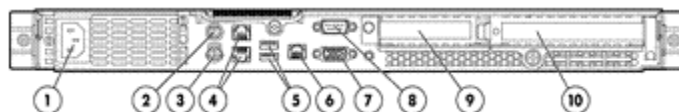
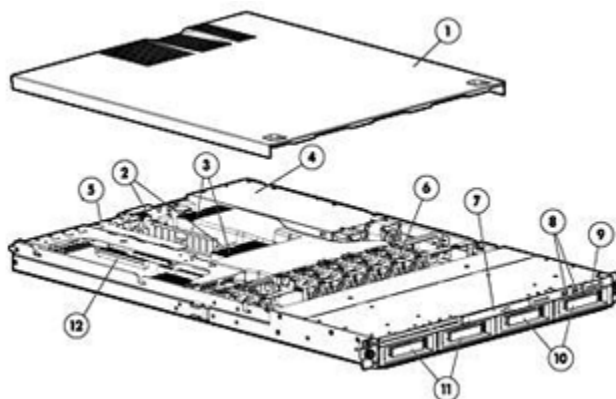


### Overview

#### Hot Plug SAS/SATA or Non-Hot Plug SATA Models



#### Front View:

1. Access panel
2. Memory banks
3. Two (2) AMD Opteron 2300 series processors
4. Power supply
5. Low-profile PCI-Express or PCI-X slot
6. System fans
7. Optical drive bay
8. Front-panel USB 2.0 ports
9. Power switch/system status LEDs
10. Optional 3rd and 4th 3.5" hot-plug SAS/SATA or non-hot plug SATA hard drive bays
11. Standard 1st and 2nd 3.5" hot-plug SAS/SATA or non-hot plug SATA hard drive bays
12. Full height/full length PCI-Express or HTX slot

#### Rear View:

1. Power supply cable socket
2. PS/2 mouse port
3. PS/2 keyboard port
4. Two (2) RJ45 GbE LAN ports
5. Rear panel USB 2.0 ports
6. Lights-Out 100 10/100Mbps port
7. Video port
8. Serial port
9. Low-profile riser board assembly slot cover
10. Full-sized riser board assembly slot cover

### What's New

- Support for AMD Opteron 2300 series Quad-Core processors
- Supports up to four SATA Hot Plug/Non-Hot Plug Midline and Entry Hard Drives

### Overview

#### At A Glance

Introducing the HP ProLiant DL165G5, now available with the latest high performance Opteron Quad Core processors, increased storage by 2X and a new high efficiency power supply option.

- **Processors:**
  - Supports up to two AMD Opteron 2300 series Quad-Core processors
  - Supports DirectConnect Architecture
  - Supports Power Now
- **Memory:**
  - 8 DIMM slots supporting up to 32GB REG PC2-5300 DDR2-667 MHz memory with Advanced ECC
- **Internal Drive Support:**
  - Internal storage capacity:
    - SATA Capacity: Support for up to 4.0TB (4 x 1TB)
    - SAS Capacity: Support for up to 1.2TB (4 x 300GB)
    - **NOTE:** Installation of the [Hot Plug Backplane 1U 2S Kit \(445985-B21\)](#) is required if ordering third or fourth Hard Drives for Hot Plug models only.
- **Network Controller:**
  - Embedded NC7782 dual-port gigabit server adapter
- **Storage Controllers:**
  - Non-Hot Plug SATA Models: HP Embedded SATA Controller
  - Hot Plug SATA/SAS Models: HP SC40Ge SAS HBA with RAID 0,1
- **Expansion Slots:**
  - Standard - PCI-Express assembly includes:
    - Slot 1: full-length/full height PCI-Express x16
    - Slot 2: half-length/low-profile PCI-Express x4 (x8 connector)
  - Optional - PCI-X assembly includes:
    - Slot 2: half-length/low-profile PCI-X 133 (note: PCI-X slots are 64 bits; 133 MHz capable)
  - Optional - HTX assembly includes: Slot 1: full-length/full height HTX
- **Management:**
  - HP ProLiant Lights Out 100i Remote Management support (IPMI 2.0 and SMASH support)
  - Virtual Media support with LO100i Select license
  - Virtual Media plus Virtual KVM support with LO100i Advanced license
- **USB Ports:**
  - Up to five USB ports (two front & two rear standard, 1 internal option)
- **Optical Drive:**
  - Support for one (optional): DVD-ROM, DVD/CD RW
- **Power Supply:**
  - 650W Power Supply (Non-Hot Plug, Autoswitching)
- **Form Factor:**
  - Rack (1U)
  - Fixed mounting rails included with all models
- **Deployment/Serviceability:**
  - Tool-less access to all system components for easy in-rack serviceability
- **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 from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Additional support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Certain restrictions and exclusions apply. SATA hard drives have a one year warranty.
  - **NOTE:** Server Warranty includes [1 year Parts, 1 year Labor, 1-year on-site support with next business day response](#). Additional information regarding worldwide limited warranty and technical support is available at: <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

### 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/4AA1-5494ENW.pdf>

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

**Processor** AMD Opteron™ processor Model 2346 HE (1.8 GHz, 55W ACP)  
 One of the following depending on Model AMD Opteron processor Model 2356 (2.3 GHz, 75W ACP)  
 AMD Opteron processor Model 2354 (2.2 GHz, 75W ACP)  
**NOTE:** Offered through Configure-To-Order only. See Factory Integrated Models section for more details.  
 AMD Opteron processor Model 2352 (2.1 GHz, 75W ACP)

**Upgradeability** Upgradeable to two processors

**Chipset** ServerWorks HT2100 and HT1000

**Cache Memory** 128K dedicated L1 per core  
 512K dedicated L2 per core  
 2MB shared L3

**Memory Protection** Advanced ECC

**Memory** Type REG PC2-5300 DIMMs (DDR2-667)  
 One of the following depending on Model Standard 2 GB (2 x 1 GB)  
 Maximum 32 GB (8 x 4 GB)

**Network Controller** Embedded NC7782 dual-port gigabit server adapter

Expansion Slots #	Technology	Bus Width**	Connector Width	Bus Number*	Form Factor	Notes
1	PCI Express	x16	x16	3	Full Height/Full Length	
1	HTX	N/A	N/A	9	Full Height/Full Length	
2	PCI Express	x4	x8	6	Low-profile	
2	PCI-X	64-bit, 133MHz	N/A	2	Low-profile	

\*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

<b>Storage Controller</b>	Non-Hot Plug SATA Models	HP Embedded SATA Controller
	Hot Plug SATA/SAS Models	HP SC40Ge SAS HBA with RAID 0,1

**NOTE:** A diskette drive is needed to install storage controller drivers during a Windows operating system installation from CD.

<b>Storage</b>	<b>Optical Drives:</b>	
	DVD-ROM	8x IDE (ATAPI) DVD-ROM drive, slim (optional)
	DVD/CD RW	24x IDE (ATAPI) DVD-ROM/CDRW drive (optional)
	Diskette Drives	Via USB only
	<b>Drive Bays:</b>	
	Non-Hot Plug SATA	Up to 4 Non-hot plug SATA 3.5" drives
	Hot-Plug SATA/SAS	Up to 4 Hot plug SATA /SAS 3.5" drives

<b>Maximum Internal Storage</b>	Non-Hot Plug SATA	3TB	4 x 750GB
	Hot Plug SATA	4.0TB	4 x 1TB
	Hot Plug SAS	1.2TB	4 x 300GB

<b>Interfaces</b>	Parallel	None
	Network RJ-45(Ethernet)	Embedded NC7782 dual-port gigabit server adapter
	Serial	1
	Pointing Device (Mouse)	1
	Graphics	1
	Keyboard	1
	USB	Up to 5 (two front & two rear standard, 1 internal option) <b>NOTE:</b> Please see the following URL for additional information regarding USB support: <a href="http://h18004.www1.hp.com/products/servers/platforms/usb-support.html">http://h18004.www1.hp.com/products/servers/platforms/usb-support.html</a> .

<b>Graphics</b>	32MB shared supporting 1600x1200x16M resolution
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<b>Form Factor</b>	Rack (1U), (1.75 in/4.45 cm)
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### Standard Features

<b>Server Management Stand Alone Software Product and ProLiant Essentials</b>	ProLiant Essentials	Rapid Deployment Pack (RDP) is an automated deployment and provisioning solution for all ProLiant servers. RDP supports image capture and deployment on 100 series servers. Every RDP disc includes 10-node trial licenses for evaluation purposes. RDP requires a license for each server deployed and is available for purchase with HP servers. For more information, visit: <a href="http://www.hp.com/go/rdp">http://www.hp.com/go/rdp</a> .
	Rapid Deployment Pack	<b>NOTE:</b> Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. AKA Tracking licenses require a 100 unit minimum forecast at initial contract signing. For AKA and flex license part numbers, please refer to each software products' QuickSpecs at: <a href="http://www.hp.com/servers/proliantessentials">http://www.hp.com/servers/proliantessentials</a> or the various ProLiant Essentials Value Pack product QuickSpecs for more information.
	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.
	Lights-Out 100i	HP Lights-Out 100i Remote Management delivers affordable, entry level remote management capabilities for HP ProLiant 100 Series servers with embedded LO100i. It allows customers or their service providers to remotely manage ProLiant 100 Series servers remotely over a LAN or the Internet and consists of the following: <ul style="list-style-type: none"><li>• LO100i Standard is embedded remote management and provides basic remote control via telnet, browser, and IPMI 2.0 and SMASH</li><li>• LO100i Select Pack License are upgrades for essential, secure, remote control, serial console and virtual media</li><li>• LO100i Advanced Pack License are upgrades for all the features of LO100i Select plus Virtual KVM (graphical hardware-based, remote console)</li></ul> <b>NOTE:</b> Flexible and volume quantity (AKA) license kits are available for both the Lights-Out 100i Select and Lights-Out 100 Advanced Pack licenses as well as Electronic License To Use (E-LTU). AKA Tracking licenses require a 100 unit minimum forecast at initial contract signing. For these additional part numbers, please refer to each software products' QuickSpecs at this link for more information: <a href="http://h18004.www1.hp.com/products/servers/management/remotemgmt.html">http://h18004.www1.hp.com/products/servers/management/remotemgmt.html</a> .
<b>Core Infrastructure Management</b>	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: <a href="http://www.hp.com/go/subscriberschoice">http://www.hp.com/go/subscriberschoice</a> and customize your profile to receive various new alerts as they become available, on a weekly or monthly basis.
	ROMPaq software and latest drivers	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: <a href="http://www.hp.com/go/support">http://www.hp.com/go/support</a> .

### Standard Features

<b>Industry Standard Compliance</b>	ACPI V2.0 Compliant PCI 2.2 Compliant PXE Support WOL Support Microsoft® Logo certifications IPMI 2.0 Compliant
<b>Manageability</b>	Embedded HP ProLiant Lights-Out 100i Remote Management, with licensable upgrades to Lights-Out 100i Select and Lights-Out 100i Advanced.
<b>Security</b>	Power-on password Setup password
<b>UPS and PDU Power Cord Matrix</b>	Please see the UPS and PDU cable matrix that lists cable descriptions, requirements, and specifications for UPS and PDU units: <a href="http://h18004.www1.hp.com/products/servers/proliantstorage/power-protection/index.html">http://h18004.www1.hp.com/products/servers/proliantstorage/power-protection/index.html</a> .
<b>Power Supply</b>	650 Watts, auto-switching, PFC (Power Factor Correcting)
<b>System Fans</b>	6 system fans ship standard; non-hot plug, non-redundant
<b>OS Support</b>	Microsoft Windows Small Business Server 2003, R2 Microsoft Windows 2003 and Microsoft Windows 2003/R2 Standard Edition (32-bit) Microsoft Windows 2003 and Microsoft Windows 2003/R2 Enterprise Edition (32-bit) Microsoft Windows 2003 and Microsoft Windows 2003/R2 Web Edition (32-bit) Microsoft Windows 2003 and Microsoft Windows 2003/R2 for Extended Systems Standard Edition (64-bit) Microsoft Windows 2003 and Microsoft Windows 2003/R2 for Extended Systems Enterprise Edition (64-bit) Microsoft Windows Server 2008 Red Hat Enterprise Linux SUSE Linux Enterprise Server Solaris 10  <b>NOTE:</b> For more complete and up-to-date information of all supported OSes for ProLiant, certification information and how to buy server operating systems from HP please visit the OS product site at: <a href="http://h18004.www1.hp.com/products/servers/software/OEM.html">http://h18004.www1.hp.com/products/servers/software/OEM.html</a> . <b>NOTE:</b> For an up-to-date listing of the latest software and drivers available for your server, please select your server: <a href="http://h20000.www2.hp.com/bizsupport/TechSupport/Product.jsp?lang=en&amp;cc=us&amp;taskId=135&amp;prodTypeId=15351&amp;prodCatId=241435">http://h20000.www2.hp.com/bizsupport/TechSupport/Product.jsp?lang=en&amp;cc=us&amp;taskId=135&amp;prodTypeId=15351&amp;prodCatId=241435</a> .

### Standard Features

#### Rack Airflow Requirements

##### Rack 10000 series Cabinets

The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors.

**CAUTION:** If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment:

Front and rear doors: If your 42U server rack includes closing front and rear doors, you must allow 5,350 sq cm (830 square inches) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation).

Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 7 cm (2.75 inches)

**CAUTION:** Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

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#### Rack Support

The DL Fixed Rail System supports installation in racks with square or round mounting holes (including Compaq/HP 7000, 9000, 10000 and HP series), with an adjustment range of 24" - 36". Installation into Telco 2 post, and 4 post, or threaded holes racks requires a 3rd party option kit. For additional information, please visit: [www.racksolutions.com](http://www.racksolutions.com).

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#### HP Factory Express Capability

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>.

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#### 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.

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### Standard Features

**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 that are purchased at the same time or afterward and internal to the enclosure. It 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 capitalize on your HP ProLiant servers' capabilities requires a service partner who thoroughly understands your server technology and systems environment. HP Services, an industry leader in provision of multi vender support solutions provides a range of support services designed to meet the varying needs of business. Whether an SMB or large global corporation HP has a ProLiant server support offer to help you speedily deploy and maximize system uptime.

**Recommended Service** - Simplify ProLiant solution implementation, maintenance and management.

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

**Enhanced Service** - Optimize service level to increase IT performance and availability

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

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.

For a complete listing of service offerings and information visit:

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

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



### *HPC Interconnects*

**NOTE:** High Performance Computing (HPC) interconnect technologies are available for the DL165 G5 under the Cluster Platform product portfolio. These high-speed interconnects are fully supported by HP when they are part of these configurations to order clusters. Solutions can be defined with a lot of flexibility with the help of configuration tools. Please visit the following URL to configure HPC Clusters with InfiniBand, Gigabit Ethernet or Myrinet Interconnects:  
<http://www.hp.com/techservers/clusters/ucp/index.html>

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<b>HPC Interconnects</b>	<b>InfiniBand</b>	PCI-X and PCI-Express adapters
	<b>Gigabit Ethernet</b>	Use embedded ports or optional 10GbE NICs
	<b>Myrinet XP</b>	PCI-X Rev D, Rev E and Rev F adapters

### Models

#### Non Hot Plug Serial ATA (SATA) Models

<p><b>HP DL165 G5 2346HE</b> 1.8GHz, 2GB, Non-Hot Plug SATA (1P) 464207-xx1</p>	<p><b>Processor(s)</b> <a href="#">One of the following depending on model</a></p> <p><b>Cache Memory</b></p>	<p>(1) AMD Opteron processor Model 2346HE (1.8 GHz, 55W ACP) (1) AMD Opteron processor Model 2352 (2.1 GHz, 75W ACP) (1) AMD Opteron processor Model 2356 (2.3 GHz, 75W ACP)</p> <p>2MB shared Level 3 cache</p>
<p><b>HP DL165 G5 2352 2.1 GHz, 2GB, Non-Hot Plug SATA (1P)</b> 445153-xx1</p>	<p><b>Memory</b> <a href="#">One of the following depending on model</a></p>	<p>2GB (2 x 1GB) Registered PC2-5300 DDR2 DIMMs (667MHz) with Advanced ECC capabilities 4GB (2 x 2GB) Registered PC2-5300 DDR2 DIMMs (667MHz) with Advanced ECC capabilities</p>
<p><b>HP DL165G5 2356</b> 2.3GHz, 4GB, Non-Hot Plug (1P) 445161-xx1</p>	<p><b>Network Controller</b> <b>Storage Controller</b> <b>Hard Drive</b> <b>Internal Storage</b> <b>Optical Drive</b> <b>Form Factor</b></p>	<p>Embedded NC7782 dual-port gigabit server adapter</p> <p>HP Embedded SATA Controller</p> <p>(1) 160GB NHP SATA HDD</p> <p>3TB maximum</p> <p>Optional DVD-ROM, DVD/CD RW</p> <p>Rack (1U)</p>

#### Hot Plug Serial ATA (SATA)/Serial Attached SCSI (SAS) Models

<p><b>HP DL165G5 2346HE</b> 1.8 GHz, 2GB, Hot Plug (1P) 464208-xx1</p>	<p><b>Processor(s)</b> <a href="#">One of the following depending on model</a></p> <p><b>Cache Memory</b></p>	<p>(1) AMD Opteron processor Model 2346HE (1.8 GHz, 55W ACP) (1) AMD Opteron processor Model 2352 (2.1 GHz, 75W ACP) (1) AMD Opteron processor Model 2356 (2.3 GHz, 75W ACP)</p> <p>2MB shared Level 3 cache</p>
<p><b>HP DL165 G5 2352 2.1 GHz, 2 GB Hot Plug SAS/SATA (1P)</b> 445164-xx1</p>	<p><b>Memory</b> <a href="#">One of the following depending on model</a></p>	<p>2 GB (2 x 1GB) Registered PC2-5300 DDR2 DIMMs (667MHz) with Advanced ECC capabilities 4GB (2 x 2GB) Registered PC2-5300 DDR2 DIMMs (667MHz) with Advanced ECC capabilities</p>
<p><b>HP DL165G5 2356 2.3 GHz, 4 GB, Hot Plug (1P)</b> 445162-xx1</p>	<p><b>Network Controller</b> <b>Storage Controller</b> <b>Hard Drive</b> <b>Internal Storage</b> <a href="#">One of the following depending on model</a> <b>Optical Drive</b> <b>Form Factor</b></p>	<p>Embedded NC7782 dual-port gigabit server adapter</p> <p>HP 8 Internal Port SAS HBA with RAID</p> <p>None ship standard (up to 4 Hot Plug SATA or SAS drives supported)</p> <p>SATA: 4.0TB Maximum SAS: 1.2TB Maximum</p> <p>Optional DVD-ROM, DVD/CD RW</p> <p>Rack (1U)</p>

<b>Country Code Key</b>	xx = 00	U.S.
	xx = 20	Brazil (Model 445164-201 only)
	xx = 29	Japan
	xx = 37	APD
	xx = 42	Euro
	xx = AA	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 is only available as a Factory Installable Option.

### Step 1: Base Configuration

#### Non-Hot Plug Model

HP ProLiant DL165 G5 Non- Hot Plug SATA Rack Chassis 445147-B21

#### Factory Integrated Model ships with:

Embedded NC7782 dual-port gigabit server adapter

Two available PCI-Express slots, including one full-length/full height and one low-profile/half height slot

HP embedded SATA controller

650 Watt Power Supply

6 Fixed, Non-Redundant Fans

Rack (1U), (1.75 in / 4.45 cm)

Fixed Mounting Rails

#### Hot Plug Model

HP ProLiant DL165 G5 Hot Plug SATA/SAS Rack Chassis 445148-B21

#### Factory Integrated Model ships with:

Embedded NC7782 dual-port gigabit server adapter

One full-length/full height PCI-Express slot. Low-profile/half height slot houses the SATA/SAS storage controller

HP SC40Ge SAS HBA with RAID 0,1

650 Watt Power Supply

6 Fixed, Non-Redundant Fans

Rack (1U), (1.75 in / 4.45 cm)

Fixed Mounting Rails

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

<b>Processors</b>	AMD Opteron™ processor model 2356 (2.3 GHz, 75W ACP), Option Kit, FIO <b>NOTE:</b> If 2 processors are desired, select one 445981-L21 and one 445981-B21.	445981-L21
	AMD Opteron™ processor model 2354 (2.2 GHz, 75W ACP), Option Kit, FIO <b>NOTE:</b> If 2 processors are desired, select one 445974-L21 and one 445974-B21.	445974-L21
	AMD Opteron™ processor model 2352 (2.1 GHz, 75W ACP), Option Kit, FIO <b>NOTE:</b> If 2 processors are desired, select one 445971-L21 and one 445971-B21.	445971-L21
	AMD Opteron™ processor model 2346HE (1.8 GHz, 55W ACP), Option Kit, FIO <b>NOTE:</b> If 2 processors are desired, select one 464210-L21 and one 464210-B21.	464210-L21

### Configuration Information - Factory Integrated Models

<b>Memory</b>	1 GB REG PC2-5300 2 x 512 MB Single Rank Kit	408850-B21
	2 GB REG PC2-5300 2 x 1 GB Single Rank Kit	408851-B21
	4 GB REG PC2-5300 2 x 2 GB Dual Rank Kit	408853-B21
	8 GB REG PC2-5300 2 x 4 GB Dual Rank Kit	408854-B21
	2 GB REG PC2-5300 2 X 1 GB Low Power Single Rank Kit	483399-B21
	4 GB REG PC2-5300 2 X 2 GB Low Power Single Rank Kit	483401-B21
	8 GB REG PC2-5300 2X 4 GB Low Power Dual Rank Kit	483403-B21

### Hard Drive

#### Serial-ATA (SATA) Non-Hot Plug Hard Drives (Non-Hot Plug Models Only)

##### SATA Non-Hot Plug Entry (ETY) Drives

HP 160GB 1.5G SATA 7.2K NHP 3.5" ETY HDD 458947-B21

##### SATA Non-Hot Plug Midline (MDL) Drives

HP 250GB 1.5G SATA 7.2K NHP 3.5" MDL HDD 458939-B21

HP 500GB 1.5G SATA 7.2K NHP 3.5" MDL HDD 458941-B21

HP 750GB 1.5G SATA 7.2K NHP 3.5" MDL HDD 462595-B21

#### Serial-ATA (SATA) Hot Plug Hard Drives (SATA/SAS Hot Plug Models Only)

##### SATA Hot Plug Entry (ETY) Drives

HP 160GB 1.5G SATA 7.2K 3.5" ETY HDD 458945-B21

##### SATA Hot Plug Midline (MDL) Drives

HP 250GB 1.5G SATA 7.2K 3.5" MDL HDD 458926-B21

HP 500GB 1.5G SATA 7.2K 3.5" MDL HDD 458928-B21

HP 750GB 1.5G SATA 7.2K 3.5" MDL HDD 458930-B21

HP 1TB 1.5G SATA 7.2K 3.5" MDL HDD 454146-B21

**NOTE:** SATA drives have a 1 year warranty. Please see the [SATA Hard Drive 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](http://h18000.www1.hp.com/products/quickspecs/11940_div/11940_div.html)  
(Worldwide)

#### Serial-Attached SCSI (SAS) Hot Plug Hard Drives (SATA/SAS Hot Plug Models Only)

HP 72GB 3G SAS 15K 3.5" DP HDD 384852-B21

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

HP 146GB 3G SAS 15K 3.5" DP HDD 384854-B21

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

HP 300GB 3G SAS 15K 3.5" DP HDD 416127-B21

HP 300GB 3G SAS 15K 3.5 SP HDD 431944-B21

**NOTE:** The purchase of an HP SAS HBA or Smart Array controller is required for proper operation of SAS drives.

### Backplane Option

Hot Plug HDD Backplane 1U 2S Kit 445985-B21

**NOTE:** Installation of the Hot Plug Backplane 1U 2S Kit (445985-B21) is required if ordering third or fourth Hard Drives for Hot Plug models only. 445985-B21

### Configuration Information - Factory Integrated Models

<b>Storage Controllers</b>	HP SC44Ge Host Bus Adapter	416096-B21
	HP SC40Ge 4INT PCIe SAS RAID Half Height HBA, FIO	449363-B21
	HP Smart Array E500/256MB Controller with Battery, FIO	462105-B21
	<b>NOTE:</b> Customers can only order one Smart Array E500/256MB Controller and one Battery-backed write cache upgrade (P/N 383280-B21) for the HP ProLiant DL165 G5 server based on battery space.	
	256MB Battery-backed write cache upgrade for RAID 5 support	383280-B21
	<b>NOTE:</b> when installing a battery-backed write cache module, the HP Smart Array E500 must be installed in the full-length PCI slot	
	HP Smart Array E200/128 BBWC Controller	411508-B21
<hr/>		
<b>Power Supply</b>	HP High Efficiency Power Supply Kit, FIO	453650-B21
	<b>NOTE:</b> Selection of the HE Power Supply Unit will remove the 650 Watt standard power supply and requires the purchase of Power Supply Backplane (p/n 453652-B21)	
	Power Supply Backplane	453652-B21
	<b>NOTE:</b> This backplane must be ordered with the high efficiency power supply (P/N 453650-B2).	

### Step 3: Choose Additional Options for Factory Integration

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

### Options

#### Server Management Stand Alone Software Product and ProLiant Essentials

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

#### DEPLOY

##### 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 Software Technical Support and Update Service.

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

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

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

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

#### Control

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

##### Lights-Out 100i Select Pack

HP Lights Out 100i Select Pack, No Media, 1-Server License 455339-B21

**NOTE:** Supports HP ProLiant DL 160 G5, DL165 G5 and DL180 G5 servers.

##### Lights-Out 100i Advanced Pack

HP Lights Out 100i Advanced Pack, No Media, 1-Server License 455342-B21

**NOTE:** Supports HP ProLiant DL 160 G5, DL165 G5 and DL185 G5 servers.

**NOTE:** Flexible and volume quantity (AKA) license kits are available for both the Lights-Out 100i Select and Lights-Out 100 Advanced Pack licenses as well as Electronic License To Use (E-LTU). AKA Tracking licenses require a 100 unit minimum forecast at initial contract signing. For these additional part numbers, please refer to each software products' QuickSpecs at this link for more information:

<http://h18004.www1.hp.com/products/servers/management/remotemgmt.html>.

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#### Processor

AMD Opteron™ processor 2356 (2.3 GHz,75W ACP) 445981-B21

AMD Opteron™ processor model 2354 (2.2 GHz, 75W ACP) 445974-B21

AMD Opteron™ processor 2352 (2.1 GHz,75W ACP) 445971-B21

AMD Opteron™ processor model 2346HE (1.8 GHz, 55W ACP) 464210-B21

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### Options

<b>Memory (DIMMs)</b>	1 GB REG PC2-5300 2 x 512 MB Single Rank Kit	408850-B21
	2 GB REG PC2-5300 2 x 1 GB Single Rank Kit	408851-B21
	4 GB REG PC2-5300 2 x 2 GB Dual Rank Kit	408853-B21
	8 GB REG PC2-5300 2 x 4 GB Dual Rank Kit	408854-B21
	2 GB REG PC2-5300 2 X 1 GB Low Power Single Rank Kit	483399-B21
	4 GB REG PC2-5300 2 X 2 GB Low Power Single Rank Kit	483401-B21
	8 GB REG PC2-5300 2 X 4 GB Low Power Dual Rank Kit	483403-B21

### Hard Drives

#### Serial-ATA (SATA) Non-Hot Plug Hard Drives (Non-Hot Plug Models Only)

##### SATA Non-Hot Plug Entry (ETY) Drives

HP 160GB 1.5G SATA 7.2K NHP 3.5" ETY HDD 458947-B21

##### SATA Non-Hot Plug Midline (MDL) Drives

HP 250GB 1.5G SATA 7.2K NHP 3.5" MDL HDD 458939-B21

HP 500GB 1.5G SATA 7.2K NHP 3.5" MDL HDD 458941-B21

HP 750GB 1.5G SATA 7.2K NHP 3.5" MDL HDD 462595-B21

##### SATA Hot Plug Entry (ETY) Drives

HP 160GB 1.5G SATA 7.2K 3.5" ETY HDD 458945-B21

##### SATA Hot Plug Midline (MDL) Drives

HP 250GB 1.5G SATA 7.2K 3.5" MDL HDD 458926-B21

HP 500GB 1.5G SATA 7.2K 3.5" MDL HDD 458928-B21

HP 750GB 1.5G SATA 7.2K 3.5" MDL HDD 458930-B21

HP 1TB 1.5G SATA 7.2K 3.5" MDL HDD 454146-B21

**NOTE:** When purchasing systems with the 500GB Non-Hot Plug SATA drives, please reference the Configuration Information Section of this QuickSpecs to order via Configuration to Order.

#### Serial-ATA (SATA) Hot Plug Hard Drives (SATA/SAS Hot Plug Models Only)

##### Serial-Attached SCSI (SAS) Hot Plug Hard Drives (SATA/SAS Hot Plug Models Only)

HP 72GB 3G SAS 15K 3.5" DP HDD 384852-B21

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

HP 146GB 3G SAS 15K 3.5" DP HDD 384854-B21

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

HP 300GB 3G SAS 15K 3.5" DP HDD 416127-B21

HP 300GB 3G SAS 15K 3.5 SP HDD 431944-B21

**NOTE:** The purchase of SAS HBA or array controller is required.

### Hot Plug HDD Backplane Option

Hot Plug HDD Backplane 1U 2S Kit 445985-B21

**NOTE:** Installation of the Hot Plug Backplane 1U 2S Kit (445985-B21) is required if ordering third or fourth Hard Drives for Hot Plug models only.

### Graphic Cards

NVIDIA Quadro FX3500 256MB PCIe 435681-B21

**NOTE:** Use Slot 2, PCI-E x16 Full Length Slot.

NVIDIA Quadro FX1500 256MB PCIe 435703-B21

**NOTE:** Use Slot 2, PCI-E x16, Full Length Slot.

**NOTE:** At this time, these graphic cards are supported on Linux and Windows.

### Options

<b>Optical Drives</b>	DVD-ROM Drive (optional)	447889-B21
	DVD/CD RW Drive (optional)	447891-B21
<hr/>		
<b>Storage Controllers</b>	<b>SAS HBA</b>	
	HP 8 Internal Port SAS HBA with RAID	347786-B21
	<b>NOTE:</b> For use with Hot Plug SAS/SATA models.	
	<b>NOTE:</b> The selection HP 8 Internal Port SAS HBA with RAID requires the purchase of the LowProfile PCI-X Riser Option kit (P/N 452698-B21).	
	HP SC44Ge Host Bus Adapter	416096-B21
	<b>NOTE:</b> PCI-Express SAS HBA.	
	<b>NOTE:</b> Please see the following QuickSpecs additional information:	
	<a href="http://h18004.www1.hp.com/products/quickspecs/12332_div/12332_div.html">http://h18004.www1.hp.com/products/quickspecs/12332_div/12332_div.html</a>	
	(8 Internal Port SAS HBA)	
	<a href="http://h18004.www1.hp.com/products/quickspecs/12617_div/12617_div.html">http://h18004.www1.hp.com/products/quickspecs/12617_div/12617_div.html</a>	
	(SC44Ge HBA)	
	<b>SCSI HBA</b>	
	HP SC11Xe Host Bus Adapter	412911-B21
	<b>NOTE:</b> Please see the following QuickSpecs additional information:	
	<a href="http://h18000.www1.hp.com/products/quickspecs/12566_div/12566_div.html">http://h18000.www1.hp.com/products/quickspecs/12566_div/12566_div.html</a>	
	(SC11Xe HBA)	
<b>SAS Controllers</b>		
<b>Smart Array E200 Controller</b>		
HP Smart Array E200/128 BBWC Controller	411508-B21	
<b>NOTE:</b> Please see the following QuickSpecs additional information:		
<a href="http://h18000.www1.hp.com/products/quickspecs/12460_div/12460_div.html">http://h18000.www1.hp.com/products/quickspecs/12460_div/12460_div.html</a>		
(Smart Array E200 Controller)		
<b>Smart Array E500 Controller</b>		
HP Smart Array E500/256MB Controller	435129-B21	
<b>NOTE:</b> Standard RAID 0, 1, 1+0.		
<b>NOTE:</b> Customers can only order one Smart Array E500/256MB Controller and one Battery-backed write cache upgrade (P/N 383280-B21) for the HP ProLiant DL165 G5 server based on battery space.		
Battery-backed write cache upgrade	383280-B21	
<b>NOTE:</b> Contains battery only. For Smart Array P400 Controller.		
<b>NOTE:</b> RAID 5 support. When installing a battery-backed write cache module, the HP Smart Array E500 must be installed in the full-length PCI slot.		
<b>NOTE:</b> Please see the following QuickSpecs additional information:		
<a href="http://h18000.www1.hp.com/products/quickspecs/12700_div/12700_div.html">http://h18000.www1.hp.com/products/quickspecs/12700_div/12700_div.html</a>		
(Smart Array E500 Controller)		
<b>Smart Array E400 Controller</b>		
HP Smart Array P400/256MB Controller	405132-B21	
<b>NOTE:</b> Customers can only order one Smart Array P400/256MB Controller and one Battery-backed write cache upgrade (P/N 383280-B21) for the HP ProLiant DL165 G5 server based on battery space.		
HP Smart Array P400/512MB BBWC Controller	411064-B21	
<b>NOTE:</b> Customers can only order one Smart Array P400/512MB BBWC Controllers for the HP ProLiant DL165 G5 server based on battery space.		
512MB Battery-backed write cache upgrade	405148-B21	
<b>NOTE:</b> Contains battery and memory module. For Smart Array P400 Controller.		
<b>NOTE:</b> Please see the following QuickSpecs additional information:		
<a href="http://h18000.www1.hp.com/products/quickspecs/12400_div/12400_div.html">http://h18000.www1.hp.com/products/quickspecs/12400_div/12400_div.html</a>		
(Smart Array P400 Controller)		



### Options

#### Smart Array P800 Controller

HP Smart Array P800/512 BBWC Controller 381513-B21

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

[http://h18000.www1.hp.com/products/quickspecs/12616\\_div/12616\\_div.html](http://h18000.www1.hp.com/products/quickspecs/12616_div/12616_div.html)  
(Smart Array P800 Controller)

#### Riser Board Kits

HP HTX Riser Board Kit 445987-B21

HP PCI-X L/P Riser Kit 452698-B21

**NOTE:** Replaces the standard Half Height (LP) PCI Express slot with a Half Height (LowProfile) PCI-X slot.

### 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.

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 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.

### HPC Specific Options

HP IB 4X DDR PCI-e Dual Port HCA 448397-B21

HP IB 4X DDR PCI-e Dual Port 0 Memory HCA 483513-B21

**NOTE:** For HPC interconnect adapters please see the HPC Interconnect section of this QuickSpecs.

### 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

HP StorageWorks 1U USB Rack-Mount Kit with one DAT 160 USB Tape Drive AG703A

#### SAS Tape Drives

**NOTE:** For the DL165 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

**NOTE:** HP recommends combining this tape drive with the 1U SAS Rack-Mount kit (AE459A) for a complete rack-mount solution.

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

**NOTE:** HP recommends combining this tape drive with the 1U SAS Rack-Mount kit (AE459A) for a complete rack-mount solution.

HP Ultrium 920 SAS Internal Tape Drive EH978A

**NOTE:** HP recommends combining this tape drive with the 1U SAS Rack-Mount kit (AE459A) for a complete rack-mount solution.

HP StorageWorks 1U SAS Rack-mount kit with one LTO-4 Ultrium 1760 EH946A

### Options

**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

HP StorageWorks 1U SCSI Rack-mount kit with one LTO-2 Ultrium 448 SCSI Tape Drive (Carbonite) DW028B

HP StorageWorks 1U SCSI Rack-mount kit with one LTO-3 Ultrium 920 EH903A

HP StorageWorks 3U SCSI Rack-Mount with 1 LTO-4 Ultrium 1840 Tape Drive EH926A

**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](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](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 and LTO-3 Ultrium 920 tape drives.

HP StorageWorks 1U USB Rack-Mount Kit A8007A

**NOTE:** The 1U USB Rack-Mount Kit can support up to (2) half-height tape drives and is compatible with the DAT 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 DAT 160 SAS, LTO-2 Ultrium 448 SAS, LTO-3 Ultrium 920 SAS and LTO-4 Ultrium 1760 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](http://h18000.www1.hp.com/products/quickspecs/10854_div/10854_div.html) (Worldwide)

#### HP D2D Backup System

HP StorageWorks D2D110 Backup System EH880A

**NOTE:** 1TB of Disk Storage

HP StorageWorks D2D110 Backup System with Data Protector Express Software Kit EH923A

**NOTE:** 1TB of Disk Storage

HP StorageWorks D2D120 Backup System EH884A

**NOTE:** 2TB of Disk Storage

HP StorageWorks D2D120 Backup System with Data Protector Express Software Kit EH924A

**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 Software Kit EH951A

**NOTE:** 3TB of Disk Storage

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

**NOTE:** 3TB of Disk Storage.

### Options

**NOTE:** Please see the HP D2D Backup Systems QuickSpecs for additional information:

[http://h18000.www1.hp.com/products/quickspecs/12651\\_div/12651\\_div.html](http://h18000.www1.hp.com/products/quickspecs/12651_div/12651_div.html)  
(Worldwide)

#### Tape Autoloaders

##### HP StorageWorks DAT Autoloader

HP StorageWorks DAT 72x10 tape autoloader AE313B

##### HP StorageWorks 1/8 Tape Autoloader

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

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; 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 1840 SCSI Drive Library AJ033A

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

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

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

HP StorageWorks MSL2024 1 LTO-3 Ultrium 960 4 GB 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 4 GB FC Library AJ036A

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

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

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

HP StorageWorks MSL4048 1 Ultrium 920 SAS Drive Library AH560A

HP StorageWorks MSL4048 1 Ultrium 920 SCSI Drive Library AH171A

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

### Options

<b>HP StorageWorks Modular Smart Array 50</b>	<p>HP StorageWorks Modular Smart Array 50 Enclosure  <b>NOTE:</b> Rack-mountable 10 SFF drive enclosure with single I/O module, redundant hot plug power supplies and hot plug fans.</p> <p>HP StorageWorks 50 Modular Smart Array Enclosure (Japan)  <b>NOTE:</b> Rack-mountable 10 SFF drive enclosure with single I/O module, redundant hot plug power supplies and hot plug fans.  <b>NOTE:</b> Please see the HP StorageWorks 50 Modular Smart Array QuickSpecs for additional information:  <a href="http://h18004.www1.hp.com/products/quickspecs/12245_div/12245_div.html">http://h18004.www1.hp.com/products/quickspecs/12245_div/12245_div.html</a></p>	364430-B21  364430-291
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<b>HP StorageWorks Modular Smart Array 60</b>	<p>HP StorageWorks 60 Modular Smart Array  <b>NOTE:</b> Rack-mountable 12-drive (3.5" 3G SAS/1.5G SATA) 2U enclosure with 3Gb/s SAS host connectivity and redundant power supplies.  <b>NOTE:</b> Please see the HP StorageWorks 60 Modular Smart Array QuickSpecs for additional information:  <a href="http://h18004.www1.hp.com/products/quickspecs/12627_div/12627_div.html">http://h18004.www1.hp.com/products/quickspecs/12627_div/12627_div.html</a></p>	418408-B21
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<b>HP StorageWorks Modular Smart Array 70</b>	<p>HP StorageWorks 70 Modular Smart Array  <b>NOTE:</b> Rack-mountable 25-drive (2.5" 3G SAS/1.5G SATA) 2U enclosure with 3Gb/s SAS host connectivity and redundant power supplies.  <b>NOTE:</b> Please see the HP StorageWorks 70 Modular Smart Array QuickSpecs for additional information:  <a href="http://h18004.www1.hp.com/products/quickspecs/12652_div/12652_div.html">http://h18004.www1.hp.com/products/quickspecs/12652_div/12652_div.html</a></p>	418800-B21
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### StorageWorks Options **StorageWorks Fibre Channel HBA**

**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

### **StorageWorks SCSI HBA**

HP U320e SCSI Host Bus Adapter	AH627A
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**NOTE:** Recommended Dual Channel Ultra320 SCSI Controller for connecting multi-drive MSL tape libraries to ProLiant servers

<b>USB Options</b>	<p>HP USB Internal Cable Kit</p> <p>1.44MB External USB Floppy Drive All</p> <p>USB Floppy Drive</p> <p>USB P/S2 Optical Mouse</p> <p>USB Standard Keyboard All</p>	451363-B21 DC141B DC361B DC369A DT528A#
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### Options

<b>HP KVM Switch Options</b>	HP 1x4 Console Switch	AF611A
	HP PS2 Server Console Cable, 6 foot, 2-Pack	AF612A
	HP USB Server Console Cable, 6 foot, 2-Pack	AF613A
	<b>NOTE:</b> required for supporting USB peripheral	
	<b>NOTE:</b> For additional information regarding KVM switches, Serial Console servers, rack mount monitors, keyboards and all related options please see the following URL: <a href="http://www.hp.com/go/kvm">http://www.hp.com/go/kvm</a>	

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<b>Service and Support Offerings</b> (HP Care Pack Services)	<b>Hardware Services 4-Hour On-site Service</b>	
	13-Hour x 5-Day Coverage, 3 Years, Electronic	U9509E
	24-Hour x 7-Day Coverage, 3 Years, Electronic	U9510E
	<b>Hardware Services Next Business Day On-Site Service</b>	
	9-Hour x 5-Day Coverage, 3 Years, Electronic	U9508E
	<b>Hardware Services 6-Hour Call to Repair On-Site Service</b>	
	9-Hour x 5-Day Coverage, 3 Years, Electronic	U9511E
	Hardware Installation, Electronic	U9520E
	<b>NOTE:</b> For more information, customer/resellers can contact: <a href="http://www.hp.com/services/carepack">http://www.hp.com/services/carepack</a>	

### Memory

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

#### HP ProLiant DL165 G5 (all models)

##### Standard Memory

2 GB (2 x 1 GB) PC2-5300 DIMM memory, with Advanced ECC Capabilities memory installed.

##### Maximum Memory

Up to 32GB memory is available with the optional installation of PC2-5300 Registered DIMM memory kits.

Memory should be installed in pairs and matched for optimum performance.

**NOTE:** Chart does not represent all possible memory configurations.

Memory	Slot							
	1	2	3	4	5	6	7	8
Standard (2 GB)	1 GB	1 GB	Empty	Empty	Empty	Empty	Empty	Empty
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:

1 GB REG PC2-5300 2 x 512 MB Single Rank Kit	408850-B21
2 GB REG PC2-5300 2 x 1 GB Single Rank Kit	408851-B21
4 GB REG PC2-5300 2 x 2 GB Dual Rank Kit	408853-B21
8 GB REG PC2-5300 2 x 4 GB Dual Rank Kit	408854-B21
2 GB REG PC2-5300 2 X 1 GB Low Power Single Rank Kit	483399-B21
4 GB REG PC2-5300 2 X 2 GB Low Power Single Rank Kit	483401-B21
8 GB REG PC2-5300 2 X 4 GB Low Power Dual Rank Kit	483403-B21

### Storage



- 1-4 Non-hot plug 3.5" SATA or Hot-plug SAS/SATA hard drive bays
- A Optional DVD-ROM, or DVD/CD RW

### Drive Support

#### Removable Media

	Quantity Supported	Position Supported	Controller
DVD-ROM	Up to 1	A	Integrated IDE (ATAPI) (optional)
DVD/CD RW	Up to 1	A	Integrated IDE (ATAPI) (optional)

#### Hard Drives

##### Serial-ATA (SATA) Non-Hot Plug Hard Drives

	Quantity Supported	Position Supported	Controller
<b>SATA Non-Hot Plug Entry (ETY) Drives (3.5")</b>			
160GB 1.5G SATA 7.2K	Up to 4	1-4	HP Embedded SATA Controller
<b>SATA Non-Hot Plug Midline (MDL) Drives (3.5")</b>			
250GB 1.5G SATA 7.2K	Up to 4	1-4	HP Embedded SATA Controller
500GB 1.5G SATA 7.2K			
750GB 1.5G SATA 7.2K			

##### Serial-ATA (SATA) Hot Plug Hard Drives

**NOTE:** Installation of the Hot Plug Backplane 1U 2S Kit (445985-B21) is required if ordering third or fourth Hard Drives for Hot Plug models only.

	Quantity Supported	Position Supported	Controller
<b>SATA Hot Plug Entry (ETY) Drives (3.5")</b>	Up to 4	1-4	HP 8 Internal Port SAS HBA with RAID
160GB 1.5G SATA 7.2K			
<b>SAS Hot Plug</b>	Up to 4	1-4	HP 8 Internal Port SAS HBA with RAID
72GB SAS 15,000 rpm			
146GB SAS 15,000 rpm			
300GB SAS 15,000 rpm			

## Storage

### Tape Drives, Tape Autoloaders, Tape Libraries & D2D 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 Part Number
<b>HP StorageWorks SCSI Tape Drives, External</b> LTO-1 Ultrium 232 LTO-2 Ultrium 448 LTO-3 Ultrium 920 LTO-3 Ultrium 960 LTO-4 Ultrium 1840 DAT 40 DAT 72 DAT 160 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP SC11Xe Host Bus Adapter	412911-B21
<b>HP StorageWorks USB Tape Drives, External</b> DAT 40 USB DAT 72 USB DAT 160 USB 1U USB Rack-Mount Kit	External	USB 2.0 Port	N/A
<b>HP StorageWorks SAS Tape Drives, External</b> 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.	416096-B21
<b>HP StorageWorks SCSI Tape Automation, External</b> DAT 72x10 Autoloader 1/8 G2 Autoloader MSL2024	External	HP SC11Xe Host Bus Adapter HP U320e SCSI Host Bus Adapter <b>NOTE:</b> Recommended for MSL tape libraries.	412911-B21 AH627A



## Storage

MSL4048  
MSL8096  
MSL6000

<b>HP StorageWorks SAS Tape Automation, External</b>	External	HP SC44Ge Host Bus Adapter	416096-B21
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1/8 G2 Autoloader  
MSL2024  
MSL4048  
MSL8096

<b>HP StorageWorks Fibre Tape Automation, External</b>	External	Please consult the EBS connectivity matrix at: <a href="http://www.hp.com/go/ebs">http://www.hp.com/go/ebs</a> for detailed connectivity information.	N/A
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MSL2024  
MSL4048  
MSL8096  
MSL6000

<b>HP StorageWorks D2D Backup Systems</b>	External	Embedded Network Controller	N/A
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D2D110  
D2D120  
D2D130

### External Storage

	Quantity Supported	Position Supported	Controller
Modular Smart Array 50 Enclosure	Up to 2	External	HP Smart Array E500/256MB controller
HP StorageWorks Modular Smart Array 60	Up to 2	External	HP Smart Array E500/256MB controller
HP StorageWorks Modular Smart Array 70	Up to 2	External	HP Smart Array E500/256MB controller

### Power Specifications

**Operational Input Voltage Range (Vrms)** 90Vac to 264Vac full range at 25oC ambient

**Frequency Range (Nominal) (Hz)** 47 Hz to 63 Hz

**Power Output** 650W Nominal

**Server Power Cords** One 6' Highline (IEC-IEC) power cord ships standard

**NOTE:** HP ProLiant DL servers no longer ship standard with NEMA power cords (163719-002) that allow connection to 110V US wall outlets in a home or office. ProLiant DL 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 DL server using a 110V receptacle (NEMA-15), the NEMA power cord (227099-001) must be ordered separately.

If customers require a local power cord, they can check the power cord matrix for the appropriate cord. Please see the following power cord matrix: <http://www.hp.com/go/powercordmatrix>.

### Technical Specifications

<b>System Unit</b>	<b>Dimensions</b> (H x W x D) (with bezel)	1.70 x 17.64 x 26.85 in (4.32 x 44.80 x 68.20 cm)	
	<b>Weight</b> (approximate)	Maximum	37.00 lb (16.78 kg) (all hard drives, power supplies, and processors installed)
		Minimum	30.00 lb (13.69 kg) (one hard drive, power supply, and processor installed)
	<b>Input Requirements</b> (per 650W power supply)	Rated Line Voltage	100-127 VAC, 200-240 VAC
		Rated Input Current	10.0 A (at 115 VAC), 5.5 A (at 230 VAC)
		Rated Input Frequency	47 to 63 Hz
		Rated Input Power	852.16 W (at 100 VAC), 805.03W (at 200 VAC)
	<b>BTU Rating</b>	Maximum	2217.89 BTU/hr (at 100 VAC), 2217.89 BTU/hr (at 200 VAC)
	<b>Power Specifications</b>	To review typical system power ratings use the Power Calculator which is available via the online tool located at URL: <a href="http://h30099.www3.hp.com/configurator/calc/Power%20Calculator%20Catalog.xls">http://h30099.www3.hp.com/configurator/calc/Power%20Calculator%20Catalog.xls</a>	
		- Click on the system of interest. Example: DL165 G5 - Follow the instructions of the next screens.	
	<b>Power Supply Output</b> (per power supply)	Rated Steady-State Power	650 W (at 100 VAC), 650 W (at 200 VAC)
		Maximum Peak Power	700 W (at 100 VAC), 700 W (at 200 VAC)
	<b>Optional High Efficiency Power Supply Specifications</b>		
	<b>Input Requirements</b> (per power supply)	Rated Line Voltage	90-132 VAC, 200-240 VAC
		Rated Input Current	9.4 A (at 115 VAC), 7.8 A (at 230 VAC)
		Rated Input Frequency	47 to 63 Hz
		Rated Input Power	1075 W (at 100 VAC), 1375W (at 200 VAC)
	<b>BTU Rating</b>	Maximum	3070.93 BTU/hr (at 100 VAC), 4094.57 BTU/hr (at 200 VAC)
	<b>Power Specifications</b>	To review typical system power ratings use the Power Calculator which is available via the online tool located at URL: <a href="http://h30099.www3.hp.com/configurator/calc/Power%20Calculator%20Catalog.xls">http://h30099.www3.hp.com/configurator/calc/Power%20Calculator%20Catalog.xls</a>	
		- Click on the system of interest. Example: DL165 G5 - Follow the instructions of the next screens.	
	<b>Power Supply Output</b> (per power supply)	Rated Steady-State Power	900 W (at 100 VAC), 1200 W (at 200 VAC)
		Maximum Peak Power	900 W (at 100 VAC), 1200 W (at 200 VAC)

### Technical Specifications

<b>System Inlet Temperature</b>	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).
<b>Relative Humidity (non-condensing)</b>	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.
<b>Altitude</b>	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).
	Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
<b>Acoustic Noise</b>	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).	
	<b>Idle</b>	
	LWAd	6.82 B
	LpAm	51.93 dBA
	<b>Operating</b>	
	LWAd	6.84 B
	LpAm	51.93 dBA

### Technical Specifications

**HP 160GB 1.5G SATA 160-GB 7.2K 7.2K NHP 3.5" ETY HDD**  
458947-B21

<b>Capacity</b>	160,041 MB	
<b>Height</b>	1.028 in (2.61 cm)	
<b>Width</b>	4.0 in (10.16 cm)	
<b>Depth</b>	5.787 in (147.0 mm)	
<b>Interface</b>	Serial ATA	
<b>Transfer Rate Synchronous (Maximum)</b>	1.5Gb/s	
<b>Native Command Queuing</b>	N/A	
<b>Seek Time</b> (typical reads, including settling)	Single Track	2.0 ms
	Average	<11 ms
	Full-Stroke	23.0 ms
<b>Physical Configuration</b>	Rotational Speed	7,200 rpm
	Bytes/Sector	512
	Logical Blocks	312,581,808
<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)	

#### Embedded SATA Controller

<b>Drives Supported</b>	Up to 4 SATA devices
<b>Channels</b>	4 1.5Gb SATA
<b>Storage Capacity</b>	2.0TB internal storage
<b>Data Transfer Method</b>	32-bit/33-MHz PCI bus-master
<b>Maximum SATA Channel Transfer Rate</b>	1.5Gb/s per channel
<b>Maximum Transfer Rate per PCI Bus (peak)</b>	266 MB/s per channel
<b>Protocols</b>	SATA
	PIO Mode[0-4]
<b>Cable</b>	SATA
<b>Internal ATA Connectors</b>	Four SATA connectors

#### HP 8 Internal Port SAS HBA with RAID

<b>Drives Supported</b>	Up to 4 SATA/SAS drives
<b>Channels</b>	4
<b>Storage Capacity</b>	1.2TB SAS, 4.0TB SATA
<b>Data Transfer Method</b>	PCI-Express
<b>Maximum SAS Channel Transfer Rate</b>	3Gb/s per channel
<b>Maximum SAS transfer rate</b>	300Mb/sec per port
<b>Protocols Supported</b>	SSP, STP, SMP
<b>Internal Connectors</b>	1 SAS

### Technical Specifications

<b>Embedded NC7782 dual-port gigabit server adapter</b>	<b>Network Interface</b>	10Base-T/ 100Base-TX/ 1000Base-TX	
	<b>Compatibility</b>	IEEE 802.3 10Base-T IEEE 802.3 1000Base-T IEEE 802.3 100Base-TX	
	<b>Data Transfer Method</b>	PCI-X	
	<b>Network Transfer Rate</b>	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)	2000 Mb/s
	<b>Connector</b>	RJ-45	
	<b>Cable Support</b>	10Base-T	Categories 3, 4 or 5 UTP; up to 328 ft (100 m)
10/100/1000Base-TX		Category 5 UTP (2 Pair); up to 328 ft (100 m)	

<b>Environment-friendly Products and Approach</b>	<b>End-of-life Management and Recycling</b>	<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: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a>. To recycle your product, please go to: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a> 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: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a>. 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.