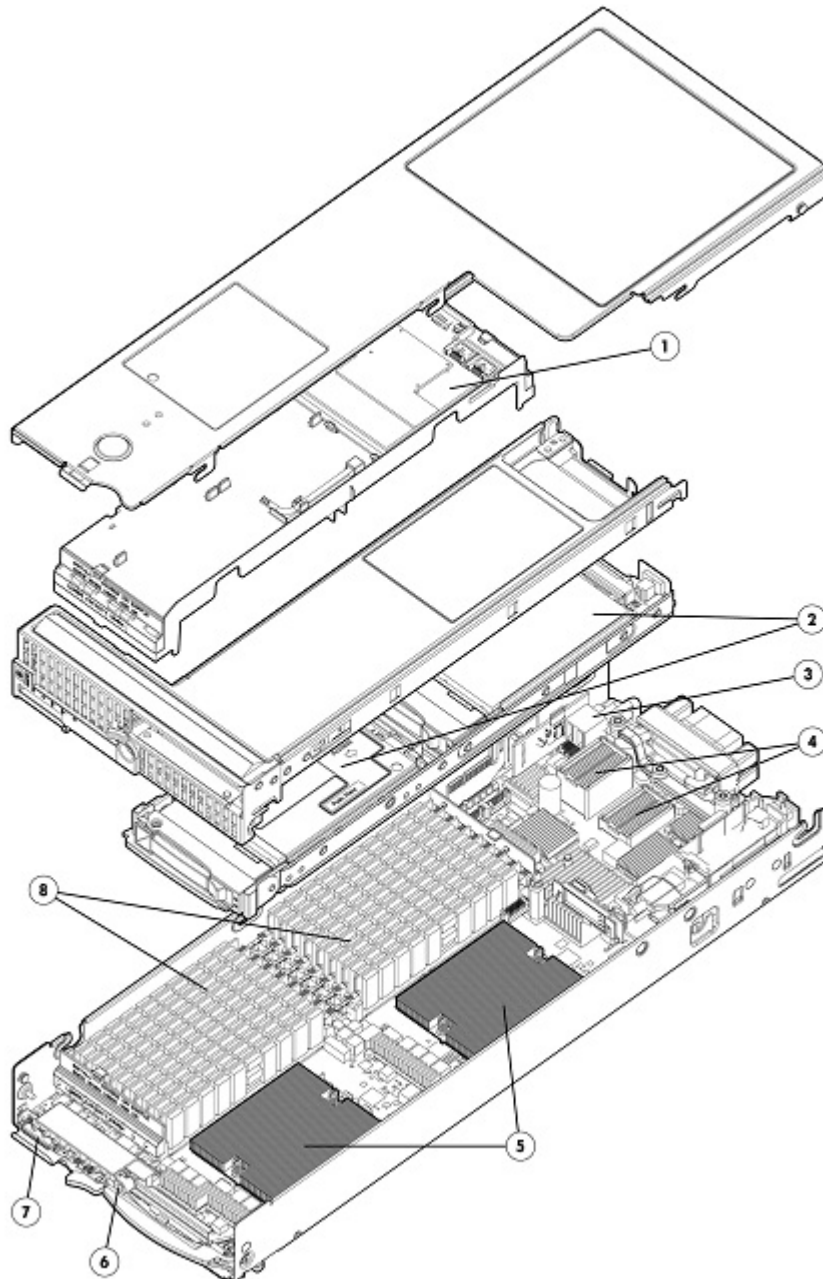*Overview*

HP ProLiant BL465c G7 Server Blade

1. Smart Array P410i storage controller (available as an option in factory integrated models)
2. Two (2) small form factor (SFF) hot plug drive bays
3. Internal USB connector
   Internal MicroSD card slot
4. Two (2) mezzanine I/O expansion slots

5. Up to two (2) Multi-Core AMD Opteron™ 6100 Series processors
6. System power button and LED
7. Local I/O connector
8. Sixteen (16) PC3-8500 DDR3 Registered DIMMs, PC3-10600 DDR3 Registered DIMMs, or PC3-10600 DDR3 Unbuffered DIMMs

What's New

- Support for 6G SAS Hot Plug Enterprise Performance Solid State Drives
- Support for 6G SAS Hot Plug Enterprise Mainstream Solid State Drives

Overview

At A Glance

This document covers the HP ProLiant BL465c G7 server blade only. For more information on HP BladeSystem c-Class Enclosures and HP BladeSystem c-Class Interconnect and Mezzanine Components, please see the following 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 BL465c G7 helps simplify network connections, lower infrastructure costs, and delivers the performance you expect for demanding application workloads.

HP ProLiant BL465c G7 server blade includes:

- **Processor**:
  - Up to two (2) Multi-Core AMD Opteron™ 6100 Series processors
    - Twelve-Core supports up to 2.3 GHz; 512 KB Level 2 cache memory per core; 12 MB Level 3 cache
    - Eight-Core supports up to 2.6 GHz; 512 KB Level 2 cache memory per core; 12 MB Level 3 cache
  - AMD SR5690 and SP5100 chipsets
- **Memory**:
  - Sixteen (16) DIMM slots
  - Up to 512GB of PC3L-10600 DDR3 Registered (RDIMM) memory, operating at 1066 MHz when fully populated at 2 DIMMs per channel in 16 slots
  - Up to 128GB of PC3-10600 DDR3 Registered (RDIMM) memory, operating at 1333 MHz when fully populated at 2 DIMMs per channel in 16 slots
  - Up to 64GB of PC3-10600 DDR3 Unbuffered (UDIMM) memory, operating at 1333 MHz when fully populated at 2 DIMMs per channel in 16 slots
  - Supporting memory interleaving (2:1)
    NOTE: Each processor memory bus will operate at up to 1333 MHz with either one quad-rank (QR) or two single-rank/dual-rank (SR/DR) DIMMs per processor memory channel and 1066 MHz with up to two QR or one QR and one SR/DR DIMMs per processor memory channel with standard voltage (1.5V, PC3) DIMMs. Memory bus will operate one speed slower when low voltage (1.35V, PC3L) memory is installed. Memory bus speeds may be further limited by the speed of the memory used as well.
- **Storage Controller**:
  - Smart Array P410i RAID controller with 1 GB flash-backed write cache (FBWC). Supports RAID 0,1.
    NOTE: The HP Smart Array P410i controller is required for all blades that support hot plug drives. See Factory Integrated Models section for more information.
- **Internal Drive Support**:
  - Up to two (2) small form factor (SFF) SAS or SATA hot plug hard disk drives or SATA solid state drives
- **Network Controller**:
  - One (1) integrated NC551i Dual Port FlexFabric 10Gb Converged Network Adapter supporting stateless TCP/IP offload, TCP Offload Engine (TOE), Fibre Channel over Ethernet (FCoE) and iSCSI protocols
    NOTE: Flex-10 capability requires the use of an HP Virtual Connect Flex-10 10Gb Ethernet module. Learn more at: www.hp.com/go/virtualconnect
    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.
    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 embedded 10/100 network 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 option
    - Dual-Port Fibre Channel Mezzanine (4-Gb or 8-Gb) options for SAN connectivity
    - Dual-Port FlexFabric Converged Network Adapter
    - Ethernet server adapter mezzanine options for additional network ports
    - InfiniBand (IB) Mezzanine options for low latency server interconnectivity

Overview

- I/O Accelerator mezzanine options for high transaction rate local storage
- SAS mezzanine option 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 security key devices and USB drive key
  - One (1) internal Micro SD-HC card slot
- **Trusted Platform Module**:
  - One (1) internal TPM 1.2 module connector
- **Form Factor**:
  - HP ProLiant BL465c G7 server blade plugs into the 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 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, VMware,, Citrix XenServer
- **Enclosures**:
  - HP offers two (2) 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 BL465c G7 servers plugged vertically.
    - The HP BladeSystem c3000 rack enclosure is 6U high and holds up to eight (8) HP ProLiant BL465c G7 servers plugged horizontally.
  - Server blades, storage blades, and interconnect modules are all designed to fit into the c7000 and c3000 enclosures.
  - For additional enclosure information, please see: http://h18004.www1.hp.com/products/blades/components/enclosures/c-class/index.html.
    NOTE: For optimal cooling and system performance the BL465c G7 requires the c7000 enclosure to be configured with 10 fans and the c3000 enclosure to be configured with 6 fans.
- **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. 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

QuickSpecs

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	**Twelve-Core Processors** AMD Opteron™ 6176 (2.3GHz/12-core/12MB/80W, ACP) Processor AMD Opteron™ 6174 (2.2GHz/12-core/12MB/80W, ACP) Processor AMD Opteron™ 6172 (2.1GHz/12-core/12MB/80W ,ACP) Processor Low Power AMD Opteron™ Model 6166 HE (1.8GHz/12-core/12MB/65W ,ACP) Processor Low Power AMD Opteron™ Model 6164 HE (1.7GHz/12-core/12MB/65W, ACP) Processor **Eight-Core Processors** AMD Opteron™ 6140 (2.6GHz/8-core/12MB/80W, ACP) Processor AMD Opteron™ 6136 (2.4GHz/8-core/12MB/80W, ACP) Processor AMD Opteron™ 6134 (2.3GHz/8-core/12MB/80W, ACP) Processor Low Power AMD Opteron™ 6132 HE (2.2GHz/8-core/12MB/65W, ACP) Processor Low Power AMD Opteron™ 6128 HE (2.0GHz/8-core/12MB/65W, ACP) Processor **NOTE:** Processor wattage references reflect Average CPU Power (ACP). For more information on ACP visit: http://www.amd.com/acp.

Upgradeability	Upgradeable to dual (2) processors

Cache Memory One of the following depending on Model	512 KB Level 2 cache memory per core 12 MB Level 3 cache memory

Chipset	AMD SR5690 and SP5100

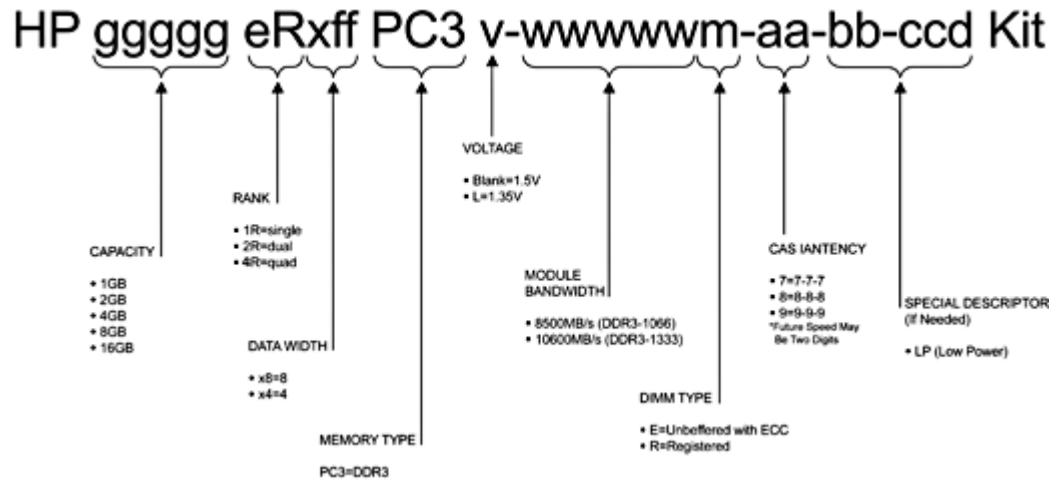|		
Memory	Type	DDR3 Registered (RDIMM) or Unbuffered (UDIMM)
	Standard	8 GB (2 x 4 GB)
	Maximum (RDIMM)	512 GB (16 x 32 GB) at 1333 MHz
	Maximum (UDIMM)	64 GB (16 x 4 GB) at 1333 MHz

NOTE: Each processor memory bus will operate at up to 1333 MHz with either one quad-rank (QR) or two single-rank/dual-rank (SR/DR) DIMMs per processor memory channel and 1066 MHz with up to two QR or one QR and one SR/DR DIMMs per processor memory channel with standard voltage (1.5V, PC3) DIMMs. Memory bus will operate one speed slower when low voltage (1.35V, PC3L) memory is installed. Memory bus speeds may be further limited by the speed of the memory used as well. Please see the Online Memory Configuration Tool at: www.hp.com/go/ddr3memory-configurator.

NOTE: Kits described as PC3L include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/ddr3memory-configurator

DDR3 memory options part number decoder

Standard Features

```
HP ggggg eRxff PC3 v-wwwwwm-aa-bb-ccd Kit
```

CAPACITY
- 1GB
- 2GB
- 4GB
- 8GB
- 16GB

RANK
- 1R=single
- 2R=dual
- 4R=quad

DATA WIDTH
- x8=8
- x4=4

MEMORY TYPE
PC3=DDR3

VOLTAGE
- Blank=1.5V
- L=1.35V

MODULE BANDWIDTH
- 8500MB/s (DDR3-1066)
- 10600MB/s (DDR3-1333)

DIMM TYPE
- E=Unbuffered with ECC
- R=Registered

CAS lATENCY
- 7=7-7-7
- 8=8-8-8
- 9=9-9-9
- *Future Speed May Be Two Digits

SPECIAL DESCRIPTOR (If Needed)
- LP (Low Power)

Network Controller	One (1) integrated NC551i Dual Port FlexFabric 10Gb Converged Network Adapter
	NOTE: Flex-10 capability requires the use of an HP Virtual Connect Flex-10 10Gb Ethernet module. Learn more at: www.hp.com/go/virtualconnect.
	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.
	One (1) additional 10/100 network adapter dedicated to iLO 3 Management
I/O Expansion Slots	Two (2) I/O expansion mezzanine slots (All x8 PCI Express)
Integrated Manageability	HP Integrated Lights-Out 3
Storage Controller	HP Smart Array P410i Controller — 1GB memory module with flash-backed write cache (FWBC). Supports RAID 0,1.
	NOTE: The HP Smart Array P410i controller is required for all blades that support hot plug drives. See Factory Integrated Models section for more information.

Maximum Internal Storage One of the following depending on Model		
Hot Plug SAS	2TB SAS (2 x 1TB) Serial SCSI
Hot Plug SATA	2TB SATA (2 x 1TB) Serial ATA
Hot Plug SATA SSD	240GB SATA SSD (2 x 120GB) Serial ATA SSD
Hot Plug SAS SSD	1.6TB SAS SSD (2 x 800GB) Serial SCSI

Graphics	Integrated ATI RN-50 1280 x 1024 x 16M color
	Resolution Color Depths — Depths 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

Standard Features

Fibre Channel Support   Two (2) optional dual-port Fibre Channel HBAs are supported by the HP ProLiant BL465c G7. Each mezzanine circuit board connects 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 (PN 403621-B21)

- Field-proven reliability and performance for a broad range of applications using drivers and management tools that are fully compatible with all Emulex HBAs

Emulex LPe1205 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem (PN 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 (PN 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 (PN 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 (PN 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 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®, Linux, VMware ESX and Citrix XenServer™ operating system environments

Compatible SAN   HP ProLiant BL465c G7 server blades are optimized for HP MSA, EVA, and XP
HP ProLiant BL465c 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)

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

Standard Features

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 8.5. 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. 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

Standard Features

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
Microsoft Windows Server
Red Hat Enterprise Linux (RHEL)
SUSE Linux Enterprise Server (SLES)
Solaris
VMware ESX
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, including how to purchase from HP, please visit our OS Support Site at: http://www.hp.com/go/supportos and our driver download page: http://www.hp.com/support/BL465cG7

QuickSpecs

Standard Features

Availability	Dual-Port Fibre Channel Mezzanine Card for redundant SAN connection
	Embedded dual-port 10Gb Converged Network Adapter for redundant LAN connections
	Two (2) hot-plug SAS/SATA/SSD drive bays and integrated RAID (Smart Array P410i) controller with flash-backed write cache
	Redundant ROM on each server blade
	Multiple mezzanine I/O expansion
	Advanced ECC Memory
	Online memory spare
	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

Security	• Power-on password
	• Administrator's password
	• 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: 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.

QuickSpecs

Standard Features

Factory Express Portfolio for Servers and Storage

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

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

For more information on Factory Express services on 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.

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, 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, 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/5981-6645EEE.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, 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/5982-6547EEE

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/5981-6645EEE.pdf

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

QuickSpecs

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

Twelve-Core Models

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

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

HP ProLiant BL465c G7 6176 1P 8GB-R P410i/1GB FBWC 2 SFF Server 632982-B21	**Processor(s)** One of the following depending on Model	(1) AMD Opteron™ 6176 (2.3GHz/12-core/12MB/80W) Processor (1) AMD Opteron™ 6174 (2.2 GHz) (1) AMD Opteron™ 6172 (2.2GHz/12-core/12MB/80W)
	Cache Memory One of the following depending on Model	512 KB Level 2 cache memory per core 12 MB Level 3 cache memory
HP ProLiant BL465c G7 6174 1P 8GB-R P410i/1GB FBWC Hot Plug 2 SFF Server 518859-B21	**Memory**	8 GB (2 x 4 GB) PC3-10600, Registered DDR3-1333
	Network Adapter	One (1) embedded HP NC551i Dual Port FlexFabric 10Gb Converged Network Adapter
	Storage Controller	Smart Array P410i RAID controller with 1 GB cache flash-backed write cache (FBWC)
HP ProLiant BL465c G7 6172 1P 8GB-R P410i/1GB FBWC Hot Plug 2 SFF Server 518851-B21	**Hard Drives**	None ships standard; (2) SFF SAS/SATA/SSD drive bays
	Internal Storage One of the following depending on Model	Up to 2TB SAS Up to 2TB SATA Up to 240GB SATA SSD Up to 1.6TB SAS SSD
	Optical Drive	None ships standard
	Form Factor	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

Eight-Core Models

HP ProLiant BL465c G7 6132HE 1P 8GB-R P410i/1GB FBWC 2 SFF Server 632985-B21	**Processor(s)** One of the following depending on Model	(1) Low Power AMD Opteron™ 6132 HE(2.2GHz/8-core/12MB/65W) Processor (1) AMD Opteron™ 6136 (2.4GHz/8-core/12MB/80W) Processor (1) Low Power AMD Opteron™ 6128 HE (2.0GHz/8-core/12MB/65W) Processor
HP ProLiant BL465c G7 6136 1P 8GB-R P410i/1GB FBWC Hot Plug 2 SFF Server 518854-xx1	**Cache Memory** One of the following depending on Model	512 KB Level 2 cache memory per core 12 MB Level 3 cache memory
	Memory	8 GB (2 x 4 GB) PC3-10600, Registered DDR3-1333
	Network Adapter	One (1) embedded HP NC551i Dual Port FlexFabric 10Gb Converged Network Adapter
HP ProLiant BL465c G7 6128HE 1P 8GB-R P410i/1GB FBWC Hot Plug 2 SFF Server 518867-B21	**Storage Controller**	Smart Array P410i RAID controller with 1 GB cache flash-backed write cache (FBWC)
	Hard Drives	None ships standard; (2) SFF SAS/SATA/SSD drive bays
	Internal Storage One of the following depending on Model	Up to 2TB SAS Up to 2TB SATA Up to 240GB SATA SSD Up to 1.6TB SAS SSD
	Optical Drive	None ships standard
	Form Factor	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

Country Code Key	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 servers must start with a CTO Chassis.
NOTE: FIO indicates that this option is a Factory Installable Option.

Step 1: Base Server Blade Configuration

HP Models	HP ProLiant BL465c G7 Configure-to-order Server	518857-B21
	Configurable Model ships with:	
	One (1) integrated HP NC551i Dual Port FlexFabric 10Gb Converged Network Adapter and one (1) additional 10/100 server adapter dedicated to iLO 3 management	
	Two (2) small form factor (SFF) SAS/SATA/SSD hot plug drive bays	
	HP Integrated Lights-Out 3 (iLO 3)	

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

HP Processors	**For single (1) processor configuration choose (one of the following):**	
	NOTE: If two (2) processors are desired, select one xxxxxx-L21 and one xxxxxx-B21.	
	Twelve-Core Processors	
	HP BL465c G7 AMD Opteron™ 6176 (2.3GHz/12-core/12MB/80W) FIO Processor Kit	632983-L21
	HP BL465c G7 AMD Opteron™ 6174 (2.2GHz/12-core/12MB/80W) FIO Processor Kit	518860-L21
	HP BL465c G7 AMD Opteron™ 6172 (2.10GHz/12-core/12MB/80W) FIO Processor Kit	518852-L21
	HP BL465c G7 AMD Opteron™ 6166HE (1.8GHz/12-core/12MB/65W) FIO Processor Kit	632991-L21
	HP BL465c G7 AMD Opteron™ 6164HE (1.7GHz/12-core/12MB/65W) FIO Processor Kit	596207-L21
	Eight-Core Processors	
	HP BL465c G7 AMD Opteron™ 6140 (2.6GHz/8-core/12MB/80W) FIO Processor Kit	632989-L21
	HP BL465c G7 AMD Opteron™ 6136 (2.4GHz/8-core/12MB/80W) FIO Processor Kit	518855-L21
	HP BL465c G7 AMD Opteron™ 6134 (2.3GHz/8-core/12MB/80W) FIO Processor Kit	518863-L21
	HP BL465c G7 AMD Opteron™ 6132HE (2.2GHz/8-core/12MB/65W) FIO Processor Kit	632986-L21
	HP BL465c G7 AMD Opteron™ 6128HE (2.0GHz/8-core/12MB/65W) FIO Processor Kit	518868-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

Configuration Information - Factory Integrated Models

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
HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit	627808-B21
HP 32GB (1x32GB) Quad Rank x4 PC3L-8500 (DDR3-1066) Registered CAS-7 LP Memory Kit	627810-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: A minimum of two (2) DIMMs per processor are required.

NOTE: Kits described as PC3L include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient.

NOTE: Each processor memory bus will operate at up to 1333 MHz with either one quad-rank (QR) or two single-rank/dual-rank (SR/DR) DIMMs per processor memory channel and 1066 MHz with up to two QR or one QR and one SR/DR DIMMs per processor memory channel with standard voltage (1.5V, PC3) DIMMs. Memory bus will operate one speed slower when low voltage (1.35V, PC3L) memory is installed. Memory bus speeds may be further limited by the speed of the memory used as well.

Step 3: Choose Additional Factory Integration Options

HP Storage Controller	HP Smart Array P410i/1G FBWC 2-ports Int PCIe x8 FIO SAS Controller	588184-B22
	NOTE: Includes 1 GB cache with flash-backed write cache (FBWC).	
	NOTE: The Smart Array P410i controller is required for all blades that support hot plug drives.	

Step 4: Choose Additional Options for Factory Integration

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

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

NOTE: Some options may not be integrated at the factory. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

HP Ethernet Mezzanine Options

Gigabit Ethernet Mezzanines

HP NC325m PCI Express Quad Port Gigabit Server Adapter	416585-B21

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

HP NC360m Dual Port 1GbE BL-c Adapter	445978-B21
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 PCI Express Dual Port Multifunction Gigabit Server Adapter	453246-B21

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 Either 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 Multifunction BL-c Adapter	467799-B21
HP NC542m Dual Port Flex-10 10GbE BL-c Adapter	539857-B21
HP NC550m 10Gb 2-port PCIe x8 Flex-10 Ethernet Adapter	581204-B21
HP BLc NC551m Dual Port FlexFabric 10Gb Converged Network Adapter	580151-B21
HP NC552m 10Gb 2-port Flex-10 Ethernet Adapter	610609-B21
HP NC553m 10Gb 2-port FlexFabric Adapter	613431-B21

HP Fibre Channel Mezzanine Options

4Gb Fibre Channel Mezzanines

Emulex LPe1105 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	403621-B21
QLogic QMH2462 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	403619-B21

8Gb Fibre Channel Mezzanines

Emulex LPe1205 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	456972-B21
QLogic QMH2562 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	451871-B21
HP BLc Brocade 804 8Gb Fibre Channel Host Bus Adapter	590647-B21

QuickSpecs

Core Options

HP Processors	**Twelve-Core Processors**	
	HP BL465c G7 AMD Opteron™ 6176 (2.3GHz/12-core/12MB/80W) Processor Kit	632983-B21
	HP BL465c G7 AMD Opteron™ 6174 (2.2GHz/12-core/12MB/80W) Processor Kit	518860-B21
	HP BL465c G7 AMD Opteron™ 6172 (2.1GHz/12-core/12MB/80W) Processor Kit	518852-B21
	HP BL465c G7 AMD Opteron™ 6166HE (1.8GHz/12-core/12MB/65W) Processor Kit	632991-B21
	HP BL465c G7 AMD Opteron™ 6164HE (1.7GHz/12-core/12MB/65W) Processor Kit	596207-B21
	Eight-Core Processors	
	HP BL465c G7 AMD Opteron™ 6140 (2.6GHz/8-core/12MB/80W) Processor Kit	632989-B21
	HP BL465c G7 AMD Opteron™ 6136 (2.4GHz/8-core/12MB/80W) Processor Kit	518855-B21
	HP BL465c G7 AMD Opteron™ 6134 (2.3GHz/8-core/12MB/80W) Processor Kit	518863-B21
	HP BL465c G7 AMD Opteron™ 6132HE (2.2GHz/8-core/12MB/65W) Processor Kit	632986-B21
	HP BL465c G7 AMD Opteron™ 6128HE (2.0GHz/8-core/12MB/65W) Processor Kit	518868-B21

NOTE: HP ProLiant BL465c G7 processor option kits contain one (1) processor.

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
	HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit	627808-B21
	HP 32GB (1x32GB) Quad Rank x4 PC3L-8500 (DDR3-1066) Registered CAS-7 LP Memory Kit	627810-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: A minimum of two (2) DIMMs per processor are required.

NOTE: Kits described as PC3L include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient.

NOTE: Each processor memory bus will operate at up to 1333 MHz with either one quad-rank (QR) or two single-rank/dual-rank (SR/DR) DIMMs per processor memory channel and 1066 MHz with up to two QR or one QR and one SR/DR DIMMs per processor memory channel with standard voltage (1.5V, PC3) DIMMs. Memory bus will operate one speed slower when low voltage (1.35V, PC3L)

Core Options

memory is installed. Memory bus speeds may be further limited by the speed of the memory used as well.

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
	NOTE: Please see the for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html (Worldwide)	
	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
	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
	6G SAS Hot Plug Enterprise Performance Solid State Drives	
	HP 200GB 6G SAS SLC SFF (2.5-inch) Enterprise Performance 3yr Warranty Solid State Drive	632492-B21
	HP 400GB 6G SAS SLC SFF (2.5-inch) Enterprise Performance 3yr Warranty Solid State Drive	632494-B21
	6G SAS Hot Plug Enterprise Mainstream Solid State Drives	
	HP 200GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	632502-B21
	HP 400GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	632504-B21
	HP 800GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	632506-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14038_div/14038_div.html (Worldwide)	
	SATA Hot Plug Midline (MDL) Solid State Drives	

Core Options

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

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html (Worldwide)

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 Media Kit for Insight Control for Linux 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

HP Insight Control for Linux

HP Insight Control for Linux including 1yr 24x7 Support Electronic License		TC213AAE
HP Insight Control for Linux including 1yr 24x7 Support Single Server License		TC209A
HP Insight Control for Linux Media Kit		TC208A

NOTE: 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: 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 software is available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent.

NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single set of activation keys.

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 iLO Advanced for BladeSystem

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

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/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, including electronic delivery options, please see the HP Integrated Lights-Out (iLO) QuickSpecs at:

QuickSpecs

Additional Options

<table>
<tr><td></td><td>http://h18000.www1.hp.com/products/quickspecs/12362_div/12362_div.html</td><td></td></tr>
<tr><td></td><td>**HP Insight Control server deployment**</td><td></td></tr>
<tr><td></td><td>HP Insight Control Server Deployment including 1yr 24x7 Support Electronic License</td><td>T9082AAE</td></tr>
<tr><td></td><td>HP Insight Control Server Deployment including 1yr 24x7 Support Single Server License</td><td>452151-B21</td></tr>
<tr><td></td><td>**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/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</td><td></td></tr>
<tr><td>**High Performance Clusters**</td><td>HP Cluster Management Utility Compute Node Flexible License
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</td><td>QL803A</td></tr>
<tr><td></td><td>HP Cluster Management Utility License and Media
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</td><td>433257-B21</td></tr>
<tr><td></td><td>HP High Performance Computing Linux Value Pack 1 Processor Flexible License
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</td><td>TC293B</td></tr>
<tr><td></td><td>HP High Performance Computing Linux Value Pack Media Kit
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</td><td>TC294A</td></tr>
<tr><td>**HP Security - TPM**</td><td>HP Trusted Platform Module Option
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.</td><td>488069-B21</td></tr>
</table>

QuickSpecs

Additional Options

HP Storage Controller	**HP Smart Array P712m Controller**	
	HP Smart Array P712m/256 6Gb 2-ports Int/2-ports Ext Mezzanine SAS Controller	488348-B21
	HP Smart Array P711m Controller	
	HP Smart Array P711m/1G 6Gb FBWC 4-ports Ext Mezzanine SAS Controller	513778-B21
	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: Supports all HP ProLiant Server Blades, except the HP ProLiant BL2x220c and BL685c G7 server blades.
NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13175_div/13175_div.html (Worldwide)

Optional Upgrades

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

NOTE: The BL465c G7 supports a maximum of one array controller battery. If one Smart Array P700m controller with cache battery kit is ordered for factory integration, the internal Smart Array P410i cache module capacitor will be removed and shipped with the server for customer installation.

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

HP I/O Expansion Options	HP 640GB IO Accelerator for BladeSystem c-Class	BK836A
	HP StorageWorks 320GB IO Accelerator for BladeSystem c-Class	AJ878B

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13220_div/13220_div.html

HP InfiniBand Mezzanine Options	HP 4X QDR QLogic InfiniBand Dual Port Mezzanine HCA for c-Class BladeSystem	583210-B21
	HP 4X QDR InfiniBand ConnectX-2 Dual Port Mezzanine HCA for c-Class BladeSystem	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

HP Ultrium Tape Blades	HP StorageWorks SB1760c Tape Blade	AQ697A

NOTE: LTO-4 Ultrium technology

NOTE: Please see the QuickSpecs for Technical Specifications and additional configuration information at:
http://h18000.www1.hp.com/products/quickspecs/12729_div/12729_div.html
NOTE: Please visit the BladeSystem c-Class enclosure QuickSpecs for a complete list of recommended data protection solutions for BladeSystem c-Class enclosures:
http://h18004.www1.hp.com/products/blades/components/enclosures/c-class/index.html.

Additional Options

HP Storage Blades	HP StorageWorks LTO-5 SB3000c Tape Blade	BS580A
	NOTE: Please see the for Technical Specifications and additional information at: http://h18000.www1.hp.com/products/quickspecs/12729_div/12729_div.html (Worldwide)	
	HP D2200sb Storage Blade	AP880A
	NOTE: Please see the HP D2200sb PCIe Storage Blade QuickSpecs for technical specifications and additional information at: http://h18006.www1.hp.com/storage/bladesystem/index.html.	
HP Expansion Blade	HP BLc PCI Expansion Blade	448018-B21
	NOTE: Ships with one pre-installed PCI-X connect board. Also includes one PCIe connect board which requires installation.	
	NOTE: Please see the QuickSpecs Technical Specifications and additional configuration information at: http://h18000.www1.hp.com/products/quickspecs/12753_div/12753_div.html	
HP USB and SD Options	HP USB 2-Button Optical Scroll Mouse	DC172B
	HP USB Standard Keyboard	DT528A#ABA
	HP 2GB USB Flash Media Drive Key Kit	608447-B21
	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.	
	HP 4GB Micro SDHC Flash Media Kit	647444-B21
HP Care Pack Services	**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.	
	Hardware Services On-site Service	
	HP 3 year 4 hour 13x5 BL4xxc Server Blade Hardware Support	UK065E
	HP 3 year 4 hour 24x7 BL4xxc Server Blade Hardware Support	UK066E
	HP 3 year 6 hour 24x7 Call to Repair BL4xxc Server Blade Hardware Support	UK067E

Memory

NOTE: Memory configurations listed do not apply to "Factory Integrated Models".
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 the HP ProLiant BL465c G7 server blade with sixteen (16) memory slots:
  - There are four (4) channels per processor; eight (8) channels per server
  - There are two (2) DIMM slots for each memory channel; sixteen (16) total slots.
  - Memory channel 1 consists of the two (2) DIMMs that are furthest from the processor
  - Memory channel 4 consists of the two (2) DIMMs that are closest from the processor
- A minimum of two (2) DIMMs per processor are required
- 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 (1) processor is installed in a two (2) CPU system, only half of the DIMM slots are available
- To maximize performance, balance the total memory capacity between all installed processors
- To maximize performance, balance the total memory capacity on any given processor across the memory channels
- You may only have up to eight (8) ranks installed per channel
- You may install up to two (2) quad-rank DIMMs per channel
- 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
- When running virtualization software, a minimum of two (2) DIMMs per processor are required. Populate DIMM sockets 1A and 5B for each processor socket populated.

DIMM slot/capacity/populated speed table								
DIMM Type		Registered DIMMS (RDIMMs)					Unbuffered with ECC DIMMs (UDIMMs)	
DIMM Rank	Single Rank (1R)	Dual Rank (2R)			Quad Rank (4R)		Dual Rank (2R)	
DIMM Capacity	4GB	2GB	8GB	16GB	16GB	32GB	2GB	4GB
DIMM Native Speed (MHz)	1333	1333	1333	1333	1066	1066	1333	1333
DIMM Voltage	LV/Std	Std	LV/Std	LV/Std	Std	LV/Std	Std	Std
SLOTS THAT CAN BE POPULATED								
16 slot servers	16	16	16	16	16	16	16	16
MAXIMUM CAPACITY (GB)								
16 slot servers	64	32	128	256	256	512	32	64
POPULATED DIMM SPEED (MHz)								
1 DIMM Per Channel	1333	1333	1333	1333	1066	1066	1333	1333
2 DIMM Per Channel	1333	1333	1333	1333	1066	1066/800*	1333	1333
* 3DPC: LV runs at 800/Std voltage runs at 1066								

NOTES:

- PC3-10600 DIMMs have a maximum speed of 1333MHz. PC3-8500 DIMMs have a maximum speed of 1066MHz.
- 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 1066MHz
- If you install 1x 1066MHz DIMM in channel 1 and 7x 1333MHz DIMMs with 1 DIMM Per Channel (DPC) in each of the other channels, the maximum speed will be 1066MHz
- References to the above MHz speeds are for the various speeds of DDR3 DIMMs; 1333 refers to DDR3-1333, etc.

HP ProLiant BL465 G7 Server Blade DIMM slot and configuration diagrams

Memory

Basic memory slot and population diagram

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

16 DIMM SLOTS (8 per CPU node)					
	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A	1	A	Chnl 1
	2	E	2	E	
Chnl 2	3	C	3	C	Chnl 2
	4	G	4	G	
Chnl 3	5	B	5	B	Chnl 3
	6	F	6	F	
Chnl 4	7	D	7	D	Chnl 4
	8	H	8	H	

HP ProLiant BL465c G7 Server Blade (1P Model)
Standard memory configuration (1 CPU model)

- 8GB, consisting of two (2) 4GB single-rank PC3-10600 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A: 4GB DIMM	1	A: empty	Chnl 1
	2	E: empty	2	E: empty	
Chnl 2	3	C: empty	3	C: empty	Chnl 2
	4	G: empty	4	G: empty	
Chnl 3	5	B: 4GB DIMM	5	B: empty	Chnl 3
	6	F: empty	6	F: empty	
Chnl 4	7	D: empty	7	D: empty	Chnl 4
	8	H: empty	8	H: empty	

Standard Memory Plus Optional Memory (1 CPU model)

- 104GB, consisting of two (2) 4GB RDIMMs plus six (6) 16GB RDIMMs
  - 2 x 4GB single-rank PC3-10600 RDIMMs
  - 6 x 16GB quad-rank PC3-8500 RDIMMs

Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A: 4GB DIMM	1	A: empty	Chnl 1
	2	E: 16GB DIMM	2	E: empty	
Chnl 2	3	C: 16GB DIMM	3	C: empty	Chnl 2
	4	G: 16GB DIMM	4	G: empty	
Chnl 3	5	B: 4GB DIMM	5	B: empty	Chnl 3
	6	F: 16GB DIMM	6	F: empty	
Chnl 4	7	D: 16GB DIMM	7	D: empty	Chnl 4
	8	H: 16GB DIMM	8	H: empty	

Standard Memory Replaced with Optional Memory (1 CPU model)

- 128GB, consisting of eight (8) 16GB quad-rank PC3-8500 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A: 16GB DIMM	1	A: empty	Chnl 1
	2	E: 16GB DIMM	2	E: empty	
Chnl 2	3	C: 16GB DIMM	3	C: empty	Chnl 2
	4	G: 16GB DIMM	4	G: empty	
Chnl 3	5	B: 16GB DIMM	5	B: empty	Chnl 3
	6	F: 16GB DIMM	6	F: empty	
Chnl 4	7	D: 16GB DIMM	7	D: empty	Chnl 4
	8	H: 16GB DIMM	8	H: empty	

UDIMM maximum configuration (1 CPU model)

- 32GB, consisting of eight (8) 4GB dual-rank PC3-10600 UDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A: 4GB DIMM	1	A: empty	Chnl 1
	2	E: 4GB DIMM	2	E: empty	
Chnl 2	3	C: 4GB DIMM	3	C: empty	Chnl 2
	4	G: 4GB DIMM	4	G: empty	
Chnl 3	5	B: 4GB DIMM	5	B: empty	Chnl 3
	6	F: 4GB DIMM	6	F: empty	
Chnl 4	7	D: 4GB DIMM	7	D: empty	Chnl 4
	8	H: 4GB DIMM	8	H: empty	

Standard Memory Replaced with Optional Memory (2 CPU Model)
RDIMM maximum configuration

- 512GB, consisting of sixteen (16) 32GB quad-rank PC3L-8500 RDIMMs

Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A: 32GB DIMM	1	A: 32GB DIMM	Chnl 1
	2	E: 32GB DIMM	2	E: 32GB DIMM	
Chnl 2	3	C: 32GB DIMM	3	C: 32GB DIMM	Chnl 2
	4	G: 32GB DIMM	4	G: 32GB DIMM	
Chnl 3	5	B: 32GB DIMM	5	B: 32GB DIMM	Chnl 3
	6	F: 32GB DIMM	6	F: 32GB DIMM	
Chnl 4	7	D: 32GB DIMM	7	D: 32GB DIMM	Chnl 4
	8	H: 32GB DIMM	8	H: 32GB DIMM	

UDIMM maximum configuration (2 CPU model)

- 64GB, consisting of sixteen (16) 4GB dual-rank PC3-10600 UDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A: 4GB DIMM	1	A: 4GB DIMM	Chnl 1
	2	E: 4GB DIMM	2	E: 4GB DIMM	
Chnl 2	3	C: 4GB DIMM	3	C: 4GB DIMM	Chnl 2
	4	G: 4GB DIMM	4	G: 4GB DIMM	
Chnl 3	5	B: 4GB DIMM	5	B: 4GB DIMM	Chnl 3
	6	F: 4GB DIMM	6	F: 4GB DIMM	
Chnl 4	7	D: 4GB DIMM	7	D: 4GB DIMM	Chnl 4
	8	H: 4GB DIMM	8	H: 4GB DIMM	

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

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

QuickSpecs

Memory

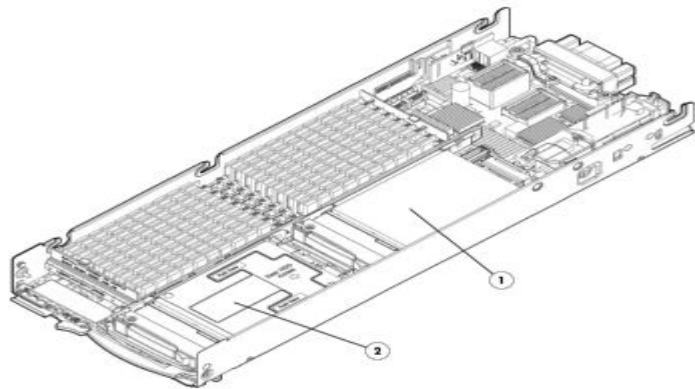| HP Memory	Registered DIMMs (RDIMMs)	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593907-B21
	HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593911-B21
	HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power 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
	HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit	627808-B21
	HP 32GB (1x32GB) Quad Rank x4 PC3L-8500 (DDR3-1066) Registered CAS-7 LP Memory Kit	627810-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: A minimum of two (2) DIMMs per processor are required.

NOTE: Kits described as PC3L include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient.

NOTE: Each processor memory bus will operate at up to 1333 MHz with either one quad-rank (QR) or two single-rank/dual-rank (SR/DR) DIMMs per processor memory channel and 1066 MHz with up to two QR or one QR and one SR/DR DIMMs per processor memory channel with standard voltage (1.5V, PC3) DIMMs. Memory bus will operate one speed slower when low voltage (1.35V, PC3L) memory is installed. Memory bus speeds may be further limited by the speed of the memory used as well.

Storage

1-2   2 x SFF SAS or SATA Hot Plug Hard Drives, or
       2 x SFF SATA Hot Plug SSD 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: Simultaneous operation of hot plug hard drives and solid state drives is not supported.
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 DP	2	1-2	Smart Array P410i Controller
600GB 6G SAS 10K DP			
450GB 6G SAS 10K DP			
300GB 6G SAS 10K DP			
146GB 6G SAS 15K DP			
146GB 6G SAS 10K DP			
72GB 6G SAS 15K DP			

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

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

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

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

6G SAS Hot Plug Enterprise Performance (2.5-inch) Solid State Drives

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

6G SAS Hot Plug Enterprise Mainstream Solid State Drives

Storage

	Quantity Supported	Position Supported	Controller
800GB 6G SAS MLC SFF	2	1-2	Smart Array P410i Controller
400GB 6G SAS MLC SFF			
200GB 6G SAS MLC SFF			

SATA Hot Plug Midline (MDL) Solid State Drives

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

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)	
	Weight (approximate)	Maximum (all hard drives, DIMMs, and processors installed)	13.9 lb (6.3 kg)
		Minimum (no hard drives, two DIMMs, and one processor installed)	9.8 lb (4.45 kg)
	Power Specifications	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	
		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	
		NOTE: For optimal cooling and system performance the BL465c G7 requires the c7000 enclosure to be configured with 10 fans and the c3000 enclosure to be configured with 6 fans.	
	System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault, or above 30°C (86°F).
		Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
	Relative Humidity (non-condensing)	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
		Non-operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
	Altitude	Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed.
		Non-operating	Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Acoustic Noise	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	

Technical Specifications

HP Smart Array P410i Controller	**Disk Drive and Enclosure Interface**	6G SAS (Serial Attached SCSI)
		3.0 G SATA (Serial Advanced Technology Attachment)
	SAS Connectors	2 internal (SFF8484) x4 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	x4 5G PCIe Gen2 provides 2 GB/s maximum bandwidth.
	SAS Speed	x2 6G SAS provides 1.2 GB/s maximum bandwidth.
	Cache Memory	72-bit 1GB cache; ECC protection, capacitor-backed
	Logical Drives Supported	Up to 32 logical drives
	Maximum Logical Drive Capacity	2 TB (2 x 1 TB)
	Host Memory Addressing	64-bit, supporting greater than 4 GB server memory space
	RAID Support	RAID 1 (Mirroring)
		RAID 0 (Striping)
	Upgradeable Firmware	Upgradeable Firmware with recovery ROM feature

Integrated HP NC551i Dual Port FlexFabric 10Gb Converged Network Adapter	**Type**	Integrated dual-port KR 10GbE with FlexFabric (FCoE or iSCSI) capability
	Network Processor	Blade Engines 2 (BE2)
	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 NC551i 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	- 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 FCoE or 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 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	

QuickSpecs

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.