HP ML350T05 E5420 LFF 458239-xx1</p> <p>HP ML350T05 E5410 LFF 458244-xx1</p> <p>HP ML350T05 E5310 LFF 440188-xx1</p> <p>Dual-Core Models</p> <p>HP ML350T05 5130 LFF 416893-xx1</p> <p>HP ML350T05 5120 LFF 416892-xx1</p> <p>Rack</p> <p>Quad-Core Models HP ML350R05 E5420 LFF 458240-xx1</p> <p>Dual-Core Models HP ML350R05 5130 LFF 416894-xx1</p>	<p>Processor(s) One of the following depending on Model</p> <p>Cache Memory</p> <p>Memory One of the following depending on Model</p> <p>Network Controller</p> <p>Storage Controller</p> <p>Hard Drive</p> <p>Internal Storage</p> <p>Optical Drive One of the following depending on Mode</p> <p>PCI-Express Slots</p> <p>Power Supplies</p> <p>Fans</p> <p>Form Factor One of the following depending on Model</p>	<p>(1) Quad-Core Intel® Xeon® E5420 Processor (2.50 GHz, 80 Watts, 1333 FSB)</p> <p>(1) Quad-Core Intel® Xeon® E5410 Processor (2.33 GHz, 80 Watts, 1333 FSB)</p> <p>(1) Quad-Core Intel® Xeon® E5310 Processor (1.6 GHz, 80 Watts, 1066 FSB)</p> <p>(1) Dual-Core Intel® Xeon® 5130 Processor (2.0GHz, 65 Watts, 1333 FSB)</p> <p>(1) Dual-Core Intel® Xeon® 5120 Processor (1.86 GHz, 65 Watts, 1066 FSB)</p> <p>12MB (2x6MB) Level 2 cache - 5400 Series</p> <p>8MB (2 x 4MB) Level 2 cache - 5300 Series</p> <p>4MB (1 x 4MB) Level 2 cache - 5100 Series</p> <p>Quad-Core 5400 Series: 1GB (2 x 512MB)</p> <p>Quad-Core 5300 Series: 1GB (2x512MB)</p> <p>Dual-Core: 512 MB (1 x 512 MB)</p> <p>Embedded NC373i Multifunction Gigabit Server Adapter</p> <p>Smart Array E200i/64 Controller (RAID 0/1/1+0)</p> <p>None Ship Standard; (0/6 LFF)</p> <p>6TB LFF SATA</p> <p>6TB LFF SAS</p> <p>Quad-Core: 16x DVD-ROM standard</p> <p>Dual-Core: 48x CD-ROM standard</p> <p>Six expansion slots (three PCI Express, three PCI-X)</p> <p>800-Watt CE-mark compliant Hot-Plug power supply</p> <p>Optional second power supply provides redundant operation</p> <p>2 fans ship standard, 4 fans total supported (does not include power supply or processor heatsink fans)</p> <p>Tower</p> <p>Rack (5U), (8.75 in/22.25 cm)</p>
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Models

<p>HP ML350 G5 Base Models</p> <p>Tower</p> <p>Quad-Core Models</p> <p>HP ML350T05 E5430 SFF 458238-xx1</p> <p>HP ML350T05 E5420 SFF 458242-xx1</p> <p>HP ML350T05 E5410 SFF 458246-xx1</p> <p>HP ML350T05 E5320 SFF 438730-xx1</p> <p>HP ML350T05 E5310 SFF 434717-xx1</p> <p>Dual-Core Models</p> <p>HP ML350T05 5140 SFF 417605-xx1</p> <p>HP ML350T05 5130 SFF 417536-xx1</p> <p>Rack</p> <p>Quad-Core Models</p> <p>HP ML350R05 E5430 SFF 458237-xx1</p> <p>HP ML350R05 E5420 SFF 458243-xx1</p> <p>HP ML350R05 E5320 SFF 440189-xx1</p> <p>Dual-Core Models</p> <p>HP ML350R05 5140 SFF 417538-xx1</p> <p>HP ML350R05 5130 SFF 417537-xx1</p>	<p>Processor(s) One of the following depending on Model</p> <p>Cache Memory One of the following depending on Model</p> <p>Memory</p> <p>Network Controller</p> <p>Storage Controller</p> <p>Hard Drive</p> <p>Internal Storage</p> <p>Optical Drive One of the following depending on Mode</p> <p>PCI-Express Slots</p> <p>Power Supplies</p> <p>Fans</p> <p>Form Factor One of the following depending on Model</p>	<p>(1) Quad-Core Intel® Xeon® E5430 Processor (2.66 GHz, 80 Watts, 1333 FSB)</p> <p>(1) Quad-Core Intel® Xeon® E5420 Processor (2.50 GHz, 80 Watts, 1333 FSB)</p> <p>(1) Quad-Core Intel® Xeon® E5410 Processor (2.33 GHz, 80 Watts, 1333 FSB)</p> <p>(1) Quad-Core Intel® Xeon® E5320 Processor (1.86 GHz, 80 Watts, 1066 FSB)</p> <p>(1) Quad-Core Intel® Xeon® E5310 Processor (1.6 GHz, 80 Watts, 1066 FSB)</p> <p>(1) Dual-Core Intel® Xeon® 5140 Processor (2.33 GHz, 65 Watts, 1333 FSB)</p> <p>(1) Dual-Core Intel® Xeon® 5130 Processor (2.0 GHz, 65 Watts, 1333 FSB)</p> <p>12MB (2 x 6MB) Level 2 cache - 5400 Series</p> <p>8MB (2 x 4MB) Level 2 cache - 5300 Series</p> <p>4MB (1 x 4MB) Level 2 cache - 5100 Series</p> <p>Quad-Core 5400 Series: 2 GB (2 x 1GB) standard</p> <p>Quad-Core 5300 Series: 1 GB (2 x 512MB) standard</p> <p>Dual-Core: 1 GB (2 x 512MB) standard</p> <p>Embedded NC373i Multifunction Gigabit Server Adapter</p> <p>Smart Array E200i/128 BBWC Controller (RAID 0/1/1+0/5)</p> <p>None Ship Standard; (0/8 SFF)</p> <p>6TB LFF SATA</p> <p>6TB LFF SAS</p> <p>Quad-Core: 16x DVD-ROM standard</p> <p>Dual-Core: 48x CD-ROM standard</p> <p>Six expansion slots (three PCI Express, three PCI-X)</p> <p>800-Watt CE-mark compliant Hot-Plug power supply</p> <p>Optional second power supply provides redundant operation</p> <p>2 fans ship standard, 4 fans total supported (does not include power supply or processor heatsink fans)</p> <p>Tower</p> <p>Rack (5U), (8.75 in/22.25 cm)</p>
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Models

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

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

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

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

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

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

Models	ML350 G5 Tower Models	
	LFF - 3.5" Drives	
	HP ProLiant ML350G5 LFF SAS/SATA Tower CTO Chassis	412645-B21
	Includes:	
	Embedded NC373i Multifunction Gigabit Server Adapter	
	Integrated Smart Array E200i Controller	
	Six Hot-Plug (LFF) SAS/SATA Drive Bays	
	Six expansion slots: one 64-bit/133-MHz PCI-X, two 64-bit/100-MHz PCI-X, and three x4 PCI Express (with x8 connectors)	
	Six USB ports	
	800W Hot-Plug Power Supply	
	Tower Form Factor	
	Keyboard	
	2-button Mouse	
	SFF - 2.5" Drives	
	HP ProLiant ML350G5 SFF SAS/SATA Tower CTO Chassis	395570-B21
	Includes:	
	Embedded NC373i Multifunction Gigabit Server Adapter	
	Integrated Smart Array E200i Controller	
	Eight Hot-Plug (SFF) SAS/SATA Drive Bays	
	Six expansion slots: one 64-bit/133-MHz PCI-X, two 64-bit/100-MHz PCI-X, and three x4 PCI Express (with x8 connectors)	
	Six USB ports	
	800W Hot-Plug Power Supply	
	Tower Form Factor	
	Keyboard	
	2-button Mouse	
	ML350 G5 Rack Models	
	LFF - 3.5" Drives	
	HP ProLiant ML350G5 LFF SAS/SATA Rack CTO Chassis	412644-B21
	Includes:	
	Embedded NC373i Multifunction Gigabit Server Adapter	
	Integrated Smart Array E200i Controller	
	Six Hot-Plug (LFF) SAS/SATA Drive Bays	
	Six expansion slots: one 64-bit/133-MHz PCI-X, two 64-bit/100-MHz PCI-X, and three x4 PCI Express (with x8 connectors)	
	Six USB ports	

Configuration Information - Factory Integrated Models

800W Hot-Plug Power Supply
Rack (5U) Form Factor

SFF - 2.5" Drives

HP ProLiant ML350G5 SFF SAS/SATA Rack CTO Chassis 395569-B21

Includes:

Embedded NC373i Multifunction Gigabit Server Adapter
Integrated Smart Array E200i Controller
Eight Hot-Plug (SFF) SAS/SATA Drive Bays
Six expansion slots: one 64-bit/133-MHz PCI-X, two 64-bit/100-MHz PCI-X, and three x4 PCI Express (with x8 connectors)
Six USB ports
800W Hot-Plug Power Supply
Rack (5U) Form Factor

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

Processors

Quad-Core Processors

Quad-Core Intel® Xeon® Processor X5460 (3.16 GHz, 120 Watts, 1333 FSB) ML350G5 FIO Kit	493457-L21
Quad-Core Intel® Xeon® Processor E5440 (2.83 GHz, 80 Watts, 1333 FSB) ML350G5 FIO Kit	458257-L21
Quad-Core Intel® Xeon® Processor E5430 (2.66 GHz, 80 Watts, 1333 FSB) ML350G5 FIO Kit	458259-L21
Quad-Core Intel® Xeon® Processor L5420 (2.50 GHz, 50 Watts, 1333 FSB) ML350G5 FIO Kit	493459-L21
Quad-Core Intel® Xeon® Processor E5420 (2.50 GHz, 80 Watts, 1333 FSB) ML350G5 FIO Kit	458265-L21
Quad-Core Intel® Xeon® Processor E5410 (2.33 GHz, 80 Watts, 1333 FSB) ML350G5 FIO Kit	458267-L21
Quad-Core Intel® Xeon® Processor E5405 (2.00 GHz, 80 Watts, 1333 FSB) ML350G5 FIO Kit	458269-L21
Quad-Core Intel® Xeon® Processor X5355 (2.66 GHz, 120 Watts, 1333 FSB) ML350G5 FIO Kit	436015-L21
Quad-Core Intel® Xeon® Processor E5345 (2.33 GHz, 80 Watts, 1333 FSB) ML350G5 FIO Kit	436013-L21
Quad-Core Intel® Xeon® Processor E5335 (2.00 GHz, 80 Watts, 1333 FSB) ML350G5 FIO Kit	437444-L21
Quad-Core Intel® Xeon® Processor E5320 (1.86 GHz, 80 Watts, 1066 FSB) ML350G5 FIO Kit	435512-L21
Quad-Core Intel® Xeon® Processor E5310 (1.60 GHz, 80 Watts, 1066 FSB) ML350G5 FIO Kit	435513-L21

Dual-Core Processors

Dual-Core Intel® Xeon® Processor X5260 (3.33 GHz, 80 Watts, 1333 FSB), ML350G5 FIO Kit	493461-L21
Dual-Core Intel® Xeon® Processor E5205 (1.86 GHz, 65 Watts, 1066 FSB) ML350G5 FIO Kit	458725-L21

Base Memory

512 MB FBD PC2-5300 1 x 512 MB Kit Single Rank Kit	413507-B21
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Configuration Information - Factory Integrated Models

1 GB FBD PC2-5300 2 x 512 MB Single Rank Kit	397409-B21
2 GB FBD PC2-5300 2 x 1 GB Dual Rank Kit	397411-B21
2 GB FBD PC2-5300 2 x 1 GB Low Power Single Rank Kit	461826-B21
4 GB FBD PC2-5300 2 x 2 GB Dual Rank Kit	397413-B21
4 GB FBD PC2-5300 2 x 2 GB Low Power Dual Rank Kit	461828-B21
8 GB FBD PC2-5300 2 x 4 GB Dual Rank Kit	397415-B21
8 GB FBD PC2-5300 2 x 4 GB Low Power Dual Rank Kit	466440-B21

NOTE: Memory Option Kits include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, please visit:
<http://h18004.www1.hp.com/products/servers/platforms/energyefficient/>.

Smart Array E200i Controller Cache	HP SA E200 64MB Cache FIO Kit	405102-B21
	NOTE: Select this option for RAID 0/1/1+0	
	128-MB Battery-Backed Write Cache (BBWC)	351580-B21
	NOTE: Select this option for RAID 0/1/1+0/5.	
Optical Drive	CD-RW/DVD-ROM Combo Drive Option Kit	331346-B21
	HP 48X CD-ROM ALL (no screws)	384758-B21
	HP DVD±R/RW 16X Half Height	383974-B21
	16X DVD-ROM Drive Option Kit (Carbon)	217053-B21
	HP Half-Height SATA DVD-ROM Optical Drive	447326-B21
	HP Half-Height SATA DVD RW Optical Drive	447328-B21

Step 3: Choose Additional Factory Integratable Options

Integrated hypervisor (iHV)	Citrix XenServer integrated hypervisor	
	integrated XenServer HP Select Edition 2P/4P	464673-B21
	integrated XenServer HP Enterprise Edition 2P/4P	464674-B21
	NOTE: For additional information and option kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/13018_div/13018_div.html (Worldwide)	
Controllers	HP Smart Array P400/256MB Controller	405132-B21
	NOTE: SAS Controller supporting RAID 0/1/1+0/5.	
	HP Smart Array P600/256 BBWC Controller	337972-B21
	NOTE: SAS Controller supporting RAID 0/1/1+0/5/6.	
	Smart Array 642 Controller	291967-B21
	NOTE: U320 Controller.	
	Smart Array 6402/128 Controller	273915-B21
	NOTE: U320 Controller.	
Smart Array 6404/256 Controller	273914-B21	
NOTE: U320 Controller.		
64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21	
HP Smart Array 6404/512 FIO CNTRLR	452240-B21	

Step 4: Choose Additional Options for Factory Integration

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

Options

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

HP ProLiant ML350 G5 Unique Options	HP Redundant Fan ML350 G5 Kit	409579-B21
	HP PCI-X Expander Kit (2 x 64-bit 100MHz PCI-X slots) NOTE: The HP PCI-X Expander kit converts a single PCI Express slot (slot 6) into two full height, full length 64-bit 100MHz PCI-X slots. NOTE: The HP PCI-X Expander kit can support a maximum of one (1) HP Smart array, HBA, or SCSI PCI-X adapter. Prioritize internal slots for use with PCI-X storage controllers. Please refer to the ML350G5 user guide for additional details.	435670-B21
	HP Tower to Rack Conversion Kit - ML350 G5 Kit NOTE: See "Redundant Options" section below for Hot Plug Redundant Power supplies.	412640-B21

HP Insight Control Management Suites

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

HP Insight Control Environment

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

452148-B22

NOTE: This part number can be purchased as a single license or as multiple licenses with a single activation key. Customer will receive a license entitlement certificate via e-mail. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service. Only available directly from HP and select resellers in the Americas region.

HP Insight Control Management Software Media Kit

436222-B21

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

NOTE: For additional License Kits, please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/12631_div/12631_div.html

Integrated Lights-Out Power Management Pack

HP iLO Power Management Pack, No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates

452145-B21

NOTE: This option kit includes 1 license for iLO Advanced and Insight Power Manager.

NOTE: For additional License Kits, please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/12632_div/12632_div.html

Server Management Stand Alone Software Product - ProLiant Essentials

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

Deploy

ProLiant Essentials Rapid Deployment Pack

ProLiant Essentials Rapid Deployment Pack No Media 1-Server License including 1 year of 24x7 Technical Support and Updates

452151-B21

NOTE: This license allows 1 server to be deployed and managed via RDP. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP



Options

Software Technical Support Service

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

http://h18000.www1.hp.com/products/quickspecs/11053_div/11053_div.html

HP Server Migration Pack - Universal Edition

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

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

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

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

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

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

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

http://h18000.www1.hp.com/products/quickspecs/12855_div/12855_div.html

Monitor

HP Insight Dynamics-VSE

HP Insight Dynamics-VSE with Insight Control Environment, 1-server license including 1 year of 24x7 Technical Support and Updates 483527-B21

NOTE: This license supports HP ProLiant ML/DL servers. Customer will receive a printed license entitlement certificate via physical shipment.

HP Insight Dynamics-VSE without Insight Control Environment, 1-server license including 1 year of 24x7 Technical Support and Updates 483531-B21

NOTE: This license supports HP ProLiant ML/DL and c-Class Blade servers. Customer will receive via email a receipt and link to a license entitlement certificate.

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

http://h18000.www1.hp.com/products/quickspecs/13050_div/13050_div.html

Control

Integrated Lights-Out Select Pack

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

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

http://h18000.www1.hp.com/products/quickspecs/12362_div/12362_div.html

Integrated Lights-Out Advanced Pack

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

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

http://h18000.www1.hp.com/products/quickspecs/10861_div/10861_div.html

Optimize



Options

Accelerated iSCSI Pack

ProLiant Essentials Accelerated iSCSI Pack, No Media, Single License 452679-B21

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

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

http://h18000.www1.hp.com/products/quickspecs/12466_div/12466_div.html

HP Insight Power Manager (IPM)

HP Insight Power Manager, No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates 452677-B21

NOTE: Customers purchasing this upgrade must already have an iLO Advanced or Select license on each managed server. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.

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

http://h18000.www1.hp.com/products/quickspecs/12623_div/12623_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 QuickSpecs for more information.

Processors

Quad-Core Processors

Quad-Core Intel® Xeon® Processor X5460 (3.16 GHz, 120 Watts, 1333 FSB) 493457-B21

Quad-Core Intel® Xeon® Processor E5440 (2.83 GHz, 80 Watts, 1333 FSB) 458257-B21

Quad-Core Intel® Xeon® Processor E5430 (2.66 GHz, 80 Watts, 1333 FSB) 458259-B21

Quad-Core Intel® Xeon® Processor L5420 (2.50 GHz, 50 Watts, 1333 FSB) 493459-B21

Quad-Core Intel® Xeon® Processor E5420 (2.50 GHz, 80 Watts, 1333 FSB) 458265-B21

Quad-Core Intel® Xeon® Processor E5410 (2.33 GHz, 80 Watts, 1333 FSB) 458267-B21

Quad-Core Intel® Xeon® Processor E5405 (2.00 GHz, 80 Watts, 1333 FSB) 458269-B21

Quad-Core Intel® Xeon® Processor X5355 (2.66 GHz, 120 Watts, 1333 FSB) 436015-B21

Quad-Core Intel® Xeon® Processor E5345 (2.33 GHz, 80 Watts, 1333 FSB) 436013-B21

Quad-Core Intel® Xeon® Processor E5335 (2.00 GHz, 80 Watts, 1333 FSB) 437444-B21

Quad-Core Intel® Xeon® Processor E5320 (1.86 GHz, 80 Watts, 1066 FSB) 435512-B21

Quad-Core Intel® Xeon® Processor E5310 (1.6 GHz, 80 Watts, 1066 FSB) 435513-B21

Dual-Core Processors

Dual-Core Intel® Xeon® Processor X5260 (3.33 GHz, 80 Watts, 1333 FSB) 493461-B21

Dual-Core Intel® Xeon® Processor E5205 (1.86 GHz, 65 Watts, 1066 FSB) 458725-B21

Dual-Core Intel® Xeon® Processor 5160 (3.0 GHz, 80 Watts, 1333 FSB) 416891-B21

Dual-Core Intel® Xeon® Processor 5150 (2.67 GHz, 65 Watts, 1333 FSB) 416890-B21

Dual-Core Intel® Xeon® Processor 5140 (2.33 GHz, 65 Watts, 1333 FSB) 416889-B21

Dual-Core Intel® Xeon® Processor 5130 (2.0 GHz, 65 Watts, 1333 FSB) 416888-B21

Dual-Core Intel® Xeon® Processor 5120 (1.86 GHz, 65 Watts, 1066 FSB) 416887-B21

Dual-Core Intel® Xeon® Processor 5110 (1.6 GHz, 65 Watts, 1066 FSB) 416886-B21

Dual-Core Intel® Xeon® Processor 5080 (3.73 GHz, 130 Watts, 1066 FSB) 409397-B21

Dual-Core Intel® Xeon® Processor 5060 (3.2 GHz, 130 Watts, 1066 FSB) 409401-B21

Options

Memory (DIMMs)	512 MB FBD PC2-5300 1 x 512 MB Kit Single Rank Kit	413507-B21
	1 GB FBD PC2-5300 2 x 512 MB Single Rank Kit	397409-B21
	2 GB FBD PC2-5300 2 x 1 GB Dual Rank Kit	397411-B21
	2 GB FBD PC2-5300 2 x 1 GB Low Power Single Rank Kit	461826-B21
	4 GB FBD PC2-5300 2 x 2 GB Dual Rank Kit	397413-B21
	4 GB FBD PC2-5300 2 x 2 GB Low Power Dual Rank Kit	461828-B21
	8 GB FBD PC2-5300 2 x 4 GB Dual Rank Kit	397415-B21
	8 GB FBD PC2-5300 2 x 4 GB Low Power Dual Rank Kit	466440-B21

NOTE: Memory Option Kits include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, please visit: <http://h18004.www1.hp.com/products/servers/platforms/energyefficient/>

Optical Drives	Floppy Drive ML350/370 G5 Kit	409582-B21
	CD-RW/DVD-ROM Combo Drive Option Kit	331346-B21
	HP DVD±R/RW 16X Half Height	383974-B21
	16X DVD-ROM Drive Option Kit (Carbon)	217053-B21
	HP Half-Height SATA DVD-ROM Optical Drive	447326-B21
	HP Half-Height SATA DVD RW Optical Drive	447328-B21

NOTE: Please note that some of the earlier BTO models may not support adding SATA Optical Drives. To ensure compatibility of the SATA Optical Drives, please add additional optical drives only on models with Quad-Core 5400 Series processors.

Serial Port Kit	Parallel/Serial Port ML370/350 G5 Kit	401222-B21
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Hard Drives

SAS Enterprise (ENT) Drives 2.5" Drives, Hot Plug

NOTE: Please note that SFF 2.5" (small form factor) drives can only be installed on tower or rack models with SFF chassis (models).

HP 146GB 3G SAS 10K SFF DP HDD	418367-B21
HP 146GB 3G SAS 10K SFF SP HDD	431958-B21
HP 72GB 3G SAS 15K SFF DP HDD	418371-B21
HP 72GB 3G SAS 15K SFF SP HDD	431935-B21
HP 72GB 3G SAS 10K SFF DP HDD	384842-B21
HP 72GB 3G SAS 10K SFF SP HDD	375861-B21
HP 36GB 3G SAS 15K SFF DP HDD	418369-B21
HP 36GB 3G SAS 15K SFF SP HDD	431933-B21

SAS Enterprise (ENT) Drives 3.5", Hot Plug

NOTE: Please note that LFF 3.5" (large form factor) drives can only be installed on tower or rack models with LFF chassis (models).

HP 450GB 3G 15K 3.5" DP SAS ENT HDD	454232-B21
HP 300GB 3G SAS 15K 3.5" SP HDD	431944-B21
HP 300GB 3G SAS 15K 3.5" DP HDD	416127-B21
HP 146GB 3G SAS 15K 3.5" SP HDD	375872-B21
HP 146GB 3G SAS 15K 3.5" DP HDD	384854-B21
HP 72GB 3G SAS 15K 3.5" SP HDD	375870-B21
HP 72GB 3G SAS 15K 3.5" DP HDD	384852-B21

SAS Midline (MDL) Drives 3.5", Hot Plug



Options

HP 1TB 7.2K 3.5" DP SAS MDL HDD	461137-B21
HP 750GB 7.2K 3.5" DP SAS MDL HDD	461135-B21

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

http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html
(Worldwide)

SFF SATA Hot Plug Entry (ETY) Drives

HP 120GB 1.5G SATA 5.4K SFF ETY HDD	458924-B21
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NOTE: SATA drives have a 1 year warranty. Please see the QuickSpecs for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature:

http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html
(Worldwide)

SATA Midline (MDL) Drives 3.5", Hot Plug

HP 1TB 3G SATA 7.2K 3.5" MDL HDD	454146-B21
HP 750GB 3G SATA 7.2K 3.5" MDL HDD	458930-B21
HP 500GB 3G SATA 7.2K 3.5" MDL HDD	458928-B21
HP 250GB 3G SATA 7.2K 3.5" MDL HDD	458926-B21

NOTE: Server BIOS update is required to support 3G SATA Drives when configured with embedded SATA Controller.

SATA Entry (ETY) Drives 3.5", Hot Plug

HP 160GB 3G SATA 7.2K 3.5" ETY HDD	458945-B21
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NOTE: Server BIOS update is required to support 3G SATA Drives when configured with embedded SATA Controller.

NOTE: SATA hard drives have a 1-year warranty. Please see the QuickSpecs for additional technical information on the hard drives Support details, please see the following:

http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html
(Worldwide)

3.5" SATA Hot Plug Drives

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

NOTE: The previous generation of 1.5G SATA drives are still supported. These drives can be purchased as an option, however they are no longer configurable.

NOTE: SATA hard drives have a 1-year warranty. Please see the QuickSpecs for additional technical information on the hard drives Support details, please see the following:

http://h18000.www1.hp.com/products/quickspecs/11940_div/11940_div.html
(Worldwide)

Serial ATA (SATA)

HP 80GB 1.5G SATA 7.2K 3.5" HDD	349237-B21
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NOTE: SATA drives have a 1 year warranty. Please see the QuickSpecs for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature:

http://h18000.www1.hp.com/products/quickspecs/11940_div/11940_div.html
(Worldwide)

Options

PCI Option	<p>HP x4-x8 PCI-E Bus Expander Option Kit 403724-B21</p> <p>NOTE: The HP x4/x8 PCI Express Bus Expander kit converts 2 x4 PCI Express slots into a single x8 PCI Express slot for high performance x8 PCI Express cards</p>
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Storage Controllers	<p>SAS Controllers</p> <p>Smart Array E200 Controller</p> <p>HP Smart Array E200/128 BBWC Controller 411508-B21</p> <p>128-MB Battery-Backed Write Cache (BBWC) 351580-B21</p> <p>NOTE: Supports the Smart Array E200 Controller and Smart Array 642 Controller.</p> <p>Smart Array E500 Controller</p> <p>HP Smart Array E500/256MB Controller 435129-B21</p> <p>HP SA-P400 and SA-E500 24 In Battery Cable Kit 417836-B21</p> <p>NOTE: This option kit contains a 24" battery cable and adhesive material for installing a batter into the server if a Smart Array P400 is integrated outside of the factory. For all solutions, please refer to the server QuickSpecs and User's Manual for detailed installation instructions.</p> <p>Smart Array P400 Controller</p> <p>HP Smart Array P400/512MB BBWC Controller 411064-B21</p> <p>NOTE: Supports RAID 0/1/1+0/5/6.</p> <p>HP Smart Array P400/256MB Controller 405132-B21</p> <p>NOTE: Supports RAID 0/1/1+0/5.</p> <p>512MB Battery-backed cache (BBWC) upgrade 405148-B21</p> <p>NOTE: for Smart Array P400 Controller.</p> <p>Battery-backed write cache (BBWC) upgrade 383280-B21</p> <p>NOTE: for Smart Array P400 Controller.</p> <p>Smart Array P400 Battery Attach Kit 417836-B21</p> <p>NOTE: This option kit contains a 24" battery cable and adhesive material for installing a battery into the server if a Smart Array P400 is integrated outside of the factory. For all solutions, please refer to the server QuickSpecs and User's Manual for detailed installation instructions.</p> <p>Smart Array P600 Controller</p> <p>HP Smart Array P600/256 BBWC Controller 337972-B21</p> <p>NOTE: Supports external drive attach.</p> <p>512MB Battery-backed write cache (BBWC) upgrade 372538-B21</p> <p>NOTE: For Smart Array P600 Controller.</p> <p>Smart Array P800 Controller</p> <p>HP Smart Array P800/512 BBWC Controller 381513-B21</p> <p>NOTE: Supports external drive attach.</p> <p>NOTE: Please see the following QuickSpecs additional information: http://h18000.www1.hp.com/products/quickspecs/12460_div/12460_div.html (Smart Array E200 Controller) http://h18000.www1.hp.com/products/quickspecs/12700_div/12700_div.html (Smart Array E500 Controller) http://h18000.www1.hp.com/products/quickspecs/12400_div/12400_div.html (Smart Array P400 Controller) http://h18000.www1.hp.com/products/quickspecs/12247_div/12247_div.html (Smart Array P600 Controller) http://h18000.www1.hp.com/products/quickspecs/12616_div/12616_div.html (Smart Array P800 Controller)</p> <p>SAS HBA</p>
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Options

HP SC08Ge Host Bus Adapter	488765-B21
HP SC44Ge Host Bus Adapter	416096-B21
HP 8 Internal Port SAS HBA with RAID	347786-B21

NOTE: Please see the HBA QuickSpecs for additional information:

http://h18004.www1.hp.com/products/quickspecs/13082_div/13082_div.html
(SC08Ge HBA)

http://h18004.www1.hp.com/products/quickspecs/12617_div/12617_div.html
(SC44Ge HBA)

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

SCSI Controllers for External Drive/Storage Support

Smart Array 6402/128 Controller	273915-B21
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NOTE: Ultra320 SCSI.

Smart Array 6404/256 Controller	273914-B21
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NOTE: Ultra320 SCSI.

Smart Array 642 Controller	291967-B21
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NOTE: Ultra320 SCSI.

128MB Battery-Backed Write Cache (BBWC)	351580-B21
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NOTE: Supports the Smart Array E200 Controller and Smart Array 642 Controller.

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

HP SC11Xe Host Bus Adapter	412911-B21
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NOTE: Supports external drive attach.

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/11943_div/11943_div.html
(Single Channel Ultra320 SCSI HBA)

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

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

http://h18000.www1.hp.com/products/quickspecs/12566_div/12566_div.html
(SC11Xe HBA)

Options

Communications	HP NC110T PCI Express Gigabit Server Adapter	434905-B21
	NOTE: Does not support Windows 2000.	
	HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
	HP NC364T PCI Express Quad Port Gigabit Server Adapter	435508-B21
	NOTE: Does not support Windows 2000.	
	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
	NOTE: Supported on a full length-full height slot only.	
	HP NC510F PCIe 10 Gigabit Server Adapter	414126-B21
NOTE: A minimum of 1 gigabyte (1 GB) of server memory is required per each NC510F adapter.		
HP NC510C PCIe 10 Gigabit Server Adapter	414129-B21	
NOTE: A minimum of 1 gigabyte (1 GB) of server memory is required per each NC510C adapter.		
HP NC7170 PCI-X Dual Port 1000T Gigabit Server Adapter	313881-B21	
Agere 06 PCI Hi-Speed 56K SftMd	440519-B21	

Redundant Options	Hot Plug Redundant Power Supply 350/370/380 G5 AU Kit	399771-011
	Hot Plug Redundant Power Supply 350/370/380 G5 EU Kit	399771-021
	Hot Plug Redundant Power Supply 350/370/380 G5 JP Kit	399771-291
	Hot Plug Redundant Power Supply 350/370/380 G5 Worldwide Kit	399771-B21
	Hot Plug Redundant Power Supply 350/370/380 G5 UK Kit	399771-031
	Hot Plug Redundant Power Supply 350/370/380 G5 US Kit	399771-001
	Redundant Fan ML350 G5 Kit	409579-B21

Tape Drives

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

DAT 160 USB Internal Tape Drive for ProLiant	EH976A
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SAS Tape Drives

NOTE: For the ML350 G5, HP recommends purchasing the HP SC44Ge HBA (416096-B21) for a dedicated SAS HBA for tape.

HP StorageWorks DAT 160 SAS Internal Tape Drive	Q1587A
HP StorageWorks LTO-2 Ultrium 448 SAS Internal Tape Drive	DW085A
HP LTO-3 Ultrium 920 SAS Internal Tape Drive for ProLiant	EH978A
HP StorageWorks LTO-4 Ultrium 1760 SAS Internal Tape Drive	EH919A

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

SCSI Tape Drives

NOTE: For the ML350 G5, HP recommends purchasing the HP 64-Bit/133-MHz Single Channel Ultra320 SCSI HBA (374654-B21) for a dedicated SCSI HBA for tape.

HP StorageWorks LTO-2 Ultrium 448 SCSI Internal Tape Drive (Carbonite)	DW016A
HP LTO-3 Ultrium 920 SCSI Internal Tape Drive for ProLiant	EH977A
HP StorageWorks LTO-4 Ultrium 1760 SCSI Internal Tape Drive	EH921A

Options

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

http://h18006.www1.hp.com/products/quickspecs/11739_div/11739_div.html
(Worldwide)

http://h18006.www1.hp.com/products/quickspecs/12128_div/12128_div.html
(Worldwide)

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

Rack-Mount Tape Drive Enclosures

HP StorageWorks 1U SCSI Rack-Mount kit A7445B

NOTE: The 1U Rack-Mount Kit can support up to (2) half-height tape drives and is compatible with multiple Single-Ended and LVD SCSI tape drives including the DAT 40, DAT 72, DAT 160, LTO-1 Ultrium 232, LTO-2 Ultrium 448, LTO-3 Ultrium 920 and LTO-4 Ultrium 1760 tape drives.

HP StorageWorks 1U USB Rack-Mount Kit A8007A

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

HP StorageWorks 1U SAS Rack-Mount Kit AE459A

NOTE: The 1U SAS Rack-Mount Kit can support up to (2) half-height tape drives and is compatible with the LTO-2 Ultrium 448 SAS, LTO-3 Ultrium 920 SAS and LTO-4 Ultrium 1760 SAS tape drives.

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

http://h18000.www1.hp.com/products/quickspecs/10854_div/10854_div.html
(Worldwide)

Disk-Based Backup

RDX Removable Disk Backup

HP StorageWorks RDX160 Internal Removable Disk Backup System AJ765A

NOTE: 160GB of Disk Storage.

HP StorageWorks RDX320 Internal Removable Disk Backup System AJ767A

NOTE: 320GB of Disk Storage.

NOTE: Please see the HP RDX Removable Disk Backup System QuickSpecs for additional information:

http://h18000.www1.hp.com/products/quickspecs/13036_div/13036_div.html

D2D Backup

HP StorageWorks D2D120 Backup System EH884A

NOTE: 2TB of Disk Storage.

HP StorageWorks D2D120 Backup System with Data Protector Express EH924A

Software Kit

NOTE: 2TB of Disk Storage.

HP StorageWorks D2D130 Backup System EH950A

NOTE: 3TB of Disk Storage.

HP StorageWorks D2D130 Backup System with Data Protector Express EH951A

Software Kit

NOTE: 3TB of Disk Storage.

HP StorageWorks D2D130 Backup System with LTO-3 Ultrium 920 SAS Tape EH952A

Drive

NOTE: 3TB of Disk Storage.

HP StorageWorks D2D2503i Backup System EH945A

NOTE: 3TB of Disk Storage.

HP StorageWorks D2D4004i Backup System EH938A

NOTE: 4.5TB of Disk Storage.

Options

NOTE: Please see the HP D2D Backup Systems QuickSpecs for additional information: <http://www.hp.com/go/d2d>.

Tape Autoloaders

HP StorageWorks DAT Autoloader

HP StorageWorks DAT 72x10 tape Autoloader AE313B

HP StorageWorks 1/8 G2 Tape Autoloader

HP StorageWorks 1/8 G2 LTO-4 Ultrium 1760 SAS Tape Autoloader AK377A

HP StorageWorks 1/8 G2 LTO-4 Ultrium 1760 SCSI Tape Autoloader AJ816A

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

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

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

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

HP StorageWorks 1/8 G2 Tape Autoloader Rack Kit AH166A

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

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

Tape Libraries

HP StorageWorks MSL2024 Tape Library

HP StorageWorks MSL2024 1 LTO-4 Ultrium 1840 SCSI Drive Library AJ033A

HP StorageWorks MSL2024 1 LTO-4 Ultrium 1840 4GB FC Library AJ034A

HP StorageWorks MSL2024 1 LTO-4 Ultrium 1760 SAS Drive Library AK378A

HP StorageWorks MSL2024 1 LTO-4 Ultrium 1760 SCSI Drive Library AJ817A

HP StorageWorks MSL2024 1 LTO-3 Ultrium 960 SCSI Drive Library AG115A

HP StorageWorks MSL2024 1 LTO-3 Ultrium 960 4GB FC Library AG326B

HP StorageWorks MSL2024 1 LTO-3 Ultrium 920 SAS Drive Library AH559A

HP StorageWorks MSL2024 1 LTO-3 Ultrium 920 SCSI Drive Library AH169A

HP StorageWorks MSL2024 1 LTO-2 Ultrium 448 SCSI Drive Library AG116A

HP StorageWorks MSL4048 Tape Library

HP StorageWorks MSL4048 1 LTO-4 Ultrium 1840 SCSI Drive Library AJ035A

HP StorageWorks MSL4048 1 LTO-4 Ultrium 1840 4GB FC Library AJ036A

HP StorageWorks MSL4048 2 LTO-4 Ultrium 1760 SAS Drive Library AK380A

HP StorageWorks MSL4048 2 LTO-4 Ultrium 1760 SCSI Drive Library AJ818A

HP StorageWorks MSL4048 1 LTO-3 Ultrium 960 SCSI Drive Library AG322A

HP StorageWorks MSL4048 1 LTO-3 Ultrium 960 4GB FC Library AG324B

HP StorageWorks MSL4048 1 LTO-3 Ultrium 920 SAS Drive Library AH560A

HP StorageWorks MSL4048 1 LTO-3 Ultrium 920 SCSI Drive Library AH171A

HP StorageWorks MSL4048 1 LTO-2 Ultrium 448 SCSI Drive Library AG320A

NOTE: Please reference the MSL 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

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. NOTE: The Modular Smart Array Enclosure 20 Family supports the SATA 1.5Gb/s 3.5" Hot Plug Hard Drives.	335921-B21
HP StorageWorks Modular Smart Array 50	HP StorageWorks Modular Smart Array 50 Enclosure 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_div/12245_div.html (Worldwide)	364430-B21
HP StorageWorks Modular Smart Array 60	HP StorageWorks 60 Modular Smart Array Enclosure NOTE: Please see the Modular Smart Array 60 QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at: http://h18000.www1.hp.com/products/quickspecs/12627_div/12627_div.html (Worldwide)	418408-B21
HP StorageWorks Modular Smart Array 70	HP StorageWorks 70 Modular Smart Array Enclosure NOTE: Please see the Modular Smart Array 70 QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at: http://h18000.www1.hp.com/products/quickspecs/12652_div/12652_div.html (Worldwide)	418800-B21
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_div/11956_div.html (Worldwide)	335880-B21
HP StorageWorks 2000sa Modular Smart Array	HP 2012sa Single Controller Modular Smart Array HP 2012sa Dual Controller Modular Smart Array NOTE: Please see the Modular Smart Array 2000sa QuickSpecs for additional options and configuration information at: http://h18000.www1.hp.com/products/quickspecs/13045_div/13045_div.html (Worldwide)	AJ752A AJ753A

Options

High Availability Cluster Options

HP Serviceguard for Linux

HP Serviceguard Linux for HP ProLiant/x86 Servers 463831-B21
 Licensed per physical server
 Includes media and One Year 24x7 Software Support & Updates

HP Serviceguard Linux Oracle Database Toolkit for HP ProLiant/x86 Servers 463833-B21
 Licensed per cluster
 Includes media and One Year 24x7 Software Support & Updates

HP Serviceguard Extension for SAP on Linux for HP ProLiant/x86 Servers 463834-B21
 Licensed per physical server
 Includes media and One Year 24x7 Software Support & Updates

HP Serviceguard Linux Extended Distance Cluster (XDC) for HP ProLiant/x86 Servers 463835-B21
 Licensed per physical server
 Includes media and One Year 24x7 Software Support & Updates

NOTE: For a detailed list of supported configuration/certification options for HP Serviceguard for Linux please refer to the HP Serviceguard for Linux Certification Matrix at: <http://www.hp.com/go/sglx/info>

NOTE: HP Serviceguard for Linux products running on x86 platforms now include one year of 24 x 7 Software Technical Support and Updates. Please see the Support Information section of the HP Serviceguard for Linux QuickSpecs for details.

NOTE: For additional information including a complete list of Product Numbers for HP Serviceguard for Linux, please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11518_div/11518_div.html (Worldwide)

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
HP StorageWorks 8Gb Simple SAN Connection Kit	AK241A
HP StorageWorks 8/20q Fibre Channel Switch	AK242A
HP StorageWorks 81E 8Gb SP PCI-e FC HBA	AJ762A
HP 82E 8Gb Dual-port PCI-e FC HBA	AJ763A
HP 82Q 8Gb Dual Port PCI-e FC HBA	AJ764A

Options

Uninterruptible Power Systems – Tower	HP, T1000 UPS NA	AF403A
	HP, T1000 UPS JPN	AF404A
	HP, T1000 UPS INTL	AF405A
	HP, T1500 UPS NA	AF406A
	HP, T1500 UPS JPN	AF407A
	HP, T1500 UPS INTL	AF408A
	HP, R/T 2200 UPS NA	AF409A
	HP, R/T 2200 UPS JPN	AF410A
	HP, R/T 2200 UPS INTL	AF411A

Uninterruptible Power Systems - Rack	HP, R1.5kVA UPS, 1U, NA	AF419A
	HP, R1.5kVA UPS, 1U, INTL	AF418A
	HP, R1.5kVA UPS, 1U, JPN/TW	AF421A
	HP R3000 VA UPS, 2U, DTC, INTL	AF414A
	HP R3000 VA UPS, 2U, L5-30, NA	AF422A
	HP R3000 VA UPS, 2U, L6-20, NA	AF423A
	HP R3000 VA UPS, 2U, L6-20, JPN	AF424A
	HP R3000 VA UPS, 2U, L5-30, JPN	AF425A
	HP R5500 VA UPS, INTL	AF416A
HP R5500 VA UPS, NA/JPN	AF426A	

HP Monitored Power Distribution Unit (PDU)	HP Monitored Power Distribution Unit: Full Rack Version	
	17.3 kVA Monitored PDU Model S2324	AF503A
	8.6 kVA Monitored PDU Model S1324	AF504A
	16.6 kVA Monitored PDU Model S2140	AF505A
	8.3 kVA Monitored PDU Model S1140	AF506A
	22 kVA Monitored PDU Model S2316	AF507A
	11 kVA Monitored PDU Model S1316	AF508A
	14.7 kVA Monitored PDU Model S2132	AF509A
	7.3 kVA Monitored PDU Model S1132	AF510A
	4.9kVA Monitored PDU model S124	AF914A
7.3kVA Monitored PDU model S132	AF915A	

Options

Modular PDUs 1U/0U (Up to 32 outlets) NOTE: 1U/0U mounting brackets shipped with the unit (optimized for 10000 and 9000 series racks).	3.6kVA Model - mPDU, 16A, High (WW)	252663-B24
	2.8 kVA Model - mPDU, 24A, Low (NA/JPN)	252663-D71
	4.9kVA Model - mPDU, 24A, High (NA/JPN)	252663-D72
	7.3kVA Model - mPDU, 32A, High (INT'L)	252663-B31
	8.3kVA Model - mPDU, 40A, High (WW)	252663-B21
	8.3kVA Model - mPDU, 40A, High (power cord attached) (NA/JPN)	252663-D73
	9.2kVA Model - mPDU, 40A, High (power cord attached) (INTL)	252663-B32
	8.3kVA Model - mPDU 40A, High (core only) (NA/JPN)	252663-D75
	9.2kVA Model - mPDU 40 A, High (core only) (Int'l)	252663-B34
	8.3kVA Model - mPDU 32A, High (core only) (Int'l)	252663-B33
	4.9kVA Model - mPDU 24A, High (core only) (NA/JPN)	252663-D74
	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_div/11041_div.html (Worldwide)	

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
	HP 1GB USB 2.0 Floppy Drive Key	442085-B21
	HP 256MB USB 2.0 Floppy Drive Key	442084-B21

Rack Conversion Kit	HP ML350 G5 Tower to Rack Conversion Kit	412640-B21
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HP Rack 5000 Series (Graphite Metallic)	HP 5642 Rack-Unassembled	358254-B21
	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_div/12074_div.html (Worldwide) NOTE: For additional information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower .	

Options

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
	10622 G2 (22U) Rack Cabinet - Pallet	AF021A
	10622 G2 (22U) Rack Cabinet - Shock Pallet	AF022A
	10842 G2 (42U) 800mm Wide Rack Cabinet - Pallet	AF041A
	10842 G2 (42U) 800mm Wide Rack Cabinet - Shock Pallet	AF042A
	10647 G2 (47U) Rack Cabinet - Pallet	AF031A

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_div/12402_div.html
(Worldwide)

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

HP Rack 10000 Series (Graphite Metallic)	HP S10614 (14U) Rack Cabinet - Shock Pallet	292302-B22
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NOTE: xxxxxx-B22 (shock pallet) used to ship racks with equipment installed (by custom systems, VARs and Channels).

NOTE: It is mandatory to use a shock pallet in order to ship racks with equipment installed. Not all 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)

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

Options

Keyboards and Monitors

TFT7600 Rackmount Keyboard Monitor US	AG052A
TFT7600 Rackmount Keyboard Monitor UK	AG053A
TFT7600 Rackmount Keyboard Monitor GR	AG054A
TFT7600 Rackmount Keyboard Monitor FR	AG055A
TFT7600 Rackmount Keyboard Monitor IT	AG056A
TFT7600 Rackmount Keyboard Monitor SP	AG057A
TFT7600 Rackmount Keyboard Monitor DEN	AG058A
TFT7600 Rackmount Keyboard Monitor NOR	AG059A
TFT7600 Rackmount Keyboard Monitor SE/FI	AG060A
TFT7600 Rackmount Keyboard Monitor SWI	AG061A
TFT7600 Rackmount Keyboard Monitor PORT	AG062A
TFT7600 Rackmount Keyboard Monitor BEL	AG063A
TFT7600 Rackmount Keyboard Monitor JPN2	AG064A
TFT7600 Rackmount Keyboard Monitor RUS	AG065A
TFT7600 Rackmount Keyboard Monitor INTL	AG066A
1U Rackmount Keyboard with USB, US	AG072A
1U Rackmount Keyboard with USB, UK	AG073A
1U Rackmount Keyboard with USB, GR	AG074A
1U Rackmount Keyboard with USB, FR	AG075A
1U Rackmount Keyboard with USB, ITL	AG076A
1U Rackmount Keyboard with USB, SP	AG077A
1U Rackmount Keyboard with USB, DEN	AG078A
1U Rackmount Keyboard with USB, NOR	AG079A
1U Rackmount Keyboard with USB, SE/FI	AG080A
1U Rackmount Keyboard with USB, SWI	AG081A
1U Rackmount Keyboard with USB, PORT	AG082A
1U Rackmount Keyboard with USB, BEL	AG083A
1U Rackmount Keyboard with USB, JPN2	AG084A
1U Rackmount Keyboard with USB, RUS	AG085A
1U Rackmount Keyboard with USB, INTL	AG086A

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

Options

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
	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 1x4 Console Switch	AF611A	
PS2 Server Console Cable, 6 ft, 2 pack	AF612A	
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.		

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	

Options

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

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

HP ProLiant ML350 G5 Memory Configuration

The HP ProLiant ML350 G5 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 G5 models ship with PC2-5300 Fully Buffered DIMMs (DDR2-667). Entry models include a single 512 MB DIMM (Dual-Core) or two 512 MB DIMMs (Quad-Core). Base models include two 512 MB DIMMs (1 GB total memory) or two 1 GB DIMMs (2 GB total memory). Factory Integrated Models include the memory capacity of your choice.

Common Memory Configuration

Valid DIMM pair combinations use slots 1/5, slots 2/6, slots 3/7, and slots 4/8. Maximum supported memory is 16 GB for Dual-Core 5000 and 5100 series models and 32 GB on Quad-Core 5300 and 5400 series models.

NOTE: Chart does not represent all possible memory configurations.

Memory		Slot							
		1A	2B	3C	4D	5A	6B	7C	8D
Standard	1 GB	512 MB	Empty	Empty	Empty	512 MB	Empty	Empty	Empty
Optional	13 GB	512 MB	2 GB	2 GB	2 GB	512 MB	2 GB	2 GB	2 GB
Maximum	32 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB

Following are memory options available from HP:

512 MB FBD PC2-5300 1 x 512 MB Kit Single Rank Kit	413507-B21
1 GB FBD PC2-5300 2 x 512 MB Single Rank Kit	397409-B21
2 GB FBD PC2-5300 2 x 1 GB Dual Rank Kit	397411-B21
2 GB FBD PC2-5300 2 x 1 GB Low Power Single Rank Kit	461826-B21
4 GB FBD PC2-5300 2 x 2 GB Dual Rank Kit	397413-B21
4 GB FBD PC2-5300 2 x 2 GB Low Power Dual Rank Kit	461828-B21
8 GB FBD PC2-5300 2 x 4 GB Dual Rank Kit	397415-B21
8 GB FBD PC2-5300 2 x 4 GB Low Power Dual Rank Kit	466440-B21

NOTE: Memory Option Kits include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, please visit: <http://h18004.www1.hp.com/products/servers/platforms/energyefficient/>.

Memory

Online spare memory configuration

FBDIMMs can either be single-rank or dual-rank. Certain FBDIMM configuration requirements are based on these classifications. A dual-rank FBDIMM is similar to having two separate FBDIMMs, or ranks, on the same module. Although only a single FBDIMM module, a dual-rank FBDIMM acts as two separate FBDIMMs.

In online spare mode, a single rank of memory acts as the spare memory. For single-rank FBDIMMs, the entire FBDIMM acts as the spare memory. For a dual-rank FBDIMM, only half of the FBDIMM acts as the spare memory while the other half is available for operating system and application usage.

Online spare FBDIMM configuration requirements (in addition to general configuration requirements):

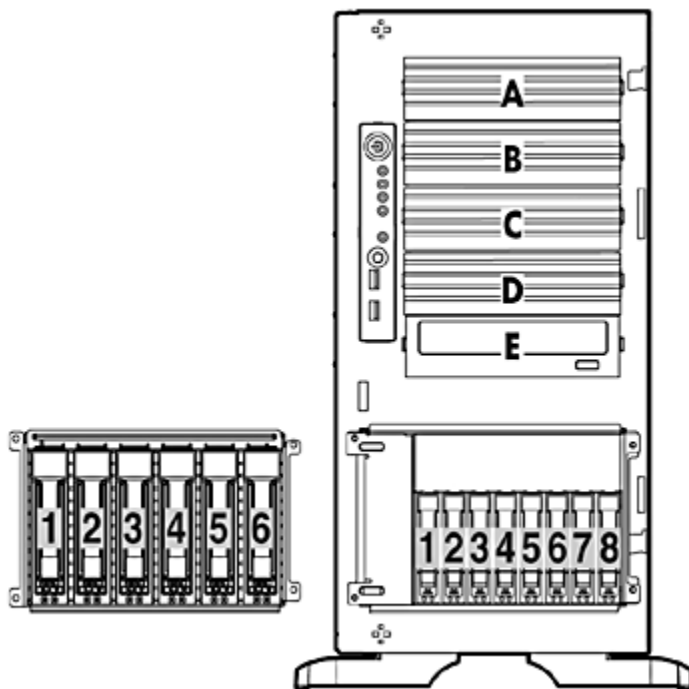
- When only bank A is being used, it must be fully populated with dual-rank FBDIMMs.
- For optimum memory usage, HP recommends all FBDIMMs be the same size with the same HP part number. If different sized FBDIMMs are used, a portion of the installed memory may not be utilized.

In online spare mode, FBDIMMs must be populated as specified in the following table:

- Configuration 1 (Bank A only) is only supported if using bank A, populated with dual-rank FBDIMMs.
- After installing FBDIMMs, use RBSU to configure the system for online spare memory support.

Bank A 1A and 5A	Bank B 2B and 6B	Bank C 3C and 7C	Bank D 4D and 8D
X	—	—	—
X	X	—	—
X	X	X	X

Storage



1 - 6 6 x 3.5" (LFF) Hot-Plug SAS/SATA hard drive bays

Or

1 - 8 8 x 2.5" (SFF) Hot-Plug SAS/SATA hard drive bays

A,B,C,D Available half height media bays

E Optical Drive

Drive Support

	Quantity Supported	Position Supported	Controller
Removable Media			
1.44-MB Diskette Drive	Up to 1	A, B, C, D, E	Integrated SATA Controller
IDE (ATAPI) CD-ROM Drive	Up to 1	A, B, C, D, E	Integrated SATA Controller
HP DVD±R/RW 16X Half Height	Up to 1	A, B, C, D, E	Integrated SATA Controller
DVD-ROM Drive Option Kit	Up to 1	A, B, C, D, E	Integrated SATA Controller
HP Half-Height SATA DVD-ROM Optical Drive	Up to 1	A, B, C, D, E	Integrated SATA Controller
HP Half-Height SATA DVD RW Optical Drive	Up to 1	A, B, C, D, E	Integrated SATA Controller

Hard Drives

SAS Enterprise (ENT) Drives 2.5" Drives, Hot Plug

	Quantity Supported	Position Supported	Controller
146GB 3G SAS 10K SP	Up to 8 SFF	1-8	HP Smart Array E200i/64MB Controller
146GB 3G SAS 10K DP			HP Smart Array E200i/128 BBWC Controller
72GB 3G SAS 10K SP			HP Smart Array E500/256MB Controller
72GB 3G SAS 10K DP			HP Smart Array P400/256MB Controller
72GB 3G SAS 15K SP			HP Smart Array P400/512MB BBWC Controller
72GB 3G SAS 15K DP			HP Smart Array P600/256 BBWC Controller
36GB 3G SAS 15K SP			HP Smart Array P800/512 BBWC Controller
36GB 3G SAS 15K DP			HP 6-Port SATA RAID Controller

Storage

SAS Enterprise (ENT) Drives 3.5", Hot Plug

	Quantity Supported	Position Supported	Controller
450GB 3G 15K 3.5" DP ENT	Up to 6 LFF	1-6	HP Smart Array E200i/64MB Controller HP Smart Array E200i/128 BBWC Controller
300GB 3G SAS 15K SP			HP Smart Array E500/256MB Controller
300GB 3G SAS 15K DP			HP Smart Array P400/256MB Controller
146GB 3G SAS 15K SP			HP Smart Array P400/512MB BBWC Controller
146GB 3G SAS 15K DP			HP Smart Array P600/256 BBWC Controller
72GB 3G SAS 15K SP			HP Smart Array P800/512 BBWC Controller
72GB 3G SAS 15K DP			HP 6-Port SATA RAID Controller

SAS Midline (MDL) Drives 3.5", Hot Plug

	Quantity Supported	Position Supported	Controller
1TB 7.2K 3.5" DP MDL	Up to 6 LFF	1-6	HP Smart Array E200i/64MB Controller HP Smart Array E200i/128 BBWC Controller
750GB 7.2K 3.5" DP MDL			HP Smart Array E500/256MB Controller HP Smart Array P400/256MB Controller
			HP Smart Array P400/512MB BBWC Controller HP Smart Array P600/256 BBWC Controller
			HP Smart Array P800/512 BBWC Controller HP 6-Port SATA RAID Controller

SFF SATA Hot Plug Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
120GB 1.5G 5.4K SFF ETY	Up to 8	1-8	HP Smart Array E200i/64MB Controller HP Smart Array E200i/128 BBWC Controller
			HP Smart Array E500/256MB Controller HP Smart Array P400/256MB Controller
			HP Smart Array P400/512MB BBWC Controller HP Smart Array P600/256 BBWC Controller
			HP Smart Array P800/512 BBWC Controller HP 6-Port SATA RAID Controller

NOTE: HP Systems Insight Manager should not be used to view the status of SATA hard drives and SATA RAID configurations.

SATA Midline (MDL) Drives (3.5"), Hot Plug

	Quantity Supported	Position Supported	Controller
1TB 3G SATA 7.2K MDL	Up to 6	1-6	HP Smart Array E200i/64MB Controller HP Smart Array E200i/128 BBWC Controller
750GB 3G SATA 7.2K MDL			HP Smart Array E500/256MB Controller HP Smart Array P400/256MB Controller
500GB 3G SATA 7.2K MDL			HP Smart Array P400/512MB BBWC Controller HP Smart Array P600/256 BBWC Controller
250GB 3G SATA 7.2K MDL			HP Smart Array P800/512 BBWC Controller HP 6-Port SATA RAID Controller

Storage

SATA Entry (ETY) Drives (3.5"), Hot Plug

	Quantity Supported	Position Supported	Controller
160GB 3G SATA 7.2K ETY	Up to 6	1-6	HP Smart Array E200i/64MB Controller HP Smart Array E200i/128 BBWC Controller HP Smart Array E500/256MB Controller HP Smart Array P400/256MB Controller HP Smart Array P400/512MB BBWC Controller HP Smart Array P600/256 BBWC Controller HP Smart Array P800/512 BBWC Controller HP 6-Port SATA RAID Controller

3.5" SATA Hot Plug Drives

	Quantity Supported	Position Supported	Controller
750GB 1.5G SATA 7.2K	Up to 6	1-6	HP Smart Array E200i/64MB Controller HP Smart Array E200i/128 BBWC Controller HP Smart Array E500/256MB Controller HP Smart Array P400/256MB Controller HP Smart Array P400/512MB BBWC Controller HP Smart Array P600/256 BBWC Controller HP Smart Array P800/512 BBWC Controller HP 6-Port SATA RAID Controller
500GB 1.5G SATA 7.2K			
250GB 1.5G SATA 7.2K			
160GB 1.5G SATA 7.2K			

Serial ATA (SATA)

	Quantity Supported	Position Supported	Controller
80GB 1.5G SATA 7.2K	Up to 6	1-6	HP Smart Array E200i/64MB Controller HP Smart Array E200i/128 BBWC Controller HP Smart Array E500/256MB Controller HP Smart Array P400/256MB Controller HP Smart Array P400/512MB BBWC Controller HP Smart Array P600/256 BBWC Controller HP Smart Array P800/512 BBWC Controller HP 6-Port SATA RAID Controller

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 50 Enclosure	Up to 2 Up to 4 Up to 4	External	HP Smart Array P600/256 BBWC Controller HP Smart Array P800
Modular Smart Array 60 Enclosure	Up to 4 Up to 8 Up to 8	External	HP Smart Array P600/256 BBWC Controller HP Smart Array P800 Controller HP Smart Array E500/256 BBWC Controller
Modular Smart Array 70 Enclosure	Up to 2 Up to 4 Up to 4	External	HP Smart Array P600/256 BBWC Controller HP Smart Array P800 Controller HP Smart Array E500/256 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 .
HP 2000sa Modular Smart Array Controller	Up to 4	External	HP SC08Ge Host Bus Adapter

Tape and Disk-Based Backup

NOTE: For an up-to-date listing of the latest O/S Support details for each of the Tape Drives listed below, please see the following: <http://h18000.www1.hp.com/products/quickspecs/division/10233.html> (Worldwide)

NOTE: For an up-to-date listing of the latest O/S Support details for each of the Tape Autoloaders and Tape Libraries listed below, please see the following: <http://h18000.www1.hp.com/products/quickspecs/division/10809.html> (Worldwide)

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

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

	Position Supported	Controller	Controller/HBA Option Kit Part Number
Internal USB Tape Drives DAT 40 USB DAT 72 USB DAT 160 USB	A,B,C,D	USB 2.0 Port	N/A
USB Tape Drives, External DAT 40 USB DAT 72 USB DAT 160 USB 1U Rack-Mount Kit	External	USB 2.0 Port	N/A
SCSI Tape Drives, Internal LTO-1 Ultrium 232 LTO-2 Ultrium 448	A,B,C,D	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21



Storage

LTO-3 Ultrium 920
 LTO-4 Ultrium 1760
 DAT 40
 DAT 72
 DAT 160

SCSI Tape Drives, Internal	A+B or C+D	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
LTO-3 Ultrium 960 LTO-4 Ultrium 1840			

SCSI Tape Drives, External	External	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
LTO-1 Ultrium 232 LTO-2 Ultrium 448 LTO-3 Ultrium 960 LTO-3 Ultrium 920 LTO-4 Ultrium 1760 LTO-4 Ultrium 1840 DAT 40 DAT 72 DAT 160 1U Rack-Mount Kit 3U Rack-Mount Kit			

SAS Tape Drives, Internal	A,B,C,D	HP SC44Ge Host Bus Adapter	416096-B21
DAT 160 SAS LTO-2 Ultrium 448 SAS LTO-3 Ultrium 920 SAS LTO-4 Ultrium 1760 SAS			

SAS Tape Drives, Internal	A+B or C+D	HP SC44Ge Host Bus Adapter	416096-B21
LTO-4 Ultrium 1840 SAS			

SAS Tape Drives, External	External	HP SC44Ge Host Bus Adapter	416096-B21
DAT 160 SAS LTO-2 Ultrium 448 SAS LTO-3 Ultrium 920 SAS LTO-4 Ultrium 1760 SAS LTO-4 Ultrium 1840 SAS 1U Rack-Mount Kit 3U Rack-Mount Kit			

SCSI Tape Automation, External	External	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
DAT 72x10 Autoloader 1/8 G2 Autoloader MSL2024 MSL4048 MSL8096 MSL6000			
		HP U320e SCSI Host Bus Adapter NOTE: Recommended for MSL tape libraries.	AH627A



Storage

SAS Tape Automation, External 1/8 G2 Autoloader MSL2024 MSL4048 MSL8096	External	HP SC44Ge Host Bus Adapter	416096-B21
HP StorageWorks Fibre Tape Automation, External MSL2024 MSL4048 MSL8096 MSL6000	External	Please consult the EBS connectivity matrix at: http://www.hp.com/go/ebs for detailed connectivity information	N/A
HP StorageWorks RDX Removable Disk Backup System, Internal RDX160 RDX320	A,B,C,D	USB 2.0 Port	N/A
HP StorageWorks D2D Backup Systems D2D120 D2D130 D2D2503i D2D4004i	External	Embedded Network Controller	N/A

Power Specifications

Part Number	380622-001
Spare Kit	403781-001
Operational Input Voltage Range (V rms)	90 - 264
Frequency Range (Nominal) (Hz)	47 - 63 (50 / 60)

Nominal Input Voltage (Vrms)	100	120	208	220	230	240
Max Rated Output Wattage Rating	800	950	1000	1000	1000	1000
Nominal Input Current (A rms)	10.0	8.8	5.85	5.5	5.2	4.97
Max Rated Input Wattage Rating (Watts)	980	1035	1193	1186	1172	1169
Max. Rated VA (Volt-Amp)	1000	1056	1217	1210	1196	1193
Efficiency (%)	81.5	82	84	84	85	85.5
Power Factor	0.98	0.98	0.98	0.98	0.98	0.98
Leakage Current (mA)	0.44	0.52	0.91	0.96	1.00	1.04
Maximum Inrush Current (A peak)	30	30	30	30	30	30
Maximum Inrush Current duration (milliseconds)	3	3	3	3	3	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 G5
- Click on: "Power Calculator" link. (You may need to scroll down to see it)

Technical Specifications

System Unit	Tower Dimensions (H x W x D) (with feet/bezel)	18.39 x 8.59 x 23.46 in (46.7 x 21.8 x 59.6 cm)
	Rack Dimensions (H x W x D) (with feet/bezel)	8.54 x 17.5 x 21.9 in. (21.7 x 44.5 x 55.7cm)
	Tower Weight (approximate)	Maximum 67 lb (30.4 kg) (all hard drives, power supplies, and processors installed)
		Minimum 50 lb (22.7 kg) (one hard drive, power supply, and processor installed)
	Rack Weight (approximate)	Maximum 61 lb (27.7 kg) (all hard drives, power supplies, and processors installed)
		Minimum 44 lb (20.0 kg) (one hard drive, power supply, and processor installed)
Max Input Requirements (per power supply)	Rated Line Voltage	100 VAC, 120 VAC 200 - 240 VAC
	Rated Input Current	10A (at 100 VAC) 9A (at 120 VAC) 6.1A (at 200 VAC)
	Rated Input Frequency	50 to 60 Hz
	Rated Input Power	980W (at 100 VAC) 1035W (at 120 VAC) 1170W (at 240 VAC)
BTU Rating	BTU/HR	3350 BTU/hr (at 100 VAC) 3530 BTU/hr (at 120 VAC) 3990 BTU/hr (at 240 VAC)
Power Specifications	To review typical system power ratings use the Power Calculator which is available via the online tool located at URL: http://h30099.www3.hp.com/configurator/calc/Power%20Calculator%20Catalog.xls	
	<ul style="list-style-type: none"> - Click on the system of interest. Example: ML350 G5 - Follow the instructions of the next screens. 	
Power Supply Output (per power supply)	Rated Steady-State Power	800 W (at 100 VAC) 850 W (at 120 VAC) 1000 W (at 200-240 VAC)
	Maximum Peak Power	800 W (at 100 VAC) 850 W (at 120 VAC) 1000 W (at 200-240 VAC)
System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options

Technical Specifications

		installed.
		System performance may be reduced if operating with a fan fault or above 30°C (86°F).
Relative Humidity (non-condensing)	Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
Altitude	Non-operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
	Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
Acoustic Noise	Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
		Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).
	Idle	
		L WAd 5.2 B
		L pAm 35 dBA
	Operating	
		L WAd 5.3 B
		L pAm 35 dBA

Smart Array E200i Controller	Disk Drive and Enclosure Interface	3G SAS (Serial Attached SCSI) 1.5G SATA (Serial Advanced Technology Attachment)
	SAS Connectors	2 internal (SFF8484) x4 wide port connectors
	Cache Memory Speed	DDR-1/266 MHz provides up to 4.2 GB/s maximum bandwidth.
	Server Interface	x4 2.5G PCIe provides 2GB/s maximum bandwidth.
	SAS Speed	x8 3G SAS provides 2.4GB/s maximum bandwidth.
	Cache Memory	40-bit 64MB ECC read cache or 40-bit 128MB ECC battery backed, transportable read/write cache
	Logical Volumes Supported	Up to 32 logical volumes
	Maximum Volume Capacity	4.5TB (6 x 750GB SATA)
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space
	RAID Support	RAID 5 (Distributed Data Guarding) RAID 1, 1+0 (Striping & Mirroring) RAID 0 (Striping)
	Upgradeable Firmware	Upgradeable Firmware

Technical Specifications

Embedded NC373i Multifunction 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	PCI Express, four lanes (x4)	
	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)	

Environment-friendly Products and Approach	End-of-life Management and Recycling	<p>Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.</p> <p>The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.</p>
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For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.