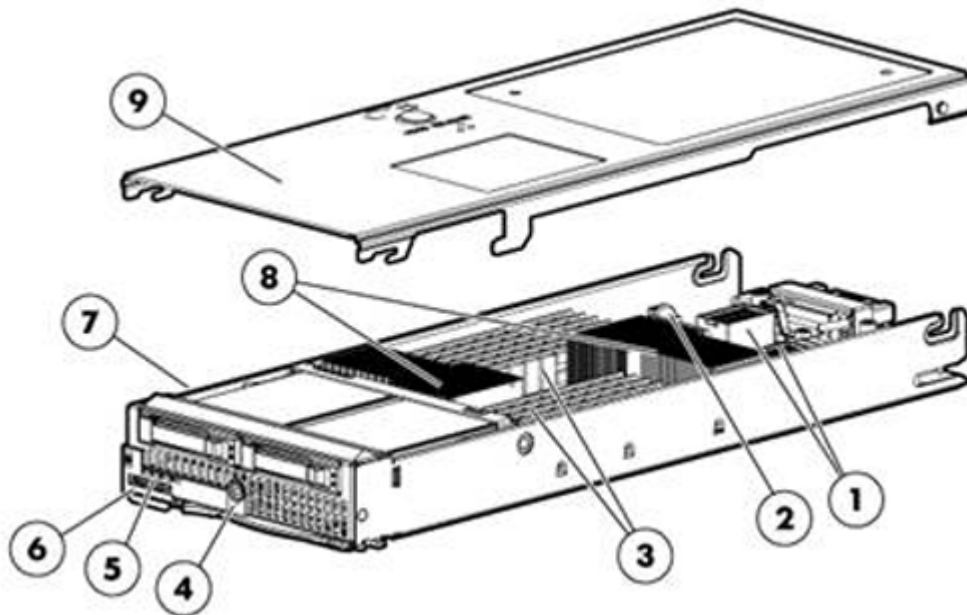


Overview



HP ProLiant BL460c G7 Server Blade

- | | |
|--|--|
| 1. Two (2) mezzanine I/O expansion slots | 5. Two (2) small form factor (SFF) hot-plug drive bays |
| 2. Internal USB connector | 6. Local I/O Connector |
| 3. Twelve (12) DDR3 Registered or Unbuffered DIMM Memory Slots | 7. Internal SD card slot |
| 4. HP Smart Array P410i Controller (under drive bays) | 8. Up to two (2) Intel® Xeon® 5500 or 5600 series processors |
| | 9. Access Panel |

What's New

- Support for 6G SAS Hot Plug Enterprise Mainstream Solid State Drives to 1.6TB per server (2x 800GB)
- Support for 6G SAS Hot Plug Enterprise Performance Solid State Drives to 800GB per server (2x 400GB)

At A Glance

This document covers the HP ProLiant BL460c G7 server blade only. For more information on HP BladeSystems c-Class Enclosures and HP BladeSystem c-Class Interconnect and Mezzanine Components, please see the following:

HP BladeSystem c-Class Enclosures QuickSpecs:

HP BladeSystem c3000 Enclosure QuickSpecs:

http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html

HP BladeSystem c7000 Enclosure QuickSpecs:

http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html

HP BladeSystem c-Class Interconnect and Mezzanine Components:

<http://h18004.www1.hp.com/products/blades/components/c-class-interconnects.html>

<http://h18004.www1.hp.com/products/blades/components/c-class-adapters.html>

The HP ProLiant BL460c G7 provides greater 2P x86 server blade density without compromise and maximum power-efficiency with flexibility and choice.

Overview

HP ProLiant BL460c G7 server blade includes:

- **Processor:**
 - Up to two (2) Intel® Xeon® 5500 or 5600 series processors
 - Intel® 5520 Chipset
- **Memory:**
 - Twelve (12) DIMM slots
 - Up to 384GB, using PC3-10600 DDR3 registered (RDIMM) memory, operating at 800MHz when fully populated at 2 DIMMs per channel in 12 slots
 - Up to 48GB, using PC3-10600 DDR3 unbuffered (UDIMM) memory, operating at 1333MHz when fully populated at 2 DIMMs per channel in 12 slots
- **Storage Controller:**
 - HP Smart Array P410i Controller with no cache supporting RAID 0 and 1
- **Internal Drive Support:**
 - Two (2) hot-plug small form factor (SFF) drive bays
 - Support for SAS, SATA, and SSD hot-plug hard drives
- **Network Controller:**
 - Integrated NC553i Dual Port FlexFabric 10Gb Adapter supporting autosensing 10Gb/1Gb Ethernet, FCoE, Flex-10, TCP/IP offload engine, hardware-based accelerated iSCSI, and iSCSI boot.
NOTE: Fibre Channel over Ethernet (FCoE) capability requires the use of an HP Virtual Connect FlexFabric 10Gb/24-port Module or HP 10GbE Pass-Thru Module. Learn more at: www.hp.com/go/virtualconnect.
NOTE: Each port is autosensing 1 Gb / 10 Gb, and can interoperate with 1 Gb HP BladeSystem c-Class interconnect components. Both ports will operate at the same speed.
 - One (1) additional 10/100 server adapter dedicated to iLO 3 Management
- **Mezzanine Support:**
 - Two (2) I/O expansion mezzanine slots
 - Supports up to two (2) mezzanine cards
 - Dual-port FlexFabric adapter mezzanine options
 - Dual-port Fibre Channel mezzanine (4 Gb or 8 Gb) options for SAN connectivity
 - Multi-port 1Gb and 10Gb Ethernet server adapter mezzanine options for additional network ports
 - InfiniBand (IB) mezzanine options for low latency and high bandwidth server interconnectivity
 - I/O accelerator mezzanine options for high transaction rate local storage
 - Smart Array SAS RAID controller mezzanine options for external direct attach and shared SAS storage
- **Expansion Blade Support:**
 - Supports one (1) optional storage, tape, or PCI expansion blade
- **Internal Media Support:**
 - One (1) internal USB 2.0 connector for USB flash media drive keys
 - One (1) internal secure digital (SD) card slot
- **Trusted Platform Module:**
 - One (1) internal TPM 1.2 module connector
- **Form Factor:**
 - HP ProLiant BL460c G7 is a half-height server blade that plugs into the HP BladeSystem c3000 and c7000 enclosures
- **Infrastructure Management:**
 - This server blade requires the latest version of the Onboard Administrator firmware. This firmware release may also require other subsystem firmware upgrades. For information on the latest firmware versions, please see the Blades Firmware Maintenance website at: <http://h18004.www1.hp.com/products/blades/components/c-class-compmatrix.html>
 - HP Integrated Lights-Out 3 (iLO 3) management processor for simplified server setup, health monitoring and recovery, power and thermal control, and lights-out remote administration.
 - HP Insight Control, 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 supports both Windows and Linux-based central management servers.
 - HP Insight Dynamics for ProLiant, a product option, is an integrated command center that enables IT Staff personnel to continuously analyze and optimize a converged infrastructure, while automating and reducing the cost of common data center tasks by as much as 40 percent. This ultimately enables them to dynamically keep pace with the organization's changing business requirements.
- **Operating Systems and Virtualization Software:**
 - Supports Windows, RHEL, SLES, Oracle Solaris, VMware, and Citrix XenServer

Overview

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 Operating System Support Matrix at: <http://www.hp.com/go/ossupport> and the BL460c G7 driver download page.

- **Enclosures:**

- HP offers two different c-Class server blade enclosures to meet your individual needs:
 - The HP BladeSystem c7000 rack enclosure is 10U high and holds up to sixteen (16) ProLiant BL460c G7 servers plugged vertically.
 - The HP BladeSystem c3000 rack enclosure is 6U high and holds up to eight (8) HP ProLiant BL460c G7 servers plugged horizontally.
- Server blades, storage blades, interconnect modules, power supplies, fans, and redundant Onboard Administrator modules are all designed to fit into the c3000 and c7000 enclosures.
- For additional enclosure information, please see: <http://h18004.www1.hp.com/products/blades/components/enclosures/c-class/index.html>.

- **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 three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Certain restrictions and exclusions apply. Hard drives have either a one year or three year warranty; refer to specific hard drive QuickSpecs for details.

NOTE: Server warranty includes 3 year Parts, 3 year Labor, 3-year on-site support. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at: <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

Standard Features

Processor

One of the following depending on Model

Six-Core Processors

Intel® Xeon® X5675 (3.06GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) Processor

Intel® Xeon® Processor X5670 (2.93GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) Processor

Intel® Xeon® Processor X5660 (2.80GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) Processor

Intel® Xeon® Processor X5650 (2.66GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) Processor

Intel® Xeon® Processor E5649 (2.53GHz/6-core/12MB/80W, DDR3-1333, HT, Turbo 1/1/1/1/2/2) Processor

Intel® Xeon® Processor E5645 (2.40GHz/6-core/12MB/80W, DDR3-1333, HT, Turbo 1/1/1/1/2/2) Processor

Intel® Xeon® Processor L5640 (2.26GHz/6-core/12MB/60W, DDR3-1333, HT, Turbo 2/2/3/3/4/4) Processor

Four-Core Processors

Intel® Xeon® Processor X5672 (3.20GHz/4-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/3/3) Processor

Intel® Xeon® Processor X5667 (3.06GHz/4-core/12MB/95W, DDR3-1333, HT, Turbo 1/1/2/2) Processor

Intel® Xeon® Processor L5630 (2.13GHz/4-core/12MB/40W, DDR3-1066, HT, Turbo 1/1/2/2)

Intel® Xeon® Processor L5520 (2.26GHz/4-core/8MB/60W, DDR3-1066, HT, Turbo 1/1/2/2) Processor

Intel® Xeon® Processor E5640 (2.66GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor

Intel® Xeon® Processor E5630 (2.53GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor

Intel® Xeon® Processor E5620 (2.40GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor

Intel® Xeon® Processor E5607 (2.26GHz/4-core/8MB/80W, DDR3-1066) Processor

Intel® Xeon® Processor E5506 (2.13GHz/4-core/4MB/80W, DDR3-800) Processor

Two-Core Processors

Intel® Xeon® Processor E5503 (2.0GHz/2-core/4MB/80W, DDR3-800) Processor

NOTE: HT indicates that the processor model supports Intel® Hyper-Threading Technology.

NOTE: Turbo indicates the maximum potential frequency increment when using Intel® Turbo Boost Technology, with 4, 3, 2, and 1 cores active (on four-core processors) or with 6, 5, 4, 3, 2, and 1 cores active (on six-core processors).

NOTE: DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed.

NOTE: For the Intel Xeon 5500 and 5600 Series, the letter preceding the model number indicates the performance/wattage of the processor. "X" denotes High Performance/Wattage; "E" denotes Enterprise Performance/Wattage (Mainstream); and "L" denotes Lower Wattage.

Upgradeability

Upgradeable to two (2) processors

Cache Memory

One of the following depending on Model

4MB shared L3 cache

8MB shared L3 cache

12MB shared L3 cache

Chipset

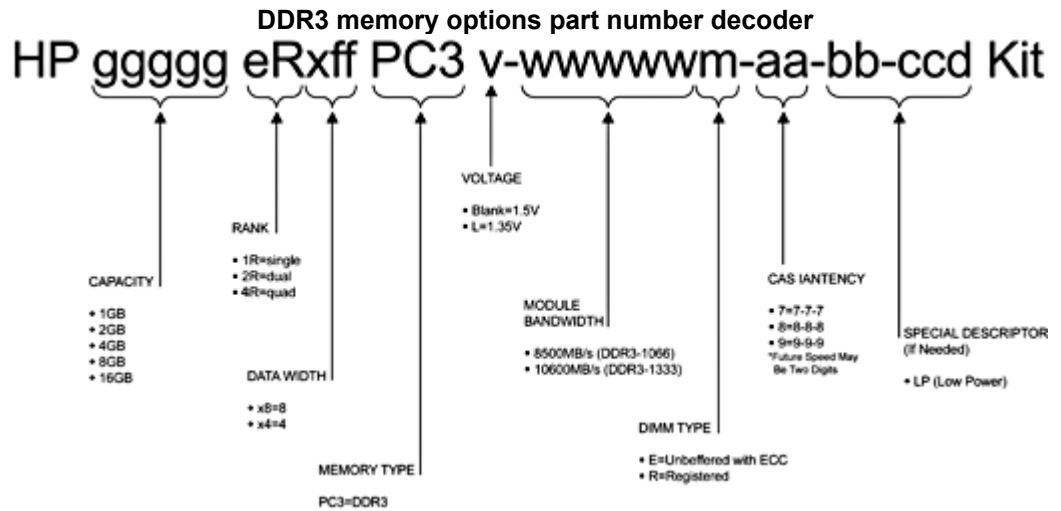
Intel® 5520 Chipset

Standard Features

Memory	Type	DDR3 Registered (RDIMM) or Unbuffered (UDIMM)
	Standard	6 GB (3 x 2GB) RDIMM
	Maximum (RDIMM)	384GB (12 x 32 GB) for registered memory configurations
	Maximum (UDIMM)	48 GB (12 x 4 GB) for unbuffered memory configurations

NOTE: A minimum of 2GB of memory must be installed.

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



Memory Protection	Advanced ECC (multi-bit error protection) Memory Mirroring Mode Memory Lock-Step Mode Memory Online Spare Mode supported on Intel Xeon 5600 Series processors
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Network Controller	Integrated NC553i Dual Port FlexFabric 10Gb Adapter NOTE: FlexFabric capability requires the use of an HP Virtual Connect FlexFabric module or HP 10GbE Pass-Thru Module. Learn more at: www.hp.com/go/virtualconnect . One (1) additional 10/100 NIC dedicated to iLO 3 Management
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I/O Expansion Slots	Two (2) I/O expansion mezzanine slots (x8 PCI Express)
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Integrated Manageability	HP Integrated Lights-Out 3 (iLO 3) management processor
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Storage Controller	Type	HP Smart Array P410i Controller with no cache supporting RAID 0 and 1
	Available Options:	256MB cache, 1G and 512MB Flash Backed Write Cache (FBWC), and Smart Array Advanced Pack.
	NOTE:	Supports two (2) small form factor (SFF) hot plug drive bays.

Maximum Internal Storage One of the following depending on Model	Hot-plug SAS	2.0TB	2 x 1.0TB drives
	Hot-plug SATA	2.0TB	2 x 1.0TB drives
	Hot-plug SAS SSD	1.6TB	2 x 800GB drives
	Hot-plug SATA SSD	240GB	2 x 120GB drives

Standard Features

Graphics

Integrated Matrox G200

Resolution Color Depths 1600 x 1200, 64K, 256, 16
1280 x 1024, 16.7M, 64k, 256, 16
1024 x 768, 16.7M, 64k, 256, 16
800 x 600, 16.7M, 64k, 256, 16
640 x 480, 16.7M, 64k, 256, 16

NOTE: Maximum resolution available via HP Integrated Lights-Out 3 (iLO 3) remote console is 1280 x 1024.

Fibre Channel Support Two (2) optional Fibre Channel HBAs are supported by the HP ProLiant BL460c G7. Both mezzanine circuit boards connect directly to the server blade system board. These Fibre Channel HBAs are available via option kits and must be ordered separately.

HBA mezzanine card option kits:

Emulex LPe1105 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem (403621-B21)

- Based on the same field-proven ASIC, firmware, and driver technology as Emulex's renowned LPe1150 HBA, the Emulex LPe1105-HP is fully driver compatible with all Emulex HBAs

Emulex LPe1205 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem (456972-B21)

- Exceptional performance, enhanced security, and scalable management for virtual server and enterprise-class applications

QLogic QMH2462 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem (403619-B21)

- Uses common drivers which means that customers can standardize on one QLogic driver whether they are using the QMH2462 or other HBAs powered by QLogic

QLogic QMH2562 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem (451871-B21)

- Provides a first step into the 8Gb future, advanced, embedded support for virtualized environments and reduced power consumption

HP BLc Brocade 804 8Gb Fibre Channel Host Bus Adapter (590647-B21)

- Application oriented quality of service (AQoS) providing the ability to configure, prioritize, and optimize traffic flows from virtual machines and/or applications to the target port

Brocade, Emulex and QLogic Fibre Channel HBAs for HP BladeSystem c-Class feature:

- Optimal performance utilizing PCI Express
- 4/2/1Gb/s auto negotiating speeds (4Gb HBAs)
- 8/4/2Gb/s auto negotiation speeds (8Gb HBAs)
- Dual-ports for redundant path connections
- Up to two Fibre Channel (FC) HBAs per server blade providing redundant FC HBA support
- Optimized for HP Storage products and supported by third party SAN vendors
- Support for Microsoft® Windows® and Linux operating system environments

Compatible SAN

HP ProLiant BL460c G7 server blades are optimized for HP MSA, EVA and XP.

HP ProLiant BL460c G7 server blades are compatible with select 3rd party SANs (please see blade storage page for more details: <http://h18004.www1.hp.com/products/blades/components/c-class-sans.html>)

Standard Features

HP Virtual Connect

HP Virtual Connect is an interconnect option for BladeSystem c-Class that simplifies server connectivity to data and storage networks, and reduces costs. Unique HP Flex-10 and FlexFabric technologies make maximum use of network bandwidths, provide dynamic tuning and enable extreme flexibility to meet individual server and infrastructure requirements. HP Virtual Connect Enterprise Manager (VCEM) provides a central console to administer network connections and workloads for thousands of servers. For more information on Virtual Connect Ethernet, Fibre Channel, Converged Network and management options see: www.hp.com/go/virtualconnect

HP Insight management software

HP Insight Foundation

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

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

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

The foundation pack includes:

- HP SmartStart
- HP Management DVD
- HP ProLiant Smart Update Firmware DVD
- SmartStart version supported (minimum): SmartStart 8.50.

<http://www.hp.com/servers/smartstart>

NOTE: In an effort to support reducing our environmental impact, the HP Insight Foundation Suite for ProLiant media will be available as a selectable option for this server at time of order of a Factory Integrated Model. This will allow customers to order the number of media kits that best meet their needs and eliminate receiving unnecessary duplicate media.

HP Integrated Lights-Out (iLO)

HP Integrated Lights-Out (iLO) simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration of ProLiant ML, DL, and BL servers. HP iLO functions without additional software and can be accessed from any location via a web browser. HP iLO works hand-in-hand with HP Systems Insight Manager, Insight Control suites, and Insight Dynamics for ProLiant, helping customers unleash the value of the ProLiant platform and deliver the highest possible quality of IT service. For more information, visit:

www.hp.com/go/iLO

HP Insight Control

HP Insight Control, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, migrate, monitor, remote control, and optimize your IT infrastructure through a single, simple management console.

Two versions of Insight Control are available, to serve environments requiring either a Linux-based or a Windows-based central management server: HP Insight Control for Linux, and HP Insight Control. See www.hp.com/go/insightcontrol

HP Insight Control 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>.

HP Insight Dynamics for ProLiant

HP Insight Dynamics for ProLiant, a product option, is advanced infrastructure management software that enables IT staff to instantly adjust their environments to meet dynamic business demands by provisioning, optimizing and protecting complex infrastructure in minutes.

Standard Features

It's a powerful toolkit, integrated-by-design, that accelerates complex technology projects and simplifies daily operations, transforming data center economics. With Insight Dynamics IT professionals can plan capacity and power continuously, balance workloads across physical and virtual resources, and ensure cost-effective high availability. It also enables IT organizations to provision infrastructure consistently and automatically from pools of shared resources using a self-service portal. Resources provisioned can range from a single virtual machine to complex multi-tier environments and their associated physical and virtual resource requirements. In addition to the previous functional benefits, it also provides a cost-effective disaster recovery for physical and virtual environments that works with HP Continuous Access software for both the Enterprise Virtual Array and the XP storage array allowing application environments to be reactivated in minutes with the touch of a button to a remote location.

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

High Performance Clusters

HP Cluster Platforms	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
HP HPC Interconnects	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
HP Cluster Management Utility	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
HP HPC Linux Value Pack	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 HPC Enterprise Edition suite of tools including the LSF workload scheduler, the HP-MPI parallelization library. Also included are 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

Operating Systems and Virtualization Software Support for ProLiant Servers

- [Microsoft Windows Server](#)
- [Red Hat Enterprise Linux \(RHEL\)](#)
- [SUSE Linux Enterprise Server \(SLES\)](#)
- [Oracle Solaris](#)
- [VMware](#)
- [Citrix XenServer](#)

NOTE: For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: <http://www.hp.com/go/ossupport> and our driver download page <http://www.hp.com/support/BL460cG7>

Standard Features

Availability

- Dual-Port Fibre Channel Mezzanine Card options for redundant SAN connection
- Dual-port embedded 10 Gigabit Ethernet adapters for redundant LAN connections
- Two (2) hot-plug SAS/SATA hard drive bays and integrated RAID (HP Smart Array P410i Controller)
- Optional Battery-backed and Flash-backed write cache module for integrated RAID controller
- Redundant ROM
- Advanced ECC Memory
- Support for Memory Mirroring Mode and Memory Lock-Step Mode
- Support for Memory Online Spare Mode with Xeon 5600 Series processors
- Network adapter teaming (network fault tolerance, transmit load balancing, switch-assisted load balancing)

Industry Standard Compliance

ACPI 2.0 Compliant
PCI 2.2 Compliant
WOL Support
Microsoft® Logo certifications
USB 2.0 Support
IMPI 2.0 Compliant
SMASH CLP Compliant

Security

- Power-on password
- Administrator's password
- Keyboard password (QuickLock)
- Integrated Lights-Out 3 with:
 - 12 customizable user accounts
 - SSL encryption
 - Secure Shell version 2
 - Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, CLP and XML scripting interface
 - AES and RC4 encryption of video
 - Disable via a global setting
- Keyboard password
- External USB port enable/disable
- Network server mode
- Serial interface control
- TPM (Trusted Platform Module) 1.2 option

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.

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.

Standard Features

Factory Express Portfolio for Servers and Storage

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

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

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

HP Enterprise Configurator

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

Service and Support

Service and Support **HP Technology Services for Industry Standard Servers and BladeSystem**

Capitalizing on HP ProLiant server and HP BladeSystem capabilities requires a service partner who understands your increasingly complex business technology environment. That's why it makes sense to team up with the people who know HP infrastructure hardware and software best - the experienced professionals at HP Services.

What HP ProLiant and BladeSystem Services can do for you

HP ProLiant and BladeSystem Services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions. This way, HP proposes services solutions that include more than just uplift of base warranty. You can get the support you need by choosing from one of a number of service packaged solutions we have designed to address wider set of customer support needs:.

HP Technology Services meets business challenges with services offered in three packages

Optimized Care Package, Standard Care Package, and Basic Care Package - available for each product group. Such packaged solutions enable customers to optimize technology operations, minimize risk and drive better business outcomes with easy-to-buy, easy-to-use scalable support packages for servers, storage, networking and software.

Optimized Care Package

Supports maintaining servers at optimum performance availability

HP Installation and Startup Service for HP BladeSystem c-Class Infrastructure for c3000/c7000 enclosure

Provides for the installation and startup of a BladeSystem c3000 Infrastructure in a single blade enclosure including hardware and software, including deployment of OS, HP SIM, RDP, PMP and VPM.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-5964ENW>

3-Year HP Critical Advantage for c3000/c7000 enclosure + 3-Year HP Critical Advantage for Blade server

Provides end-to-end infrastructure support solution for business critical applications running on virtualized/x86 infrastructures, enabling the customers to cost effectively build, operate, and continuously improve their IT environment. <http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA3-1772ENW>

HP Installation and Startup Service for HP BladeSystem c-Class Enhanced Network

HP Provides for the configuration and testing of BladeSystem Ethernet interconnect switches to facilitate proper implementation of network protocols and access to advanced features.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4aa0-5969ENW>

Additional Services: Virtualization Services - Strategy, Design, Transition, Operation, Continual Service Improvement.

Service and Support

Standard Care Package Package that maintains high level of server availability

HP Installation and Startup Service for HP BladeSystem c-Class Infrastructure for c3000/c7000 enclosure

Provides for the installation and startup of a BladeSystem c3000 Infrastructure in a single blade enclosure including hardware and software, including deployment of OS, HP SIM, RDP, PMP and VPM.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-5964ENW>

HP Installation and Startup Service for HP BladeSystem c-Class Enhanced Network

HP Provides for the configuration and testing of BladeSystem Ethernet interconnect switches to facilitate proper implementation of network protocols and access to advanced features.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4aa0-5969ENW>

3-Year, HP 6 hour Hardware Support Onsite Call-to-Repair Service for c3000/c7000 enclosure + 3-Year, HP 6 hour Hardware Support Onsite Call-to-Repair Service for Blade server

Provides an IT manager with a team of support specialists who will quickly begin troubleshooting the system to help return the hardware to operating condition within 6 hours of the initial service request to the HP Global Solution Center.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EN.pdf>

3-Year , HP 24x7 Software Support for Insight Control

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6645EEEE.pdf>

Additional Services: Software OS (Microsoft, Linux (SUSE/Red Hat) & VMware Installation & Start Up and Software Support); Microsoft or Linux or VMware education courses; +60 Proactive Select Credits, Factory Express.

Basic Care Package

Delivers minimum recommended support service level

HP Installation and Startup Service for HP BladeSystem c-Class Infrastructure for c3000/c7000 enclosure

Provides for the installation and startup of a BladeSystem c3000 Infrastructure in a single blade enclosure including hardware and software, including deployment of OS, HP SIM, RDP, PMP and VPM.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-5964ENW>

3-Year, HP 24x7 4 hour Response, Hardware Support Onsite Service for c3000/c7000 enclosure + 3-Year, HP 24x7 4 hour Response, Hardware Support Onsite Service for Blade server

Provides you with rapid remote support and if required an HP authorized representative who will arrive on site any time and day of the year to begin hardware maintenance service within 4 hours of the service request being logged.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EEEE>

3-Year , HP 24x7 Software Support for Insight Control

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6645EEEE.pdf>

Additional Services: Startup Blade System c-Class Enhanced Network Service; Software OS (Microsoft, Linux (SUSE/Red Hat) & VMware Installation & Start Up and Software Support); +30 Proactive Select Credits, Factory Express.

Service and Support

Insight Remote Support The packages include HP Insight Remote Support that uses proven technology to deliver secure, reliable 24x7 remote monitoring, diagnoses, and problem resolution. It is available at no additional cost to all warranty, HP Care Pack Service, and service agreement customers.

For more information To learn more on HP ProLiant servers and HP BladeSystem servers, please contact your HP sales representative or HP Authorized Channel Partner. Or visit: www.hp.com/services/bladesystem

Models

Models

NOTE: Not all models are available in all regions. Check with your local country HP offices for availability.

<p>HP ProLiant BL460c G7 X5675 1P 12GB-R Server 637390-B21</p>	<p>Processor(s) One of the following depending on Model</p>	<p>(1) Intel® Xeon® X5675 (3.06GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) Processor (1) Intel® Xeon® X5670 (2.93GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) Processor (1) Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) Processor (1) Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W, DDR3-1333, HT, Turbo1/1/1/1/2/2) Processor (1) Intel® Xeon® E5640 (2.66GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor (1) Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor (1) Intel® Xeon® E5506 (2.13GHz/4-core/4MB/80W, DDR3-800) Processor (1) Intel® Xeon® L5640 (2.26GHz/6-core/12MB/60W, DDR3-1333, HT, Turbo 2/2/3/3/4/4) Processor</p>
<p>HP ProLiant BL460c G7 X5670 1P 12GB-R P410i Server 603251-B21</p>		
<p>HP ProLiant BL460c G7 X5650 1P 6GB-R P410i Server 603259-xx1</p>		
<p>HP ProLiant BL460c G7 E5649 1P 6GB-R Server 637391-B21</p>	<p>Cache Memory</p>	<p>4MB or 12MB shared L3 cache</p>
<p>HP ProLiant BL460c G7 E5640 1P 6GB-R P410i Server 603569-B21</p>	<p>Memory One of the following depending on Model</p>	<p>12 GB (3 x 4 GB) PC3-10600 (DDR3-1333) Registered DIMMs 6 GB (3 x 2 GB) PC3-10600 (DDR3-1333) Registered DIMMs 12GB (3 x 4 GB) PC3L-10600 (DDR3-1333) Low Voltage Registered DIMMs</p>
<p>HP ProLiant BL460c G7 E5620 1P 6GB-R P410i Server 603588-B21</p>	<p>Network Adapter</p>	<p>Embedded NC553i Dual Port FlexFabric 10Gb Adapter and one (1) additional 10/100 server adapter dedicated to iLO 3 Management</p>
<p>HP ProLiant BL460c G7 E5506 1P 6GB-R P410i Server 603591-B21</p>	<p>Storage Controller</p>	<p>HP Smart Array P410i Controller with no cache supporting RAID 0 and 1</p>
<p>HP ProLiant BL460c G7 E5506 1P 6GB-R P410i Server 603591-B21</p>	<p>Hard Drives</p>	<p>None ship standard</p>
<p>HP ProLiant BL460c G7 L5640 1P 12GB-L P410i Server 603256-B21</p>	<p>Internal Storage</p>	<p>Two hot plug SFF drive bays</p>
	<p>Optical Drive</p>	<p>None</p>
	<p>Form Factor</p>	<p>Up to eight (8) half-height blades supported in the HP BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HP BladeSystem c7000 Enclosure</p>

Country Code	xx = B2	Worldwide
	xx = 20	Brazil

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 server blades must start with a CTO Blade.

NOTE: FIO indicates that this option is a Factory Installable Option.

Step 1: Base Server Blade Configuration (Select a configurable Blade)

Models	HP ProLiant BL460c G7 Configure-to-order Server	603718-B21
	Configurable Model ships with:	
	Integrated NC553i Dual Port FlexFabric 10Gb Adapter and one (1) additional 10/100 server adapter dedicated to iLO 3 management	
	Smart Array P410i Controller with no cache supporting RAID 0 and 1	
	Integrated Lights-Out 3 Standard Blade Edition	

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

HP Processors	For single processor configuration choose:	
	Six-Core Processor Option Kits	
	NOTE: If two processors are desired, select one xxxxxx-L21 and one xxxxxx-B21.	
	HP BL460c G7 Intel® Xeon® X5675 (3.06GHz/6-core/12MB/95W) FIO Processor Kit	637406-L21
	HP BL460c G7 Intel® Xeon® X5670 (2.93GHz/6-core/12MB/95W) FIO Processor Kit	610859-L21
	HP BL460c G7 Intel® Xeon® X5660 (2.80GHz/6-core/12MB/95W) FIO Processor Kit	603254-L21
	HP BL460c G7 Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W) FIO Processor Kit	610860-L21
	HP BL460c G7 Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W) FIO Processor Kit	637410-L21
	HP BL460c G7 Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W) FIO Processor Kit	637412-L21
	HP BL460c G7 Intel® Xeon® L5640 (2.26GHz/6-core/12MB/60W) FIO Processor Kit	610863-L21
	Four-Core Processor Option Kits	
	HP BL460c G7 Intel® Xeon® X5672 (3.20GHz/4-core/12MB/95W) FIO Processor Kit	637408-L21
	HP BL460c G7 Intel® Xeon® X5667 (3.06GHz/4-core/12MB/95W) FIO Processor Kit	626902-L21
	HP BL460c G7 Intel® Xeon® L5630 (2.13GHz/4-core/12MB/40W) FIO Processor Kit	603574-L21
	HP BL460c G7 Intel® Xeon® L5520 (2.26GHz/4-core/8MB/60W) FIO Processor Option Kit	641568-L21
	HP BL460c G7 Intel® Xeon® E5640 (2.66GHz/4-core/12MB/80W) FIO Processor Kit	610861-L21
	HP BL460c G7 Intel® Xeon® E5630 (2.53GHz/4-core/12MB/80W) FIO Processor Kit	610862-L21
	HP BL460c G7 Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W) FIO Processor Kit	612127-L21
	HP BL460c G7 Intel® Xeon® E5506 (2.13GHz/4-core/4MB/80W) FIO Processor Kit	610864-L21

Configuration Information - Factory Integrated Models

	HP BL460c G7 Intel® Xeon® E5607 (2.26GHz/4-core/8MB/80W) FIO Processor Kit	637414-L21
	Two-Core Processor Option Kits	
	HP BL460c G7 Intel® Xeon® E5503 (2.0GHz/2-core/4MB/80W) FIO Processor Kit	612890-L21
HP Memory	Registered DIMMS (RDIMMs)	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
	HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
	HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
	HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604504-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500662-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604506-B21
	HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
	HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit	627812-B21
	HP 32GB (1x32GB) Quad Rank x4 PC3L-8500 (DDR3-1066) Registered CAS-7 LP Memory Kit	627814-B21
	Unbuffered with ECC DIMMs (UDIMMs)	
	HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-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: PC3L is low voltage memory.	

Step 3: Choose Additional Options for Factory Integration

NOTE: For additional options, please refer to the "Core Options" and "Additional Options" section below. For additional options, including server blade enclosures interconnect, mezzanine options and power subsystem options; please see the Core Options and Additional sections below; or the following:

HP BladeSystem c-Class Enclosures QuickSpecs:

HP BladeSystem c3000 Enclosure QuickSpecs:

http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html

HP BladeSystem c7000 Enclosure QuickSpecs:

http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html

and HP BladeSystem c-Class Interconnect and Mezzanine Components:

<http://h18004.www1.hp.com/products/blades/components/c-class-interconnects.html>

<http://h18004.www1.hp.com/products/blades/components/c-class-adapters.html>

Core Options

HP Ethernet Mezzanine Gigabit Ethernet Mezzanines

Options

HP NC325m PCI Express Quad Port 1Gb Server Adapter for c-Class BladeSystem 416585-B21

NOTE: If the NC325m is installed in mezzanine slot 1 of a half-height server, connectivity will be provided on 2 of the 4 ports.

HP NC364m Quad Port 1GbE BL-c Adapter 447883-B21

NOTE: If the NC364m is installed in mezzanine slot 1 of a half-height server, connectivity will be provided on only 2 of the 4 ports.

HP NC382m Dual Port 1GbE Multifunction BL-c Adapter 453246-B21

NOTE: The Gigabit Ethernet adapters above transmit from the server at 2000 Mbps, full duplex per port only. For more information, see the "Network Controller" segment in the Standards Features section.

10 Gigabit Ethernet Mezzanines

NOTE: A 10 Gigabit Ethernet adapter is required for each server blade connecting to a 10Gb interconnect in bays 3-8 (HP BladeSystem c7000 Enclosure) or bays 2-4 (HP BladeSystem c3000 Enclosure).

NOTE: Each 10 Gigabit Ethernet adapter requires a minimum of 2GB of server memory.

NOTE: Each 10 Gigabit Ethernet adapter supports linking at 1000Mbps or 10000Mbps when not connected to a Flex-10 enabled module and will link with all current 1Gb switches at 1Gb.

NOTE: The ROM Based Setup Utility (RBSU) feature allows for the configuring of a FlexFabric Adapter to any of the supported protocols. For example iSCSI to FCoE (Fibre Channel over Ethernet). Note that a HP Virtual Connect profile takes precedence over the setting in this menu. Also, some FlexFabric Adapters may require that network boot be enabled in order to configure the protocol. If the protocol is configured without enabling network boot with certain FlexFabric Adapters, the protocol may not take effect. Once the protocol has taken effect on the first boot after configuring this option, network boot may be disabled if desired.

HP NC532m Dual Port 10GbE BL-c Adapter 467799-B21

HP NC542m Dual Port Flex-10 10GbE Multifunction BL-c Adapter 539857-B21

HP BLc NC552m Flex-10GbE Dual Port Adapter 610609-B21

HP NC553m 10Gb 2-port FlexFabric Adapter 613431-B21

HP Fiber Channel Mezzanine Options

HP BLc Brocade 804 8Gb Fibre Channel Host Bus Adapter 590647-B21

Emulex LPe1205 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem 456972-B21

Emulex LPe1105 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem 403621-B21

QLogic QMH2562 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem 451871-B21

QLogic QMH2462 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem 403619-B21

Core Options

HP Processors

Six-Core Processor Option Kits

HP BL460c G7 Intel® Xeon® X5675 (3.06GHz/6-core/12MB/95W) Processor Kit	637406-B21
HP BL460c G7 Intel® Xeon® X5670 (2.93GHz/6-core/12MB/95W) Processor Kit	610859-B21
HP BL460c G7 Intel® Xeon® X5660 (2.80GHz/6-core/12MB/95W) Processor Kit	603254-B21
HP BL460c G7 Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W) Processor Kit	610860-B21
HP BL460c G7 Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W) Processor Kit	637410-B21
HP BL460c G7 Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W) Processor Kit	637412-B21
HP BL460c G7 Intel® Xeon® L5640 (2.26GHz/6-core/12MB/60W) Processor Kit	610863-B21

Four-Core Processor Option Kits

HP BL460c G7 Intel® Xeon® X5672 (3.20GHz/4-core/12MB/95W) Processor Kit	637408-B21
HP BL460c G7 Intel® Xeon® X5667 (3.06GHz/4-core/12MB/95W) Processor Kit	626902-B21
HP BL460c G7 Intel® Xeon® L5630 (2.13GHz/4-core/12MB/40W) Processor Kit	603574-B21
HP BL460c G7 Intel® Xeon® L5520 (2.26GHz/4-core/8MB/60W) Processor Kit	641568-B21
HP BL460c G7 Intel® Xeon® E5640 (2.66GHz/4-core/12MB/80W) Processor Kit	610861-B21
HP BL460c G7 Intel® Xeon® E5630 (2.53GHz/4-core/12MB/80W) Processor Kit	610862-B21
HP BL460c G7 Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W) Processor Kit	612127-B21
HP BL460c G7 Intel® Xeon® E5607 (2.26GHz/4-core/8MB/80W) Processor Kit	637414-B21
HP BL460c G7 Intel® Xeon® E5506 (2.13GHz/4-core/4MB/80W) Processor Kit	610864-B21

Two-Core Processor Option Kits

HP BL460c G7 Intel® Xeon® E5503 (2.0GHz/2-core/4MB/80W) Processor Kit	612890-B21
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HP Memory

Registered DIMMS (RDIMMs)

HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604504-B21
HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500662-B21
HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604506-B21
HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit	627812-B21
HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
HP 32GB (1x32GB) Quad Rank x4 PC3L-8500 (DDR3-1066) Registered CAS-7 LP Memory Kit	627814-B21

Unbuffered with ECC DIMMs (UDIMMs)

HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-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.

Core Options

NOTE: Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see:

<http://h18004.www1.hp.com/products/servers/platforms/energyefficient/>

NOTE: PC3L is a low voltage memory.

HP Hard Drives

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

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

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

HP 900GB 6G SAS 10K rpm SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive 619291-B21

HP 600GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 581286-B21

HP 450GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 581284-B21

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

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

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

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

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

HP 1TB 6G SAS 7.2K rpm SFF (2.5-inch) Hot Plug Midline 1yr Warranty Hard Drive 605835-B21

HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) Dual Port Midline 1yr Warranty Hard Drive 507610-B21

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

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

NOTE: The hard drive options are not required when configuring a Drive-less Model.

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

HP 1TB 3G SATA 7.2K rpm SFF (2.5-inch) Hot Plug Midline 1yr Warranty Hard Drive 625609-B21

HP 500GB 3G SATA 7.2K rpm SFF (2.5-inch) Midline 1yr Warranty Hard Drive 507750-B21

HP 160GB 3G SATA 7.2K rpm SFF (2.5-inch) Midline 1yr Warranty Hard Drive 530888-B21

SATA Hot Plug SFF Midline Solid State Drives

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

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

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

http://h18000.www1.hp.com/products/quickspecs/13121_div/13121_div.html

6G SAS Hot Plug Enterprise Performance Solid State Drives

HP 400GB 6G SAS SLC SFF (2.5-inch) Enterprise Performance 3yr Warranty Solid State Drive 632494-B21

HP 200GB 6G SAS SLC SFF (2.5-inch) Enterprise Performance 3yr Warranty Solid State Drive 632492-B21

6G SAS Hot Plug Enterprise Mainstream Solid State Drives

Core Options

HP 800GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	632506-B21
HP 400GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	632504-B21
HP 200GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	632502-B21

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

http://h18000.www1.hp.com/products/quickspecs/13121_div/13121_div.html

Additional Options

HP Insight software

HP Insight Control

HP Insight Control including 1yr 24x7 Technical Support and Updates Electronic License T9074BAE

HP Insight Control including 1yr 24x7 Technical Support and Updates Single Server License 452148-B22

HP Insight Software Media Kit 436222-B21

NOTE: Insight Software DVD media without licenses. Contains Insight Control, Insight Dynamics and Virtual Connect Enterprise Manager. Uses an integrated installer to perform quick and accurate software installation and updates.

NOTE: Licenses ship without media. The HP 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 & Update Service.

NOTE: For additional license kits, including bundles with HP BladeSystem enclosures, please see the Insight Control QuickSpecs at:

http://h18004.www1.hp.com/products/quickspecs/12631_div/12631_div.html

HP Insight Control for Linux

HP Insight Control for Linux including 1yr 24x7 Support Electronic License TC213AAE

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

NOTE: Electronic LTUs are only available through limited points of sales; if not available, order a printed license entitlement certificate instead.

HP Insight Control for Linux including 1yr 24x7 Support Single Server License TC209A

HP Insight Control for Linux Media Kit TC208A

NOTE: This optional Media pack DVD contains the ISO image for HP Insight Control for Linux, HP Systems Insight Manager, HP Insight Control power management, HP Insight Control virtual machine management, and an integrated installer. Servers must be acquired separately.

NOTE: This Media pack is optional because the latest ISO image and latest updates may be downloaded at no cost from: <http://www.hp.com/go/ic-linux> (click on Download button).

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 Integrated Lights-Out (iLO) Advanced for ProLiant BladeSystem Remote Management

HP iLO Advanced for BladeSystem including 1yr 24x7 Support Electronic License TA851AAE

HP iLO Advanced for BladeSystem including 1yr 24x7 Support Single Server License 512488-B21

Additional Options

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 HP Integrated Lights-Out (iLO) QuickSpecs at: www.hp.com/go/iLO.

High Performance Clusters

HP Cluster Management Utility

HP Cluster Management Utility Compute Node Flexible License

QL803A

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.

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

TC293B

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.

HP High Performance Computing Linux Value Pack Media Kit

TC294A

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 Security - TPM

HP Trusted Platform Module (TPM) Kit

488069-B21

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.

Additional Options

HP Storage Controllers HP Smart Array P700m Controller

HP Smart Array P700m/512 4-ports Ext PCIe x8 SAS Controller 508226-B21

HP Smart Array P700m/256 4-ports Ext PCIe x8 SAS Controller 507925-B21

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

http://h18000.www1.hp.com/products/quickspecs/13175_div/13175_div.html
(Worldwide)

HP Smart Array P711m Controller

HP Smart Array P711m/1G 6Gb FBWC 4-ports Ext Mezzanine SAS Controller 513778-B21

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

http://h18004.www1.hp.com/products/quickspecs/14035_div/14035_div.html
(Worldwide)

HP Smart Array P712M Controller

HP Smart Array P712m/256 6Gb 2-ports Int/2-ports Ext Mezzanine SAS Controller 488348-B21

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

http://h18000.www1.hp.com/products/quickspecs/13296_div/13296_div.html
(Worldwide)

Optional Upgrades

HP Smart Array P-Series Low Profile Battery 452348-B21

NOTE: The Smart Array Low Profile Battery supports the HP Smart Array P700m Controller.

NOTE: The Smart Array battery option kit is required to enable battery-backed write cache (BBWC).

NOTE: The options listed below supports the integrated HP Smart Array P410i.

HP 256MB P-series Cache Upgrade 462968-B21

HP 512MB Flash Backed Write Cache 534916-B21

HP 1GB Flash Backed Cache 534562-B21

HP Smart Array Advanced Pack including 1yr 24x7 Technical Support and Updates Single Server License 516471-B21

NOTE: A license key, a minimum of 256MB cache, and battery kit is required to enable Smart Array Advanced Pack features. For more information go to:

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

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

http://h18000.www1.hp.com/products/quickspecs/13201_div/13201_div.html
(Worldwide)

HP I/O Expansion Options

HP StorageWorks 320GB IO Accelerator for BladeSystem c-Class AJ878B

HP 640GB IO Accelerator for BladeSystem c-Class BK836A

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

http://h18000.www1.hp.com/products/quickspecs/13220_div/13220_div.html

HP c-Class Mezzanine Options

QLogic 4X QDR IB Dual Port Mezzanine HCA for HP BladeSystem c-Class 583210-B21

HP 4X QDR IB CX2 Dual Port Mezz HCA for HP BladeSystem c-Class 592519-B21

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

http://h18000.www1.hp.com/products/quickspecs/12586_div/12586_div.html

Additional Options

HP Ultrium Tape Blades	<p>HP StorageWorks SB1760c Tape Blade AQ697A</p> <p>NOTE: LTO-4 Ultrium tape technology.</p> <p>NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12729_div/12729_div.html</p>
HP Storage Blades	<p>HP StorageWorks LTO-5 SB3000c Tape Blade BS580A</p> <p>NOTE: Please see the for Technical Specifications and additional information at: http://h18000.www1.hp.com/products/quickspecs/12729_div/12729_div.html (Worldwide)</p> <p>HP StorageWorks SB40c Storage Blade 411243-B21</p> <p>NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12587_div/12587_div.html (Worldwide)</p> <p>HP StorageWorks D2200sb PCIe Storage Blade AP880A</p> <p>NOTE: Please see the HP D2200sb PCIe Storage Blade QuickSpecs for technical specifications and additional information at: http://h18006.www1.hp.com/storage/bladessystem/index.html.</p>
HP Expansion Blade	<p>HP PCI Expansion Blade 448018-B21</p> <p>NOTE: Ships with one pre-installed PCI-X connect board. Also includes one PCIe connect board which requires installation.</p> <p>NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12753_div/12753_div.html</p>
HP USB and SD Options	<p>HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver) DC172B</p> <p>HP USB Standard Keyboard DT528A#ABA</p> <p>HP 2GB USB Flash Media Drive Key 608447-B21</p> <p>NOTE: HP qualified blank USB key for use with HP ProLiant servers that support the VMware virtualization environment and other HP value-add software like Smartstart. HP recommends this industry standard USB flash device for use with VMware ESXi. USB device must be installed in the internal slot of the ProLiant server for use with VMware ESXi. Refer to HP VMware Getting Started Guide for installation instructions.</p> <p>HP 4GB SD Flash Media 580387-B21</p> <p>NOTE: Blank SD media devices are supported for use with VMware and Citrix. SD media must be installed in the internal slot of the ProLiant server. Learn more at: http://www.hp.com/go/proliantvirtualization</p>
HP Care Pack Services	<p>NOTE: The HP Care Pack service part numbers below for ProLiant BL c-Class server blades, cover the server blade and all HP branded hardware options qualified for the server, purchased at the same time or afterwards, internal to the server.</p> <p>Hardware Services On-site Service</p> <p>4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic UK065E</p> <p>4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic UK066E</p> <p>6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic UK067E</p>

Memory

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

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 the HP ProLiant BL460c G7 server with twelve (12) memory slots:
 - There are three (3) channels per processor; six (6) channels per server
 - There are two (2) DIMM slots for each memory channel; twelve (12) total slots.
 - Memory channel 1 consists of the two (2) DIMMs that are closest to the processor
 - Memory channel 3 consists of the two (2) DIMMs that are furthest from the processor
- DIMM slots that are white should be populated first
- 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 two processor 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
- 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 processor
- For memory mirroring mode, channel 3 must be unpopulated. Channels 1 and 2 are populated identically
- For lock-step mode, channel 3 must be unpopulated. DIMMs in channels 1 and 2 will be installed in pairs. The paired slots will be 1,4; 2,5 on the BL460c G7
- Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.
- If mixing DIMM voltage is a requirement, please note that the DIMMs will run at 1.5V since all 1.35V are capable of supporting 1.5V operations

DIMM slot/capacity/populated speed table										
DIMM Type	Registered DIMMS (RDIMMs)						Unbuffered with ECC DIMMs (UDIMMs)			
	Single Rank (1R)	Dual Rank (2R)			Quad Rank (4R)		Single Rank (1R)	Dual Rank (2R)		
DIMM Rank										
DIMM Capacity	4GB	2GB	4GB	8GB	16GB	16GB	32 GB	1GB	2GB	4GB
DIMM Native Speed (MHz)	1333	1333	1333	1333	1333	1066	1066	1333	1333	1333
DIMM Voltage	LV/Std	Std	Std	LV/Std	LV/Std	Std	LV/Std	Std	Std	Std
SLOTS THAT CAN BE POPULATED										
12 slot servers	12	12	12	12	12	12	12	12	12	12
MAXIMUM CAPACITY (GB)										
	48	24	48	96	192	192	384	12	24	48
POPULATED DIMM SPEED (MHz)										
1 DIMM Per Channel	1333	1333	1333	1333	1333	1066	1066	1333	1333	1333
2 DIMM Per Channel	1066/ 1333*	1333	1333	1066/ 1333*	1066/ 1333*	800	800	1333	1333	1333

* By default, low voltage (LV) DIMMs will operate at standard voltage (1.5V) and operate at 1333MHz in a 2 DIMM per channel configuration. For power savings, this behavior can be changed in RBSU to operate at low voltage (1.35V) and 1066MHz.

NOTES:

- PC3-10600 DIMMs have a maximum speed of 1333MHz.
- PC3-8500 DIMMs have a maximum speed of 1066MHz.
- 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, the maximum speed will be



Memory

1066MHz

- If you install 1x 1066MHz DIMM in channel 1 and 5x 1333MHz DIMMs with 1 DIMM per channel in each of the other channels, the maximum speed will be 1066MHz
- Maximum memory speed will also depend on the processor installed
- References to the above MHz speeds are for the various speeds of DDR3 DIMMs; 1333 refers to DDR3-1333, etc.

HP ProLiant BL460c G7 Server Blade DIMM slot and configuration diagrams

Basic memory slot and population diagram

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

12 DIMM SLOTS (6 per CPU node)					
	CPU1		CPU2		
	slot #	population order	slot #	population order	
Channel 1	1	D	1	D	Channel 1
	2	A	2	A	
Channel 2	3	E	3	E	Channel 2
	4	B	4	B	
Channel 3	5	F	5	F	Channel 3
	6	C	6	C	

HP ProLiant BL460c G7 Server Blade (1P Model)

Standard memory configuration (1 CPU model)

- 6GB (3 x 2GB) of PC3-10600 (DDR3-1333) RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Channel 1	1	D: empty	1	D: empty	Channel 1
	2	A: 2GB DIMM	2	A: empty	
Channel 2	3	E: empty	3	E: empty	Channel 2
	4	B: 2GB DIMM	4	B: empty	
Channel 3	5	F: empty	5	F: empty	Channel 3
	6	C: 2GB DIMM	6	C: empty	

Standard Memory Plus Optional Memory (1 CPU model)

- 30 GB of PC3-10600 (DDR3-1333) RDIMMs (3 x 2GB plus 3 x 8GB)

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Channel 1	1	D: 2GB DIMM	1	D: empty	Channel 1
	2	A: 8GB DIMM	2	A: empty	
Channel 2	3	E: 2GB DIMM	3	E: empty	Channel 2
	4	B: 8GB DIMM	4	B: empty	
Channel 3	5	F: 2GB DIMM	5	F: empty	Channel 3
	6	C: 8GB DIMM	6	C: empty	

Memory

Standard Memory Replaced with Optional Memory (1 CPU model)

- 96GB of PC3-8500 Quad-Rank RDIMMs (6 x 16GB)

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Channel 1	1	D: 16GB DIMM	1	D: empty	Channel 1
	2	A: 16GB DIMM	2	A: empty	
Channel 2	3	E: 16GB DIMM	3	E: empty	Channel 2
	4	B: 16GB DIMM	4	B: empty	
Channel 3	5	F: 16GB DIMM	5	F: empty	Channel 3
	6	C: 16GB DIMM	6	C: empty	

UDIMM maximum configuration (1 CPU model)

- 24GB, consisting of six (6) 4GB dual-rank PC3-10600 UDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Channel 1	1	D: 4GB DIMM	1	D: empty	Channel 1
	2	A: 4GB DIMM	2	A: empty	
Channel 2	3	E: 4GB DIMM	3	E: empty	Channel 2
	4	B: 4GB DIMM	4	B: empty	
Channel 3	5	F: 4GB DIMM	5	F: empty	Channel 3
	6	C: 4GB DIMM	6	C: empty	

Standard Memory Replaced with Optional Memory (2 CPU Model)

RDIMM maximum configuration

- 384GB, consisting of twelve (12) 32GB quad-rank PC3-8500 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Channel 1	1	D: 32GB DIMM	1	D: 32GB DIMM	Channel 1
	2	A: 32GB DIMM	2	A: 32GB DIMM	
Channel 2	3	E: 32GB DIMM	3	E: 32GB DIMM	Channel 2
	4	B: 32GB DIMM	4	B: 32GB DIMM	
Channel 3	5	F: 32GB DIMM	5	F: 32GB DIMM	Channel 3
	6	C: 32GB DIMM	6	C: 32GB DIMM	

UDIMM maximum configuration (2 CPU model)

- 48GB, consisting of twelve (12) 4GB dual-rank PC3-10600 UDIMMs

Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Channel 1	1	D: 4GB DIMM	1	D: 4GB DIMM	Channel 1
	2	A: 4GB DIMM	2	A: 4GB DIMM	
Channel 2	3	E: 4GB DIMM	3	E: 4GB DIMM	Channel 2
	4	B: 4GB DIMM	4	B: 4GB DIMM	
Channel 3	5	F: 4GB DIMM	5	F: 4GB DIMM	Channel 3
	6	C: 4GB DIMM	6	C: 4GB DIMM	

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

- 1GB = 1024MB
- 2GB = 2048MB
- 4GB = 4096MB
- 8GB = 8192MB
- 16GB = 16384MB
- 32GB = 32768MB

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	500656-B21
HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604504-B21
HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500662-B21
HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604506-B21
HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit	627812-B21
HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
HP 32GB (1x32GB) Quad Rank x4 PC3L-8500 (DDR3-1066) Registered CAS-7 LP Memory Kit	627814-B21

Unbuffered with ECC DIMMs (UDIMMs)

HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-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: PC3L is a low voltage memory.

Storage



1-2 2 x SFF hot-plug SAS, SATA, SAS SDD, and SATA SSD hard drives

Hard Drives

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

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

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

	Quantity Supported	Position Supported	Controller
900GB 6G SAS 10K	2	1-2	HP Smart Array P410i Controller
600GB 6G SAS 10K			
450GB 6G SAS 10K			
300GB 6G SAS 10K			
146GB 6G SAS 15K			
146GB 6G SAS 10K			
72GB 6G SAS 15K			

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

	Quantity Supported	Position Supported	Controller
1TB 6G SAS 7.2K	2	1-2	HP Smart Array P410i Controller
500GB 3G SAS 7.2K			

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

	Quantity Supported	Position Supported	Controller
1TB 3G SATA 7.2K	2	1-2	HP Smart Array P410i Controller
500GB 3G SATA 7.2K			
160GB 3G SATA 7.2K			

SAS Hot Plug Enterprise Performance Solid State Drives

	Quantity Supported	Position Supported	Controller
400GB 6G SAS SLC	2	1-2	HP Smart Array P410i Controller
200GB 6G SAS SLC			

SAS Hot Plug Enterprise Mainstream Solid State Drives

	Quantity Supported	Position Supported	Controller

Storage

800GB 6G SAS MLC	2	1-2	HP Smart Array P410i Controller
400GB 6G SAS MLC			
200GB 6G SAS MLC			

SATA Hot Plug SFF Midline solid state drives

	Quantity Supported	Position Supported	Controller
60GB 3G SATA SSD	2	1-2	HP Smart Array P410i Controller
120GB 3G SATA SSD			

External Storage

	Quantity Supported	Position Supported	Host Controller or Adapter
XP Disk Array Systems	Please see the XP Disk Array Systems QuickSpecs below to determine configuration requirements	External	Please see the XP Disk Array Systems Quick Specs for the latest list of supported HBAs

HP XP10000 Disk Array:

<http://h18006.www1.hp.com/products/storageworks/xp10000/index.html> (Worldwide)

Enterprise Virtual Array Systems	Please see the XP Disk Array Systems QuickSpecs below to determine configuration requirements	External	Please see the XP Disk Array Systems Quick Specs for the latest list of supported HBAs
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HP Enterprise Virtual Array Family:

http://h18006.www1.hp.com/products/quickspecs/12408_div/12408_div.html (Worldwide)

Technical Specifications

System Unit	Dimensions (H x W x D) 7.154 x 2.19 x 20.058 in (18.17 x 5.56 x 50.95 cm) (with bezel)									
	Weight (approximate)	<table border="0"> <tr> <td style="padding-right: 20px;">Maximum</td> <td>16.5 lb (7.5 kg)</td> </tr> <tr> <td colspan="2">(all hard drives and processors installed)</td> </tr> <tr> <td>Minimum</td> <td>11.50 lb (5.22 kg)</td> </tr> <tr> <td colspan="2">(one hard drive and processor installed)</td> </tr> </table>	Maximum	16.5 lb (7.5 kg)	(all hard drives and processors installed)		Minimum	11.50 lb (5.22 kg)	(one hard drive and processor installed)	
Maximum	16.5 lb (7.5 kg)									
(all hard drives and processors installed)										
Minimum	11.50 lb (5.22 kg)									
(one hard drive and processor installed)										
	Power Specifications	<p>For power specifications including Input Requirements, BTU Rating, and Power Supply Output, please see the HP BladeSystem c-Class Enclosures QuickSpecs located at URL: HP BladeSystem c3000 Enclosure QuickSpecs: http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html HP BladeSystem c7000 Enclosure QuickSpecs: http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html</p> <p>To review typical system power ratings use the HP BladeSystem Power Sizer which is available via the online tool located at URL: http://www.hp.com/go/bladesystem/powercalculator</p>								
	System Inlet Temperature	<table border="0"> <tr> <td style="padding-right: 20px;">Operating</td> <td>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.</td> </tr> <tr> <td></td> <td>System performance may be reduced if operating with a fan fault or above 30°C (86°F).</td> </tr> <tr> <td style="padding-right: 20px;">Non-operating</td> <td>-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).</td> </tr> </table>	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).		
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	System performance may be reduced if operating with a fan fault or above 30°C (86°F).									
Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).									
	Relative Humidity (non-condensing)	<table border="0"> <tr> <td style="padding-right: 20px;">Operating</td> <td>10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.</td> </tr> <tr> <td style="padding-right: 20px;">Non-operating</td> <td>5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.</td> </tr> </table>	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.				
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	<table border="0"> <tr> <td style="padding-right: 20px;">Operating</td> <td>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).</td> </tr> <tr> <td style="padding-right: 20px;">Non-operating</td> <td>9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).</td> </tr> </table>	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).				
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).									
	Acoustic Noise	<p>For acoustic noise specifications, please see the HP BladeSystem c-Class Enclosures QuickSpecs located at URL: HP BladeSystem c3000 Enclosure QuickSpecs: http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html HP BladeSystem c7000 Enclosure QuickSpecs: http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html</p>								

Technical Specifications

HP Smart Array P410i Controller	Disk Drive Interface	6Gb/s SAS (Serial Attached SCSI) 3Gb/s SATA (Serial ATA)
	Server Interface	x4 PCI Express host interface
	Cache Memory	0 MB (none) standard Optional 256MB, 512MB, or 1GB cache memory
	Logical Drives Supported	2 (with standard 0MB cache)
	Maximum Logical Drive Capacity	32 (with optional 256MB cache) 64 (with optional 512MB cache)
	Host Memory Addressing	64-bit, supporting servers memory space greater than 4 GB
	RAID Support	RAID 1(Mirroring) RAID 0 (Striping)
	Upgradeable Firmware	Controller: Upgradeable Firmware with Recovery ROM feature Online Drive Flash (with SAS drives) requires 256MB, 512MB, or 1GB cache module

Embedded HP NC553i Dual Port FlexFabric 10Gb Adapter	Type	Integrated dual-port KR 10Gb with FlexFabric (FCoE or iSCSI) capability
	Network Processor	ServerEngines BE3
	Data Transfer Method	x8 PCI Express 2.0
	Network Transfer Rate	Two ports, each at 20 Gbps full duplex; 40 Gbps aggregate full duplex theoretical bandwidth NOTE: Each port is autosensing 1 Gb / 10 Gb, and can interoperate with 1 Gb HP BladeSystem c-Class interconnect components. Both ports will operate at the same speed. NOTE: Each port on the NC553i adapter transmits from the server at 20 Gbps (theoretical) full duplex.
	IEEE Compliance	802.1p QoS, 802.1Q VLAN tagging, 802.3ad link aggregation, 802.3ap 10GBase-KR, and 802.3x flow control
	Standard Features	<ul style="list-style-type: none"> ● ProLiant Teaming including Network Fault Tolerance, Transmit Load Balancing, and Switch-Assisted Load Balancing ● 9K Jumbo frames (4K Jumbo frames when in FCoE mode) ● Microsoft Windows Receive Side Scaling (RSS) ● Accelerated iSCSI

Technical Specifications

HP Integrated Lights-Out 3 (iLO 3) integrated on system board	Architecture	PCI Express based health and remote management ASIC
	Processor	PCI Express RISC processor core running at 250MHz
	Upgradeability	Option firmware upgradeable via Flash ROM
	Video Support	1600 x 1200 DVR max resolution
	Interfaces	One Ethernet Sideband connection (10/100/1000 Mb/s) One Ethernet network connection (10/100Mb/s)
	Memory	128 MB DDR with ECC
	Operating System Support	Microsoft Windows 2008 R2 Microsoft Windows 2008 (32 bit and 64 bit) Microsoft Windows Server 2008 Standard Edition (32bit and 64bit) Microsoft Windows Server 2008 Enterprise Edition (32bit and 64bit) Microsoft Windows Server 2003 and Windows Server 2003 R2, and Windows Server 2003 for Extended Systems Standard Edition, Enterprise Edition Red Hat Enterprise Linux 5.4 (32 bit and 64 bit) SUSE LINUX Enterprise Server 11 (32bit and 64bit) SUSE LINUX Enterprise Server 10 (32bit and 64bit) VMware ESX 4.0 VMware ESX 3.5.0
	Client System Support	Microsoft Windows 7 Microsoft Windows XP Professional Edition Microsoft Windows Vista Business and Ultimate Editions Red Hat Enterprise Desktop 5.00 SUSE Linux Enterprise Desktop 11 SUSE Linux Enterprise Desktop 10
	Client Browser Support	Microsoft Internet Explorer 8 Microsoft Internet Explorer 7 Microsoft Internet Explorer 6 Firefox 3.5 (on supported Windows and Linux systems) Firefox 3.0 (on supported Windows and Linux systems)
	Command Line Support	Secure Shell and serial port access Secure Socket Layer Secure Shell version 2
	Security	Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, CLP and XML scripting interface AES encryption of video RC4 encryption of video
	Directory Support Services	Active Directory v1.0 (Windows 2003)
	Driver Support	HP ProLiant iLO3 Management Controller Driver Package
Management protocols supported	SNMP, IPMI 2.0 (system and LAN interface), DMTF Systems Management Architecture for Server Hardware Command Line Protocol (SMASH CLP), HP RIBCL XML	

Technical Specifications

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.