Overview
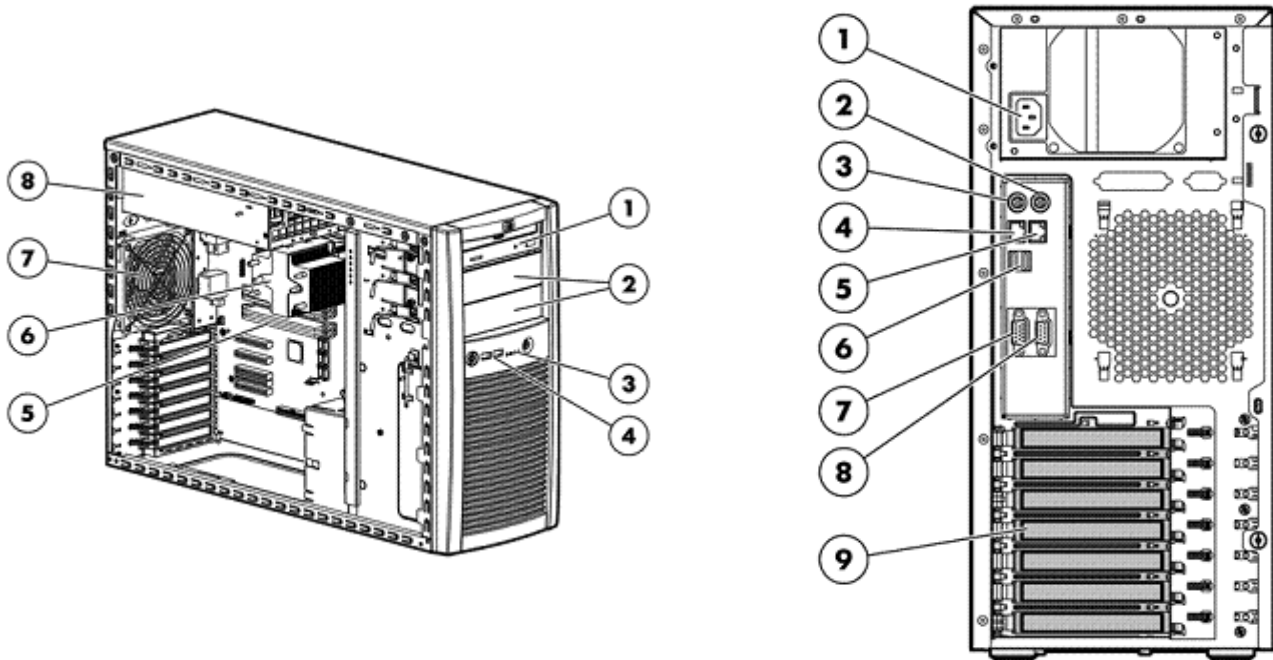

Front View:

1. SATA DVD-ROM
2. Removable Media Bays
3. LED Indicators and Power Button
4. Upfront USB Ports
5. Four DIMM Sockets for up to 8GB DDR2 memory
6. Processor Socket (Intel® Xeon®, Core™2, Pentium® or Celeron®)
7. System Fan
8. 410W Non-Hot Plug Non-Redundant Power Supply or 430W Hot Plug Redundant Power Supplies

Rear View:

1. Power cord connections for Non-Redundant Power Supply
2. Mouse connector
3. Keyboard connector
4. Embedded Gigabit NIC / Shared iLO 2 Management Port
5. Dedicated Integrated Lights-Out 2 (iLO 2) Management Port
6. USB 2.0 (qty 2)
7. Video Port
8. Serial Port
9. Up to Five Expansion Slots (Four PCI Express and One PCI-X (Optional))

What's New

- Quad-Core Intel® Xeon® processor X3370 Quad (3.0GHz, 12MB cache, 95 Watts, 1333MHz FSB)
- Quad-Core Intel® Xeon® processor X3330 (2.66GHz, 6MB cache, 95 Watts 1333MHz FSB)
- Dual-Core Intel® Xeon® processor E3120 (3.16GHz, 6MB cache, 65 Watts, 1333MHz FSB)

At A Glance

The HP ProLiant ML310 G5 is an affordable, single processor tower server designed to provide the solid network foundation essential to fuel thriving small offices. Processing power ranging from single-core Celeron to quad-core Xeon combines with industry-

Overview

leading management and essential data protection features for a secure, affordable platform that helps you run your business efficiently.

- Processors:
  - Quad-Core Intel® Xeon® 3000 processor sequence
  - Dual-Core Intel® Xeon® 3000 processor sequence
  - Dual-Core Intel® Core™2 E4600 processor
  - Dual-Core Intel® Pentium® E2160 processor
  - Single-Core Intel® Celeron® 400 sequence
  - Dual-Core Intel® Xeon® processor E3000 sequence processor
  - 1333 MHz Front Side Bus (FSB)
  - Intel® 3210 Chipset
- Memory:
  - Up to 8 GB of PC2-6400 800MHz unbuffered DDR2 SDRAM with ECC capabilities and optional interleaving
- Storage Controller:
  - SAS Models: HP SC40Ge SAS HBA with RAID 0,1 in a PCI Express slot
    NOTE: When using the SC40Ge with SATA Hard Drives, 1.5G SATA Hard Drives are required. Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS.
  - SATA Models: Embedded SATA with integrated SATA RAID 0,1
    NOTE: Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS.
- Internal Drive Support:
  - Supports up to four hot plug SAS or SATA hard drives for up to 4.0TB internal storage
  - Models support SAS and SATA hard drives
- Network Controller:
  - Embedded NC326i Gigabit Server Adapter
- Expansion Slots:
  - Up to 5 Total: (1) PCI Express x8, (3) PCI Express x1, Optional Extender Board for (1) 64-bit/100MHz PCI-X
- USB 2.0 Ports:
  - 6 Total: (2) front; (2) rear; (1) internal; (1) dedicated internal for tape
- Management:
  - HP Insight Control suite delivers essential management, including proactive health management, lights out remote control, optimization of power usage, rapid server deployment, performance analysis, vulnerability scanning and patch management and virtual machine management. For more information, go to: www.hp.com/go/ice.
  - HP ProLiant Onboard Administrator (powered by the Integrated Light-Out 2 management processor) for simplified server setup, health monitoring and recovery, power and thermal control, and lights-out remote administration
  - Integrated Lights-Out 2 Advanced unlocks the full capabilities of the ProLiant Onboard Administrator with high performance Integrated Remote Console, multi-user console sharing, video record and replay, and virtual media, including virtual folders for rapid server updates.
  - System Insight Display on the front bezel for quick and easy server diagnostics
- Operating Systems and Virtualization Software Support for ProLiant Servers:
  - Supports Windows, RHEL, SLES, OEL, VMware, and NetWare
- Deployment/Serviceability:
  - 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
- Form Factor:
  - Tower (5U)
  - Optional Tower-to-Rack Enabling Kit available, system & tray occupy 6U
- Warranty:
  - This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for one year, with 1 year Next Business Day and year on-site support from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Expanded support may be covered under the warranty or available for an additional fee.

Overview

Enhancements to warranty services are available through HP Care Pack services or customized service agreements. SATA hard drives have a one-year warranty.

NOTE: 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 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.html

QuickSpecs

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/4AA1-5499ENW.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 Intel® Xeon® processor X3370 Quad (3.0GHz, 12MB cache, 95 Watts, 1333MHz FSB)
	Quad-Core Intel® Xeon® processor X3360 (2.83GHz, 12MB L2 Cache, 95 Watts, 1333MHz Front Side Bus (FSB))
	Quad-Core Intel® Xeon® processor X3360 (2.83GHz, 12MB L2 Cache, 95 Watts, 1333MHz Front Side Bus (FSB))
	Quad-Core Intel® Xeon® processor X3350 (2.66GHz, 12MB L2 Cache, 95 Watts, 1333MHz FSB)
	Quad-Core Intel® Xeon® processor X3330 (2.66GHz, 6MB cache, 95 Watts 1333MHz FSB)
	Quad-Core Intel® Xeon® processor X3320 (2.5GHz, 6MB L2 Cache, 95 Watts, 1333MHz FSB)
	Quad-Core Intel® Xeon® processor X3220 (2.4GHz, 8MB L2 Cache, 95 Watts, 1066MHz FSB)
	Dual-Core Intel® Core™2 processor E4600 (2.4GHz, 2MB L2 Cache, 800MHz FSB)
	Dual-Core Intel® Pentium processor E2160 (1.8GHz, 1MB L2 Cache, 800MHz FSB)
	Single-Core Intel® Celeron® processor 440 (2.0GHz, 512KB L2 Cache, 800MHz FSB)
	Single-Core Intel® Celeron® processor 420 (1.60GHz, 512KB L2 Cache, 800MHz FSB)
	NOTE: The processors listed above available via Configure to Order only. Please see "Configuration Information - Factory Integrated Models" section of this QuickSpecs.
	Quad-Core Intel® Xeon® processor X3210 (2.13 GHz, 8MB L2 Cache, 95 Watts, 1066MHz FSB)
	Dual-Core Intel® Xeon® processor E3120 (3.16GHz, 6MB cache, 65 Watts, 1333MHz FSB)
	Dual-Core Intel® Xeon® processor E3110 (3.0GHz, 6MB L2 Cache, 65 Watts, 1333MHz FSB)
	Dual-Core Intel® Xeon® processor 3075 (2.66GHz, 4MB L2 Cache, 65 Watts, 1333MHz FSB)
	Dual-Core Intel® Xeon® processor 3065 (2.33 GHz, 4MB L2 Cache, 65 Watts, 1333MHz FSB)
Cache Memory One of the following depending on Model	12 MB L2 Cache NOTE: For Models with Intel Xeon processor X3350, X3360 and X3370.
	8 MB L2 Cache NOTE: For Models with Intel Xeon processor X3220 and X3210.
	6 MB L2 Cache NOTE: For Models with Intel Xeon processor X3320, X3330, E3110 and E3120.
	4 MB L2 Cache NOTE: For Models with the Intel Xeon processor 3075 and 3065.
	2 MB L2 Cache NOTE: For Models with the Intel Core2 processor E4600.
	1 MB L2 Cache NOTE: For Models with the Intel Pentium processor E2160.
	512 KB L2 Cache NOTE: For Models with the Intel Celeron processor 420.
Memory Protection	ECC

QuickSpecs

Standard Features

Memory One of the following depending on Model	Type	PC2-6400 unbuffered DDR2 SDRAM (800MHz)
	Standard - Xeon 3075 and Xeon 3065 Models	512 MB (1 x 512 MB)
	Standard - Xeon X3210 and Xeon E3110 Models	1 GB (1 x 1 GB)
	Maximum	8 GB

Network Controller Embedded NC326i Gigabit Server Adapter

Expansion Slots

Expansion Slots #	Technology	Bus Width***	Connector Width	Bus Number*	Device No.**	Form Factor	Notes
7	PCIe	x1	x8	4	0	Half length, full height slot	
6	PCIe	x1	x8	7	0	Half length, full height slot	
5	PCIe	x1	x8	10	0	Full length, full height slot	
3	PCIe	x8	x8	18	0	Full length, full height slot	
1 (Optional)	PCI-X (100MHz, 3.3V)	64-bit	Not applicable	14	2	Full length, full height slot	

Storage Controllers

The HP ProLiant ML310 G5 supports Serial ATA (SATA) and Serial Attached SCSI (SAS) hard drives. Models described as SAS models include an 8 port HBA that supports both SATA and SAS hard drives in non-RAID, RAID 0, or RAID 1 configurations. Models described as SATA/SAS support SATA hard drives standard and require the installation of an HBA or controller to support SAS.

HP SC40Ge SAS HBA with RAID (in PCIe slot) (SAS Models)
NOTE: When using the SC40Ge with SATA Hard Drives, 1.5G SATA Hard Drives are required. Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS.

Embedded SATA with integrated SATA RAID 0,1 (SATA/SAS Models)
NOTE: Use of the embedded SATA RAID feature with a Linux operating system requires installation of a driver from a floppy drive. The supported floppy drive can be a USB drive key, USB floppy drive, half-height internal floppy drive, or virtual floppy via Integrated Lights-Out 2 (iLO 2).

NOTE: Any Smart Array Controller or SAS HBA requires the purchase of the HP SAS Cable for the ML310 G5.

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

QuickSpecs

Standard Features

Storage	Optical Drive	SATA DVD-ROM Drive Standard
	Diskette Drive	Optional 1.44 MB Diskette Drive

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

Maximum Internal Storage	Hot Plug SAS (3.5")	4.0TB	4 x 1TB SAS
	Hot Plug SATA (3.5")	4.0TB	4 x 1TB SATA

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

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

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

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

Graphics	Integrated ATI ES1000, 32 MB video standard

- 16 bit color: maximum resolution of 1600 x 1200
- 32 bit color: maximum resolution of 1280 x 1024

NOTE: Maximum resolution available via iLO 2 remote console is 1280 x 1024.

Form Factor	Tower (5U)

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

Standard Features

HP Insight Control suite

HP Insight Control suite delivers essential infrastructure management, including proactive health management, lights out remote control, optimization of power usage, rapid server deployment, performance analysis, vulnerability scanning and patch management and virtual machine management.

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

- HP Systems Insight Manager (SIM)
- HP iLO Advanced Pack
- HP Insight Rapid Deployment software (RDP)
- HP Insight Power Manager (IPM)
- HP Insight Performance Manager module (PMP)
- HP Insight Vulnerability and Patch Manager module (VPM)
- HP Insight Virtual Machine Manager software for ProLiant (VMM)

Additional Insight software standalone products and management tools included on the Insight Software media kit can be installed manually:

- HP Insight Server Migration software for ProLiant (SMP)
  NOTE: HP Insight Server Migration software for ProLiant is licensed separately from Insight Control suite.
- HP Open Service Event Manager
- HP Insight Remote Support Standard
- HP Insight Remote Support Advanced (previously Service Essentials Remote Support Pack)

NOTE: Insight Server Migration software for ProLiant can be installed from the SMP CD included in the Insight Software media kit.
NOTE: For additional product and licensing information about HP Insight Control suite, visit: http://www.hp.com/go/ice.

NOTE: As of Feb. 1, 2009, HP iLO Power Management Pack is being discontinued. Customers can either purchase HP Insight Control suite which contains all the components of IPMP or the standalone components which include iLO Advanced, Insight Power Manager and Systems Insight Manager.

HP Insight Control suite and most Insight software products 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/insight.

Standard Features

| HP ProLiant Onboard Administrator | HP ProLiant Onboard Administrator (powered by the Integrated Lights-Out 2 management processor) simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration of ProLiant ML, DL, and BL servers. HP ProLiant Onboard Administrator functions without additional software, and can be accessed from any location via a web browser. It works hand-in-hand with HP Systems Insight Manager, Insight Control, and Insight Dynamics - VSE suite helping customers unlock the value of the ProLiant platform and deliver the highest possible quality of IT service to the business. |

Capabilities of the HP ProLiant Onboard Administrator embedded in ProLiant ML/DL servers include, but are not limited to the following:

- Rom-based Setup Utility (RBSU) and Option Rom Configuration for Arrays (ORCA)
- IML and iLO event logging
- Automatic Server Recovery (ASR)
- OS independent hardware health status
- Present server power consumption
- Virtual Unit ID control
- Remote serial console
- Virtual power button control
- Dynamic Sector Repairing (with Smart Array controller)
- Drive Parameter Tracking (with Smart Array controller)
- Hot Spare Boot
  NOTE: Upon the event of a failed processor in a multi-processing environment, the system will automatically reboot and attempt to use the remaining good processor.

Unlock the full remote administration capabilities of HP ProLiant Onboard Administrator with Integrated Lights-Out 2 Advanced.

Server Management Stand Alone Software Product - Insight software	HP Systems Insight Manager (SIM)	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. For additional information, please see: www.hp.com/go/hpsim
	HP Insight Rapid Deployment software (RDP)	HP Insight Rapid Deployment Software (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.
	HP Insight Server Migration software for ProLiant (SMP)	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. Insight Server Migration software for ProLiant (SMP) automates the manual processes required for migrating servers between physical or virtual platforms, whether migrating to VMware or Microsoft virtual machines. SMP allows all of the following migrations:

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

Standard Features

- virtual to ProLiant

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

HP Insight Dynamics - VSE suite for ProLiant	The HP Insight Dynamics - VSE suite for ProLiant is advanced infrastructure management software that allows you to analyze and optimize your adaptive infrastructure to manage physical and virtual resources in the same way. HP Insight Dynamics - VSE gives you a powerful toolkit to accelerate complex technology projects and simplify daily operations. It enables you to plan capacity and power continuously, balance across physical and virtual resources, ensure cost-effective high availability and provision infrastructure consistently.
	NOTE: For more information, visit: http://www.hp.com/go/insightdynamics
HP Integrated Lights-Out (iLO) Advanced Pack	Unlocks the full capabilities of the ProLiant Onboard Administrator with comprehensive remote control including Virtual KVM remote graphical console, power management capabilities such as power measurement, regulation, and capping, new iLO Text Console, automatic and on-demand video recording of server events, global team collaboration for up to four remote users, virtual media (floppy, CD/DVD, USB key), virtual folders, and enterprise security (directory services and two-factor authentication). For additional information, please see: www.hp.com/go/iLO
HP Insight Virtual Machine Manager software for ProLiant (VMM)	Get the most out of server virtualization by unifying the management of physical and virtual servers in HP Systems Insight Manager software. The Insight Virtual Machine Manager software for ProLiant provides central management and control of VMware and Microsoft virtual machines and provides physical host to virtual machine association.
	For additional information, please see: http://www.hp.com/go/vm-manage.

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

Core Infrastructure Management	HP Foundation Pack	Managing the growing number of servers can be complex and expensive for your organization. IT managers need to address changing business needs with tools that meet the challenges of managing today's complex Datacenters.

HP provides management solutions that are designed to simplify a server's installation, configuration and maintenance throughout the entire server lifecyle. This provides the customer with higher levels of operational efficiency and highly reliable systems: www.hp.com/go/foundation.

The foundation pack includes:

- HP SmartStart
- HP Management
- HP ProLiant Firmware Maintenance

SmartStart version supported (minimum): SmartStart 7.51
http://www.hp.com/servers/smartstart |
| | Insight Management Agents | The Insight Management Agents should be installed on all HP servers to present system instrumentation, health and configuration information into HP |

Standard Features

| | | 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 Rapid Deployment Pack.

For additional information about the Management Agents and the HP System Management Homepage please visit the management Web site at: http://www.hp.com/servers/manage. |
| | Subscriber's Choice | Subscriber's Choice Driver and Support Alerts/Notifications is a web-based email subscription service that provides software and driver change notifications for ProLiant products. Sign up at: http://www.hp.com/go/subscriberschoice and customize your profile to receive various new alerts as they become available, on a weekly or monthly basis. |
| | ProLiant Support Packs and ROMPaq, software | The latest software, drivers, and firmware fully optimized and tested for your ProLiant server and options, available through ProLiant Support Packs the Rapid Deployment Pack, SmartStart or downloaded from software and drivers download pages website at: http://www.hp.com/go/support. |

Industry Standard Compliance

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

Manageability

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

Security

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

QuickSpecs

Standard Features

Server Power Cords	All models ship with one 1.8m (6 foot) standard low-line, power cord. Localized cables included with models in other world regions. NOTE: HP ProLiant ML310 a C13 to C14 2.8M jumper cord ships standard. If customers require a local power cord, they can check the power cord matrix for the appropriate sku. Please see the following power cord matrix: http://www.hp.com/go/powercordmatrix.
Power Specifications	NOTE: To review typical system power ratings use the HP Power Advisor which is available online located at url: www.hp.com/go/proliant-energy-efficient or www.hp.com/go/hppoweradvisor
Power Supply	410 Watt PFC (Power Factor Correcting) non-hot plug non-redundant power supply or 430 Watt PFC hot plug redundant power supplies (ships with two power supplies)
UPS and PDU Power Cord Matrix	Please see the UPS and PDU cable matrix that lists cable descriptions, requirements, and specifications for UPS and PDU units: http://h18004.www1.hp.com/products/servers/proliantstorage/power-protection/index.html
System Fans	1 - Non-hot plug, Non-redundant system fans; 1 optional fan for PCI-X Extender Board NOTE: Does not include fan in power supply.
Operating Systems and Virtualization Software Support for ProLiant Servers	Microsoft Windows Server Microsoft Windows Server Hyper V Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) Oracle Enterprise Linux (OEL) NetWare VMware NOTE: The ML310 Embedded SATA RAID feature is not available for use with Netware. NOTE: For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: http://www.hp.com/go/ossupport and our driver download page www.hp.com/support/ML310G5.

Standard Features

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

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

Rack and Rack Options   Rack Cabinets:

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

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

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

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

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

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

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

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

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

Standard Features

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

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

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

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

QuickSpecs

Models

Models with SAS Support Standard

ML310T05 X3210 HP SAS/SATA 445336-001	Processor(s)	Quad-Core Intel® Xeon® processor X3210 (2.13 GHz, 8MB L2 Cache, 95 Watts, 1066MHz FSB)
	Cache Memory	8 MB L2
	Memory	1 GB (1 x 1 GB)
	Network Controller	Embedded NC326i Gigabit Server Adapter
	Storage Controller	HP SC40Ge SAS HBA with RAID 0, 1 in a PCIe slot NOTE: When using the SC40Ge with SATA Hard Drives, 1.5G SATA Hard Drives are required. Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS.
	Hard Drives	None ship standard (up to 4 hot plug SAS or SATA 3.5" drives supported)
	Internal Storage	SAS: 4.0TB maximum; SATA: 4.0TB maximum
	Optical Drive	SATA DVD-ROM Drive
	Diskette Drive	None ship standard (Optional 1.44 MB Diskette Drive available)
	Power Supply	410W non-hot plug non-redundant power supply
	Form Factor	Tower (5U) (Optional Tower to Rack Enabling Kit available, system & tray occupy 6U)

Models with SATA Support Standard

ML310T05 3065 HP SATA 445333-001	Processor(s)	Dual-Core Intel® Xeon® processor 3065 (2.33 GHz, 4MB L2 Cache, 65 Watts, 1333MHz FSB)
	Cache Memory	4MB L2
	Memory	512 MB (1 x 512 MB)
	Network Controller	Embedded NC326i Gigabit Server Adapter
	Storage Controller	Embedded SATA with integrated SATA RAID 0, 1
	Hard Drives	None ship standard (Up to 4 hot plug SATA 3.5" drives supported standard. SAS 3.5" drives supported with optional HBA or controller)
	Internal Storage	SAS: 4.0TB maximum; SATA: 4.0TB maximum
	Optical Drive	SATA DVD-ROM Drive
	Diskette Drive	None ship standard (Optional 1.44 MB Diskette Drive)
	Power Supply	410W non-hot plug non-redundant power supply
	Form Factor	Tower (5U) (Optional Tower to Rack Enabling Kit available, system & tray occupy 6U)

QuickSpecs

Models

ML310T05 3075 HP SATA 445334-001	Processor(s)	Dual-Core Intel® Xeon® processor 3075 (2.66GHz, 4MB L2 cache, 65 Watts, 1333MHz FSB)
	Cache Memory	4MB L2
	Memory	512 MB (1 x 512 MB)
	Network Controller	Embedded NC326i Gigabit Server Adapter
	Storage Controller	Embedded SATA with integrated SATA RAID 0, 1
	Hard Drives	None ship standard (Up to 4 hot plug SATA 3.5" drives supported standard. SAS 3.5" drives supported with optional HBA or controller)
	Internal Storage	SAS: 4.0TB maximum; SATA: 4.0TB maximum
	Optical Drive	SATA DVD-ROM Drive
	Diskette Drive	None ship standard (Optional 1.44 MB Diskette Drive available)
	Power Supply	410W non-hot plug non-redundant power supply
	Form Factor	Tower (5U) (Optional Tower to Rack Enabling Kit available, system & tray occupy 6U)

ML310T05 E3110 HP SATA 460383-001	Processor(s)	Dual-Core Intel® Xeon® processor E3110 (3.0GHz, 6MB L2 cache, 65 Watts, 1333MHz FSB)
	Cache Memory	6 MB L2
	Memory	1 GB (1 x 1 GB)
	Network Controller	Embedded NC326i Gigabit Server Adapter
	Storage Controller	Embedded SATA with integrated SATA RAID 0, 1
	Hard Drives	None ship standard (Up to 4 hot plug SATA 3.5" drives supported standard. SAS 3.5" drives supported with optional HBA or controller)
	Internal Storage	SAS: 4.0TB maximum; SATA: 4.0TB maximum
	Optical Drive	SATA DVD-ROM Drive
	Diskette Drive	None ship standard (Optional 1.44 MB Diskette Drive available)
	Power Supply	410W non-hot plug non-redundant power supply
	Form Factor	Tower (5U) (Optional Tower to Rack Enabling Kit available, system & tray occupy 6U)

QuickSpecs

Models

ML310T05 X3210 HP SATA/SAS RPS 445335-001	Processor(s)	Quad-Core Intel® Xeon® processor X3210 (2.13 GHz, 8MB L2 Cache, 95 Watts, 1066MHz FSB)
	Cache Memory	8 MB L2
	Memory	1 GB (1 x 1 GB)
	Network Controller	Embedded NC326i Gigabit Server Adapter
	Storage Controller	Embedded SATA with integrated SATA RAID 0, 1
	Hard Drives	None ship standard (Up to 4 hot plug SATA 3.5" drives supported standard. SAS 3.5" drives supported with optional HBA or controller)
	Internal Storage	SAS: 4.0TB maximum; SATA: 4.0TB maximum
	Optical Drive	SATA DVD-ROM Drive
	Diskette Drive	None ship standard (Optional 1.44 MB Diskette Drive available)
	Power Supply	430W hot plug redundant power supplies
	Form Factor	Tower (5U) (Optional Tower to Rack Enabling Kit available, system & tray occupy 6U)

QuickSpecs

Smart Buys

The ProLiant Smart Buy program offers a collection of promotional server and option products that are configured with SMB in mind, offered at discounted prices, and positioned for quick delivery. Smart Buy server offers are available for a limited time only.

S-Buy ML310G5 X3075 HP-SAS 456116-005	Processor(s)	(1) Dual-Core Intel® Xeon® processor 3075 (2.66GHz, 4MB L2 cache, 65 Watts, 1333MHz FSB)
	Cache Memory	4MB L2 Cache
	Memory	1GB (1 x 1 GB) PC2-6400 DDR2
	Network Controller	Embedded NC326i Dual Port Gigabit Server Adapter
	Storage Controller	HP SC40Ge SAS HBA with RAID 0, 1 in a PCIe slot
	Hard Drives	None ship standard
	Internal Storage	SATA: 3 TB maximum; SAS: 1.2TB maximum
	Optical Drive	16x DVD-RW Drive
	Diskette Drive	None ship standard (Optional 1.44 MB Diskette Drive available)
	Power Supply	410W non-hot plug non-redundant power supplies
	Form Factor	Tower (5U) (Tower to Rack Enabling Kit available)

S-Buy ML310G5 E4600 SATA 470064-778	Processor(s)	(1) Dual-Core Intel® Core™2 E4400 (2.40 GHz, 65W, 800 FSB, 2M)
	Cache Memory	1 MB L2 Cache
	Memory	1GB (1 x 1 GB) PC2-6400 DDR2
	Network Controller	Embedded NC326i Dual Port Gigabit Server Adapter
	Storage Controller	Embedded SATA with integrated SATA RAID 0, 1
	Hard Drives	(1) 250GB SATA 7.2K 3.5"
	Internal Storage	SATA: 3 TB maximum; SAS: 1.2TB maximum
	Optical Drive	48x IDE (ATAPI) DVD-ROM Drive
	Diskette Drive	None ship standard (Optional 1.44 MB Diskette Drive available)
	Power Supply	410W non-hot plug non-redundant power supplies
	Form Factor	Tower (5U) (Tower to Rack Enabling Kit available)

S-Buy ML310G5 X3330 SAS 496042-005	Processor(s)	(1) Quad-Core Intel® Xeon® X3330 (2.66 GHz, 95W, 1333 FSB)
	Cache Memory	6 MB L2 Cache
	Memory	2GB (1 x 2 GB) Unbuffered PC2-6400 DDR2
	Network Controller	Embedded NC326i Dual Port Gigabit Server Adapter
	Storage Controller	HP Smart Array E200/128
	Hard Drives	Not Included
	Internal Storage	SATA: 4 TB maximum; SAS: 4TB maximum
	Optical Drive	16x DVD-RW Drive16x DVD-RW Drive
	Diskette Drive	None ship standard (Optional 1.44 MB Diskette Drive available)
	Power Supply	410W non-hot plug non-redundant power supplies
	Form Factor	Tower (5U) (Tower to Rack Enabling Kit available)

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

Step 1: Base Configuration

Models	HP ProLiant ML310 G5 CTO Chassis	445343-B21
	Factory Integrated Models ship with:	
	Embedded NC326i Gigabit Server Adapter	
	Integrated Four Port SATA Controller (HP-SATA/SAS chassis only)	
	Keyboard and Mouse	

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

Processors	HP C420 ML310G5 FIO Kit	450134-L21
	HP E2160 ML310G5 FIO Kit	450133-L21
	HP E3110 ML310G5 FIO Kit	463430-L21
	HP X3065 ML310G5 FIO Kit	450130-L21
	HP X3075 ML310G5 FIO Kit	450131-L21
	HP X3210 ML310G5 FIO Kit	454631-L21
	HP X3220 ML310G5 FIO Kit	451245-L21
	HP X3320 ML310G5 FIO Kit	463428-L21
	HP X3350 ML310G5 FIO Kit	464790-L21
	HP X3360 ML310G5 FIO Kit	489907-L21
	HP X3370 ML310G5 FIO Kit	493256-L21
Base Memory	2 GB Unbuffered PC2-6400 ECC DIMM (1 x 2 GB)	450260-B21
	1 GB Unbuffered PC2-6400 ECC DIMM (1 x 1 GB)	450259-B21
	512 MB Unbuffered PC2-6400 ECC DIMM (1 x 512 MB)	450258-B21
Optical Drive	HP Half-Height SATA DVD-ROM Optical Drive	447326-B21
	HP Half-Height SATA DVD RW Optical Drive	447328-B21
Power Supply	430W Hot-plug Redundant Power Supply, FIO	431652-B21
	NOTE: Hot plug redundant power supply (PN 431652-B21) ships with two power supplies.	
	410W Non-hot-plug Power Supply, FIO	459902-B21
	NOTE: Non-hot plug power supply (PN 459902-B21) ships with one power supply.	

Configuration Information - Factory Integrated Models

Step 3: Choose Additional Factory Integratable Options

PCI-X Slot	HP ML310 G5 PCI-X Extender Board Kit	451778-B21
SAS HBAs	HP SAS Cable ML310 G5	460310-B21
	HP SC40Ge SAS HBA, FIO NOTE: RAID 0, 1. NOTE: When using the SC40Ge with SATA Hard Drives, 1.5G SATA Hard Drives are required. Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS.	449176-B21
	HP SC44Ge Host Bus Adapter NOTE: RAID 0, 1. NOTE: When using the SC44Ge with SATA Hard Drives, 1.5G SATA Hard Drives are required. Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS.	416096-B21
Controllers	NOTE: When SATA hard drives are installed, SATA LED functionality and full SATA hot-plug capability are not supported with the embedded controller. For full LED and hot-plug support, an optional SAS RAID controller must be installed. NOTE: When hot-plug SATA hard drives are installed, SATA LED functionality and full SATA hot-plug capability are not supported with the embedded controller. For full LED and hot-plug support, an optional SATA RAID or SAS controller must be installed. SAS Controllers support both SAS and SATA hard drives.	
	HP Smart Array E200/128 BBWC Controller NOTE: RAID 0, 1, 1+0, 5.	411508-B21
	HP Smart Array P400/256MB Controller NOTE: RAID 0, 1, 1+0, 5.	405132-B21
	HP Smart Array P400/512MB BBWC Controller NOTE: RAID 0, 1, 1+0, 5, 6.	411064-B21
	HP Smart Array E500/256MB Controller NOTE: RAID 0, 1, 1+0 standard, 5 optional	435129-B21
	HP Smart Array P800/512MB BBWC Controller NOTE: RAID 0, 1, 1+0, 5, 6.	381513-B21
	HP SAS Cable ML310 G5 NOTE: Any Smart Array Controller requires the purchase of the HP SAS Cable ML310 G5 (460310-B21).	460310-B21

Step 4: Choose Additional Options for Factory Integration

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

QuickSpecs

Core Options

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

Memory (SDRAM DIMMs)	2 GB Unbuffered PC2-6400 ECC DIMM (1 x 2 GB)	450260-B21
	1 GB Unbuffered PC2-6400 ECC DIMM (1 x 1 GB)	450259-B21
	512 MB Unbuffered PC2-6400 ECC DIMM (1 x 512 MB)	450258-B21

Diskette Drives	1.44MB Diskette Drive Option Kit	379257-B21

Optical Drives	HP Half-Height SATA DVD-ROM Optical Drive	447326-B21
	HP Half-Height SATA DVD RW Optical Drive	447328-B21

Hard Drives

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

SAS Hot Plug 3.5" Enterprise (ENT) Drives
NOTE: SAS HBA or array controller is required.

HP 450GB 3G 15K 3.5" DP SAS ENT HDD	454232-B21
HP 400GB 3G 10K 3.5" DP SAS ENT HDD	459508-B21
HP 300GB 3G SAS 15K 3.5" SP HDD	431944-B21
HP 300GB 3G SAS 15K 3.5" DP ENT HDD	416127-B21
HP 146GB 3G SAS 15K 3.5" SP HDD	375872-B21
HP 146GB 3G SAS 15K 3.5" DP ENT HDD	384854-B21
HP 72GB 3G SAS 15K 3.5" SP HDD	375870-B21
HP 72GB 3G SAS 15K 3.5" DP ENT HDD	384852-B21

SAS Hot Plug 3.5" Midline (MDL) Drives

HP 1TB 3G SAS 7.2K 3.5" DP MDL HDD	461137-B21
HP 750GB 3G SAS 7.2K 3.5" DP MDL HDD	461135-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/12244_na/12244_na.html

SATA Hot Plug 3.5" Midline (MDL) Drives

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. Please see communication for details
http://h20000.www2.hp.com/bizsupport/TechSupport/Document.jsp?objectID=c01511475

SATA Hot Plug 3.5" Entry (ETY) Drives

HP 160GB 3G SATA 7.2K 3.5" ETY HDD	458945-B21

Core Options

NOTE: Server BIOS update is required to support 3G SATA Drives when configured with embedded SATA Controller. Please see communication for details http://h20000.www2.hp.com/bizsupport/TechSupport/Document.jsp?objectID=c01511475

NOTE: SATA hard drives have a 1-year warranty. Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13021_na/13021_na.html

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.

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/11940_na/11940_na.html

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Communications

HP NC110T PCI Express Gigabit Server Adapter	434905-B21
HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
HP NC364T PCI Express Quad Port Gigabit Server Adapter	435508-B21
HP NC373F PCI Express Multifunction Gigabit Server Adapter	394793-B21
HP NC373T PCI Express Multifunction Gigabit Server Adapter	394791-B21
HP NC380T PCI Express Dual Port Multifunction Gigabit Server Adapter	394795-B21

NOTE: Supported on a Full Length-Full Height slot only.

2006 Agere PCI high-speed international soft modem	EK694AA

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: www.hp.com/go/ProLiantNICs

Additional Options

HP Insight Control suite	NOTE: Electronic licensing options are available for Insight Control suite software products. Please see the appropriate Insight Control QuickSpecs for additional information. www.hp.com/go/ice	

HP Insight Control Environment (ICE)

HP Insight Control Environment, No Media 1-Server License including 1 year of 24x7 Technical Support and Updates 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.	452148-B22
HP Insight Software Media Kit NOTE: Insight Software DVD media without licenses. Contains Systems Insight Manager and Insight software products and components licensed by Insight Control suite. Uses an integrated installer to perform quick and accurate software installation and updates.	436222-B21

HP Insight Control suite for Linux (ICE-LX)

HP Insight Control suite for Linux, Media pack (DVD) - No licenses included NOTE: This optional Media pack DVD contains the ISO image for HP Insight Control suite for Linux, HP Systems Insight Manager, HP Insight Power Manager, HP Insight Virtual Machine Manager software for ProLiant, and an integrated installer. Servers must be acquired separately. NOTE: This Media pack is optional because the latest ISO image and latest updates may be downloaded at no cost from: http://www.hp.com/go/ice-linux (click on Download button).	464422-B22
HP Insight Control suite for Linux, No Media, 1-Server license, including one year of 24x7 Technical Support and Updates NOTE: This part number can be used to purchase one (1) license with a single activation key. 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: One certificate is shipped for each license.	464423-B22

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

Server Management Stand Alone Software Products - Insight software	NOTE: Electronic licensing options are available for select software products. Please see the appropriate Insight Software standalone product QuickSpecs for additional information.

Deploy

HP Insight Rapid Deployment software (RDP)

HP Insight Rapid Deployment software No Media 1-Server License including 1 year of 24x7 Technical Support and Updates 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	452151-B21

Additional Options

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/11053_na/11053_na.html

HP Insight Server Migration software for ProLiant (SMP)

HP Insight Server Migration software for ProLiant, No Media, Physical / Virtual to ProLiant Single Migration License, including 1 year of 24x7 Technical Support and Updates **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.	460750-B21
HP Insight Server Migration software for ProLiant, No Media, Physical / Virtual to Virtual Single Migration License, including 1 year of 24x7 Technical Support and Updates **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.	460753-B21
HP Insight Server Migration software for ProLiant, No Media, 1-Year Unlimited Migration License, including 1 year of 24x7 Technical Support **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.	460756-B21

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

Monitor

HP Insight Dynamics-VSE suite for ProLiant

HP Insight Dynamics-VSE with Insight Control Environment, 1-server license including 1 year of 24x7 Technical Support and Updates **NOTE:** This license supports HP ProLiant ML/DL servers. Customer will receive a printed license entitlement certificate via physical shipment.	483527-B21
HP Insight Dynamics-VSE without Insight Control Environment, 1-server license including 1 year of 24x7 Technical Support and Updates **NOTE:** This license supports HP ProLiant ML/DL and c-Class Blade and c-Class Blade servers. Customer will receive via email a receipt and link to a license entitlement certificate.	483531-B21

NOTE: For additional License Kits, please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/13050_na/13050_na.html

Control

HP Integrated Lights-Out Advanced Pack (iLO)

Additional Options

	HP Integrated Lights-Out Advanced Pack, No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates NOTE: For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12362_na/12362_na.html	512485-B21

Optimize

HP Insight Virtual Machine Manager software for ProLiant (VMM)

	Insight Virtual Machine Manager software for ProLiant, No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates NOTE: 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/12328_na/12328_na.html NOTE: Flexible and volume quantity license kits are available for Insight software products. Refer to: http://www.hp.com/go/insightcontrol or the various Insight software product QuickSpecs for more information.	452153-B21

Storage Controllers	**SAS Cable** NOTE: A SAS HBA or Controller is required if SAS hard drives are selected. SAS HBAs support both SAS and SATA hard drives. Some SAS HBAs also have SAS tape support. Please refer to the "Tape Drives, Tape Autoloader & Tape Libraries" table in the Storage section for a list of SAS HBAs with tape support.	
	HP SAS Cable ML310 G5	460310-B21
	NOTE: Any SAS HBA or Smart Array Controller requires the purchase of the HP SAS Cable ML310 G5 (460310-B21).	
	SAS Controllers	
	Smart Array E200 Controller	
	HP Smart Array E200/128 BBWC Controller	411508-B21
	Smart Array E500 Controller	
	HP Smart Array E500/256MB Controller	435129-B21
	HP SA-P400 and SA-E500 24 In Battery Cable Kit NOTE: This option kit contains a 24" battery cable and adhesive material for installing a batter into the server if a Smart Array E500 is integrated outside of the factory. For all solutions, please refer to the server QuickSpecs and User's Manual for detailed installation instructions.	417836-B21
	Smart Array P400 Controller	
	HP Smart Array P400/256MB Controller	405132-B21
	HP Smart Array P400/512MB BBWC Controller	411064-B21
	Battery-backed write cache upgrade NOTE: For Smart Array P400 Controller only.	383280-B21
	512MB Battery-backed cache upgrade NOTE: For Smart Array P400 Controller only.	405148-B21
	Smart Array P800 Controller	
	HP Smart Array P800/512 BBWC Controller	381513-B21

Additional Options

Smart Array P212 Controller

HP Smart Array P212/ZM Controller	462828-B21
HP Smart Array P212/256 MB Controller	462834-B21
256 MB Cache	462968-B21

Smart Array P410 Controller

HP Smart Array P410/256 MB Controller	462862-B21
HP Smart Array P410/512 MB with BBWC Controller	462864-B21
512MB BBWC	462967-B21

Smart Array P411 Controller

HP Smart Array P411/256 MB Controller	462830-B21
HP Smart Array P411/512 MB with BBWC Controller	462832-B21
512MB BBWC	462967-B21

NOTE: Please see the following QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/12460_na/12460_na.html (Smart Array E200 Controller)
http://h18000.www1.hp.com/products/quickspecs/12700_na/12700_na.html (Smart Array E500 Controller)
http://h18000.www1.hp.com/products/quickspecs/12400_na/12400_na.html (Smart Array P400 Controller)
http://h18000.www1.hp.com/products/quickspecs/12616_na/12616_na.html (Smart Array P800 Controller)
http://h18000.www1.hp.com/products/quickspecs/13203_na/13203_na.html (Smart Array P212 Controller)
http://h18000.www1.hp.com/products/quickspecs/13201_na/13201_na.html (Smart Array P410 Controller)
http://h18000.www1.hp.com/products/quickspecs/13202_na/13202_na.html (Smart Array P411 Controller)

SAS HBA

HP SC08Ge Host Bus Adapter	488765-B21
HP SC44Ge Host Bus Adapter	416096-B21

NOTE: When using the SC44Ge with SATA Hard Drives, 1.5G SATA Hard Drives are required. Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS.

HP 8 Internal Port SAS HBA with RAID	347786-B21

NOTE: When using the 8 Internal Port SAS HBA with SATA Hard Drives, 1.5G SATA Hard Drives are required. Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS.
NOTE: Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS.

NOTE: Please see the HBA QuickSpecs for additional information:
http://h18004.www1.hp.com/products/quickspecs/13082_na/13082_na.html (SC08Ge HBA)
http://h18004.www1.hp.com/products/quickspecs/12617_na/12617_na.html (SC44Ge HBA)
http://h18004.www1.hp.com/products/quickspecs/12332_na/12332_na.html (8 Internal Port SAS HBA)

SCSI Controllers for External Drive/Storage Support

Additional Options

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

NOTE: If a Non-Hot Plug SCSI Tape Drive is selected in any model, then customer must add either 374654-B21 or 412911-B21.

SCSI HBA

HP SC11Xe Host Bus Adapter   412911-B21

NOTE: Recommended HBA for SCSI tape drive connect.

NOTE: If a Non-Hot Plug SCSI Tape Drive is selected in any model, then customer must add either 374654-B21 or 412911-B21.

NOTE: Please see the following QuickSpecs for additional information:
http://h18004.www1.hp.com/products/quickspecs/11943_na/11943_na.html
(SCSI HBA)
http://h18000.www1.hp.com/products/quickspecs/12566_na/12566_na.html
(SC11Xe HBA)

PCI-X Slot

HP ML310 G5 PCI-X Extender Board Kit   451778-B21

NOTE: An additional fan is required with PCI-X Extender Board. This fan is included in the HP ML310 G5 PCI-X Extender Board Kit.

Serial / Parallel Port Kit   HP ProLiant Second Serial / Parallel port option kit   401222-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

DAT USB Tape Drives

HP StorageWorks DAT 160 USB Internal Drive   Q1580A

SAS Tape Drives

NOTE: For the ML310 G5, HP recommends purchasing the HP SC44Ge HBA (416096-B21) for a dedicated SAS HBA for tape.

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

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.

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

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QuickSpecs

Additional Options

Disk-Based Backup
RDX Removable Disk Backup
HP StorageWorks RDX320 Internal Removable Disk Backup System — AJ767A
NOTE: 320GB of Disk Storage.
D2D Backup
HP StorageWorks D2D2502i Backup System — EJ001A
NOTE: 2 TB raw capacity/1.5 TB useable capacity.

HP StorageWorks D2D2504i Backup System — EJ002A
NOTE: 4 TB raw capacity/3 TB useable capacity.

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

Tape Autoloaders
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-3 Ultrium 920 SAS Autoloader — AH558A
HP StorageWorks 1/8 G2 Tape Autoloader Rack Kit — AH166A
NOTE: Required to install the 1/8 G2 Autoloaders in a standard 19-inch rack; includes rails and rackmount instructions

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

Tape Libraries
HP StorageWorks MSL2024 Tape Library
HP StorageWorks MSL2024 1 LTO-4 Ultrium 1760 SAS Drive Library — AK378A
HP StorageWorks MSL2024 1 LTO-3 Ultrium 920 SAS Drive Library — AH559A
HP StorageWorks MSL4048 Tape Library
HP StorageWorks MSL4048 2 LTO-4 Ultrium 1760 SAS Drive Library — AK380A
HP StorageWorks MSL4048 1 LTO-3 Ultrium 920 SAS Drive Library — AH560A

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.

StorageWorks Options
StorageWorks SCSI HBA
HP U320e SCSI Host Bus Adapter — AH627A
NOTE: Recommended HBA for MSL SCSI Tape Library connect.

HP StorageWorks 60 Modular Smart Array
HP StorageWorks 60 Modular Smart Array — 418408-B21
NOTE: Please see the QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at: http://h18000.www1.hp.com/products/quickspecs/12627_na/12627_na.html

Additional Options

HP StorageWorks 70 Modular Smart Array	HP StorageWorks 70 Modular Smart Array	418800-B21

NOTE: Please see the QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at:
http://h18000.www1.hp.com/products/quickspecs/12652_na/12652_na.html

HP StorageWorks 2000sa Modular Smart Array	HP 2012sa Single Controller Modular Smart Array	AJ752A
	HP 2012sa Dual Controller Modular Smart Array	AJ753A

NOTE: Please see the QuickSpecs for additional options and configuration information at:
http://h18000.www1.hp.com/products/quickspecs/13045_na/13045_na.html

Uninterruptible Power Systems – Tower

HP T750 G2 UPS

HP T750 G2 UPS   AF446A

NOTE: Please see the QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/13160_na/13160_na.html

HP T1000 G2 UPS

NOTE: Please see the QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/12506_na/12506_na.html

HP T1000 G3 UPS

HP T1000 G3 UPS   AF448A

NOTE: Please see the QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/13160_na/13160_na.html

HP T1500 G3 UPS

HP T1500 G3 UPS   AF450A

NOTE: Please see the QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/13160_na/13160_na.html

HP R/T 2200 G2 UPS

HP, R/T 2200 UPS   AF409A

NOTE: Please see the QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/13179_na/13179_na.html

NOTE: For additional information on HP Uninterruptable Power Systems please go to:
www.hp.com/servers/rackups.

Rack Kits	ProLiant Rack Enabling Kit (RoHS Compliant)	417705-B21

NOTE: This is a Rack Enabling Kit that supports the HP ProLiant ML110 and HP ProLiant ML310 servers (system & tray occupy 6U).
NOTE: Support for racks with round or square mounting holes (including all Compaq and HP Rack System /E and HP Systems), with an adjustment range of 24" - 36".

Additional Options

USB Options	HP USB-P/S2 Optical Mouse	DC369A
	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

Service and Support Offerings (HP Care Pack Services)	**Hardware Services On-site Service**	
	Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 3 Years, Electronic	U4445E
	NOTE: To attach 3 year, 4-Hour On-site Service to Smart Buy servers, Smart Buy Care Packs must be used. For other service levels, order standard Care Pack part numbers.	
	4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	U4446E
	4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	U4447E
	NOTE: Use one of the following Smart Buy Care Packs to attach 3 year, 4-Hour On-site Service to Smart Buy servers. For other service levels, order standard Care Pack part numbers.	
	ML310 Smart Buy 4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	UE899E
	ML310 Smart Buy 4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UE900E
	6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	U4448E
	Installation & Start-up Services	
	Hardware Installation, Electronic	U4456E
	Installation & Start-Up of a ProLiant server and Microsoft or Linux O/S per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excl. HP holidays, Electronic	U4457E
	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	U4458E
	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	U4459E
	Onsite HW support 24x7, 4hr response and SuSE Linux SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic	U6306E
	Onsite HW support 24x7, 4hr response and Red Hat ES Linux SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic	U8328E
	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 ML310 G5 Memory Configuration

Standard Memory

All HP ProLiant ML310 G5 models ship with unbuffered, ECC PC2-6400 DDR2 SDRAM running at 800MHz.
Dual-core models include a single 512 MB DIMM. Quad-core models include a single 1GB DIMM.
Factory Integrated Models include the memory capacity of your choice.

Standard Memory Replaced with Optional Memory

Up to 8 GB memory is available with the optional installation of four 2 GB PC2-6400 Unbuffered ECC DDR2 SDRAM DIMM kits.

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

- Single-channel mode – DIMMs installed for one channel only
- Dual-channel asymmetric mode – DIMMs installed for both channels but of unequal channel capacities.
- Dual-channel interleaved mode (recommended) – DIMMs installed for both channels and offering equal channel capacities, providing the highest performance.
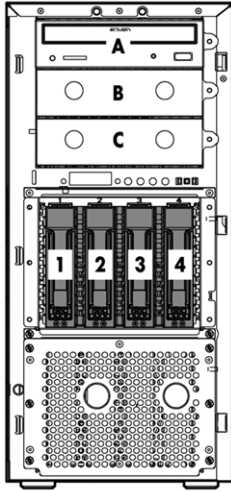
The first DIMM should be installed in Socket 1. A DIMM should not be installed in Socket 2 without a DIMM in Socket 1. Likewise a DIMM should not be installed in Socket 4 without a DIMM in Socket 3. A DIMM need not be installed in Socket 2 in order to install a DIMM in Socket 3.

Table 3-1 shows some of the suggested memory configurations for these systems.
NOTE: Table 3-1 does not list all possible configurations. Balanced-capacity, dual-channel loading yields best performance.

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

Storage

B, C   Removable Media Bays (1.6" each)

A   SATA DVD-ROM

1 - 4   Four Hot Plug Hard Drive Bays

Drive Support

	Quantity Supported	Position Supported	Controller
Removable Media			
1.44-MB Diskette Drive	Up to 1	A, B, or C	Integrated
HP Half-Height SATA DVD-ROM Optical Drive	Up to 2	A, B, or C	Integrated SATA
HP Half-Height SATA DVD RW Optical Drive	Up to 2	A, B, or C	Integrated SATA

Hard Drives
NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

SAS Hot Plug 3.5" Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
450GB 3G SAS 15K DP	Up to 4	1-4	HP SC40Ge SAS HBA with RAID
400GB 3G SAS 10K DP			NOTE: When using the SC40Ge with SATA Hard Drives, 1.5G
300GB 3G SAS 15K SP			SATA Hard Drives are required. Transfer rate: 1.5 Gb/s SATA, 3
300GB 3G SAS 15K DP			Gb/s SAS.
146GB 3G SAS 15K SP			HP 8 Internal Port SAS HBA with RAID
146GB 3G SAS 15K DP			NOTE: Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS.
72GB 3G SAS 15K SP			HP Smart Array E200/128 BBWC Controller
72GB 3G SAS 15K DP			HP Smart Array E500/256 MB Controller
			HP Smart Array P400/256 MB Controller
			HP Smart Array P400/512 MB BBWC Controller
			HP Smart Array P800/512 BBWC Controller

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

Storage

SAS Hot Plug 3.5" Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
1TB 7.2K DP 750GB 7.2K DP	Up to 4	1-4	HP SC40Ge SAS HBA with RAID NOTE: When using the SC40Ge with SATA Hard Drives, 1.5G SATA Hard Drives are required. Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS. HP 8 Internal Port SAS HBA with RAID NOTE: Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS. HP Smart Array E200/128 BBWC Controller HP Smart Array E500/256 MB Controller HP Smart Array P400/256 MB Controller HP Smart Array P400/512 MB BBWC Controller HP Smart Array P800/512 BBWC Controller

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

SATA Hot Plug 3.5" Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
1TB 3G SATA 7.2K	Up to 2	1-2	HP 8 Internal Port SAS HBA with RAID
750GB 3G SATA 7.2K	Up to 4	1-4	NOTE: Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS.
500GB 3G SATA 7.2K	NOTE:	NOTE:	HP Smart Array E200/128 BBWC Controller
250GB 3G SATA 7.2K	depending on model.	depending on model.	HP Smart Array P400/256MB Controller HP Smart Array P400/512MB BBWC Controller HP Smart Array P800/512MB BBWC Controller

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

SATA Hot Plug 3.5" Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
160GB 3G SATA 7.2K	Up to 4	1-4	HP 8 Internal Port SAS HBA with RAID NOTE: Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS. HP Smart Array E200/128 BBWC Controller HP Smart Array P400/256MB Controller HP Smart Array P400/512MB BBWC Controller HP Smart Array P800/512MB BBWC Controller

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

3.5" SATA Hot Plug Drives

	Quantity Supported	Position Supported	Controller
750GB 1.5G SATA 7.2K 500GB 1.5G SATA 7.2K 250GB 1.5G SATA 7.2K	Up to 4	1-4	HP SC44Ge Host Bus Adapter NOTE: When using the SC44Ge with SATA Hard Drives, 1.5G SATA Hard Drives are required. Transfer rate: 1.5 Gb/s SATA, 3

Storage

160GB 1.5G SATA 7.2K

Gb/s SAS.
HP 8 Internal Port SAS HBA with RAID
NOTE: When using the 8 Internal Port SAS HBA with SATA Hard Drives, 1.5G SATA Hard Drives are required.
NOTE: Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS.
HP Smart Array E200/128 BBWC Controller
HP Smart Array P400/256MB Controller
HP Smart Array P400/512MB BBWC Controller
HP Smart Array P800/512MB BBWC Controller

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

External Storage

	Quantity Supported	Position Supported	Controller
60 Modular Smart Array	Up to 8	External	HP Smart Array P800/512 BBWC Controller HP Smart Array E500/256 MB Controller
70 Modular Smart Array	Up to 4	External	HP Smart Array P800/512 BBWC Controller HP Smart Array E500/256 MB Controller
HP 2000sa Modular Smart Array Controller	Up to 4	External	HP SC08Ge Host Bus Adapter

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Tape and Disk-Based Backup

NOTE: For a complete listing of compatible tape and disk-based backup offerings, please visit: www.hp.com/go/connect

	Position Supported	Controller	Controller/HBA Option Kit Part Number
HP StorageWorks SCSI Tape Drives, Internal LTO-1 Ultrium 232 LTO-2 Ultrium 448 LTO-3 Ultrium 920 LTO-4 Ultrium 1760 DAT 40 DAT 72 DAT 160	B,C	HP SC11Xe Host Bus Adapter	412911-B21
HP StorageWorks SCSI Tape Drives, External LTO-1 Ultrium 232 LTO-2 Ultrium 448 LTO-3 Ultrium 920 LTO-3 Ultrium 960 LTO-4 Ultrium 1760 LTO-4 Ultrium 1840 DAT 40 DAT 72 DAT 160	External	HP SC11Xe Host Bus Adapter	412911-B21

Storage

1U Rack-Mount Kit
3U Rack-Mount Kit

HP StorageWorks USB Tape Drives, Internal DAT 40 USB DAT 72 USB DAT 160 USB	B,C	USB 2.0 Port on motherboard	N/A
HP StorageWorks USB Tape Drives, External DAT 40 USB DAT 72 USB DAT 160 USB 1U USB Rack-Mount Kit	External	USB 2.0 Port	N/A
HP StorageWorks SAS Tape Drives, Internal DAT160 SAS LTO-2 Ultrium 448 SAS LTO-3 Ultrium 920 SAS LTO-4 Ultrium 1760 SAS	B,C	HP SC44Ge Host Bus Adapter **NOTE:** Recommended.	416096-B21
HP StorageWorks SAS Tape Drives, External 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	External	HP SC44Ge Host Bus Adapter **NOTE:** Recommended.	416096-B21
HP StorageWorks SCSI Tape Automation, External DAT 72x10 Autoloader 1/8 G2 Autoloader MSL2024 MSL4048 MSL8096 MSL6000	External	HP SC11Xe Host Bus Adapter HP U320e SCSI Host Bus Adapter **NOTE:** Recommended for MSL tape libraries.	412911-B21 AH627A
HP StorageWorks SAS Tape Automation, External 1/8 G2 Autoloader MSL2024 MSL4048	External	HP SC44Ge Host Bus Adapter **NOTE:** Please visit: http://www.hp.com/go/connect for details about minimum SAS controller firmware version and SAS cabling requirements.	416096-B21

Storage

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 RDX500	B,C	USB 2.0 Port	N/A
HP StorageWorks RDX Removable Disk Backup System, External RDX160 RDX320 RDX500	External	USB 2.0 Port	N/A
HP StorageWorks D2D Backup Systems D2D120 D2D130 D2D2500i D2D4000i	External	Embedded Network Controller	N/A

Technical Specifications

System Unit	**Dimensions** (H x W x D) (with bezel)		17.0 x 7.9 x 24.0 in (43.2 x 20.0 x 61.0 cm)
	Tower Weight (approximate)	Maximum (two hard drives, power supply, and processor installed)	50 lb (22.7 kg)
		Minimum (one hard drive, power supply, and processor installed)	33.1 lb (15.0 kg)
	Input Requirements (per power supply)	Rated Line Voltage	90 VAC – 264 VAC
		Rated Input Current	6.5 A (at 100 VAC), 3 A (at 230 VAC)
		Rated Input Frequency	47 to 63 Hz
		Rated Input Power	<527W @115/230 VRMS
	BTU Rating	Maximum	1836 BTU/hr (at 100 VAC), 1706 BTU/hr (at 200 VAC)
	Power Specifications		To review typical system power ratings use the Active Answers HP Power Advisor which is available via the online tool located at URL: www.hp.com/go/proliant-energy-efficienct - Click on the system of interest. Example: ML310 G5 - Follow the instructions of the next screens.
	Power Supply Output (per power supply)	Rated Steady-State Power	400 W (at 100 VAC), 400 W (at 200 VAC)
		Maximum Peak Power	400 W (at 100 VAC), 400 W (at 200 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 installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).
		Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
	Relative Humidity (non-condensing)	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
		Non-operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
	Altitude	Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed.

Technical Specifications

		Maximum allowable altitude change rate is 457 m/min (1500 ft/min).		
	Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).		
Acoustic Noise		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 (BELS)	5.0 B	
		L pAm (dBA)	32 dBA	
		Operating		
		L WAd (BELS)	5.0 B	
		L pAm (dBA)	32 dBA	
Emissions Classification (EMC)	FCC Rating	B		
	Normative Standards	CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1		

NOTE: Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.

HP SATA DVD-ROM Optical Drive	**Applicable Disk**	DVD-ROM		
		DVD-R /-RW (Read Only) DVD+R /+RW (Read Only)		
		2.6 GB/side DVD-RAM (Read Only)		
		5.2 GB/side DVD-RAM (Read Only)		
		CD-ROM Mode-1 data disc		
		CD-ROM Mode-2 data disc		
		CD Audio disc		
		CD-Extra		
		CD-RW (Read Only)		
		CD-R (Read Only)		
		CD Text		
		PhotoCD		
		CD-I (mode 2)		
		CD-I Ready		
		CD-Bridge		
	Capacity	DVD-ROM	DVD-SL	4.7 GB/side
			DVD-DL	8.5 GB/side
			Double Sided	9.40 GB/side

Technical Specifications

	DVD-R/-RW		4.7 GB/side
	DVD-RAM		2.6 GB/5.2 GB/side
	DVD+R/+RW		4.7 GB
	CD-ROM	Mode-1	650 (700 MB)
		Mode-2	742 MB (640 MB)
Block Size	DVD		2,048 bytes
	CD		2,352 (Mode-0) 2352, 2340, 2336, 2048 bytes (Mode-1) 2352, 2340, 2336, 2048 bytes (Mode-2)
Diameter	120 mm, 80 mm (with adapter at vertical mounting mode)		
Loading Mechanism	Tray type Auto Loading		
Interface	SATA 1.5		
Access Times (typical)	Random	DVD-ROM < 140 ms, CD-ROM < 125 ms	
	Full-Stroke	DVD-ROM < 250 ms, CD-ROM < 210 ms	
Data Transfer Rate (sustained)	DVD-ROM	21.6 MB/sec. Max.	
	CD-ROM	6 MB/sec. Max.	
Cache Buffer	2 MB		
Spin-up Time (typical)	less than 10 seconds		
MTBF	125,000 Power On Hours (POH)		
Ambient Temperature	Operating	41° to 122° F (5° to 50° C)	
	Storage/Transportation	-40° to 120° F (-40° to 60° C)	
Relative Humidity	Operating	10% to 90%	
	Storage/Transportation	5% to 95%	
Drive Dimensions (HxWxD, maximum)	1.62 x 5.75 x 7.87 in (41.3 x 146 x 200 mm)		

HP SC40Ge SAS Host Bus Adapter with RAID	RAID Support	RAID 1 (Mirroring) RAID 0 (Striping)
	Logical Drives Supported	Up to 2 Logical Volumes Up to 10 drives total in all RAID volumes Up to 2 Drives per RAID 1 Up to 8 Drives per RAID 0
	Maximum Capacity	4TB (4 x 1TB)
	Data Transfer Method	64-bit wide, PCIe 133 MHz (1 GB/s maximum bandwidth)
	Port Transfer Rate	12 Gb/s per x4 Wide SAS Port (4 x 3 Gb/s)
	Simultaneous Drive Transfer Ports	2 x4 Wide SAS Connectors
	Protocols	3 Gbps SAS (Serial Attached SCSI) 1.5 Gbps SATA (Serial Advanced Technology Attachment)
	External SAS Connectors	None
	Internal SAS Connectors	2 internal SFF8484 x4 SAS Connectors

Technical Specifications

	Upgradeable Firmware	4MB flashable ROM

Embedded NC326i Gigabit Server Adapter	Network Interface Compatibility	10Base-T/100Base-TX/1000Base-TX
		IEEE 802.3 10Base-T
		IEEE 802.3ab 1000Base-T
		IEEE 802.3u 100Base-TX
	Data Transfer Method	Four lane (x4), 100MHz PCI Express Reference Clock
	Network Transfer Rate	10Base-T (Half-Duplex) — 10 Mb/s
		10Base-T (Full-Duplex) — 20 Mb/s
		100Base-TX (Half-Duplex) — 100 Mb/s
		100Base-TX (Full-Duplex) — 200 Mb/s
		1000Base-TX (Half and Full-Duplex) — 2000Mb/s
	Connector	RJ-45
	Cable Support	10Base-T — Categories 3, 4 or 5 UTP; up to 328 ft (100 m)
		10/100/1000Base-TX — Category 5 UTP; up to 328 ft (100 m)

Environment-friendly Products and Approach	End-of-life Management and Recycling	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.
		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.