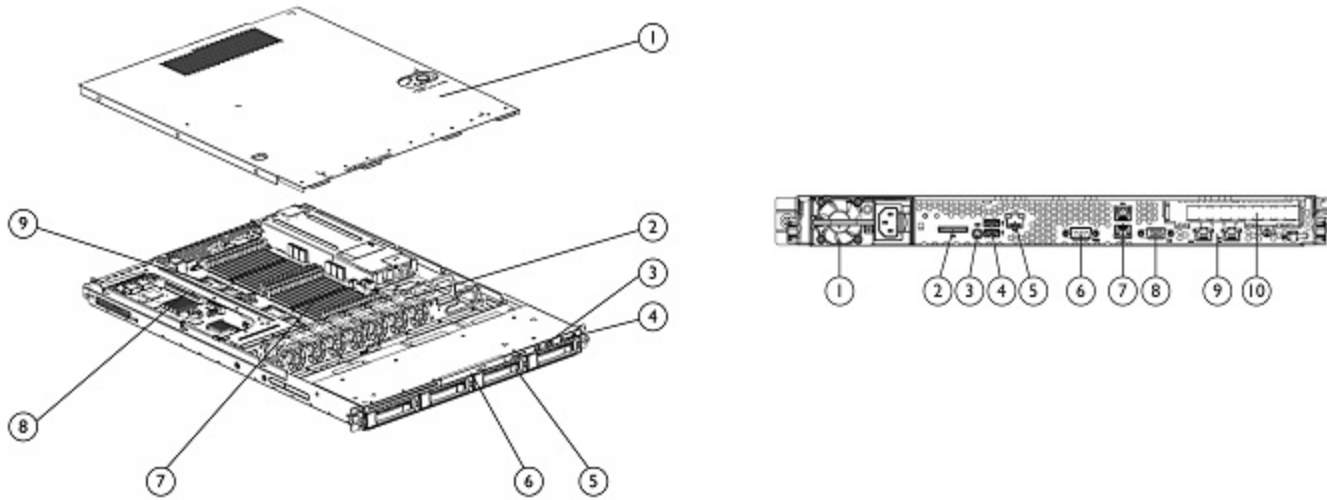


Overview

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



Front View:

1. Access panel
2. System fans
3. Front-panel USB 2.0 ports
4. Power switch/system status LEDs
5. Standard 1st , 2nd , 3rd and 4th 3.5" hot-plug SAS/SATA or non-hot plug SATA hard drive bays
6. Optical drive bay
7. Twenty Four DIMM Slots
8. Slot 1: Full-length/Full height x16 PCI-Express Gen2 slot, or Slot 1: Half-length/Full height x16 PCI-Express Gen2 slot and Slot 2: Low Profile x4 PCI-Express Gen2 slot (accepts x8 cards, internal only)
9. Two (2) AMD Opteron 6100 series processors

Rear View:

1. Power supply
2. Optional SD Card Reader
3. Unit Identification LED (UID)
4. Two USB ports
5. Optional Lights-Out 100 10/100Mbps port
6. Serial port
7. (2) RJ45 GbE LAN ports (3rd & 4th port)
8. VGA port
9. (2) RJ45 GbE LAN ports (1st & 2nd port)
10. Slot 1: Full-length/Full height x16 PCI-Express Gen2 slot, or Slot 1: Half-length/Full height x16 PCI-Express Gen2 slot and Slot 2: Low Profile x4 PCI-Express Gen2 slot (accepts x8 cards, internal only)

At A Glance

Introducing the HP ProLiant DL165G7, now available with the latest high performance Opteron Eight and Twelve Core processors, 24 DDR3 memory DIMMs, 2 PCIe Gen2 slots, four NIC ports and an Easy Setup CD.

- **Processors:**
 - Supports up to two AMD Opteron™ 6000 series Eight and Twelve Core processors
 - Supports DirectConnect Architecture
 - Supports Power Now
- **Memory:**
 - Up to 256GB, using 2x8GB Dual-Rank and 1x16GB Quad-Rank PC3-8500R-7 DDR3 Registered (RDIMM) memory per memory channel, operating at 800MHz in 24 slots. (See memory section for population rules)
 - Up to 192GB, using 8GB PC3-10600R or PC3-8500R DDR3 Registered (RDIMM) memory, operating at 800MHz when populated at 3 DIMMs per Channel in 24 slots.
 - Up to 64GB, using PC3-10600E DDR3 Unbuffered (UDIMM) memory, operating at 1066MHz when populated at 2 DIMMs per Channel in 16 slots.
- **Internal Drive Support:**
 - Internal storage capacity:
 - SATA Capacity: Support for up to 8.0TB (4 x 2TB) with Hot Plug Model. 8.0TB (4 x 2TB) with Non Hot Plug Model
 - SAS Capacity: Support for up to 8.0 TB (4 x 2TB) with Hot Plug Model
- **Network Controller:**
 - (2) HP NC362i Integrated Dual Port Gigabit Server Adapter (4 ports total)
- **Storage Controllers:**
 - Non-Hot Plug SATA Models: HP Embedded B110i SATA Smart Array RAID Controller
 - Cold Plug SATA Models: HP Embedded B110i SATA Smart Array RAID Controller
 - Hot Plug SATA/SAS Models: HP P410 Smart Array Controller or HP Smart Array Hot Plug Advance Pack for B110i SATA RAID license key upgrade.
- **Expansion Slots:**
 - Standard - PCI-Express assembly includes:

Overview

- Slot 1: Either full-length/full height PCI-Express Gen2 x16 or half-length/full height when internal slot is installed
- Slot 2: half-length/low-profile PCI-Express Gen2 x4 (x8 connector) (Internal ONLY)
- **Infrastructure Management:**
 - HP Lights-Out 100 with optional LO100 Advanced Licenses for Virtual KVM and Virtual Media.
 - HP Insight Control for Linux, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, migrate, monitor, control and optimize your IT infrastructure through a single, simple management console. Insight Control for Linux supports Linux-based central management servers.
- **USB Ports:**
 - Up to Six USB ports (two front & two rear standard, 2 internal option)
- **Optical Drive:**
 - Support for one (optional): Slim 9.5 mm DVD-ROM or DVD/CD RW
- **Power Supply:**
 - 500W Power Supply [Non-Hot Plug, PFC (Autoswitching)]
 - Optional FIO high-efficiency pluggable power supplies: 750W Power Supply
- **Form Factor:**
 - Rack (1U)
 - Fixed mounting rails included with all models
- **Deployment/Serviceability:**
 - HP ProLiant DL165 G7 models have tool-less fixed rails which provide support for racks with round mounting holes and tool-free support for racks with square mounting holes (including Compaq/HP 7000, 9000, 10000 and HP series), with an adjustment range of 26" - 36"
 - Tool-less access to all system components for easy 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
- **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. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.
NOTE: Server Warranty includes 3 year Next Day Parts replacement, 0-Years Labor, 0-Years Onsite support. Warranty terms may vary by region. 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 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

- AMD Opteron™ Processor Model 6128 (2.0 GHz, 12MB Level 3 Cache, 80W)
- AMD Opteron™ Processor Model 6128HE (2.0 GHz, 12MB Level 3 Cache, 65W)
- AMD Opteron™ Processor Model 6134 (2.3 GHz, 12MB Level 3 Cache, 80W)
NOTE: Available through Configure To Order only. See Factory Integration Models section for more details.
- AMD Opteron™ Processor Model 6136 (2.4 GHz, 12MB Level 3 Cache, 80W)
- AMD Opteron™ Processor Model 6164HE (1.7 GHz, 12MB Level 3 Cache, 65W)
NOTE: Available through Configure To Order only. See Factory Integration Models section for more details.
- AMD Opteron™ Processor Model 6172 (2.1 GHz, 12MB Level 3 Cache, 80W)
- AMD Opteron™ Processor Model 6174 (2.2 GHz, 12MB Level 3 Cache, 80W)
NOTE: Available through Configure To Order only. See Factory Integration Models section for more details.

Upgradeability Upgradeable to two processors

Chipset AMD Chipset SR5670/SP5100

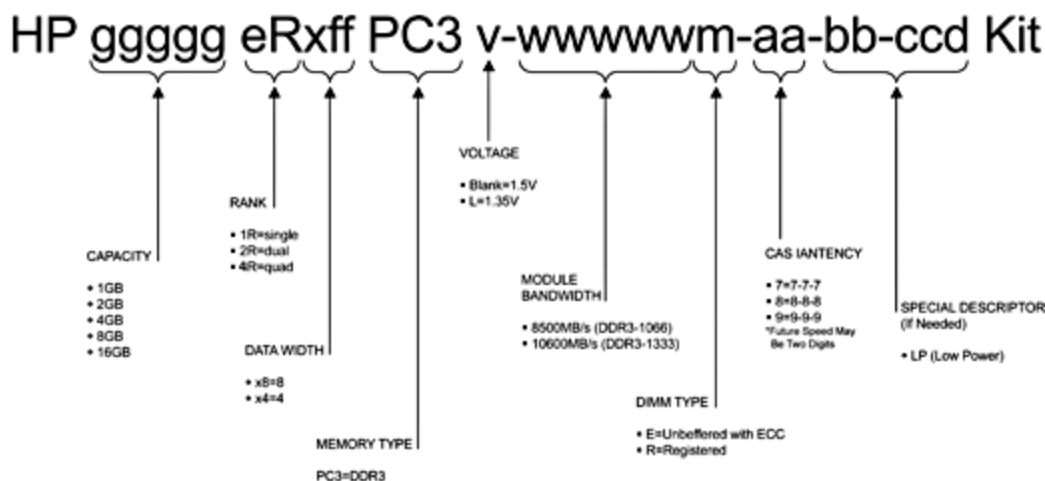
Cache Memory Model Series 6000
 12MB shared L3

Memory Protection Advanced ECC

Memory	Type	Standard	Performance Model
One of the following depending on Model	Standard	Entry Model	4 GB (2 x 2 GB) RDIMMs
		Base Model	8 GB (4 x 2 GB) RDIMMs
		Performance Model	16 GB (8 x 2 GB) RDIMMs
		Efficiency Model	4 GB (2 x 2 GB) RDIMMs
	Maximum (RDIMM)	256 GB	(8 x 16 GB + 16 x 8 GB)
	Maximum (UDIMM)	64 GB	(16 x 4 GB)

NOTE: Depending on the memory configuration and processor model, the memory speed may run at 1333MHz, 1066MHz, or 800MHz. Please see the Online Memory Configuration Tool at: www.hp.com/go/ddr3memory-configurator.

DDR3 memory options part number decoder



Network Controller (2) HP NC362i Integrated Dual Port Gigabit Server Adapter

Standard Features

Expansion Slots #	Technology	Bus Width**	Connector Width	Bus Number*	Device No.**	Form Factor	Notes
1	PCI-Express 2.0	x16	x16	5	0	Full Height/Full Length	3.3 volts
2***	PCI-Express 2.0	x4	x8	2	0	Low Profile, Internal Only	3.3 volts

* 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).

***In order to access expansion slot #2, the low profile internal only slot, expansion slot #1 may only be populated with a half length, full height form factor card.

Storage Controller	Non-Hot Plug SATA	HP Smart Array B110i SATA RAID Controller
		NOTE: To enable RAID for embedded SATA controller, use EZ set-up CD to download driver, hpahcizr.sys, is part of the 8.20 PSP, Smart Start, EZSetup CD. For more information on Smart Array B110i, go to: www.hp.com/go/sataraid
	Cold Plug SATA Models	HP Smart Array B110i SATA RAID Controller NOTE: Supported on LFF models only.
	Hot Plug SATA/SAS	HP Smart Array P410 Controller (RAID 0/1/1+0) HP Smart Array P410 Controller 256 BBWC (RAID/0/1/1+0/5/5+0) NOTE: Transfer rate: up to 3 Gb/s SATA, up to 6 Gb/s SAS. HP Smart Array B110i SATA RAID Controller NOTE: Hot plug functionality requires the addition of a Smart Array Advanced Pack License Key upgrade (P/N TC421A) NOTE: To enable RAID for embedded SATA controller, use EZ set-up CD to download driver, hpahcizr.sys, is part of the 8.20 PSP, Smart Start, EZSetup CD. For more information on Smart Array, go to: www.hp.com/go/sataraid
		NOTE: A diskette drive or virtual FDD using LO100 Advanced Pack is needed to install storage controller drivers during a Windows operating system installation from a CD. NOTE: Addition of the battery backed cache upgrade enables BBWC, RAID 5, 5+0, array expansion, logical drive extension, RAID migration, and stripe size migration. NOTE: RAID 6 functionality requires the addition of Smart Array Advanced Pack (P/N: 516471-B21).

Storage	Diskette Drives	Via USB only
	Optical Drives	Optional SATA 9.5mm DVD-ROM Optical Drive Optional SATA 9.5mm DVD RW Optical Drive
	Hard Drives	Up to 4 Non-hot plug SATA 3.5" drives Up to 4 Hot plug SAS/SATA 3.5" drives Up to 8 Hot plug SAS 2.5" drives

Maximum Internal Storage	Non-Hot Plug LFF SATA	8.0TB	4 x 2TB
	Hot Plug LFF SATA	8.0TB	4 x 2TB
	Hot Plug LFF SAS	8.0TB	4 x 2TB
	Hot Plug SFF SAS	4.0TB	8 x 500GB

Standard Features

Interfaces	Parallel	None
	Network RJ-45(Ethernet)	4 10/100/1000 NIC ports (plus 1 optional dedicated port for the HP ProLiant Lights Out 100i Remote Management)
	Serial	1
	Pointing Device (Mouse)	0 (via USB only)
	Graphics	1
	Keyboard	0 (via USB only)
	USB	6 (two front, two internal, two rear) NOTE: One optional internal USB connector is reserved for connection to the rear SD Card Reader (592710-B21) NOTE: In order to connect a USB device internally, the internal USB Cable G6 Kit must be used (536769-B21) NOTE: Please see the following URL for additional information regarding USB support: http://h18004.www1.hp.com/products/servers/platforms/usb-support.html

Graphics	32MB shared supporting all display resolutions up to 1600x1200 16bpp@75Hz NOTE: 8MB is dedicated to video memory.
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Form Factor	Rack (1U), (1.75 in/4.45 cm)
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Embedded Manageability	HP LO100 Advanced	HP Lights-Out 100 with Optional LO100 Advanced Licenses for Virtual KVM and Virtual Media.
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Standard Features:

- Embedded IPMI standard reporting
- System event log access
- Remote Serial console (serial redirection)
- Browser, Telnet access
- SMASH-CLP compliant
- IPMI 2.0 compliant
- Secure Socket Layer (SSL) Encryption
- Secure Shell (SSH) Encryption

Licensed Features:

- Virtual media (Floppy, CD, USB 2.0)
- Virtual KVM

NOTE: Flexible and volume quantity (AKA) license kits are available for the 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: www.hp.com/go/lo100

Standard Features

HP Insight Control management software	HP Insight Control for Linux	<p>HP Insight Control for Linux, as a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, monitor, remote control, and optimize your IT infrastructure through a single, simple management console. The Insight Control for Linux installs and license software modules that are integrated into HP System Insight Manager.</p> <p>The HP Insight Control for Linux (IC-Linux) serves environments requiring a Linux-based management consoles. See: www.hp.com/go/ic-linux</p> <p>HP Insight Control 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.</p>
	Insight Control server deployment	<p>HP Insight Control server deployment is a deployment solution for HP ProLiant and Integrity servers hosted on a Windows CMS. It automates the process of deploying and provisioning server software, enabling companies to quickly and easily adapt to changing business demands. Insight Control server deployment includes software optimizations for HP servers, including the HP scripting toolkits, configuration jobs for leading industry-standard operating systems, sample unattended files, and HP server support packs that include software drivers, management agents, and important documentation. Deploying servers can be accomplished either through imaging or through scripting.</p> <p>Insight Control server deployment is hosted on a Windows server and is intended for heterogeneous environments deploying Windows, Linux, VMware ESX and Microsoft Hyper-V systems.</p> <p>Insight Control server deployment includes 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.</p>
High Performance Clusters	HP Cluster Platforms	<p>HP Cluster Platforms are specifically engineered, factory-integrated large-scale ProLiant clusters optimized for High Performance Computing, with a choice of servers, networks and software. Operating system options include specially priced offerings for Red Hat Enterprise Linux and Novell SLES, as well as Microsoft Windows HPC Server. A Cluster Platform Configurator simplifies ordering. [http://www.hp.com/go/clusters]</p>
	HP HPC Interconnects	<p>High Performance Computing (HPC) interconnect technologies are available for this server as part of the HP Cluster Platform portfolio. These high-speed InfiniBand and Gigabit interconnects are fully supported by HP when integrated within an HP cluster. Flexible, validated solutions can be defined with the help of configuration tools. [http://www.hp.com/techservers/clusters/ucp/index.html]</p>
	HP Cluster Management Utility	<p>HP Cluster Management Utility (CMU) is an HP-licensed and HP-supported suite of tools that are used to manage large-scale Linux ProLiant systems. CMU includes software for the centralized provisioning, management and monitoring of nodes. CMU makes the administration of clusters user friendly, efficient, and effective. [http://www.hp.com/go/cmu]</p>
	HP HPC Linux Value Pack	<p>HP HPC Linux Value Pack (Value Pack) is an HP-licensed and HP-supported specially priced software bundle for the development and deployment of applications on HPC Cluster Platforms. Value Pack includes the Platform LSF workload scheduler, the HP-MPI parallelization library, the HP Unified Parallel C compiler and the HP Shmem library, as well as the execution environments for the libraries and compiler. [HP HPC Linux Value Pack].</p>

Standard Features

Industry Standard Compliance	ACPI V2.0 Compliant
	PCI 2.2 Compliant
	PXE Support
	WOL Support
	Microsoft® Logo certifications
	IPMI 2.0, SMASH CLP, DCMI 1.0 compliant

Security	Power-on password
	Setup password
	Diskette boot control
	Secure Sockets Layer (SSL)
	Secure Shell (SSH)

Security - Trusted Platform Module	The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008. BitLocker leverages the enhanced security capabilities of a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2008 has not been tampered with while the system was offline.
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NOTE: For more information about TPM, including a white paper, go to:

<http://www.hp.com/go/TPM>

NOTE: ProLiant OS pre-installed units will come with the partition required for TPM deployment.

NOTE: The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.

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.
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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>.

UPS and PDU Power Cord Matrix	Please see the UPS and PDU cable matrix's on the HP Power Protection and Management page. Under Power Cords, click on the "HP Power Cord Matrix" link. That link will list cable descriptions, requirements, and specifications for UPS and PDU units. Please see the following link: www.hp.com/products/powercords .
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Power Supply	500 Watts, auto-switching, high efficiency, PFC (Power Factor Correcting). NOTE: Factory upgradeable to high-efficiency 750W pluggable power supply.
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System Fans	4 non-hot plug system fans ship standard with 1P models, optional upgrade to N+1 redundant. 7 non-hot plug system fans ship standard with 2P models, N+1 Redundant Standard
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Operating Systems and Virtualization Software Support for ProLiant Servers	<p>Microsoft Windows Server</p> <p>Microsoft Windows Server 2008 Hyper V</p> <p>Red Hat Enterprise Linux (RHEL)</p> <p>SUSE Linux Enterprise Server (SLES)</p> <p>VMware</p> <p>Citrix Essentials for XenServer (Retail)</p> <p>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/supportos and our driver download page http://www.hp.com/support/DL165G7.</p>
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Standard Features

Rack Airflow Requirements

Rack 10000 G2 series Cabinets

The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 G2 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.

NOTE: For additional information, refer to the Setup and Installation Guide or the Documentation CD provided with the server, or to the server documentation located in the Support section at the following URL: www.hp.com/servers/dl165.

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".

Telco Rack Support

Installation into Telco 2 post, and 4 post, or threaded holes racks requires a 3rd party option kit.

For additional information, please visit: www.hp.com/go/rackandpower

NOTE: The 4 post Telco racks also supported.

Factory Express Portfolio for Servers and Storage

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

Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSAXxxx, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches.

For more information on Factory Express services for your specific server model please contact your sales representative or go to: <http://www.hp.com/go/factory-express>.

HP Enterprise Configurator

The HP 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>

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 24x7 4 hr Response service support coverage
- **Deployment Service** - Hardware Installation

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

- **Support Service** - 3Year 24x7 24 hr Call to repair service support coverage
- **Support Service** - 3-Year 24x7 6 hr Call to repair service support coverage
- **Support Plus** - 24x7 24 hr Call to repair service support including OS coverage Operating

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://h20219.www2.hp.com/services/us/en/warranty/carepack-servers-proliant.html>

Models

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

HP DL165G7 6172 Hot Plug SAS/SATA 590261-xx1	Processor(s)	(2) AMD Opteron™ Processor Model 6172 (2.1 GHz, 12MB Level 3 Cache, 80W)
	Cache Memory	12 MB shared L3 cache
	Memory	16GB (8 x 2GB) PC3-10600R (RDIMM)
	Network Controller	2x HP NC362i Integrated Dual Port Gigabit Server Adapter
	Storage Controller	HP Smart Array P410/ 256MB BBWC
	Hard Drive	None ship standard
	Internal Storage	Up to 8 Small form factor Hot Plug drives 4.0TB (8 x 500GB Hot Plug 2.5" SAS Hard Drives), Maximum
	Optical Drive	None ship standard
	Power Supply	750W Power Supply
	Form Factor	1U

HP DL165G7 6136 Hot Plug SAS/SATA 590260-xx1	Processor(s)	(1) AMD Opteron™ Processor Model 6136 (2.4 GHz, 12MB Level 3 Cache, 80W)
	Cache Memory	12 MB shared L3 cache
	Memory	8GB (4 x 2GB) PC3-10600R (RDIMM)
	Network Controller	2x HP NC362i Integrated Dual Port Gigabit Server Adapter
	Storage Controller	HP Smart Array P410
	Hard Drive	None ship standard
	Internal Storage	8.0TB (4 x 2TB Hot Plug 3.5" SATA Hard Drives), Maximum 8.0TB (4 x 2TB Hot Plug 3.5" SAS Hard Drives), Maximum
	Optical Drive	None ship standard
	Power Supply	500W Power Supply
	Form Factor	1U

HP DL165G7 6128 Cold Plug SAS/SATA 590259-xx1	Processor(s)	(1) AMD Opteron™ Processor Model 6128 (2.0 GHz, 12MB Level 3 Cache, 80W)
	Cache Memory	12 MB shared L3 cache
	Memory	4GB (2 x 2GB) PC3-10600R (RDIMM)
	Network Controller	2x HP NC362i Integrated Dual Port Gigabit Server Adapter
	Storage Controller	HP Smart Array B110i
	Hard Drive	None ship standard
	Internal Storage	8.0TB (4 x 2TB Hot Plug 3.5" SATA Hard Drives), Maximum 8.0TB (4 x 2TB Hot Plug 3.5" SAS Hard Drives), Maximum
	Optical Drive	None ship standard
	Power Supply	500W Power Supply
	Form Factor	1U

HP DL165G7 6128HE Cold Plug SATA 590258-xx1	Processor(s)	(1) AMD Opteron™ Processor Model 6128HE (2.0 GHz, 12MB Level 3 Cache, 65W)
	Cache Memory	12 MB shared L3 cache
	Memory	4GB (2 x 2GB) PC3-10600R (RDIMM)
	Network Controller	2x HP NC362i Integrated Dual Port Gigabit Server Adapter
	Storage Controller	HP Smart Array B110i
	Hard Drive	None ship standard
	Internal Storage	8.0TB (4 x 2TB Hot Plug 3.5" SATA Hard Drives), Maximum 8.0TB (4 x 2TB Hot Plug 3.5" SAS Hard Drives), Maximum
	Optical Drive	None ship standard
	Power Supply	500W Power Supply
	Form Factor	1U

Country Code Key	xx=00	U.S.
	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: FIO indicates that this option is only available as a Factory Installable Option.

Step 1: Base Configuration

Non-Hot Plug SATA Model (choose one of the following configurable models)

HP DL165G7 NHP CTO Chassis 591660-B21

Factory Integrated Model ships with:

Two HP NC362i Integrated Dual Port Gigabit Server Adapters

Slot 1: FL /FH PCI-Express x16 Gen 2 slot or

Slot 1 : HL/FH x16 PCI-Express Gen2 slot and

Slot 2 : HL/LP x8 PCI-Express Gen2 slot (internal only)

HP Smart Array B110i SATA RAID Controller

One Highline IEC Power Cord

4 Fixed, Non-Redundant Fans (standard); 6 Fixed, N+1 Redundant Fans (standard with addition of second processor)

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

Tool-less Fixed Rails

Hot Plug/Cold Plug Models

HP DL165G7 LFF CTO Chassis 592226-B21

Factory Integrated Model ships with:

Two HP NC362i Integrated Dual Port Gigabit Server Adapters

Slot 1: FL /FH PCI-Express x16 Gen 2 slot or

Slot 1 : HL/FH x16 PCI-Express Gen2 slot and

Slot 2 : HL/LP x8 PCI-Express Gen2 slot (internal only)

One Highline IEC Power Cord

4 Fixed, Non-Redundant Fans (standard); 6 Fixed, N+1 Redundant Fans (standard with addition of second processor)

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

Tool-less Fixed Rails

HP DL165G7 SFF CTO Chassis 592227-B21

Factory Integrated Model ships with:

Two HP NC362i Integrated Dual Port Gigabit Server Adapters

Slot 1: FL /FH PCI-Express x16 Gen 2 slot or

Slot 1 : HL/FH x16 PCI-Express Gen2 slot and

Slot 2 : HL/LP x8 PCI-Express Gen2 slot (internal only)

One Highline IEC Power Cord

4 Fixed, Non-Redundant Fans (standard); 6 Fixed, N+1 Redundant Fans (standard with addition of second processor)

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

Tool-less Fixed Rails

NOTE: SFF CTO Chassis (P/N: 592227-B21) requires the use of the HP 750W CS HE Power Supply (P/N: 535683-B21)

Configuration Information - Factory Integrated Models

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

HP Processors

NOTE: If 2 processors are desired, select one xxxxxx-L21 and one xxxxxx-B21.

AMD Opteron™ Processor Model 6128 (2.0 GHz, 12MB Level 3 Cache, 80W) FIO Kit	601111-L21
AMD Opteron™ Processor Model 6128HE (2.0 GHz, 12MB Level 3 Cache, 65W) FIO Kit	601110-L21
AMD Opteron™ Processor Model 6134 (2.3 GHz, 12MB Level 3 Cache, 80W) FIO Kit	601115-L21
AMD Opteron™ Processor Model 6136 (2.4 GHz, 12MB Level 3 Cache, 80W) FIO Kit	601112-L21
AMD Opteron™ Processor Model 6164HE (1.7 GHz, 12MB Level 3 Cache, 65W) FIO Kit	601116-L21
AMD Opteron™ Processor Model 6172 (2.1 GHz, 12MB Level 3 Cache, 80W) FIO Kit	601113-L21
AMD Opteron™ Processor Model 6174 (2.2 GHz, 12MB Level 3 Cache, 80W) FIO Kit	601118-L21

HP Memory

Registered DIMMs (RDIMMs)

HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593907-B21
HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593911-B21
HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604500-B21
HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593913-B21
HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604502-B21
HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	593915-B21

Unbuffered with ECC DIMMs (UDIMMs)

HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	593921-B21
HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	593923-B21

NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator.

NOTE: Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: <http://www.hp.com/go/proliant-energy-efficient>

NOTE: There is a maximum support limitation of 8 ranks per memory channel (maximum of 2 quad rank DIMMs per channel)

NOTE: PC3L is a low voltage memory.

Configuration Information - Factory Integrated Models

HP Hard Drives

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, 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.

NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

NOTE: A minimum of one SATA Non-Hot Plug hard drive is required ONLY when purchasing Non-Hot Plug CTO Chassis Model (P/N 591660-B21) in Step 1.

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

SATA Non-Hot Plug LFF (3.5-inch) Entry (ETY) Drives

HP 250GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Entry 1yr Warranty Hard Drive	571232-B21
HP 160GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Entry 1yr Warranty Hard Drive	458947-B21

SATA Non-Hot Plug LFF (3.5-inch) Midline (MDL) Drives

HP 2TB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive	507774-B21
HP 1TB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive	507772-B21
HP 500GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive	458941-B21

HP Storage Controllers

NOTE: With the HP Smart Array P410 Controller, the addition of the battery backed cache upgrade enables BBWC, RAID 5, 5+0, array expansion, logical drive extension, RAID migration, and stripe size migration. In order to upgrade to RAID 6, at least 256MB Cache and a Battery is required in addition to the Smart Array Advanced Pack license (P/N 516471-B21).

NOTE: To use the internal only PCI-e slot when purchasing the Hot Plug CTO Chassis, a HP Smart Array P410 controller must be selected. When selecting the HP Smart Array P212 Controller (P/N 491191-B21), the controller will be installed in the x16 slot since it has both an internal and external port. This prevents the use of the internal slot and no PCI-E slots will be available.

NOTE: A minimum of one primary HP Storage Controller is required ONLY when purchasing SFF CTO Chassis Model (P/N 592227-B21) in Step 1.

HP Smart Array P812/1G Flash Backed Cache Controller	487204-B21
HP P410 w/1G Flash Backed Cache Controller	572532-B21
HP P410 w/512MB Flash Backed Cache Controller	578230-B21
HP P410/Zero Memory FIO Smart Array Controller	462860-B21
HP P410/256MB Smart Array Controller	462862-B21
HP Smart Array P411/256 w/Battery FIO	491193-B21
HP Smart Array P410/256MB w/ Battery FIO	491195-B21
HP P410/512MB BBWC Smart Array Controller	462864-B21

HP Power Supplies

CAUTION: Many HP ProLiant Servers now offer new power options, including Common Slot Power Supplies. These power supplies come in multiple power ratings and higher efficiency levels to offer the Right Size solution to fit your configuration. This provides improved power delivery and the advantage of reclaiming lost power. Prior to making a power supply selection it is "highly recommended" that the "HP Power Advisor" is run to determine the right size power supply for your server configuration. The HP Power Advisor is located at: www.hp.com/go/hppoweradvisor. In ProLiant Servers that have more than one power slot (bay), only same size power supplies are recommended. If non-matched power supplies are inserted you will get errors and operation will fail.

HP High Efficiency 500W Non hot plug Power Supply Kit	515915-B21
HP High Efficiency 750W 92% Power Supply Kit	535683-B21

Configuration Information - Factory Integrated Models

Step 3: Choose Additional Factory Integratable Options

HP Storage Controllers **NOTE:** With the HP Smart Array P410 Controller, the addition of the battery backed cache upgrade enables BBWC, RAID 5, 5+0, array expansion, logical drive extension, RAID migration, and stripe size migration. In order to upgrade to RAID 6, at least 256MB Cache and a Battery is required in addition to the Smart Array Advanced Pack license (P/N 516471-B21).

NOTE: To use the internal only PCI-e slot when purchasing the Hot Plug CTO Chassis, a HP Smart Array P410 controller must be selected. When selecting the HP Smart Array P212 Controller (P/N 491191-B21), the controller will be installed in the x16 slot since it has both an internal and external port. This prevents the use of the internal slot and no PCI-E slots will be available.

HP P212/256MB FIO Smart Array BBWC 491191-B21

NOTE: P212 may be used as external controller only in SFF models.

HP P410/Zero Memory FIO Smart Array Controller 462860-B21

HP Smart Array P410/256MB w/ Battery FIO 491195-B21

Step 4: Choose Additional Options for Factory Integration

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

Core Options

NOTE: Some options may not be available for factory integration. Please contact an HP sales representative for additional information.

HP Processors	AMD Opteron™ Processor Model 6128 (2.0 GHz, 12MB Level 3 Cache, 80W) Kit	601111-B21
	AMD Opteron™ Processor Model 6128HE (2.0 GHz, 12MB Level 3 Cache, 65W) Kit	601110-B21
	AMD Opteron™ Processor Model 6134 (2.3 GHz, 12MB Level 3 Cache, 80W) Kit	601115-B21
	AMD Opteron™ Processor Model 6136 (2.4 GHz, 12MB Level 3 Cache, 80W) Kit	601112-B21
	AMD Opteron™ Processor Model 6164HE (1.7 GHz, 12MB Level 3 Cache, 65W) Kit	601116-B21
	AMD Opteron™ Processor Model 6172 (2.1 GHz, 12MB Level 3 Cache, 80W) Kit	601113-B21
	AMD Opteron™ Processor Model 6174 (2.2 GHz, 12MB Level 3 Cache, 80W) Kit	601118-B21

HP Memory	Registered DIMMs (RDIMMs)	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593907-B21
	HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593911-B21
	HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604500-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593913-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604502-B21
	HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	593915-B21
	Unbuffered with ECC DIMMs (UDIMMs)	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	593921-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	593923-B21

NOTE: PC3L is a low voltage memory.

HP Optical Drives	DVD-ROM Drive Optical Drive	481045-B21
	DVD RW Drive Optical Drive	481047-B21

HP Hard Drives	NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, 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.	
	NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.	
	SATA Hot Plug LFF (3.5-inch) Midline (MDL) Drives	
	HP 2TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	507632-B21
	HP 1TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	454146-B21
	HP 500GB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	458928-B21
	SATA Non-Hot Plug LFF (3.5-inch) Midline (MDL) Drives	
	HP 2TB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive	507774-B21
	HP 1TB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive	507772-B21
	HP 500GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive	458941-B21
	SATA Hot Plug LFF (3.5-inch) Entry (ETY) Drives	
	HP 250GB 3G SATA 7.2K rpm LFF (3.5-inch) Entry 1yr Warranty Hard Drive	571230-B21
	HP 160GB 3G SATA 7.2K rpm LFF (3.5-inch) Entry 1yr Warranty Hard Drive	458945-B21
	SATA Non-Hot Plug LFF (3.5-inch) Entry (ETY) Drives	

Core Options

HP 250GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Entry 1yr Warranty Hard Drive 571232-B21

HP 160GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Entry 1yr Warranty Hard Drive 458947-B21

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

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

SATA Hot Plug 2.5" Midline (MDL) Solid State Drives

HP 120GB 3G SATA SFF (2.5-inch) Midline 1yr Warranty Solid State Drive 572073-B21

HP 60GB 3G SATA SFF (2.5-inch) Midline 1yr Warranty Solid State Drive 572071-B21

SATA Hot Plug 3.5" Midline (MDL) Solid State Drives

HP 120GB 3G SATA LFF (3.5-inch) Midline 1yr Warranty Solid State Drive 570763-B21

HP 60GB 3G SATA LFF (3.5-inch) Midline 1yr Warranty Solid State Drive 570761-B21

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

http://h18000.www1.hp.com/products/quickspecs/13415_div/13415_div.html (Worldwide)

SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives

HP 300GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 507127-B21

HP 146GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 507125-B21

HP 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 512547-B21

HP 72GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 512545-B21

SAS Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives

HP 600GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 516828-B21

HP 450GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 516816-B21

HP 450GB 3G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 454232-B21

HP 300GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 516814-B21

HP 300GB 3G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 416127-B21

HP 146GB 3G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 384854-B21

SAS Hot Plug LFF (3.5-inch) Midline (MDL) Drives

HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive 507616-B21

HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive 507614-B21

HP 1TB 3G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive 461137-B21

HP 750GB 3G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive 461135-B21

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

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

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

Core Options

HP Networking

Gigabit Ethernet Adapters

HP NC112T PCIe Gigabit Server Adapter	503746-B21
HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
HP NC375T PCI Express Quad Port Gigabit Server Adapter	538696-B21
HP NC364T PCI Express Quad Port Gigabit Server Adapter	435508-B21
HP NC365T 4-port Ethernet Server Adapter	593722-B21
HP NC373F PCI Express Multifunction Gigabit Server Adapter	394793-B21
HP NC373T PCI Express Multifunction Gigabit Server Adapter	394791-B21
HP NC382T PCI Express Dual Port Multifunction Gigabit Server Adapter	458492-B21

10 Gigabit Ethernet Adapters

NOTE: No more than two 10GbE I/O devices are supported in a single ProLiant server.

NOTE: A minimum of two Gigabytes (2 GB) of server memory is required per each adapter.

NOTE: Direct Attach Cable (DAC) for copper environments or fiber transceivers and cables for fiber-optic environments must be purchased separately.

HP NC522SFP Dual Port 10GbE Server Adapter	468332-B21
HP NC550SFP Dual Port 10GbE Server Adapter	581201-B21

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

HP Cooling Options

HP DL165G7 Redundant Fan OPT KIT	593114-B21
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NOTE: Redundant Fan Option Kit ONLY required for fan redundancy in single processor configurations. Two processor configurations offer N+1 fan redundancy as standard.

Additional Options

HP Entry-Level Server Management HP LO100i Advanced Pack, No Media 1-Server License including 1 year of 24x7 Technical Support and Updates 530521-B21
NOTE: For additional License Kits please see the Lights-Out 100i QuickSpecs at: www.hp.com/go/lo100.

HP Insight Software **HP Insight Control for Linux**
 HP Insight Control for Linux, 1-server license, including one year of 24x7 Technical Support and Updates, Electronic TC213AAE
 HP Insight Control for Linux, No Media, 1-Server license, including one year of 24x7 Technical Support and Updates TC209A
 HP Insight Control for Linux, Media pack (DVD) - No licenses included TC208A

NOTE: Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: <http://www.hp.com/go/ic-linux> (click on Download button).

NOTE: Electronic licenses can be used to purchase multiple licenses with a single activation key, and are available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent.

NOTE: Customer will receive a license entitlement certificate, which must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service.

NOTE: For additional License Kits, including electronic licensing options, please see the QuickSpecs at:

http://h18000.www1.hp.com/products/quickspecs/13019_div/13019_div.html

HP Insight Control server deployment

HP Insight Control server deployment Electronic License including 1 year 24x7 Technical Support and Updates T9082AAE
 HP Insight Control server deployment 1-Server License including 1 year 24x7 Technical Support and Updates 452151-B21

NOTE: Licenses ship without media. The Insight Control Media Kit can be ordered separately, or can be downloaded at:

<http://www.hp.com/go/insightupdates>.

NOTE: Electronic licenses can be used to purchase multiple licenses with a single activation key, and is available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent.

NOTE: Customer will receive a license entitlement certificate, which must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service.

NOTE: For additional license kits please see the Insight Control QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/12631_div/12631_div.html

High Performance Clusters **HP Cluster Management Utility**
 HP Cluster Management Utility Compute Node Flexible License 436284-B21
NOTE: This part number can be used to purchase one certificate for multiple licenses with a single activation key. Each license is for one node (server). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key.

NOTE: For additional license kits please see the QuickSpecs at:

http://h18004.www1.hp.com/products/quickspecs/12612_div/12612_div.html

HP Cluster Management Utility License and Media 433257-B21

NOTE: Order a minimum of one license per cluster to purchase media including software and documentation, which will be delivered to the customer, and also licenses CMU management. No license key is delivered or required.

NOTE: For additional license kits please see the QuickSpecs at:

http://h18004.www1.hp.com/products/quickspecs/12612_div/12612_div.html

HP HPC Linux Value Pack

HP High Performance Computing Linux Value Pack 1 Processor Flexible License TC293A

NOTE: This part number can be used to purchase one certificate for multiple licenses with a single activation key. Each license is for one socket (a.k.a. processor). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key.

NOTE: For additional license kits please see the QuickSpecs at:

http://h18004.www1.hp.com/products/quickspecs/13485_div/13485_div.html

HP High Performance Computing Linux Value Pack Media Kit TC294A



Additional Options

NOTE: This part number can be used to purchase media including software and documentation, which will be delivered to the customer.

NOTE: For additional license kits please see the QuickSpecs at:
http://h18004.www1.hp.com/products/quickspecs/13485_div/13485_div.html

HP Graphic Options	HP Graphic Card Power Adapter Kit	533955-B21
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HP Security - TPM	HP Trusted Platform Module Option Kit	488069-B21
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HP Storage Controllers SAS Controllers

NOTE: To utilize the internal only slot, the HP Smart Array P410 Controller must be selected. The selection of the HP Smart Array P212 Controller for internal and external connectivity, will require the use of the Full Length Full Height PCI-E x16 slot.

NOTE: With the HP Smart Array P410 Controller, the addition of the battery backed cache upgrade enables BBWC, RAID 5, 5+0, array expansion, logical drive extension, RAID migration, and stripe size migration. In order to upgrade to RAID 6, at least 256MB Cache and a Battery is required in addition to the HP Smart Array Advanced Pack license (P/N 516471-B21).

Smart Array P212 Controller

HP Smart Array P212/Zero Memory Controller	462828-B21
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HP Smart Array P212/256MB Controller	462834-B21
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Smart Array P410 Controller

HP Smart Array P410/256MB Controller	462862-B21
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HP Smart Array P410/512MB with BBWC Controller	462864-B21
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HP Smart Array P410/512MB with FBWC	578230-B21
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HP Smart Array P410/1G with FBWC	572532-B21
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Smart Array P411 Controller

NOTE: Controllers for use with external storage only.

HP Smart Array P411/256MB Controller	462830-B21
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HP Smart Array P411/512MB BBWC	462832-B21
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HP Smart Array P411/512MB Flash Backed Write Cache	578229-B21
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HP Smart Array P411/1G Flash Backed Write Cache	572531-B21
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Smart Array P812 Controller

HP Smart Array P812/1G Flash Backed Cache Controller	487204-B21
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Optional upgrades

1G Flash Backed Write Cache	534562-B21
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512MB Flash Backed Write Cache	534916-B21
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256 MB Cache Module	462968-B21
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NOTE: Supported on HP Smart Array P212 Controller only.

512MB BBWC	462967-B21
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NOTE: Supported on HP Smart Array P411 Controller only.

Battery Kit upgrade	462969-B21
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HP Smart Array Hot Plug Advanced Pack for B110i No Media 1-Server license including 1yr 24x7 Technical Support	TC421A
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SAS HBA

HP SC08Ge Host Bus Adapter	488765-B21
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HP SC08e 6Gb 2-ports Ext PCIe SAS HBA	614988-B21
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NOTE: This is a 2 x4 External Port HBA.

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

http://h18000.www1.hp.com/products/quickspecs/13203_div/13203_div.html
(Smart Array P212 Controller)

http://h18000.www1.hp.com/products/quickspecs/13201_div/13201_div.html
(Smart Array P410 Controller)

http://h18000.www1.hp.com/products/quickspecs/13202_div/13202_div.html
(Smart Array P411 Controller)

http://h18000.www1.hp.com/products/quickspecs/13558_div/13558_div.html
(Smart Array P812 Controller)

http://h18000.www1.hp.com/products/quickspecs/13495_div/13495_div.html
(Smart Array Advanced Pack)

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

Additional Options

HP InfiniBand Options HP IB 4X DDR PCI-e DUAL PORT HCA 448397-B21

NOTE: Please see the QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/13078_div/13078_div.html

HP Backup & Recovery Data Protector Express

Software

HP Data Protector Express 4.0 SP1 Backup Server	BB117BA
HP Data Protector Express 4.0 SP1 for Microsoft Small Business Server	BB118BA
HP Data Protector Express Backup Server 4.0 SP1 Upgrade from Data Protector Express Single Server Edition	BB117BT

NOTE: Only one of these Data Protector Express base products is required. To see available options: <http://www.hp.com/go/dataprotectorexpress>

HP Tape Backup

NOTE: For the complete range of StorageWorks tape drives, autoloaders, libraries and media see: <http://www.hp.com/go/tape>. For hardware and software compatibility of HP StorageWorks tape backup products see: <http://www.hp.com/go/connect>.

HP StorageWorks DAT 160 SAS Internal Tape Drive	Q1587A
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NOTE: For installation into 1U SAS Rack-Mount Kit (AE459B) or 3U SAS Rack-Mount Kit (AG576B). No peripheral bay available for installation into the server. Connection using the HP SC44Ge SAS Host Bus Adapter (416096-B21) recommended.

HP StorageWorks 1U USB Rack-Mount Kit with one DAT 320 USB Tape Drive	AP835A
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HP StorageWorks DAT 320 SAS Internal Tape Drive	AJ830A
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NOTE: For installation into 1U SAS Rack-Mount Kit (AE459B) or 3U SAS Rack-Mount Kit (AG576B). No peripheral bay available for installation into the server. Connection using the HP SC44Ge SAS Host Bus Adapter (416096-B21) recommended.

HP StorageWorks LTO-2 Ultrium 448 SAS Internal Tape Drive	DW085A
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NOTE: For installation into 1U SAS Rack-Mount Kit (AE459B) or 3U SAS Rack-Mount Kit (AG576B). No peripheral bay available for installation into the server. Connection using the HP SC44Ge SAS Host Bus Adapter (416096-B21) recommended.

HP StorageWorks LTO-3 Ultrium 920 SAS Internal Tape Drive	EH847A
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NOTE: For installation into 1U SAS Rack-Mount Kit (AE459B) or 3U SAS Rack-Mount Kit (AG576B). No peripheral bay available for installation into the server. Connection using the HP SC44Ge SAS Host Bus Adapter (416096-B21) recommended.

HP StorageWorks 1/8 G2 LTO-3 Ultrium 920 SAS Tape Autoloader	AH558A
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NOTE: Requires HP 1U Tape Autoloader Rack-Mount Kit (AH166A) for rack installation. Connection using the HP SC44Ge SAS Host Bus Adapter (416096-B21) recommended.

HP StorageWorks MSL2024 Tape Library with one LTO-3 Ultrium 920 SAS Drive	AH559A
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NOTE: Connection using the HP SC44Ge SAS Host Bus Adapter (416096-B21) recommended.

Additional Options

HP Disk Backup

NOTE: For the complete range of StorageWorks D2D Backup Systems see: <http://www.hp.com/go/d2d>. For the complete range of StorageWorks RDX drives and media see: <http://www.hp.com/go/rdx>. For hardware and software compatibility of HP StorageWorks disk backup products see: <http://www.hp.com/go/connect>.

HP StorageWorks D2D Backup Systems with Backup Data Deduplication

HP StorageWorks D2D2502i Backup System EJ001B

NOTE: 1.5TB of usable network disk backup capacity. Network connected appliance with connectivity using the iSCSI protocol. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.

HP StorageWorks D2D2504i Backup System EJ002B

NOTE: 3.0TB of usable network disk backup capacity. Network connected appliance with connectivity using the iSCSI protocol. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.

USB Removable Media RDX Disk Backup Systems

HP StorageWorks RDX320 Internal Removable Disk Backup System AJ767A

NOTE: For installation into 1U USB Rack-Mount Kit (A8007A). No peripheral bay available for drive installation into the server. 320GB of disk capacity per data cartridge.

HP StorageWorks RDX500 Internal Removable Disk Backup System AJ934A

NOTE: For installation into 1U USB Rack-Mount Kit (A8007A). No peripheral bay available for drive installation into the server. 500GB of disk capacity per data cartridge.

HP StorageWorks RDX750 Internal Removable Disk Backup System AW577A

NOTE: For installation into 1U USB Rack-Mount Kit (A8007A). No peripheral bay available for drive installation into the server. 750GB of disk capacity per data cartridge.

HP 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>

Brocade Fibre Channel HBAs

HP 81B PCIe 8Gb FC Single Port HBA AP769A

HP 82B PCIe 8Gb FC Dual Port HBA AP770A

HP 41B PCIe 4Gb FC Single Port HBA AP767A

HP 42B PCIe 4Gb FC Dual Port HBA AP768A

Emulex Fibre Channel HBAs

HP StorageWorks 81E 8Gb SP PCI-e FC HBA AJ762A

HP StorageWorks 82E 8Gb Dual-port PCI-e FC HBA AJ763A

HP StorageWorks FC2142SR 4Gb PCI-e HBA A8002A

HP StorageWorks FC2242SR Dual Channel 4Gb PCI-e HBA A8003A

QLogic Fibre Channel HBAs

HP StorageWorks 81Q 8Gb PCI-e FC HBA AK344A

HP StorageWorks 82Q 8Gb Dual Port PCI-e FC HBA AJ764A

HP StorageWorks FC1142SR 4Gb PCI-e HBA AE311A

HP StorageWorks FC1242SR Dual Channel 4Gb PCI-e HBA AE312A

StorageWorks SCSI HBA

HP U320e SCSI Host Bus Adapter AH627A

NOTE: Recommended for MSL SCSI Tape Library connect.

NOTE: Recommended Dual Channel Ultra320 SCSI Controller for connecting multi-drive MSL tape libraries to ProLiant servers.

StorageWorks Converged Network Adapter

HP CN1000E 2P Converged Network Adapter AW520A

Additional Options

HP Uninterruptible Power Systems

HP Rack-mountable UPS

HP R1500 G2 UPS

HP, R1.5kVA UPS, 1U, NA	AF419A
HP, R1.5kVA UPS, 1U, INTL	AF418A
HP, R1.5kVA UPS, 1U, JPN/TW	AF421A

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

http://h18000.www1.hp.com/products/quickspecs/12507_div/12507_div.html (Worldwide)

HP T1000 G3 UPS

HP T1000 G3 UPS, NA/JPN	AF448A
HP T1000 G3 UPS, INTL	AF449A

NOTE: Please see the QuickSpecs for additional information:

http://h18000.www1.hp.com/products/quickspecs/13160_div/13160_div.html (Worldwide)

HP T1500 G3 UPS

HP T1500 G3 UPS, NA/JPN	AF450A
HP T1500 G3 UPS, INTL	AF451A

NOTE: Please see the QuickSpecs for additional information:

http://h18000.www1.hp.com/products/quickspecs/13160_div/13160_div.html (Worldwide)

NOTE: For additional information on all HP Uninterruptible Power Systems and accessories please go to: www.hp.com/products/ups (Worldwide)

NOTE: For additional information on sizing your server, please reference: <http://www.upssizer.com>

HP Rack Series

HP Rack 10000 G2 Series (Carbon/Graphite Metallic)

HP Universal Rack 10642 G2 Pallet ALL	AF001A
HP Universal Rack 10642 G2 Shock ALL	AF002A

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

NOTE: xxxxxx-B22 (shock pallet) used to ship racks with equipment installed (by custom systems, VARs and Channels).

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

http://h18000.www1.hp.com/products/quickspecs/12402_div/12402_div.html (Worldwide)

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

HP Rack Options

Keyboards and Monitors

HP KVM Switch Options

Server console switch 0x2x8	AF616A
Server console switch 0x2x16	AF617A

HP 1x4 Console Switch

0x2x16 KVM Server Console G2 Switch with Virtual Media and CAC	AF618A
0x2x32 KVM Server Console G2 Switch with Virtual Media and CAC	AF619A
1x1Ex8 KVM IP Console Switch G2 with Virtual Media and CAC	AF620A
2x1Ex16 KVM IP Console Switch G2 with Virtual Media and CAC	AF621A
4x1Ex32 KVM IP Console Switch G2 with Virtual Media and CAC	AF622A

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

HP USB and SD Options

HP USB-P/S2 Mouse	DC369A
HP USB 04 Standard Keyboard	DT528A#ABA
HP DL165G7 SD Card Reader Module OPT KIT	592710-B21

Memory

HP ProLiant DL165 G7 (all models)

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

Standard Memory

4 GB (2 x 2 GB) PC2-6400 DIMM memory, with Advanced ECC Capabilities memory installed.

Maximum Memory

Up to 246GB memory is available with the optional installation of PC2-8500R-7 Registered DIMM memory kits.

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

DDR3 memory population guidelines

For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool:

www.hp.com/go/ddr3memory-configurator

Some DIMM installation guidelines are summarized below:

- For servers with twenty-four (24) memory slots:
 - There are four (4) channels per processor; eight (8) channels per server
 - There are three (3) DIMM slots for each memory channel; twenty-four (24) total slots
 - Memory channel 1 consists of the three (3) DIMMs that are furthest from the processor
 - Memory channel 4 consists of the three (3) DIMMs that are closest to the processor
- Do not mix Unbuffered memory (UDIMMs) with Registered memory (RDIMMs)
- Do not install DIMMs if the corresponding processor is not installed
- If only one processor is installed in a 2CPU system, only half of the DIMM slots are available
- To maximize performance, balance the total memory capacity between all installed processors
- It is not required, but it is recommended to load the channels similarly if possible
- You can only have up to eight (8) ranks installed per channel
- Mixing DIMM speeds is allowed, but the system processor speed rules always override the DIMM capabilities
- If you do mix DIMM speeds, the memory bus will default to the minimum clock rate of all DIMMs in the system - even if the slower DIMM is on the other processor
- If you install 1x 1066MHz DIMM in channel 1 and 1x 1333MHz DIMM in channel 2, you still run at 1066MHz
- If you install 1x 1066MHz DIMM in channel 1 and 5x 1333MHz DIMMs with 1 DIMM Per Channel (DPC) in each of the other channels, you run at 1066MHz
- If you install 3DPC in one channel (if applicable) and 1DPC in all other channels, you run at 800MHz
- 95 Watt CPU's are required for 1333MHz DIMM speeds. All other CPU's are capable of up to 1066MHz
- References to the above MHz speeds are for the various speeds of DDR3 DIMMs; 1333 refers to DDR3-1333, etc
- You can only install one quad-rank DIMMs per channel and it must be in the center socket
- You can only install two UDIMMs per channel; if available, the second (or middle) slot in the channel must remain empty
- Populate DIMMs from heaviest load (quad-rank) to lightest load (single-rank) within a channel
- Heaviest load (DIMM with most ranks) within a channel goes furthest from the chipset

DIMM Type	Registered DIMMS (RDIMMs)				Unbuffered with ECC DIMMs (UDIMMs)	
	Single Rank	Dual Rank (2R)		Quad Rank (4R)	Dual Rank (2R)	
DIMM Rank						
DIMM Capacity	4GB	2GB	8GB	16GB	2GB	4GB
DIMM Native Speed (MHz)	1333	1333	1333	1066	1333	1333
Voltage	LV/Reg	Reg	LV/Reg	Reg	Reg	Reg
SLOTS THAT CAN BE POPULATED						
24 slot servers	24	24	24	8	16	16
MAXIMUM CAPACITY (GB)						
24 slot servers	96	48	192	256*	32	64
POPULATED DIMM SPEED (MHz)						
1 DIMM Per Channel	1333	1333	1333	1066	1333	1333
2 DIMM Per Channel	1333	1333	1333	n/a	1333	1333
3 DIMM Per Channel	1333	1066	1066	n/a	n/a	n/a

* This capacity is achieved by loading 1 16GB in center socket and remaining sockets with 8GB DIMMs.

Memory

DIMM slot and configuration diagrams

Basic memory slot & population diagram

- Population order; start with "A" first, "B" second, "C" third, etc.

24 DIMM SLOTS (12 per CPU node)					
	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A	1	A	Chnl 1
	2	I	2	I	
	3	E	3	E	
Chnl 2	4	C	4	C	Chnl 2
	5	K	5	K	
	6	G	6	G	
Chnl 3	7	B	7	B	Chnl 3
	8	J	8	J	
	9	F	9	F	
Chnl 4	10	D	10	D	Chnl 4
	11	L	11	L	
	12	H	12	H	

NOTE: Capacity references are rounded to the common Gigabyte values.

- 2GB = 2048MB
- 4GB = 4096MB
- 8GB = 8192MB
- 16GB = 16384MB

Following are memory options available from HP:

HP Memory

Registered DIMMs (RDIMMs)

HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593907-B21
HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593911-B21
HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604500-B21
HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593913-B21
HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604502-B21
HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	593915-B21

Unbuffered with ECC DIMMs (UDIMMs)

HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	593921-B21
HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	593923-B21

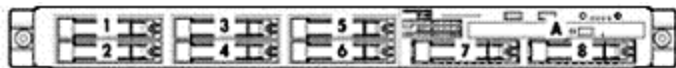
NOTE: PC3L is a low voltage memory.

Storage



1-4 Hot plug 3.5" SATA or Hot-plug SAS/SATA hard drive bays

A Optional DVD-ROM, or DVD/CD RW



1-8 Eight Hot-plug SAS hard drive bays

A Optional DVD-ROM, or DVD RW

Drive Support

Removable Media

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

Hard Drives

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, 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.

NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

SATA Non-Hot Plug LFF (3.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
2TB 3G SATA 7.2K	Up to 4	1-4	HP Smart Array P212 Controller
1TB 3G SATA 7.2K			HP Smart Array P410 Controller
500GB 3GSATA 7.2K			HP Smart Array P812 Controller

SATA Hot Plug LFF (3.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
2TB 3G SATA 7.2K	Up to 4	1-4	HP Smart Array P212 Controller
1TB 3G SATA 7.2K			HP Smart Array P410 Controller
500GB 3G SATA 7.2K			HP Smart Array P812 Controller
250GB 3G SATA 7.2K			
160GB 3G SATA 7.2K			

SATA Hot Plug LFF (3.5-inch) Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
250GB 3G SATA 7.2K	Up to 4	1-4	HP Smart Array P212 Controller
160GB 3G SATA 7.2K			HP Smart Array P410 Controller
			HP Smart Array P812 Controller

SATA Hot Plug 2.5" Midline (MDL) Solid State Drives

	Quantity Supported	Position Supported	Controller
60GB 3.0G SATA SSD	Up to 8	1-8	HP Smart Array P212 Controller
120GB 3.0G SATA SSD			HP Smart Array P410 Controller
			HP Smart Array P812 Controller

SATA Hot Plug 3.5" Midline (MDL) Solid State Drives

	Quantity Supported	Position Supported	Controller
60GB 3.0G SATA SSD	Up to 4	1-4	HP Smart Array P212 Controller
120GB 3.0G SATA SSD			HP Smart Array P410 Controller
			HP Smart Array P812 Controller

SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
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Storage

500 6G SAS 7.2K	Up to 8	1-8	HP Smart Array P212 Controller HP Smart Array P410 Controller HP Smart Array P812 Controller
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SAS Hot Plug LFF (3.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
2TB 6G SAS 7.2K	Up to 4	1-4	HP Smart Array P212 Controller
1TB 6G SAS 7.2K			HP Smart Array P410 Controller
1TB 3G SAS 7.2K			HP Smart Array P812 Controller
750 3G SAS 7.2K			

SAS Hot Plug SFF(2.5-inch) Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
300GB 6G SAS 10K	Up to 8	1-8	HP Smart Array P212 Controller
146GB 6G SAS 15K			HP Smart Array P410 Controller
146GB 6G SAS 10K			HP Smart Array P812 Controller
72GB 6G SAS 15K			

SAS Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
600GB 6G SAS 15K	Up to 4	1-4	HP Smart Array P212 Controller
450GB 6G SAS 15K			HP Smart Array P410 Controller
450GB 3G SAS 15K			HP Smart Array P812 Controller
300GB 6G SAS 15K			
300GB 3G SAS 15K			
146GB 3G SAS 15K			

Tape and Disk Backup

NOTE: For the complete range of StorageWorks tape drives, autoloaders, libraries and media, including the internal fitting models, see: <http://www.hp.com/go/tape>. For the complete range of StorageWorks D2D Backup Systems see: <http://www.hp.com/go/d2d>. For the complete range of StorageWorks RDX drives and media see: <http://www.hp.com/go/rdx>. For hardware and software compatibility of HP StorageWorks disk and tape backup products see: <http://www.hp.com/go/connect>.

	Position	Recommended Controller	Part Number
HP StorageWorks SCSI Tape Drives LTO-1 Ultrium 232 LTO-2 Ultrium 448 LTO-3 Ultrium 920 LTO-3 Ultrium 960 LTO4 Ultrium 1760 LTO-4 Ultrium 1840 DAT 40 DAT 72 DAT 160 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP SC11Xe Host Bus Adapter Please check the full compatibility information at: http://www.hp.com/go/connect	412911-B21
HP StorageWorks USB Tape Drives DAT 40 DAT 72 DAT 160 DAT 320 1U USB Rack-Mount Kit	External	USB 2.0 Port	N/A
HP StorageWorks SAS Tape Drives DAT 160 DAT 320 LTO-2 Ultrium 448 LTO-3 Ultrium 920 LTO-4 Ultrium 1760 LTO-4 Ultrium 1840	External	HP Smart Array P212 SAS controller Please check the full compatibility information at: http://www.hp.com/go/connect	462828-B21

Storage

LTO-5 Ultrium 3000
 LTO-5 Ultrium 3280
 1U Rack-Mount Kit
 3U Rack-Mount Kit

<p>HP StorageWorks SCSI Tape Autoloaders DAT 72x10 Autoloader 1/8 G2 Autoloader</p>	<p>External</p>	<p>HP SC11Xe Host Bus Adapter</p> <p>Please check the full compatibility information at: http://www.hp.com/go/connect</p>	<p>412911-B21</p>
<p>HP StorageWorks SCSI Tape Libraries MSL2024 MSL4048 MSL8096 MSL6000</p>	<p>External</p>	<p>HP U320e SCSI Dual Channel Controller</p> <p>Please check the full compatibility information at: http://www.hp.com/go/connect</p>	<p>AH627A</p>
<p>HP StorageWorks SAS Tape Autoloaders and Libraries 1/8 G2 Autoloader MSL2024 MSL4048 MSL8096</p>	<p>External</p>	<p>HP Smart Array P212 SAS controller</p> <p>Please check the full compatibility information at: http://www.hp.com/go/connect</p>	<p>462828-B21</p>
<p>HP StorageWorks Fibre Channel Tape Libraries MSL2024 MSL4048 MSL8096 MSL6000</p>	<p>External</p>	<p>Please consult the EBS connectivity matrix at: http://www.hp.com/go/ebs for connectivity information and the supported Fibre Channel HBAs shown in this QuickSpecs.</p>	
<p>HP StorageWorks USB RDX Removable Disk Backup System RDX160 RDX320 RDX500 RDX750</p>	<p>External</p>	<p>USB 2.0 port</p>	<p>N/A</p>
<p>HP StorageWorks D2D Backup Systems, iSCSI D2D2500i D2D4000i</p>	<p>Rack Mount</p>	<p>Embedded Network Controller. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.</p>	
<p>HP StorageWorks D2D Backup Systems, Fibre Channel D2D4000fc</p>	<p>Rack Mount</p>	<p>Direct server attach is not supported, requires connection via SAN fabric. See: http://www.hp.com/go/connect</p>	

Power Specifications

HP 500W Power Supply							
Part Number - AC 500W PSU	515915-B21 F10						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	47/63						
Nominal Input Voltage (Vrms)	100	120	200	220	230	240	
Maximum Rated Output Wattage	500	500	500	500	500	500	
Nominal Input Current (A rms)	5.74	4.99	2.86	2.58	2.46	2.36	
Max Rated Input Wattage Rating (Watts)	568	568	562	556	556	556	
Max. Rated VA (Volt-Amp)	574	574	573	567	567	567	
Efficiency (%) at Max. Rated Output Wattage	88	88	89	90	90	90	
Power Factor	0.99	0.99	0.98	0.98	0.98	0.98	
Leakage Current (mA)	0.42	0.50	0.81	0.91	0.95	1.00	
Max. Inrush Current (A peak)	30	30	30	30	30	30	
Max. Inrush Current duration (mS)	20	20	20	20	20	20	
Maximum British Thermal Unit Rating (BTU-Hr)							

HP 750W CS HE Power Supply Kit							
Part Number	512327-B21 Option Kit						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	100	120	200	208	220	230	240
Maximum Rated Output Wattage Rating	750	750	750	750	750	750	750
Nominal Input Current (A rms)	8.9	7.4	4.3	4.1	3.9	3.7	3.6
Maximum Rated Input Wattage Rating (Watts)	857	847	824	825	820	820	820
Maximum Rated VA (Volt-Amp)	894	884	859	854	854	854	854
Efficiency (%)	87.5	88.5	91	91	91.5	91.5	91.5
Power Factor	0.97						
Leakage Current (mA)	0.42	0.50	0.83	0.87	0.92	0.96	1.00
Maximum Inrush Current (A peak)	30						
Maximum Inrush Current duration (mS)	20						
Maximum British Thermal Unit Rating (BTU-Hr)	2925	2892	2812	2812	2797	2797	2797

NOTE:
 To review typical system power ratings use the Active Answers Power Advisor which is available via the online tool located at URL: www.hp.com/go/proliant-energy-efficient or www.hp.com/go/hppoweradvisor

System Specifications

Power

ProLiant DL165 G7 Fully Configured	115V/60Hz	220V/50Hz
Fully Loaded System Input Wattage (W)	568	556
Fully Loaded System Input Current (A rms)	4.99	2.58
Fully Loaded System Thermal (BTU- Hr)	1939.15	1898.18
Fully Loaded System VA (Volt-Amp)	574	567
System Inrush Current with all power supplies loaded 30 (A)		30
Power cord requirements	Nema 5-15P to IEC320-C13	IEC320-C13 to IEC320-C14

NOTE: Power shown is for a fully configured system consisting of (2) CPU, (8) double-sided DIMMs, (2) HDDs, (1) CD-ROM, and (2) PCI cards.

Power Cord AF556A

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

System Unit	Dimensions (H x W x D) (with bezel)	1.70 x 17.64 x 27.59 in (4.32 x 44.80 x 69.95 cm)	
	Weight (approximate)	Maximum (all hard drives, power supplies, and processors installed)	32.08 lb (14.55 kg)
		Minimum (one hard drive, power supply, and processor installed)	27.4 lb (12.43 kg)
Input Requirements (per 500W power supply)	Rated Line Voltage	100 to 127 VAC	200 to 240 VAC
	Rated Input Current	4.99A (at 115 VAC), 2.46A (at 230 VAC)	
	Rated Input Frequency	47 to 63 Hz	
	Rated Input Power	574W (at 100 VAC)	573W (at 200 VAC)
BTU Rating	Maximum	500W	1700 BTU / hr (at 100 VAC) 1700 BTU/hr (at 200 VAC)
Power Specifications	To review typical system power ratings use the Power Advisor which is available via the online tool located at URL: www.hp.com/go/hppoweradvisor		
	- Click on the system of interest. Example: DL165 G7 - Follow the instructions of the next screens.		
Power Supply Output (per power supply)	Rated Steady-State Power	500 Watts (at 100 VAC),	500 Watts (at 200 VAC)
	Maximum Peak Power	500 Watts (at 100 VAC),	500 Watts (at 200 VAC)
	Optional High Efficiency Power Supply Specifications		
Input Requirements (per power supply)	Rated Line Voltage	90-110 VAC, 108-132 VAC 180-264VAC	
	Rated Input Current	7.4 A (at 115 VAC), 3.6 A (at 230 VAC)	
	Rated Input Frequency	47 to 63 Hz	
	Rated Input Power	846 W (at 115 VAC), 822W (at 230 VAC)	
BTU Rating	Maximum	750 W	2550 BTU/hr (at 100 VAC), 2550 BTU/hr (at 200 VAC)
Power Specifications	To review typical system power ratings use the Power Advisor which is available via the online tool located at URL: www.hp.com/go/proliant-energy-efficient		
	- Click on the system of interest. Example: DL165 G7 - Follow the instructions of the next screens.		
Power Supply Output (per power supply)	Rated Steady-State Power	750 W (at 100 VAC),	750W (at 200 VAC)
	Maximum Peak Power	750 W (at 100 VAC),	750 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).	

Technical Specifications

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. Maximum allowable altitude change rate is 609 m/min (2000 ft/min).
	Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 609 m/min (2000 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).	
Emissions Classification (EMC)	Idle	
	LWAd	6.03 B
	LpAm	46.1 dBA
	Operating	
	LWAd	6.08 B
	LpAm	46.4 dBA
Emissions Classification (EMC)	FCC Rating	Class A
	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 B110i Smart Array Controller	Drives Supported	Up to 4 SATA devices
	Channels	4 1.5Gb SATA
	Storage Capacity	3.0TB internal storage
	Data Transfer Method	32-bit/33-MHz PCI bus-master
	Maximum SATA Channel Transfer Rate	1.5Gb/s per channel
	Maximum Transfer Rate per PCI Bus (peak)	266 MB/s per channel
	Protocols	SATA
		PIO Mode[0-4]
	Cable	SATA
	Internal ATA Connectors	Four SATA connectors
		NOTE: Raid support requires optional slot based raid controller.

Technical Specifications

Smart Array P410/410i Controller	Disk Drive and Enclosure Interface	6Gb/s SAS (Serial Attached SCSI) 3Gb/s SATA (Serial ATA)	
	SAS Connectors	2 internal (Mini-SAS) x8 wide port connectors	
	Cache Memory Speed	DDR2-533MHz with 40 or 72-bit wide bus provides up to 4.2 GB/s maximum bandwidth.	
	Server Interface	x8 2.5G PCIe 2.0 provides 2GB/s maximum bandwidth	
	SAS Speed	x8 6Gb/s SAS provides 4.8GB/s maximum bandwidth	
	Cache Memory	40-bit 256MB ECC protected cache (72-bit 512MB BBWC module upgrades available); transportable with battery-backed upgrade	
	Logical Drives Supported	Up to 64 logical drives	
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space	
	RAID Support	RAID 6, 6+0 (Advanced Data Guarding) NOTE: The minimum of 256 MB cache, battery kit, and Smart Array Advanced Pack License Key upgrade is required to enable RAID 6, 6+0 RAID 5, 5+0 (Distributed Data Guarding) NOTE: The 256 MB is required to enable RAID 5, 5+0 support of the Smart Array P410i RAID 1+0 (Striping & Mirroring) RAID 0 (Striping)	
	(2x) NC362i Integrated Dual Port Gigabit Server Adapter	Network Interface	Integrated 10/100/1000BASE-T Transceiver Combines a triple-speed IEEE 802.3TM - Compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver.
		Data Transfer Method	Compliant to x1 PCIe Specification
		Controller	Intel® 82576
Network Transfer Rate		10Base-T (Half-Duplex)	
		10Base-T (Full-Duplex)	
		100Base-TX (Half-Duplex)	
	100Base-TX (Full-Duplex)		
Connector	1000Base-TX (Half and Full-Duplex) RJ-45 connector		
Cable Support	Performs all the physical layer functions for 10BASE-T, 100BASE-T, and 1000BASE-T Ethernet on standard Category 5 UTP		
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.	

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