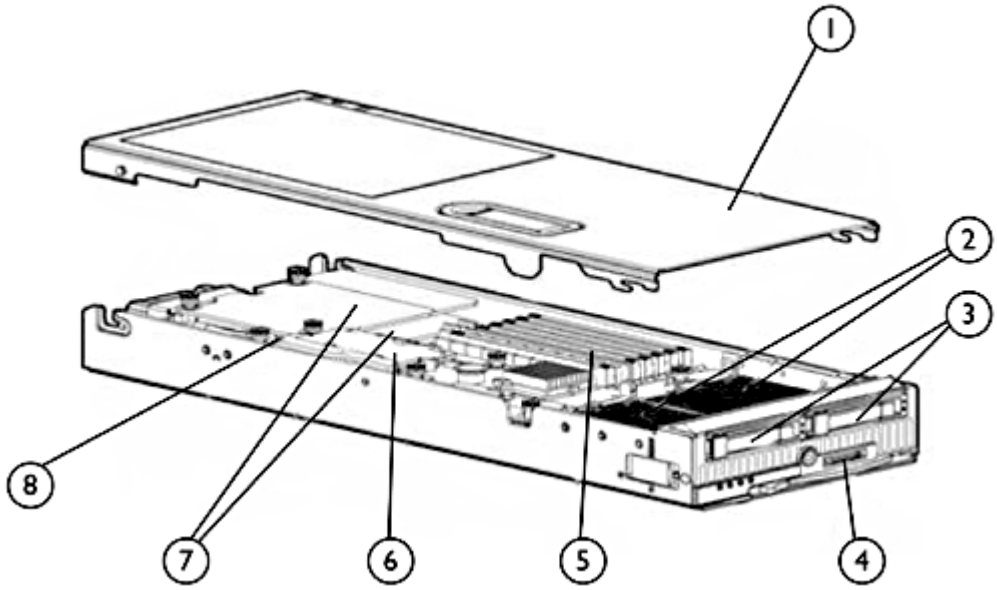
RETIRED: This document has been officially retired, and the base products listed herein are now considered obsolete and are no longer available for sale. Consequently, the information contained within may no longer be current. This document is provided exclusively for reference and informational purposes.

QuickSpecs

Overview



HP ProLiant BL460c Carrier-Grade Server Blade

1. Access Panel
2. Up to two Quad-Core or Dual-Core Intel® Xeon® 5000 Sequence processors
3. Small form factor (SFF) hot-plug drive bays (standard BTO models)
4. Local I/O connector
5. Eight (8) PC2-5300, Fully Buffered DIMMs (DDR2-667) Memory Slots
6. HP Smart Array E200i Controller with optional battery-backed write cache (standard BTO models)
7. Two Mezzanine slots
8. Internal USB Connector (standard BTO models)

What's Carrier-Grade

- NEBS Level-3 and ETSI Certified
- NEBS (Network Equipment Building Standards) compliance is an important issue for telecommunication service providers and their network equipment providers that are seeking to install equipment in central offices. They view compliance as key to ensuring personnel safety, protection of property, and operational reliability. NEBS Level 3 criteria provide maximum assurance of equipment operability in network facility environments. The physical components are described in GR-63-CORE, and the electromagnetic compatibility (EMC) and safety components are described in GR-1089-CORE.

At A Glance

This document covers the HP ProLiant BL460c carrier-grade (CG) server blade only. For more information on HP BladeSystem c7000 carrier-grade enclosure, HP BladeSystem AMC Expansion Blade, commercially available HP ProLiant BL460c, and HP BladeSystem c-Class Interconnect Components, please see the following QuickSpecs:

HP BladeSystem c7000 Carrier-Grade Enclosure QuickSpecs:
http://h18004.www1.hp.com/products/quickspecs/13181_div/13181_div.html

Overview

HP BladeSystem AMC Expansion Blade QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/13088_div/13088_div.html

HP ProLiant BL460c QuickSpecs (commercially available):
http://h18000.www1.hp.com/products/quickspecs/12518_div/12518_div.html

HP BladeSystem c-Class Interconnect Components QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12524_div/12524_div.html

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

HP ProLiant BL460c-cg server blade includes:

- Processor:
  - Up to two Dual-Core Intel® Xeon® 5140 Series processors
  - 2.33 GHz, 1333 MHz FSB -1X6 MB Level 2 cache memory
  - Intel 5000P chipset supporting up to a 1333 MHz Front Side Bus
- Memory:
  - Up to 32 GB of memory, supported by (8) slots of PC2-5300 Fully Buffered DIMMs at 667 MHz
  - Supporting low-power memory
  - Advanced ECC memory support
  - Supporting memory interleaving (2x1); memory mirroring and online spare capacity.
- Storage Controller:
  - Integrated HP Smart Array E200i RAID controller with 64 MB cache (with optional upgrade to 64 MB cache. Supports RAID 0,1
    - NOTE: Drive-less model available for customers not utilizing internal disk drives and attaching directly to SAN.
- Internal Drive Support:
  - Up to 2 SAS hot plug hard disk drives
    - NOTE: Drive-less model available for customers not utilizing internal disk drives and attaching directly to SAN.
- Network Controller:
  - Two (2) embedded NC373i Multifunction Gigabit Server Adapters with iSCSI boot, TCP/IP offload engine, and optional accelerated iSCSI
  - One (1) additional embedded 10/100 network adapter dedicated to iLO 2 management
    NOTE: The Gigabit Ethernet adapters transmit from the server at 2000 Mbps only, full duplex per port. For more information, see the "Network Controller" item in Standards Features section.
- Mezzanine Support:
  - Two (2) additional I/O expansion slots via mezzanine card.
  - Supports up to two (2) mezzanine cards
    - Dual-Port Fibre Channel Mezzanine (4-Gb) options for SAN connectivity (QLogic).
    - Variety of 10GbE and 1GbE network adapter options for additional network ports
- Internal USB Support:
  - One (1) internal USB 2.0 connector for security key devices and USB drive keys
    - NOTE: Drive-less model available for customers not utilizing internal disk drives and attaching directly to SAN.
- Form Factor:
  - HP ProLiant BL460c carrier-grade server blade plugs vertically into the BladeSystem c7000 carrier-grade enclosure.
- Management:
  - HP Integrated Lights-Out 2 (iLO 2) Standard Blade Edition with virtual KVM graphical remote console, with the option to upgrade to the iLO Select Pack. iLO Select Pack is a no installation upgrade offering automatic video footage of the events leading up to the server event (like bluescreens), automatic video footage of the server blade's last boot sequence, on-demand video record and playback for training videos, team collaboration features for up to four users

Overview

on a single iLO session, and much more. Learn more at: www.hp.com/go/iLO.

- Operating Systems:
  - Supports Red Hat Linux Operating Systems
- Enclosure:
  - HP offers one c-Class server blade enclosure for carrier-grade needs:
    - The HP BladeSystem c7000 carrier-grade rack enclosure is 10U high and holds up to 16 ProLiant BL460c-cg servers plugged vertically.
  - Server blades, AMC blades, interconnect modules, power supplies, fans, and redundant Onboard Administrator modules are all designed to fit into the c7000-cg enclosure.
- For additional enclosure information, please see:.
- 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. SAS drives have a 3 year warranty.
  - 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

NOTE: For a brief, printer friendly data sheet that describes this product and informs you of the essential capabilities and specifications, please visit: http://h71028.www7.hp.com/ERC/downloads/4AA1-6142ENW.pdf.

Processor	Dual-Core Processor Option Kits Dual-Core Intel® Xeon® processor X5140 (2.33 GHz, 1333 FSB, 65W)*	
Upgradeability	Upgradeable to 2 processors	
Chipset	Intel® 5000P Chipset	
Memory	Type	PC2-5300 Fully Buffered DIMMs at 667 MHz
	Standard	2 GB (2 x 1 GB) 4 GB (2 x 2 GB) 8GB (2 x 4GB)
	Maximum	32 GB (8 x 4 GB) NOTE: Memory must be installed in pairs.
Network Controller	Two (2) embedded NC373i Multifunction Gigabit Server Adapters with iSCSI boot, TCP/IP offload engine, and optional accelerated iSCSI One (1) additional 10/100 NIC dedicated to iLO 2 Management NOTE: The Gigabit Ethernet adapters transmit from the server at 2000 Mbps, full duplex per port only. However, within a Linux environment, the speed can be reduced or "throttled" using a feature available within the Linux operating system; see the white paper at: http://h71028.www7.hp.com/ERC/downloads/4AA1-5513ENW.pdf for more information.	
Multifunction Networking	The embedded multifunction NC373i adapters combine standard Gigabit Ethernet networking, TCP/IP offload engine (TOE), iSCSI boot and optional accelerated iSCSI into a single adapter. • TOE moves the processing of data in the TCP protocol stack from the server CPU to the network card, freeing CPU cycles for other activities. With TOE, network communications are improved, and server efficiency is increased. The NC373i offers TOE for Microsoft® Windows 2000 and 2003 environments. • The iSCSI network boot (iSCSI boot) allows the BL460c-cg to boot from a remote operating system (OS) image located on a storage area network (SAN). The BL460c-cg uses an iSCSI firmware image (iSCSI boot option ROM) making the remote disk drive appear as a local, bootable C: drive. The BL460c-cg is configured to connect to and boot from the iSCSI target disk on the network and download the OS image from the iSCSI target disk. The iSCSI boot option ROM is supplied by HP at no cost. The additional cost and mezzanine slot usage of an add-in iSCSI HBA card is not required. Additionally, the HP iSCSI boot solution includes scripts to significantly simplify the installation process.	
I/O Expansion Slots	Two I/O expansion mezzanine slots (one x8 and one x4)	

Standard Features

Integrated Manageability	Integrated Lights-Out 2 (iLO 2) Standard Blade Edition (integrated on motherboard)		
Storage Controller	HP Smart Array E200i Controller	64 MB memory module supports RAID 0,1	
	NOTE: For customers who choose to configure a driveless model, a storage controller is not required.		
Maximum Internal Storage	Hot Plug SAS	292GB SAS	2 x 146GB Serial SCSI
	NOTE: For customers who choose to configure a driveless model, internal storage is not required. See Factory Integrated Models section for more information.		
Graphics	Integrated ATI RN-50 1600x1280x64K 16M color (32 MB DDR1 memory)		
Graphics Resolution Supported	Resolution Color Depths	1600 x 1280, 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	
Fibre Channel Support	One optional Fibre Channel HBA is supported by the HP ProLiant BL460c-cg. The mezzanine circuit board connects directly to the server blade system board. QLogic QMH2462 4Gb FC HBA for HP 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 4Gb and 2Gb HBAs powered by QLogic		
Compatible SAN	HP ProLiant BL460c carrier-grade server blades are optimized for HP StorageWorks MSA, EVA and XP HP ProLiant 460c server blades are compatible with select 3rd party SANs (please see blade storage page for more details: http://h18000.www1.hp.com/products/servers/proliant-bl/c-class/storage.html		

Standard Features

OS Support	Red Hat Enterprise Linux
Integrated Manageability	Integrated Lights-Out 2 Standard Blade Edition (iLO 2) • Virtual KVM based remote console • Virtual media (single server, browser based access only) • Remote Serial Console • Virtual Power Button Control • Virtual Unit ID control • Integrated Remote Console (ActiveX Control client) • Dedicated network connectivity • OS independent hardware health status • Present server power consumption • Browser, command line and scripted access • Automatic IP Configuration via DHCP/DNS/WINS • Industry Standard 128-bit Secure Sockets Layer (SSL) and Secure Shell security (SSH) • Advanced Encryption Standard (AES)/Triple Data Encryption Standard (3DES) • IML and iLO Event Logging • Support for 12 user accounts with customizable access privilege • Single sign-on from HP BladeSystem Onboard Administrator
Availability	• Dual-Port Fibre Channel Mezzanine Card for redundant SAN connection • Two (2) embedded Gigabit Ethernet adapters for redundant LAN connections Two (2) hot-plug SAS/SATA hard drive bays and integrated RAID (HP Smart Array E200i) controller on every BTO model server blade (Battery-backed write cache is optional.)* • Redundant ROM on each server blade • Advanced ECC Memory - can correct a multi-bit error (up to 4 bits) that occurs within one memory chip • Memory Mirroring • Memory Online Spare Capacity • Network adapter teaming (network fault tolerance, transmit load balancing, switch-assisted load balancing) * For customers who choose to configure a driveless model via CTO, these features are not required. See Factory Integrated Models section for more information.
Industry Standard Compliance	ACPI 2.0 Compliant PCI 2.2 Compliant WOL Support Microsoft® Logo certifications USB 2.0 Support

Standard Features

Security

- One (1) internal USB 2.0 connector for security key devices and USB drive keys on every BTO model server blade* Power-on password
- Administrator's password
- Integrated Lights-Out 2 has 12 customizable user accounts and SSL encryption
- Integrated Lights-Out 2 can be disabled via a Global Setting

* For customers who choose to configure a driveless model via CTO, internal USB connectors are not available unless 447711-B21 is selected. See Factory Integrated Models section for more information.

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 MSA, VA7, 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.

Service and Support

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

The HP Care Pack service for HP 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.

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

Available Services - Simplify ProLiant solution implementation, maintenance and management.

- HP CP 1Y 4h 13x5 Carrier Grade BL460c Blade HW Supp (HA103A1#6XN)
- HP CP 1Y 4h 24x7 Carrier Grade BL460c Blade HW Supp (HA104A1#6XN)
- HP CP 3Y 4h 13x5 Carrier Grade BL460c Blade HW Supp (HA103A3#6XN)
- HP CP 3Y 4h 24x7 Carrier Grade BL460c Blade HW Supp (HA104A3#6XN)
- HP CP 4Y Next Day Carrier Grade BL460c Blade HW Supp (HA101A4#6XN)
- HP CP 4Y 4h 13x5 Carrier Grade BL460c Blade HW Supp (HA103A4#6XN)0
- HP CP 4Y 4h 24x7 Carrier Grade BL460c Blade HW Supp (HA104A4#6XN)
- HP CP 5Y Next Day Carrier Grade BL460c Blade HW Supp (HA101A5#6XN)
- HP CP 5Y 4h 13x5 Carrier Grade BL460c Blade HW Supp (HA103A5#6XN)
- HP CP 5Y 4h 24x7 Carrier Grade BL460c Blade HW Supp (HA104A5#6XN)

Models

Dual-Core Model

HP ProLiant BL460c-cg AH349A	Processor(s)	(1 or 2) Dual-Core Intel® Xeon® processors X5140 (2.33 GHz, 1333 FSB, 65 W)
	Cache Memory	1 x 6 MB Level 2 cache memory (5200 Series)
	Memory	2 GB (2 x 1 GB) PC2-5300, FBD DDR2-667 4 GB (2 x 2 GB) PC2-5300, FBD DDR2-667 8GB (2 x 4GB) PC2-5300, FBD DDR2-667
	Network Adapter	Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 network adapter dedicated to iLO 2 Management
	Storage Controller	HP Smart Array E200i Controller with 64MB
	Hard Drives	No drives included; (2) SFF SAS drive bays
	Internal Storage	SAS: 292GB
	Optical Drive	None
	Form Factor	Up to 16 half-height blades supported in HP BladeSystem c7000 Carrier-Grade Enclosure

Country Code Key	XX=B2	Worldwide
	XX=20	Brazil

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: This product offering does not support HP Factory Express Server Configuration Level 1.
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-cg Driveless CTO Blade	AH349A
	Configurable Model ships with:	
	Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 NIC dedicated to iLO 2 Management	
	Integrated Lights-Out 2 Standard Blade Edition	

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

Processors	For single processor configuration choose:	
	Dual-Core Processor Option Kits	
	Dual-Core Intel® Xeon® processor X5140 (2.33 GHz, 1333 FSB, 65W) NOTE: If 2 processors are desired, select one 416658-21 and one 416658-B21.	416658-L21
Memory	2 GB FBD PC2-5300 (2 x 1 GB) Kit	397411-B21
	4 GB FBD PC2-5300 (2 x 2 GB) Kit	397413-B21
	8 GB FBD PC2-5300 (2 x 4 GB LP) Kit	466440-B21
	NOTE: Memory Option 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: Must be installed in pairs	

Step 3: Choose Additional Factory Integratable Options (one of the following from each list unless otherwise noted):

Hard Drive Backplane	HP ProLiant BL460c-cg Hard Disk Drive Backplane, FIO NOTE: Includes USB connector.	447711-B21
	NOTE: The Hard Drive Backplane is required for all blades that support hard disk drives or require the internal USB 2.0 connector for security key devices, licensing or VMware ESX Server 3i.	
Controller Cache	64 MB Cache - FIO Only NOTE: Integrated HP Smart Array E200i RAID controller supporting RAID 0/1 Controller cache module selection is required for all blades that support hard disk drives. Select the standard 64 MB module above. NOTE: This option is not required when configuring a Drive-less Model.	405102-B21

Step 4: Choose Additional Options for Factory Integration

NOTE: For additional options, including server blade enclosures interconnect options and power subsystem options; please see the options section below; or the following QuickSpecs:
HP BladeSystem c-Class Enclosures QuickSpecs:
HP BladeSystem c7000 Carrier-Grade Enclosure QuickSpecs:
and HP BladeSystem c-Class Interconnect Components QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12524_div/12524_div.html.

Options

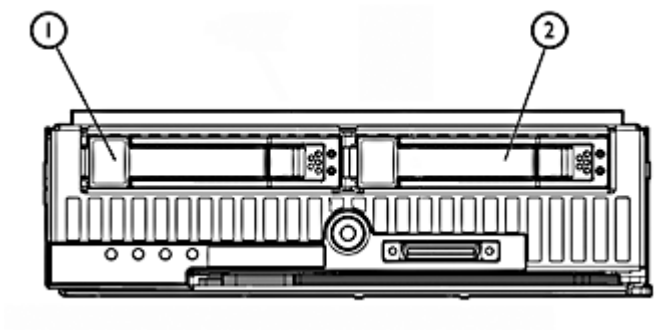
Ethernet Mezzanine Options	HP NC325m PCI Express Quad Port 1Gb Server Adapter for c-Class BladeSystem NOTE: If the NC325m is installed in mezzanine slot 1 of a half-height server, connectivity will be provided on 2 of the 4 ports	416585-B21
	HP NC373m PCI Express Dual Port Multifunction Gigabit Server Adapter for c-Class BladeSystem	406770-B21
	HP NC512m Dual Port 10GbE Multifunction BL-c Adapter NOTE: The NC512m is supported in type II x8 PCI Express mezzanine slots; maximum two adapters per server. For more information, see the Mezzanine Slot Compatibility matrix within the HP NC512m Dual Port 10GbE Multifunction BL-c Adapter QuickSpecs: http://h18004.www1.hp.com/products/servers/networking/nc512m/index.html. NOTE: A minimum of 2 GB of server memory is required per NC512m and supports a maximum of 32 GB for Windows and 64 GB for Linux. NOTE: The NC512m adapter transmits from the server only at 20 Gbps, full duplex per port.	440910-B21
Fiber Channel Mezzanine Options	QLogic QMH2462 4Gb FC HBA for HP c-Class BladeSystem	403619-B21
HP AMC Expansion Blade	HP AMC Expansion Blade NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13088_div/13088_div.html	AH333A
Processors	Dual-Core Process Option Kits	
	Dual-Core Intel® Xeon® processor X5140 (2.33 GHz, 1333 FSB, 65W)	416658-B21
Memory	2 GB FBD PC2-5300 2 x 1 GB Kit	397411-B21
	4 GB FBD PC2-5300 2 x 2 GB Kit	397413-B21
	8 GB FBD PC2-5300 2 x 4 GB Low Power Kit	466440-B21
	NOTE: Memory Option 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: Must be installed in pairs.	

Options

Hard Drives	SAS Enterprise (ENT) Drives 2.5" Drives, Hot Plug	
	HP 72GB 3G SAS 15K SFF SP HDD	431935-B21
	HP 146GB 3G SAS 10K SFF SP HDD	431958-B21
	NOTE: SAS drives have a 3 year warranty. 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.	

Service and Support Offerings (HP Care Pack Services)	NOTE: The HP Care Pack service part numbers below for ProLiant BL460c carrier-grade server blade, 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.	
	• HP CP 1Y 4h 13x5 Carrier Grade BL460c Blade HW Supp	HA103A1#6XN
	• HP CP 1Y 4h 24x7 Carrier Grade BL460c Blade HW Supp	HA104A1#6XN
	• HP CP 3Y 4h 13x5 Carrier Grade BL460c Blade HW Supp	HA103A3#6XN
	• HP CP 3Y 4h 24x7 Carrier Grade BL460c Blade HW Supp	HA104A3#6XN
	• HP CP 4Y Next Day Carrier Grade BL460c Blade HW Supp	HA101A4#6XN
	• HP CP 4Y 4h 13x5 Carrier Grade BL460c Blade HW Supp	HA103A4#6XN
	• HP CP 4Y 4h 24x7 Carrier Grade BL460c Blade HW Supp	HA104A4#6XN
	• HP CP 5Y Next Day Carrier Grade BL460c Blade HW Supp	HA101A5#6XN
	• HP CP 5Y 4h 13x5 Carrier Grade BL460c Blade HW Supp	HA103A5#6XN
	• HP CP 5Y 4h 24x7 Carrier Grade BL460c Blade HW Supp	HA104A5#6XN

Storage



1-2 2 x SFF SAS Hot Plug Hard Drives

Hard Drives

SAS Enterprise (ENT) Drives 2.5" Drives, Hot Plug

	Quantity Supported	Position Supported	Controller
72GB 3G 15K SAS 146GB 3G 10K SAS	2	1-2	HP Smart Array E200i Controller

System Unit	**Dimensions** (H x W x D) (with bezel)	7.154 x 2.19 x 20.058 in (18.17 x 5.56 x 50.95 cm)	
	Weight (approximate)	Maximum (all hard drives and processors installed)	14.20 lb (6.44 kg)
		Minimum (one hard drive and processor installed)	10.75 lb (4.87 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 c7000 Carrier-Grade Enclosure QuickSpecs: 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	
	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. 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	For acoustic noise specifications, please see the HP BladeSystem c-Class Enclosures QuickSpecs located at URL: HP BladeSystem c7000 Carrier-Grade Enclosure QuickSpecs:	

Technical Specifications

HP Smart Array E200i Controller	Disk Drive and Enclosure Interface	3G SAS (Serial Attached SCSI) 1.5G SATA (Serial Advanced Technology Attachment)
	Cache Memory Speed	DDR-1/266 MHz provides up to 4.2 GB/s maximum bandwidth.
	Server Interface	x4 2.5G PCIe provides 2GB/s maximum bandwidth.
	SAS Speed	x2 3G SAS provides 600MB/s maximum bandwidth.
	Cache Memory	40-bit 64 MB or 128 MB cache: ECC protection, battery-backed, and transportable
	Logical Drives Supported	Up to 32 logical volumes
	Maximum Logical Drive Capacity	144GB (2 x 72GB)
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space
	RAID Support	RAID 5 (Distributed Data Guarding) requires 128MB BBWC option RAID1, 1+0 (Striping & Mirroring) RAID 0 (Striping)
	Upgradeable Firmware	Upgradeable Firmware
Embedded NC373i Multifunction Gigabit Server Adapter	Network Processor	Broadcom 5708S
	Data Transfer Method	Four lane (x4) PCI Express
	Network Transfer Rate	2000 Mb/s full duplex (theoretical maximum value) 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.
	IEEE Compliance	802.1p, 802.1Q, 802.3, 802.3ad, and 802.3x
	Standard Features	• TCP/IP offload engine (TOE) for Microsoft Windows 2003 • iSCSI Boot for Linux • Optional accelerated iSCSI • 9K jumbo frames • TCP/IP checksum offload (TCO) • Large send offload (LSO) • Interrupt coalescence • Dual address cycles (DAC) • Wake-on-LAN (WOL) • Pre-boot execution environment (PXE) • ProLiant Teaming including Network Fault Tolerance, Transmit Load Balancing, and Switch-Assisted Load Balancing • IPv6 packet transmit and receive (excluding all offload capabilities); IPv6 aware SNMPv1 agents for Microsoft Windows

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.