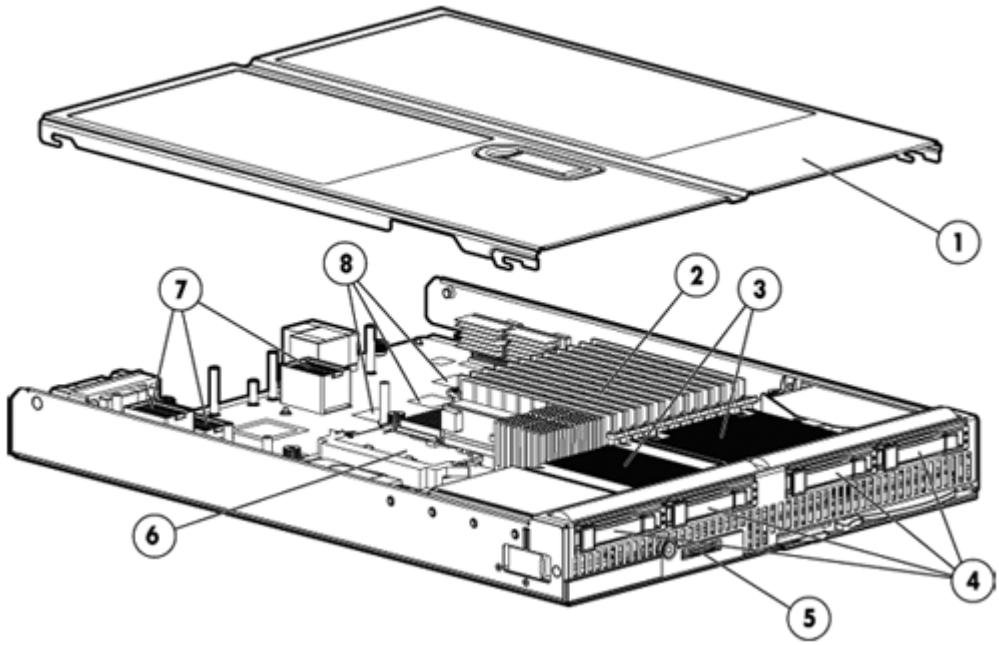
RETIRED: This document has been officially retired, and the base products listed herein are now considered obsolete and are no longer available for sale. Consequently, the information contained within may no longer be current. This document is provided exclusively for reference and informational purposes.

QuickSpecs

Overview

HP ProLiant BL480c Server Blade



1. Access panel
2. Up to 64 GB PC2-5300, FBD DDR2-667 memory (12 DIMMs)
3. Up to two 2-core or 4-core Intel® Xeon® 5000 sequence processors
4. Four small form factor (SFF) hot-plug drive bays
5. Local I/O connector
6. HP Smart Array P400i Controller with battery-backed write cache options
7. Three I/O expansion mezzanine slots
8. Four embedded Gigabit Ethernet adapter ports, two are multifunction

What's New

- Support for new HP storage options including:
  - 160GB and 500GB 3G SATA 7.2K MDL hard disk drives
  - 500GB 6G SAS 7.2K DP MDL hard disk drives

At A Glance

This document covers the HP ProLiant BL480c server blade only. For more information on HP BladeSystem c-Class Infrastructure and HP BladeSystem c-Class Interconnects, 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 Components QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12524_div/12524_div.html

Overview

The HP ProLiant BL480c delivers outstanding performance and expansion for a 2P x86 BladeSystem server blade to handle your most demanding applications. The HP ProLiant BL480c server blade includes:

- Processor:
  - Up to two Intel® Xeon® 5200, 5300, or 5400 series processors
  - Intel® 5000P chipset supporting up to a 1333 MHz Front Side Bus
    NOTE: All processors within the server must be identical.
    NOTE: The 5300 series are available as processors kits for existing servers. T he 5200 and 5300 series may be purchased with a new server and as processors kits.
- Memory:
  - Up to 64 GB of memory supported by twelve (12) PC2-5300, fully-buffered DIMMs at 667 MHz
  - Low-power DIMM memory support
  - Advanced ECC memory
  - Memory interleaving (2 x 1), memory mirroring, and online spare capacity
- Storage Controller:
  - Integrated HP Smart Array P400i Controller with 256MB ECC protected cache and RAID 0, 1, and 5.
  - Upgrades include:
    - Battery-backed write cache (BBWC)
    - 512MB cache upgrade with BBWC
- Internal Drive Support:
  - Four (4) drive bays supporting your choice of small form factor (SFF) SAS or SATA hot-plug hard drives
- Network Controller:
  - Four (4) embedded network adapter ports, plus one (1) additional management network adapter port:
    - One (1) embedded NC326i Dual Port Gigabit Server Adapter
    - Two (2) embedded NC373i Multifunction Gigabit Server Adapters with TCP/IP offload engine for Microsoft Windows, iSCSI boot 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 only at 2000 Mbps, full duplex per port. For more information, see the "Network Controller" item in Standards Features section.
- Mezzanine Support
  - Three (3) mezzanine expansion slots; one Type I x4 PCIe (15 watts) and two x8 PCIe (25 watts). The expansion slots provide a choice of additional I/O including:
    - Dual Port 4 Gb Fibre Channel for SAN connectivity (choice of Emulex or QLogic)
    - Multiple 10 Gb Ethernet options for high bandwidth network connectivity
    - Multiple dual and quad port multifunction and general Gigabit Ethernet options for increased bandwidth and additional network ports
    - Dual port 20 Gb 4X DDR InfiniBand for low latency server interconnectivity
- Internal USB Support:
  - One (1) internal USB 2.0 connector for security key devices and USB drive keys
- Form Factor:
  - HP ProLiant BL480c server blades plug into the HP BladeSystem c7000 and c3000 enclosures
- Operating Systems and Virtualization Software:
  - Supports Windows, RHEL, SLES, OEL, NetWare, VMware, Solaris & Citrix Essential for XenServer
- Enclosures:
  - HP offers three different c-Class server blade enclosures to meet your individual needs:
    - The HP BladeSystem c7000 rack enclosure is 10U high and holds up to 8 HP ProLiant BL480c servers plugged vertically.
    - The HP BladeSystem c3000 rack enclosure is 6U high and holds up to 4 HP ProLiant BL480c servers plugged horizontally.
    - The HP BladeSystem c3000 tower enclosure is designed with casters for sites without racks and holds up to 4 HP ProLiant BL480c servers plugged vertically.

Overview

- 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.

- Infrastructure Management:
  - HP ProLiant Onboard Administrator (powered by the HP Integrated Lights-Out 2 management processor) for simplified server setup, health monitoring and recovery, power and thermal control, and lights-out remote administration. .
  - HP Insight Control (ICE) suites, as product options, deliver essential infrastructure management that can help save time and money by making it easy to deploy, monitor, control and optimize your IT infrastructure through a single, simple management console. ICE suites support both Windows and Linux-based management consoles.
  - HP Insight Dynamics - VSE suite for ProLiant servers, a product option, is an integrated command center that enables you to continuously analyze and optimize your adaptive infrastructure. This advanced infrastructure management software lets you reduce the cost of common data center tasks by as much as 40 percent while keeping pace with your changing business.
- 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. Additional Enhancements to warranty services are available through HP Care Pack services or customized service agreements. SATA hard drives have a one year warranty. SAS drives have a 3 year warranty.
    NOTE: Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response. 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

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/4AA0-6088enw.pdf
NOTE: All processors within the server must be identical.
NOTE: The 5300 series are available as processors kits for existing servers. T he 5200 and 5300 series may be purchased with a new server and as processors kits.

Processor	4-Core Processor 5400 Series
	Intel® Xeon® Processor X5470 (3.33 GHz, 120Watt, 1333 FSB)
	Intel® Xeon® Processor X5460 (3.16 GHz, 120 Watt, 1333 FSB)
	Intel® Xeon® Processor X5450 (3.00 GHz, 120 Watt, 1333 FSB)
	Intel® Xeon® Processor E5450 (3.00 GHz, 80 Watt, 1333 FSB)
	Intel® Xeon® Processor E5440 (2.83GHz, 80 Watt, 1333 FSB)
	Intel® Xeon® Processor E5430 (2.66 GHz, 80 Watt, 1333 FSB)
	Intel® Xeon® Processor E5420 (2.50 GHz, 80 Watt, 1333 FSB)*
	Intel® Xeon® Processor E5410 (2.33 GHz, 80 Watt, 1333 FSB)
	Intel® Xeon® Processor E5405 (2.00 GHz, 80 Watt, 1333 FSB)*
	4-Core Processor 5400 Series Low Voltage
	Intel® Xeon® Processor L5420 (2.50 GHz, 50 Watt, 1333 FSB)*
	4-Core Processor 5300 Series
	Intel® Xeon® Processor X5365 (3.00 GHz, 120 Watt, 1333 FSB)
	Intel® Xeon® Processor X5355 (2.66 GHz, 120 Watt, 1333 FSB)
	Intel® Xeon® Processor E5345 (2.33 GHz, 80 Watt, 1333 FSB)
	Intel® Xeon® Processor E5335 (2.00 GHz, 80 Watt, 1333 FSB)*
	Intel® Xeon® Processor E5320 (1.86 GHz, 80 Watt, 1066 FSB)
	Intel® Xeon® Processor E5310 (1.60 GHz, 80 Watt, 1066 FSB)
	4-Core Processor 5300 Series Low Voltage
	Intel® Xeon® Processor L5335 (2.00 GHz, 50 Watt, 1333 FSB)*
	Intel® Xeon® Processor L5320 (1.86 GHz, 50 Watt, 1066 FSB)*
	2-Core Processor 5200 Series
	Intel® Xeon® Processor X5260 (3.33 GHz, 80 Watt, 1333 FSB)
	2-Core Processor 5200 Series Low Voltage
	Intel® Xeon® Processor L5240 (3.00 GHz, 40 Watt, 1333 FSB, 40W)
	NOTE: The 5400, 5300, and 5200 Series processors feature Intel® 64-bit architecture providing flexibility for 64 and 32-bit applications and operating systems, Intel® Virtualization Technology, Intel® Enhanced SpeedStep® Technology, and Enhanced thermal and power management. Intel® 5200 Series processors are 2-core; Intel® 5400 and 5300 Series processors are 4-core.
	* Offered through Configure-To-Order only. See the Factory Integrated Models section for more details.
Upgradeability	Upgradeable to dual processors

Standard Features

Cache Memory	1x6 MB Level 2 cache memory (5200 Series) 2x4 MB Level 2 cache memory (5300 Series) 2x6 MB Level 2 cache memory (5400 Series)	
Chipset	Intel® 5000P chipset	
Memory	Type	PC2-5300 fully buffered DIMMs operating at 667 MHz
	Standard	2 GB (2 x 1 GB) 4 GB (4 x 1 GB)
	Maximum	64 GB (8 x 8 GB) or (6 x 8GB + 4 x 4GB)
	NOTE: Memory must be installed in pairs.	

Network Controller

Four (4) embedded Gigabit Ethernet network adapter ports, plus (1) additional management network adapter port:

- One (1) embedded NC326i Dual Port Gigabit Server Adapter
- Two (2) embedded NC373i Multifunction Gigabit Server Adapters with TCP/IP offload engine for Microsoft Windows, iSCSI boot, 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, full duplex per port. 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.
Once the adapter signal reaches the interconnect within the blade enclosure and communicates outside the blade enclosure to the LAN, the blade interconnect uplink types and settings determine the cable media, speed, duplex mode, and auto negotiation mode. Interconnects are available with Ethernet uplinks supporting 10/100/1000T, 10/100/1000 SFP, 1000 SX fiber, and 10Gb speeds.

Multifunction Networking

The embedded multifunction NC373i combines standard Gigabit Ethernet networking, TCP/IP offload engine (TOE) for Microsoft Windows, 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 environments.
- The iSCSI boot allows the BL480c to boot from a remote operating system (OS) image located on a storage area network (SAN). The BL480c uses an iSCSI firmware image (iSCSI boot option ROM) making the remote disk drive appear as a local, bootable C: drive. The BL480c 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

Three I/O expansion mezzanine slots; one Type I x4 PCIe (15 watts) and two x8 PCIe (25 watts)

Standard Features

Integrated Manageability	HP ProLiant Onboard Administrator (includes but not limited to functionality in Integrated Lights-Out 2 Standard Blade Edition (iLO 2)

Storage Controller

The server includes an integrated Smart Array P400i Controller. The P400i is an x8 PCI Express serial attached SCSI (SAS) v1.0 embedded RAID controller and provides server performance and reliability through its support of advanced SCSI technology and RAID capabilities. The P400i includes 256MB of 40-bit ECC protected cache and supports RAID levels 0 (striping), 1 (mirroring), and 5 (distributed data guarding).

The controller supports both SAS and SATA hard drives letting you deploy drive technology as needed to fit your computing environment. The sever provides four hot-plug drive bays for up to 1.2TB of SAS and 1.0TB of SATA storage.

Providing high availability data cache retention, the Smart Array P400i supports two battery backed write cache (BBWC) options:

- BBWC for the existing 256GB cache.
- Upgrade to 72-bit 512MB ECC protected cache with BBWC.

If additional SAS or SATA drives are desired, the server supports the StorageWorks SB40c Storage Blade. For additional information, see: http://h18006.www1.hp.com/products/storageworks/sb40c/index.html.

Maximum Internal Storage	Hot plug serial attach SCSI (SAS) 2.0TB	4 x 500GB serial SCSI
	Hot plug serial ATA (SATA) 2.0TB	4 x 500GB serial ATA
Graphics	Integrated ATI RN-50 1280 x 1024 x 16M color (32 MB DDR1 memory)	
Graphics Resolution Supported	Resolution color 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

Fibre Channel Support

Two 4 Gb Fibre Channel HBA mezzanines are available:

- Emulex LPe1105-HP 4Gb FC HBA for HP c-Class BladeSystem (403621-B21)
- QLogic QMH2462 4Gb FC HBA for HP c-Class BladeSystem (403619-B21)

NOTE: For additional information on the optional 4 Gb Fibre Channel HBA mezzanines, see: http://h18004.www1.hp.com/products/blades/components/c-class-interconnects.html

Standard Features

Compatible SAN		HP ProLiant BL480c server blades are optimized for HP StorageWorks MSA, EVA, and XP HP ProLiant BL480c server blades are compatible with select third party SANs (please see the blade storage page for more details: http://h18000.www1.hp.com/products/servers/proliant-bl/c-class/storage.html)
Core Infrastructure Management	HP Insight Foundation	Managing the growing number of servers can be complex and expensive for your organization. IT managers need to address changing business needs with tools that meet the challenges of managing today's complex Datacenters. HP provides management solutions that are designed to simplify a server's installation, configuration and maintenance throughout the entire server lifecyle. This provides the customer with higher levels of operational efficiency and highly reliable systems: www.hp.com/go/foundation. The foundation pack includes: • HP SmartStart • HP Management • HP ProLiant Firmware Maintenance SmartStart version supported (minimum): SmartStart 8.0 http://www.hp.com/servers/smartstart
	ProLiant Onboard Administrator	HP ProLiant Onboard Administrator (powered by the HP Integrated Lights-Out 2 management processor) simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration of ProLiant ML, DL, and BL servers. HP ProLiant Onboard Administrator functions without additional software, and can be accessed from any location via a web browser. It works hand-in-hand with HP Systems Insight Manager, Insight Control suites, and the Insight Dynamics-VSE suite helping customers unlock the value of the ProLiant platform and deliver the highest possible quality of IT service to the business. See www.hp.com/go/onboardadministrator
	HP Insight Control (ICE) suites	HP Insight Control (ICE) suites, as product options, deliver essential infrastructure management that can help save time and money by making it easy to deploy, monitor, remote control, and optimize your IT infrastructure through a single, simple management console. ICE installs and licenses software modules that are integrated into HP System Insight Manager. Two ICE suites are available for environments requiring either a Windows or a Linux-based management console: HP Insight Control suites include one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: http://www.hp.com/services/insight.
	HP Insight Dynamics - VSE suite	The HP Insight Dynamics - VSE suite for ProLiant, a product option, is an integrated command center that enables you to continuously analyze and optimize your adaptive infrastructure. This advanced infrastructure management software that allows you to analyze and optimize your adaptive infrastructure to manage physical and virtual resources in the same way. HP

Standard Features

Insight Dynamics - VSE gives you a powerful toolkit to accelerate complex technology projects and simplify daily operations. It enables you to plan capacity and power continuously, balance across physical and virtual resources, ensure cost-effective high availability, and provision infrastructure consistently.
HP Insight Orchestration, an optional extension to Insight Dynamics - VSE, 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.

HP Insight Recovery, also an optional extension for Insight Dynamics - VSE, enables cost-effective disaster recovery for physical and virtual environments. Application environments can 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,
http://www.hp.com/go/insightorchestration,
http://www.hp.com/go/insightrecovery

Virtualization Software Support for ProLiant Servers

Microsoft Windows Server Hyper V
Red Hat Enterprise Linux (RHEL)
SUSE Linux Enterprise Server (SLES)
Oracle Enterprise Linux (OEL)
VMware
HP Citrix XenServer
Solaris 10 for x86/x64 based Systems

NOTE: For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: http://www.hp.com/go/supportos and our driver download page http://www.hp.com/support/BL480c

Availability

- Dual Port Fibre Channel mezzanine card option for redundant SAN connection
- Four (4) embedded Gigabit Ethernet adapters for redundant LAN connections
- Multiple mezzanine I/O expansion slots
- Four (4) hot-plug SAS/SATA hard drive bays
  Integrated RAID (HP Smart Array P400i) controller with ECC protected cache, RAID 0/1/5, and BBWC options
- Redundant ROM
- Advanced ECC memory - can correct a multi-bit error (up to 4 bits) that occurs within one memory chip
- Memory mirroring with memory online spare capacity
- Network adapter teaming (network fault tolerance, transmit load balancing, switch-assisted load balancing)

Standard Features

Industry Standard Compliance	• ACPI 2.0 compliant • PCI 2.2 compliant • WOL support • Microsoft® logo certifications • USB 2.0 support • PXE 2.1 • IEEE (see the Technical Specifications section)
Security	• One (1) internal USB 2.0 connector for security key devices and USB drive keys • 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
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.

Standard Features

Service and Support

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

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.

Recommended Service – Simplify ProLiant solution implementation, maintenance and management.

- Support Service – 4-Hour Response Coverage, 3-Year, 24 x 7, Same Business Day
- Deployment Service – Installation and Start Up for HP BladeSystem Infrastructure

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

- Support Service – HP Proactive BladeSystem Service, 1-Year
- Deployment Service – Enhanced Network Installation and Start-up for HP BladeSystem Switches

Installation & Start-Up service for HP BladeSystem Infrastructure plus HP BladeSystem Enhanced Network Installation and Start-UP as per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excluding HP holidays.

For a complete listing of service offerings and information visit:
http://www.hp.com/services/bladesystemservices
http://www.hp.com/go/proliant/carepack

Models

4-Core Models

HP ProLiant BL480c X5470 4G (2P) 492327-B21	**Processor(s)** One of the following depending on model	Two (2) Intel® Xeon® X5470 (3.33 GHz, 120W, 1333 FSB) Two (2) Intel® Xeon® X5460 (3.16 GHz, 120W, 1333 MHz FSB) Two (2) Intel® Xeon® E5450 (3.00 GHz, 80W, 1333 MHz FSB) Two (2) Intel® Xeon® E5440 (2.83 GHz, 80W, 1333 MHz FSB) One (1) Intel® Xeon® E5430 (2.66 GHz, 80W, 1333 MHz FSB) One (1) Intel® Xeon® E5410 (2.33 GHz, 80W, 1333 MHz FSB)
HP ProLiant BL480c X5460 4G (2P) 459496-B21	**Cache Memory**	2 x 6 MB Level 2 cache memory (5400 Series) 2 x 4 MB Level 2 cache memory (5300 Series)
HP ProLiant BL480c E5450 4G (2P) 459497-B21	**Memory** One of the following depending on model	4 GB (4 x 1 GB) PC2-5300, FBD DDR2-667 2 GB (2 x 1 GB) PC2-5300, FBD DDR2-667
HP ProLiant BL480c E5440 4G (2P) 459498-B21	**Network Controller**	Four (4) embedded Gigabit Ethernet network adapter ports, plus one (1) additional management network adapter port: • Two (2) embedded NC373i Multifunction Gigabit Server Adapters with TCP/IP offload engine for Microsoft Windows, iSCSI boot, and optional accelerated iSCSI • One (1) NC326i Dual Port Gigabit Server Adapter • One (1) additional embedded 10/100 network adapter dedicated to iLO 2 management
HP ProLiant BL480c E5430 2G (1P) 459499-B21	**Storage Controller**	Integrated HP Smart Array P400i Controller with 256MB cache and RAID 0, 1, and 5. Optional battery-backed write cache upgrades
HP ProLiant BL480c E5410 2G (1P) 459500-B21	**Hard Drives**	No drives included; four (4) SFF SAS/SATA drive bays
	Internal Storage	SAS: 2.0TB SATA: 2.0TB
	Optical Drive	None
	Form Factor	Up to 4 full-height blades supported in the HP BladeSystem c3000 enclosure Up to 8 full-height blades supported in the HP BladeSystem c7000 enclosure

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

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

Models	HP ProLiant BL480c CTO Blade	404707-B21
	Configurable Model ships with:	
	Four (4) embedded Gigabit Ethernet network adapter ports, plus (1) additional network adapter port for management: • Two (2) embedded NC373i Multifunction Gigabit Server Adapters with TCP/IP offload engine for Microsoft Windows iSCSI boot, and optional accelerated iSCSI • One (1) NC326i Dual Port Gigabit Server Adapter • One (1) additional embedded 10/100 network adapter dedicated to iLO 2 management	
	Integrated HP Smart Array P400i Controller with RAID 0/1/5 NOTE: Controller cache module selection is required. Select either the standard 256 MB module or the 512 MB module with BBWC upgrade in step 2 below. Four (4) small form factor (SFF) SAS/SATA hot-plug hard drive bays Integrated Lights-Out 2 Standard Blade Edition.	

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

NOTE: All processors within the server must be identical.

Processors	**4-Core Processor 5400 Series**	
	Intel® Xeon® X5470 (3.33 GHz, 120W, 1333 FSB) NOTE: If 2 processors are desired, select one 492325-L21 and one 492325-B21.	492325-L21
	Intel® Xeon® X5460 (3.16 GHz, 120W, 1333 MHz FSB) NOTE: If 2 processors are desired, select one 459501-L21 and one 459501-B21.	459501-L21
	Intel® Xeon® X5450 (3.00 GHz, 120W, 1333 FSB) NOTE: If 2 processors are desired, select one 463058-L21 and one 463058-B21.	463058-L21
	Intel® Xeon® E5450 (3.00 GHz, 80W, 1333 FSB) NOTE: If 2 processors are desired, select one 459502-L21 and one 459502-B21.	459502-L21
	Intel® Xeon® E5440 (2.83 GHz, 80W, 1333 FSB) NOTE: If 2 processors are desired, select one 459503-L21 and one 459503-B21.	459503-L21
	Intel® Xeon® E5430 (2.66 GHz, 80W, 1333 FSB) NOTE: If 2 processors are desired, select one 459504-L21 and one 459504-B21.	459504-L21
	Intel® Xeon® E5420 (2.50 GHz, 80W, 1333 FSB) NOTE: If 2 processors are desired, select one 459505-L21 and one 459505-B21.	459505-L21
	Intel® Xeon® E5410 (2.33 GHz, 80W, 1333 FSB) NOTE: If 2 processors are desired, select one 459506-L21 and one 459506-B21.	459506-L21

	Intel® Xeon® E5405 (2.00 GHz, 80W, 1333 FSB) NOTE: If 2 processors are desired, select one 459507-L21 and one 459507-B21.	459507-L21
	4-Core Processor 5400 Series Low Voltage	
	Intel® Xeon® L5420 (2.50 GHz, 50W, 1333 FSB) NOTE: If 2 processors are desired, select one 462866-L21 and one 462866-B21.	462866-L21
	2-Core Processor 5200 Series	
	Intel® Xeon® X5260 (3.33 GHz, 80W, 1333 MHz FSB) NOTE: If 2 processors are desired, select one 461628-L21 and one 461628-B21.	461628-L21
	2-Core Processor 5200 Series Low Voltage	
	Intel® Xeon® L5240 (3.00 GHz, 40Watts, 1333 FSB, 40W) NOTE: If 2 processors are desired, select one 461629-L21 and one 461629-B21.	461629-L21
Memory	1 GB FBD PC2-5300 2 x 512 MB Kit	397409-B21
	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 Kit	397415-B21
	16 GB FBD PC2-5300 2 x 8 GB Dual Rank Kit	413015-B21
	64 GB FBD PC2-5300 8 x 8 GB Dual Rank Kit	495604-B21
	2 GB FBD PC2-5300 2 x 1 GB Low Power Kit	461826-B21
	4 GB FBD PC2-5300 2 x 2 GB Low Power Kit	461828-B21
	8 GB FBD PC2-5300 2 x 4 GB Low Power Kit	466440-B21
	NOTE: For more information on ProLiant energy efficient features, see: http://h18004.www1.hp.com/products/servers/platforms/energyefficient/ NOTE: Two-way memory interleaving is enabled when an identical pair of DIMMs is installed. NOTE: DIMM banks are active only when the corresponding processor socket is populated.	
Smart Array P400i upgrade options	HP Smart Array P400i 256MB cache	405139-B21
	HP Smart Array P400i 512MB and battery-backed write cache upgrade	405148-B21

Step 3: Choose Additional Options for Factory Integration

NOTE: For additional "Core Options" and "Additional Options" please see the options sections below. For additional options, including server blade enclosures, interconnect options and power subsystem options; please see the following QuickSpecs:
HP BladeSystem c-Class Enclosures QuickSpecs:
HP BladeSystem c3000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html
HP BladeSystem c7000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html
and HP BladeSystem c-Class Interconnect Components QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12524_div/12524_div.html.

Core Options

Ethernet Mezzanine Options	**Gigabit Ethernet Mezzanines**	
	HP NC325m PCI Express Quad Port 1Gb Server Adapter for c-Class BladeSystem	416585-B21
	HP NC326m PCI Express Dual Port 1Gb Server Adapter for c-Class BladeSystem	406771-B21
	HP NC360m Dual Port 1GbE BL-c Adapter	445978-B21
	HP NC364m Quad Port 1GbE BL-c Adapter	447883-B21
	HP NC373m PCI Express Dual Port Multifunction Gigabit Server Adapter for c-Class BladeSystem	406770-B21
	HP NC382m Dual Port 1GbE Multifunction BL-c Adapter	453246-B21
	QLogic QMH4062 1GbE iSCSI Adapter for HP BladeSystem c-Class	488074-B21
	NOTE: The Gigabit Ethernet adapters above transmit from the server only at 2000 Mbps, full duplex per port. For more information, see the "Network Controller" segment in the Standards Features section.	
	10 Gigabit Ethernet Mezzanines	
	HP NC512m Dual Port 10GbE Multifunction BL-c Adapter NOTE: An NC512m network adapter card is required for each server blade connecting to the HP 10Gb Ethernet BL-c Switch. 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: Each port on the NC512m adapter transmits from the server only at 20 Gbps, full duplex.	440910-B21
	HP NC522m Dual Port 10GbE Multifunction BL-c Adapter NOTE: The NC522m requires a minimum of 2 GB of server memory. NOTE: The NC522m 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.	467801-B21
	HP NC532m Dual Port Flex-10 10GbE Multifunction BL-c Adapter NOTE: The NC532m network adapter card is required for each server blade connecting to a 10Gb interconnect in bays 3-8 (HP BladeSystem c7000 Enclosure) or bays 3-4 (HP BladeSystem c3000 Enclosure) NOTE: The NC532m requires a minimum of 2 GB of server memory. NOTE: The NC532m 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.	467799-B21
Fibre Channel Mezzanine Options	Emulex LPe1105 FC Dual Channel 4Gb, PCI-E-to-Fibre Channel Host Bus Adapter	403621-B21
	QLogic QMH2462 4Gb FC HBA for HP c-Class BladeSystem	403619-B21

Core Options

Processors	NOTE: All processors within the server must be identical.	
	4-Core Processor 5400 Series	
	Intel® Xeon® X5470 (3.33 GHz, 120Watts, 1333 FSB)	492325-B21
	Intel® Xeon® X5460 (3.16 GHz, 120 Watts, 1333 FSB)	459501-B21
	Intel® Xeon® X5450 (3.00 GHz, 120 Watts, 1333 FSB)	463058-B21
	Intel® Xeon® E5450 (3.00 GHz, 80 Watts, 1333 FSB)	459502-B21
	Intel® Xeon® E5440 (2.83 GHz, 80 Watts, 1333 FSB)	459503-B21
	Intel® Xeon® E5430 (2.66 GHz, 80 Watts, 1333 FSB)	459504-B21
	Intel® Xeon® E5420 (2.50 GHz, 80 Watts, 1333 FSB)	459505-B21
	Intel® Xeon® E5410 (2.33 GHz, 80 Watts, 1333 FSB)	459506-B21
	Intel® Xeon® E5405 (2.00 GHz, 80 Watts, 1333 FSB)	459507-B21
	4-Core Processor 5400 Series Low Voltage	
	Intel® Xeon® L5420 (2.5 GHz, 40 Watt, 1333 FSB)	462866-B21
	4-Core Processor 5300 Series	
	Intel® Xeon® X5365 (3.00 GHz, 120 Watts, 1333 FSB)	453188-B21
	Intel® Xeon® X5355 (2.66 GHz, 120 Watts, 1333 FSB)	435579-B21
	Intel® Xeon® E5345 (2.33 GHz, 80 Watts, 1333 FSB)	435578-B21
	Intel® Xeon® E5335 (2.00 GHz, 80 Watts, 1333 FSB)	443744-B21
	Intel® Xeon® E5320 (1.86 GHz, 80 Watts, 1066 FSB)	435577-B21
	Intel® Xeon® E5310 (1.60 GHz, 80 Watts, 1066 FSB)	435576-B21
	4-Core Processor 5300 Series Low Voltage	
	Intel® Xeon® L5335 (2.00 GHz, 50 Watts, 1333 FSB)	453611-B21
	Intel® Xeon® L5320 (1.86 GHz, 50 Watts, 1066 FSB)	443743-B21
	2-Core Processor 5200 Series	
	Intel® Xeon® X5260 (3.33 GHz, 80 Watts, 1333 FSB)	461628-B21
	2-Core Processor 5200 Series Low Voltage	
	Intel® Xeon® L5240 (3.00 GHz, 40 Watts, 1333 FSB	461629-B21

Core Options

Memory	1 GB FBD PC2-5300 2 x 512 MB Kit	397409-B21
	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 Kit	397415-B21
	16 GB FBD PC2-5300 2 x 8 GB Dual Rank Kit	413015-B21
	64 GB FBD PC2-5300 8 x 8 GB Dual Rank Kit	495604-B21
	2 GB FBD PC2-5300 2 x 1 GB Low Power Kit	461826-B21
	4 GB FBD PC2-5300 2 x 2 GB Low Power Kit	461828-B21
	8 GB FBD PC2-5300 2 x 4 GB Low Power Kit	466440-B21
	NOTE: For more information on ProLiant energy efficient features, see: http://h18004.www1.hp.com/products/servers/platforms/energyefficient/.	
	NOTE: DIMM banks are active only when the corresponding processor socket is populated.	
Hard Drives	NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.	
	SAS Hot Plug SFF Enterprise (ENT) Drives	
	HP 300GB 6G SAS 10K SFF DP ENT HDD	507127-B21
	HP 300GB 3G SAS 10K SFF DP ENT HDD	492620-B21
	HP 146GB 6G SAS 15K SFF DP ENT HDD	512547-B21
	HP 146GB 3G SAS 15K SFF DP ENT HDD	504062-B21
	HP 146GB 6G SAS 10K SFF DP ENT HDD	507125-B21
	HP 146GB 3G SAS 10K SFF DP HDD	418367-B21
	HP 72GB 6G SAS 15K SFF DP ENT HDD	512545-B21
	HP 72GB 3G SAS 15K SFF DP HDD	418371-B21
	HP 72GB 3G SAS 10K SFF DP HDD	384842-B21
	NOTE: SAS drives have a 3 year warranty.	
	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 Midline (MDL) Drives	
	HP 500GB 6G SAS 7.2K SFF DP MDL HDD	507610-B21
	SATA Hot Plug SFF Midline (MDL) Drives	
	HP 500GB 3G SATA 7.2K 2.5in MDL HDD	507750-B21
	HP 160GB 3G SATA 7.2K 2.5in MDL HDD	530888-B21
	SATA Hot Plug SFF Entry (ETY) Drives	
	HP 250GB 3G SATA 5.4K SFF ETY HDD	460355-B21
	HP 120GB 1.5G SATA 5.4K SFF ETY HDD	458924-B21
	NOTE: SATA drives have a 1 year warranty. 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 Control suite (ICE)	NOTE: Electronic licensing options are available for Insight Control suites software products. Please see the appropriate Insight Control QuickSpecs for additional information: www.hp.com/go/ice.	
	Insight Control suite	
	HP Insight Control suite, No Media 1-Server License including 1 year of 24x7 Technical Support and Updates NOTE: Contains 1 license for each of RDP, PMP, VMM, VPM, IPM and iLO Advanced. Includes one year of 24 x 7 HP Software Technical Support and Update Service NOTE: Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.	452148-B22
	HP Insight Software Media Kit NOTE: Insight Software DVD media without licenses. Contains Insight Software suites, standalone software products and components licensed by Insight Control suites. Uses an integrated installer to perform quick and accurate software installation and updates.	436222-B21
	NOTE: For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12631_div/12631_div.html	
	HP Insight Control Suite for Linux	
	HP Insight Control suite for Linux, No Media, 1-Server License including one year of 24x7 Technical Support and Updates NOTE: This part number can be used to purchase one (1) license with a single activation key. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service. NOTE: One certificate is shipped for each license.	464423-B22
	HP Insight Control suite for Linux, Media pack (DVD) - No licenses included NOTE: This optional Media pack DVD contains the ISO image for HP Insight Control suite for Linux, HP Systems Insight Manager, HP Insight Power Manager, HP Insight Virtual Machine Manager software for ProLiant, and an integrated installer. Servers must be acquired separately. NOTE: This Media pack is optional because the latest ISO image and latest updates may be downloaded at no cost from: http://www.hp.com/go/ice-linux (click on Download button).	464422-B22
	NOTE: For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/13019_div/13019_div.html	
Storage Controllers	HP Smart Array P700m/256 Controller	507925-B21
	HP Smart Array P700m/512 Controller	508226-B21
	P400i battery-backed write cache upgrade	383280-B21
	P400i 512MB cache and battery-backed write cache upgrade	405148-B21

Additional Options

HP InfiniBand Mezzanine Options	HP 4X DDR IB Dual Port Mezzanine HCA for HP BladeSystem c-Class	448262-B21
	HP 4X DDR IB Mezzanine HCA for HP BladeSystem c-Class	410533-B21
I/O Accelerator Mezzanine Options	HP StorageWorks 80GB IO Accelerator for BladeSystem c-Class	AJ876A
	HP StorageWorks 160GB IO Accelerator for BladeSystem c-Class	AJ877A
	HP StorageWorks 320GB IO Accelerator for BladeSystem c-Class	AJ878A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13220_div/13220_div.html	
c-Class Mezzanines	HP PCI Express Mezzanine Pass-Thru Card for HP BladeSystem c-Class	431643-B21
	NOTE: Required to support the HP StorageWorks SB40c Storage Blade (P/N 411243-B21), PCI expansion Blade (P/N 448018-B21), and StorageWorks Ultrium tape blades with HP c-Class BladeSystem full-height server blades. The PCI Express Mezzanine Pass-Thru Card must be installed in mezzanine slot 3.	
Disk-Based Backup	D2D Backup	
	HP StorageWorks D2D2504i Backup System	EJ002A
HP Ultrium Tape Blades	HP StorageWorks SB1760c Tape Blade	AQ697A
	NOTE: LTO-4 Ultrium technology	
	HP StorageWorks SB920c Tape Blade	AJ401A
	NOTE: LTO-3 Ultrium technology	
	HP StorageWorks Ultrium 448c Tape Blade	440947-B21
	NOTE: LTO-2 Ultrium technology	
	NOTE: The HP PCI Express Mezzanine Pass-Thru Card for HP BladeSystem c-Class (P/N 431643-B21) is required to support the HP StorageWorks Ultrium Tape Blades. The PCI Express Mezzanine Pass-Thru Card must be installed in mezzanine slot 3. Please see the QuickSpecs for Technical Specifications and additional 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://www.hp.com/go/blades	
HP StorageWorks SB40c Storage Blade	HP StorageWorks SB40c Storage Blade	411243-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information at: http://h18000.www1.hp.com/products/quickspecs/12587_div/12587_div.html (Worldwide)	
	NOTE: The HP PCI Express Mezzanine Pass-Thru Card for HP BladeSystem c-Class (P/N 431643-B21) is required to support the HP StorageWorks SB40c Storage Blade with HP c-Class BladeSystem full-height server blades (e.g. BL480c.)	

Additional Options

HP PCI Expansion Blade	HP PCI Expansion Blade NOTE: Ships with one pre-installed PCI-X connect board. Also includes one PCIe connect board which requires installation. NOTE: The HP PCI Express Mezzanine Pass-Thru Card for HP BladeSystem c-Class (P/N 431643-B21) is required to support the HP PCI Expansion Blade with HP c-Class BladeSystem full-height server blades. The PCI Express Mezzanine Pass-Thru Card must be installed in mezzanine slot 3. Please see the QuickSpecs for Technical Specifications and additional information at: http://h18000.www1.hp.com/products/quickspecs/12753_div/12753_div.html	448018-B21
Service and Support Offerings (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	
	4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	UK065E
	4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UK066E
	6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UK067E

Memory

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

DIMM installation guidelines:

1. The maximum memory is 64 GB
2. All DIMMs must be PC2-5300 fully buffered DIMMs operating at 667 MHz.
3. Both DIMM slots in a memory bank must be populated.
4. Banks must be populated in sequential alphabetic order, starting with bank A.
5. Both DIMMs in a memory bank must be identical. Install identical DIMMs as pairs only, starting with DIMM socket 1, bank A.
6. Multiple advanced memory protection (AMP) modes are supported, based on FBDIMM population and RBSU selection. The server blade defaults to Advanced ECC.

HP ProLiant BL480c Server Blade (1P Models)

Standard Memory

2 GB (2 x 1 GB) of PC2-5300, FBD DDR2-667 ECC DIMMs

Standard Memory Plus Optional Memory

Up to 62 GB of PC2-5300, FBD DDR2-667 DIMM memory is available with the installation of optional PC2-5300, FBD DDR2-667 DIMM memory expansion kits.

Standard Memory Replaced with Optional Memory

Up to 64 GB of PC2-5300, FBD DDR2-667 DIMM memory is available with the removal of standard memory and the installation of optional PC2-5300, FBD DDR2-667 DIMM memory expansion kits.

Memory		Slot											
		1A	2C	3E	4A	5C	6E	7B	8D	9F	10B	11D	12F
Standard	2 GB	1 GB	Empty	Empty	1 GB	Empty	Empty	Empty	Empty	Empty	Empty	Empty	Empty
Optional	62 MB	1 GB	8 GB	8 GB	1 GB	8 GB	8 GB	8 GB	4 GB	2 GB	8 GB	4 GB	2 GB
Maximum	64 MB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	Empty	Empty	8 GB	Empty	Empty

NOTE: Other maximum memory configurations are possible using two pairs of 4 GB DIMMs in place of a pair of 8 GB DIMMs.

NOTE: For a specific memory level, the best performance is achieved using a homogenous memory configuration (i.e. all DIMMs have the same capacity).

HP ProLiant BL480c Server Blade (2P Models)

Standard Memory

4 GB (4 x 1 GB) of PC2-5300, FBD DDR2-667 ECC DIMMs

Standard Memory Plus Optional Memory

Up to 60 GB of PC2-5300, FBD DDR2-667 DIMM memory is available with the installation of optional PC2-5300, FBD DDR2-667 DIMM memory expansion kits.

Standard Memory Replaced with Optional Memory

Up to 64 MB of PC2-5300 FBD, DDR2-667 DIMM memory is available with the removal of standard memory and the installation of optional PC2-5300, FBD DDR2-667 DIMM memory expansion kits.

Memory		Slot											
		1A	2C	3E	4A	5C	6E	7B	8D	9F	10B	11D	12F
Standard	4 GB	1 GB	Empty	Empty	1 GB	Empty	Empty	1 GB	Empty	Empty	1 GB	Empty	Empty
Optional	60 GB	1 GB	8 GB	8 GB	1 GB	8 GB	8 GB	1 GB	8 GB	4 GB	1 GB	8 GB	4 GB
Maximum	64 GB	8 GB	8 GB	Empty	8 GB	8 GB	Empty	8 GB	8 GB	Empty	8 GB	8 GB	Empty

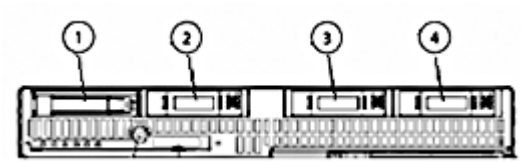
Memory

NOTE: DIMM banks are active only when the corresponding processor socket is populated.

NOTE: Other maximum memory configurations are possible using two pairs of 4 GB DIMMs in place of a pair of 8 GB DIMMs.

Following are memory options available from HP:

1 GB FBD PC2-5300 2 x 512 MB Kit	397409-B21
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 Kit	397415-B21
16 GB FBD PC2-5300 2 x 8 GB Dual Rank Kit	413015-B21
64 GB FBD PC2-5300 8 x 8 GB Dual Rank Kit	495604-B21
2 GB FBD PC2-5300 2 x 1 GB Low Power Kit	461826-B21
4 GB FBD PC2-5300 2 x 2 GB Low Power Kit	461828-B21
8 GB FBD PC2-5300 2 x 4 GB Low Power Kit	466440-B21



1-4 4 x SFF SAS or SATA hot-plug hard drives

Hard Drives

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

SAS Hot Plug SFF Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
300GB 6G 10K DP	4	1-4	HP Smart Array P400i Controller
300GB 3G 10K DP			
146GB 6G 15K DP			
146GB 3G 15K DP			
146GB 6G 10K DP			
146GB 3G 10K DP			
72GB 6G 15K DP			
72GB 3G 15K DP			
72GB 3G 10K DP			
36GB 3G 15K DP			

SAS Hot Plug SFF Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
500GB 6G SAS 7.2K	2	1-2	HP Smart Array P400i Controller

SATA Hot Plug SFF Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
500GB 3G SATA 7.2K	2	1-2	HP Smart Array P400i Controller
160GB 3G SATA 7.2K			

SATA Hot Plug SFF Entry (ETY) Drives

250GB 3G SATA 5.4K	4	1-4	HP Smart Array P400i Controller
120GB 1.5G SATA 5.4K			

System Unit	**Dimensions** (H x W x D)	Full height server blade; 7.15 x 2.03 x 20.06 in (36.63 x 5.16 x 50.95 cm)	
	Weight (approximate)	Maximum (all hard drives and processors installed)	21.02 lb (9.53 kg)
		Minimum (one hard drive and processor installed)	18.74 lb (8.50 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: 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 available at: http://www.hp.com/go/bladesystem/powercalculator	
	System Inlet Temperature	Operating	50° to 95°F (10° to 35°C) at sea level with an altitude derating of 1.8°F per every 1000 ft (1.0°C per every 305 m) above sea level to a maximum of 10,000 ft (3050 m), no direct sustained sunlight. Maximum rate of change is 18°F/hr (10°C/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 86°F (30°C).
		Non-Operating	-22° to 140°F (30° to 60°C), maximum rate of change is 36°F/hr (20°C/hr).
	Relative Humidity (non-condensing)	Operating	10% to 90% relative humidity (Rh), 82.4°F (28°C) maximum wet bulb temperature, non-condensing.
		Non-Operating	10% to 95% relative humidity (Rh), 101.7°F (38.7°C) maximum wet bulb temperature, non-condensing.
	Altitude	Operating	10,000 ft (3050 m). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 1500 ft/min (457 m/min).
		Non-operating	30,000 ft (9144 m). Maximum allowable altitude change rate is 1500 ft/min (457 m/min).
	Acoustic Noise	For acoustic noise specifications, please see the HP BladeSystem c-Class Enclosures QuickSpecs located at: 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/	

Smart Array P400i Controller	Disk Drive and Enclosure Interface	3G SAS (Serial Attached SCSI) 1.5G 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	x8 2.5G PCIe provides 2 GB/s maximum bandwidth.
	SAS Speed	x8 3G SAS provides 2.4 GB/s maximum bandwidth.
	Cache Memory	40-bit 256 MB cache with optional battery-backed write cache (BBWC) and optional 72-bit 512MB module upgrade with BBWC); ECC protection and transportable.
	Logical Drives Supported	Up to 32 logical drives
	Maximum Logical Drive Capacity	584GB (4 x 146GB) SAS 480GB (4 x 120GB) SATA
	Host Memory Addressing	64-bit, supporting greater than 4 GB server memory space
	RAID Support	RAID 0 (Striping) RAID 1 (Mirroring) RAID 5 (Distributed Data Guarding)
	Upgradeable Firmware	Upgradeable firmware with recovery ROM feature

Embedded NC326i Dual Port Gigabit Server Adapter	Network Processor	Broadcom 5715S
	Data Transfer Method	Four lane (x4) PCI Express
	Network Transfer Rate	Two ports, each at 1000 Mb/s (theoretical maximum values) NOTE: The Gigabit Ethernet adapters transmit from the server only at 2000 Mbps, full duplex per port. 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	• 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) version 2.1 • 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 Windows, Linux, and VMware

Technical Specifications

Embedded NC373i Multifunction Gigabit Server Adapters	Network Processor	Broadcom 5708S
	Data Transfer Method	Four lane (x4) PCI Express
	Network Transfer Rate	2000 Mb/s full duplex per port (theoretical maximum value) NOTE: The Gigabit Ethernet adapters transmit from the server only at 2000 Mbps, full duplex per port. 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 Microsoft Windows and Linux • Optional accelerated iSCSI for Microsoft Windows and Linux • 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) version 2.1 • 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 Windows, Linux, and VMware

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.