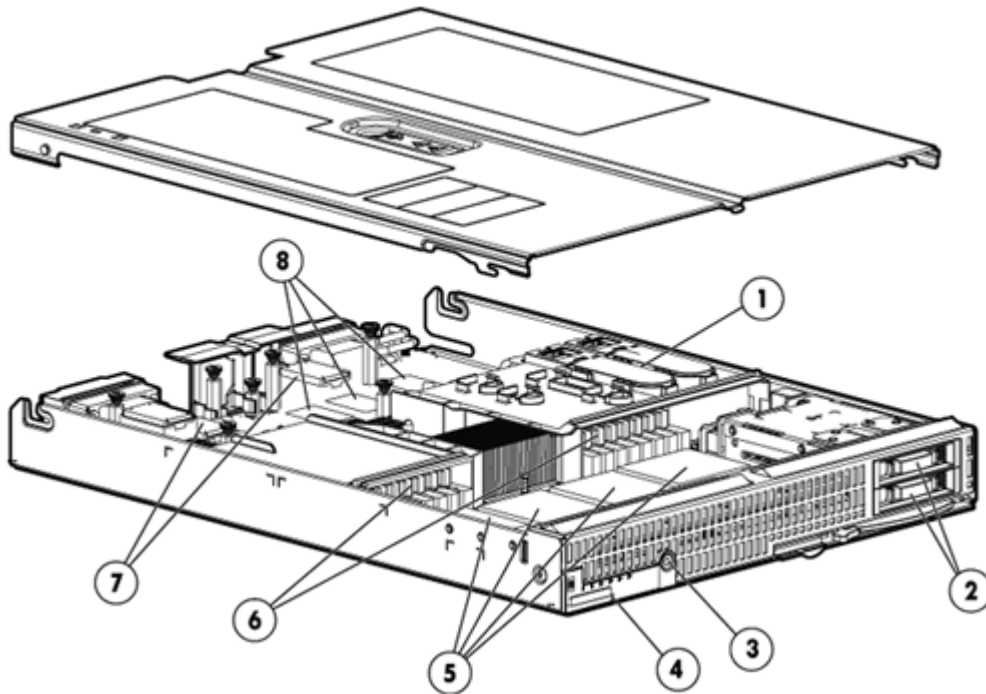


Overview



HP ProLiant BL680c Generation 5 (G5) Server Blade

Front view image

1. Cache battery modules
2. Two small form factor (SFF) hot-plug drive bays
3. Power button
4. Local I/O connector
5. Two or four Intel® Xeon® 7400 series processors providing up to 6 cores
6. To 128 GB PC2-5300, DDR2 FB memory via 16 DIMMs
7. Three I/O expansion mezzanine slots
8. Four embedded Gigabit Ethernet adapter ports

What's New

- Support for the HP 2GB USB Flash Media Drive Key Kit for VMware, SmartStart, and other HP value-add software

At A Glance

This document covers the HP ProLiant BL680c G5 server blade only. For more information on the HP BladeSystem c-Class Enclosure 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

- The HP ProLiant BL680c G5 Server Blade delivers no-compromise performance and expansion for a 4-core to 6-core BladeSystem Server. With two or four Intel Xeon 7400 series processors, 128 GB of fully buffered memory, two hot-plug serial



Overview

attached SCSI (SAS) or serial ATA (SATA) hard drives, four embedded Gigabit Ethernet adapters (two multifunction) and three I/O expansion slots, the HP ProLiant BL680c G5 delivers the density you want with the performance you need to handle the most demanding enterprise class applications. The HP ProLiant BL680c G5 server blade includes:

- **Processor:**
 - Two or four Intel Xeon 7400 series processors with up to 6 cores
 - NOTE: The BL680c G5 supports either two or four processors. One and three processors are not supported.
 - NOTE: All processors within the server must be identical.
 - Intel 7300 chipset supporting a 1066 MT/s Dedicated High-Speed Interconnect (DHSI)
 - Demand Based Switching (DBS) with Enhanced Intel SpeedStep® Technology on select models
 - Up to 16 MB of L3 cache
 - Intel® Virtualization Technology
- **Memory:**
 - Sixteen (16) DIMM slots supporting:
 - 128 GB PC2-5300, fully buffered DDR2-667MHz memory
 - 64 GB PC2-5300, fully buffered DDR2-667MHz low power memory
 - Advanced ECC memory technology
 - 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 and 1
 - Upgrades include:
 - Battery-backed write cache (BBWC) for standard 256MB cache
 - 512MB ECC protected cache upgrade with BBWC
 - Optional Storage Works P700m Controller with either 256MB or 512MB BBWC
 - Optional StorageWorks IO Accelerator cards for high I/O performance
- **Internal Drive Support:**
 - Up to two (2) small form factor (SFF) SAS or SATA hot-plug hard drives
 - Support for the optional StorageWorks SB40c Storage Blade
- **Network Controller:**
 - Four (4) embedded 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 2management
 - NOTE: The Gigabit Ethernet adapters transmit from the server 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 for additional I/O mezzanine including:
 - Dual Port 4Gb Fibre Channel for SAN connectivity (choice of Emulex or QLogic)
 - Multiple dual port 10Gb Ethernet adapter options for high bandwidth network connectivity
 - Multiple dual and quad port Gigabit Ethernet network adapter options for increased bandwidth and additional network ports
 - StorageWorks I/O Accelerators for high transaction rate local storage
 - 4X DDR InfiniBand (20Gb) for low latency, high bandwidth server interconnectivity
 - For additional I/O expansion, the BL680c G5 supports the PCI Expansion Blade, see:
http://h18004.www1.hp.com/products/blades/expansion/index.html?jumpid=reg_R1002_USEN
- **Internal USB Support:**
 - One (1) internal USB 2.0 connector for security key devices and USB drive keys
- **Infrastructure Management:**
 - HP Integrated Lights-Out 2 (iLO 2) 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



Overview

by making it easy to deploy, 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 System Support:**
 - Microsoft Windows, RHEL, SLES, OEL, Sun Solaris, VMware ESX, and HP Essentials Citrix for XenServer
- **Form Factor:**
 - The HP ProLiant BL680c G5 is a full height server blade that plugs into the HP BladeSystem c3000 and c7000 enclosures
- **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 BL680c servers plugged vertically.
 - The HP BladeSystem c3000 rack enclosure is 6U high and holds up to 4 HP ProLiant BL680c servers plugged horizontally.
 - The HP BladeSystem c3000 tower enclosure is designed with casters for sites without racks and holds up to 4 HP ProLiant BL680c servers plugged vertically.
 - 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>.
- **Warranty:**
 - This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners resellers. 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 the specific hard drive QuickSpecs for details.
NOTE: Server warranty includes 3 year Parts, 3 year Labor, 3-year on-site support. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at:
<http://h18004.www1.hp.com/products/ servers/ platforms/ warranty/ index.html>



Standard Features

Processor	Intel Xeon E7458 (6 core, 2.40 GHz, 16 MB L3 cache, 90W)
	Intel Xeon E7450 (6 core, 2.40 GHz, 12 MB L3 cache, 90W)
	Intel Xeon E7440 (4 core, 2.40 GHz, 16 MB L3 cache, 90W)
	Intel Xeon E7430 (4 core, 2.13 GHz, 12 MB L3 cache, 90W)
	Intel Xeon E7420 (4 core, 2.13 GHz, 8 MB L3 cache, 90W)
	NOTE: Offered as Configure-To-Order. See the Factory Integrated Models section for more details.
	Intel Xeon L7455 (6 core, 2.13 GHz, 12 MB L3 cache, 65W)
	NOTE: Offered as Configure-To-Order. See the Factory Integrated Models section for more details.
	Intel Xeon L7445 (4 core, 2.13 GHz, 12 MB L3 cache, 50W)
	NOTE: Offered as Configure-To-Order. See the Factory Integrated Models section for more details.

NOTE: All processors within the server must be identical.

NOTE: The BL680c G5 supports either two or four processors. One and three processors are not supported.

NOTE: The letter preceding the model number indicates the performance/wattage of the processor. The "E" denotes enterprise performance/wattage and the "L" denotes lower wattage.

NOTE: If upgrading an existing BL680c G5 server to a different processor, the server's ROM must be flashed to the latest BIOS prior to the upgrade.

Upgradeability	Upgradeable to four processors
	NOTE: The server supports two or four processors. One and three processors are not supported.
	NOTE: All processors within the server must be identical.
	NOTE: If upgrading an existing BL680c G5 server to a different processor, the server's ROM must be flashed to the latest BIOS prior to the upgrade.

Cache Memory	Up to 16 MB level 3 cache memory
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Chipset	Intel® 7300 chipset
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Memory	Type	PC2-5300 Fully Buffered DIMMs operating at 667 MHz
	Standard	8GB (2 x 4GB)
	Maximum	128GB (16 x 8GB DIMMs) 64GB (16 x 4GB Low Power DIMMs)
	NOTE: See the "DIMM installation guidelines" section for memory installation rules.	



Standard Features

Network Controllers

Four (4) embedded Gigabit Ethernet network adapter ports, plus (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

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.

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) acceleration for 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.
- The iSCSI boot allows the BL680c G5 to boot from a remote operating system (OS) image located on a storage area network (SAN) within a Red Hat or SUSE Linux environment. The BL680c G5 uses an iSCSI firmware image (iSCSI boot option ROM) making the remote disk drive appear as a local, bootable C: drive. The BL680c G5 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).

Integrated Manageability

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



Standard Features

Storage Controller

The BL680c G5 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) and 1 (mirroring).

The controller supports both SAS and SATA hard drives letting you deploy drive technology as needed to fit your computing environment. The BL680c G5 provides two hot-plug drive bays for up to 1.0TB of SAS and 500GB 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 25MB cache.
- Upgrade to 72-bit 512MB ECC protected cache with BBWC.

If additional SAS or SATA drives are desired, the BL680c G5 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)	1.0TB SAS	2 x 500GB SAS
	Hot Plug Serial Attach (SATA)	1.0TB SATA	2 x 500GB SATA

Graphics	Integrated ATI RN-50 1280 x 1024 x 16M color (32 MB DDR1 memory)
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Graphics Resolution	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 Up to three 4 Gb Fibre Channel HBA mezzanines are supported ordered separately:

- 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>

Compatible SAN

HP ProLiant BL680c G5 server blades are optimized for HP StorageWorks MSA, EVA, and XP HP ProLiant BL680c G5 server blades are compatible with select third party SANs (please see blade storage page for more details: <http://h18004.www1.hp.com/products/blades/components/c-class-sans.html>)

HP Insight management software

HP Insight Foundation

Managing the growing number of servers can be complex and expensive for your organization. IT managers need to address changing business needs



Standard Features

with tools that meet the challenges of managing today's complex Datacenters.

HP provides management solutions that are designed to simplify a server's installation, configuration and maintenance throughout the entire server lifecycle. This provides the customer with higher levels of operational efficiency and highly reliable systems: www.hp.com/go/foundation. The foundation pack includes:

- HP SmartStart
- HP Management
- HP ProLiant Firmware Maintenance

Minimum SmartStart version supported is SmartStart 7.60, see: <http://www.hp.com/servers/smartstart>

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, 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, 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 Dynamics for ProLiant

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, 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. As a powerfully integrated by design toolkit to accelerate complex technology projects and simplify daily operations that ultimately enable IT Staff personnel to dynamically keep pace with the organizations changing business requirements. It enables them to plan capacity and power continuously, balance 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



Standard Features

benefits, it also provides a cost-effective disaster recovery for physical and virtual environments that works with HP StorageWorks 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>

Operating Systems and Virtualization Software Support for ProLiant Servers

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

NOTE: For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at:
<http://www.hp.com/go/supportos> and our driver download page
<http://www.hp.com/support/BL680cG5>

Availability

- Optional dual-port Fibre Channel mezzanine cards for redundant SAN connection
- Four (4) embedded Gigabit Ethernet adapters for redundant LAN connections
- Multiple mezzanine I/O expansion slots each routed to redundant interconnect modules
- Two (2) hot-plug SAS/SATA hard drive bays
- Integrated Smart Array P400i Controller with ECC protected cache and battery backed write cache options
- 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)

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)



Standard Features

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 MSAxxx, 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

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 support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services or customized service agreements.

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, a service partner is required 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 BladeSystem server support offer to help you speedily deploy and maximize system uptime.

NOTE: SAN/Fabric switches for the HP c-Class BladeSystem are not covered under the c7000 and c3000 enclosure Care Packs, SAN/Fabric switches carry separate Care Packs. SAN/Fabric Switch Care Pack service level support should always be uplifted to match existing storage or server service level.



Standard Features

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 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/bladessystemservices>

<http://h20219.www2.hp.com/services/us/en/always-on/servers-bladesystem.html>



Models

4 or 6-Core 7400 Series Models

HP ProLiant BL680c G5 E7458 6C 8G (2P) 517409-B21	Processor(s) One of the following depending on model	(2) Intel Xeon E7458 (6 core, 2.40 GHz, 16 MB L3 cache, 90W) (2) Intel Xeon E7450 (6 core, 2.40 GHz, 12 MB L3 cache, 90W) (2) Intel Xeon E7440 (4 core, 2.40 GHz, 16 MB L3 cache, 90W) (2) Intel Xeon E7430 (4 core, 2.13 GHz, 12 MB L3 cache, 90W)
HP ProLiant BL680c G5 E7450 6C 8G (2P) 492334-xx1	Cache Memory One of the following depending on model	16 MB Level 3 cache memory 12 MB Level 3 cache memory 8 MB Level 3 cache memory
HP ProLiant BL680c G5 E7440 4C 8G (2P) 492335-B21	Memory Network Controllers	8 GB (2x4 GB) PC2-5300, FBD DDR2-667 Four (4) embedded Gigabit Ethernet network adapter ports, plus one (1) additional management network adapter port:
HP ProLiant BL680c G5 E7430 4C 8G (2P) 492336-xx1		<ul style="list-style-type: none">• 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
	Storage Controller	Integrated HP Smart Array P400i Controller with 256MB cache and RAID 0 and 1. Optional battery-backed write cache upgrades.
	Hard Drives	No drives included; supports up to two (2) SFF SAS/SATA drives
	Internal Storage	SAS: 1TB; SATA: 1TB
	Optical Drive	None
	Form Factor	Up to 4 full-height blades in the HP BladeSystem c3000 enclosure Up to 8 full-height blades in the HP BladeSystem c7000 enclosure

Country Code Key	xx=B2	Worldwide
	xx=20	Brazil



Configuration Information - Factory Integrated Models

NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on CTO product offerings and requirements.

NOTE: HP does not allow factory integration of options into standard models listed above.

Configure-to-order 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)

HP Models HP ProLiant BL680c G5 CTO Blade 443527-B21

Configurable model ships with:

1. Four (4) embedded Gigabit Ethernet network adapter ports, plus one (1) additional management network adapter port:
 - o Two (2) embedded NC373i Multifunction Gigabit Server Adapters with TCP/IP offload engine for Microsoft Windows, iSCSI boot, and optional accelerated iSCSI
 - o One (1) NC326i Dual Port Gigabit Server Adapter
 - o One (1) additional embedded 10/100 network adapter dedicated to iLO 2 management
2. Integrated HP Smart Array P400i Controller with RAID 0 and 1.
NOTE: A controller cache module selection is required. In the "HP Storage Controllers" section of step 2 below, select either the 256 MB module (with or without optional BBWC) or the 512 MB module with BBWC.
3. Two (2) small form factor (SFF) SAS/SATA hot-plug hard drive bays
4. Three I/O expansion slots: one Type 1 x4 PCIe (15 watts) and two x8 PCIe (25 watts)
5. Integrated Lights-Out 2 Standard Blade Edition

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

HP Processors

NOTE: The BL680c G5 supports either two or four processors. One and three processors are not supported.

NOTE: All processors within the server must be identical.

NOTE: All processor kits contain two (2) processors.

NOTE: If 4 processors are desired, select one xxxxx-L21 and one xxxxx-B21.

Intel Xeon E7458 (6 core, 2.40 GHz, 16 MB L3 cache, 90W, 2P), FIO Base	517411-L21
Intel Xeon E7450 (6 core, 2.40 GHz, 12 MB L3 cache, 90W, 2P), FIO Base	492344-L21
Intel Xeon E7440 (4 core, 2.40 GHz, 16 MB L3 cache, 90W, 2P), FIO Base	492345-L21
Intel Xeon E7430 (4 core, 2.13 GHz, 12 MB L3 cache, 90W, 2P), FIO Base	492346-L21
Intel Xeon E7420 (4 core, 2.13 GHz, 8 MB L3 cache, 90W, 2P), FIO Base	492347-L21
Intel Xeon L7455 (6 core, 2.13 GHz, 12 MB L3 cache, 65W, 2P), FIO Base	492348-L21
Intel Xeon L7445 (4 core, 2.13 GHz, 12 MB L3 cache, 50W, 2P), FIO Base	493577-L21

HP Memory

2 GB FBD PC2-5300 2 x 1 GB Kit Dual Rank Kit	397411-B21
2 GB FBD PC2-5300 2 x 1 GB Low Power Single Rank Kit	461826-B21
4 GB FBD PC2-5300 2 x 2 GB Dual Rank Kit	397413-B21
4 GB FBD PC2-5300 2 x 2 GB Low Power Dual Rank Kit	461828-B21



Configuration Information - Factory Integrated Models

8 GB FBD PC2-5300 2 x 4 GB Dual Rank Kit	397415-B21
8 GB FBD PC2-5300 2 x 4 GB Low Power Dual Rank Kit	466440-B21
16 GB FBD PC2-5300 2 x 8 GB Dual Rank Kit	413015-B21
64 GB FBD PC2-5300 8x 8 GB Dual Rank Kit	495604-B21

NOTE: For more information low power memory option kits and other 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.

HP Storage Controllers

NOTE: Selection of either the 256 MB cache module or the 512 MB cache module with BBWC is required.

HP Smart Array P400 256MB FIO Cache	405139-B21
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NOTE: Supports Smart Array P400 Controller and Smart Array P400i Controller.

512MB Battery-backed write cache upgrade	405148-B21
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NOTE: Supports Smart Array P400 Controller and Smart Array P400i Controller.

Step 3: Choose Additional Options for Factory Integration

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



Core Options

NOTE: For additional "Core Options" and "Additional Options" please see the options sections below.

HP 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 NC382m Dual Port 1GbE Multifunction BL-c Adapter	453246-B21
		HP BLc QLogic iSCSI Dual Port Adapter with Virtual Connect Kit	488074-B22
		NOTE: The Gigabit Ethernet adapters above transmit from the server 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 NC522m Dual Port 10GbE Multifunction BL-c Adapter	467801-B21
	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 1GbE switches at 1Gb.		
	HP NC532m Dual Port Flex-10 10GbE Multifunction BL-c Adapter	467799-B21	
	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 will downspeed to 1Gb if paired with a 1GbE interconnect.		
	HP NC550m 10GbE 2-port PCIe x8 Flex-10 Ethernet Adapter	581204-B21	
	NOTE: The NC550m 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 NC550m requires a minimum of 2 GB of server memory.		
	NOTE: The NC550m supports linking at 1000Mbps or 10000Mbps when not connected to a Flex-10 device. The NC550m will only support 1000Mbps when connected to a 1Gb Ethernet interconnect.		
<hr/>			
HP 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	
<hr/>			



Core Options

HP Processors

NOTE: The BL680c G5 supports either two or four processors. One and three processors are not supported.

NOTE: All processors within the server must be identical.

NOTE: All processor kits contain two (2) processors.

NOTE: If upgrading an existing BL680c G5 server to a different processor, the server's ROM must be flashed to the latest BIOS prior to the upgrade.

Intel Xeon E7458 (6 core, 2.40 GHz, 16 MB L3 cache, 90W, 2P)	517411-B21
Intel Xeon E7450 (6 core, 2.40 GHz, 12 MB L3 cache, 90W, 2P)	492344-B21
Intel Xeon E7440 (4 core, 2.40 GHz, 16 MB L3 cache, 90W, 2P)	492345-B21
Intel Xeon E7430 (4 core, 2.13 GHz, 12 MB L3 cache, 90W, 2P)	492346-B21
Intel Xeon E7420 (4 core, 2.13 GHz, 8 MB L3 cache, 90W, 2P)	492347-B21
Intel Xeon L7455 (6 core, 2.13 GHz, 12 MB L3 cache, 65W, 2P)	492348-B21
Intel Xeon L7445 (6 core, 2.13 GHz, 12 MB L3 cache, 50W, 2P)	493577-B21

HP Memory

2 GB FBD PC2-5300 2 x 1 GB Kit Dual Rank Kit	397411-B21
2 GB FBD PC2-5300 2 x 1 GB Low Power Single Rank Kit	461826-B21
4 GB FBD PC2-5300 2 x 2 GB Dual Rank Kit	397413-B21
4 GB FBD PC2-5300 2 x 2 GB Low Power Dual Rank Kit	461828-B21
8 GB FBD PC2-5300 2 x 4 GB Dual Rank Kit	397415-B21
8 GB FBD PC2-5300 2 x 4 GB Low Power Dual Rank Kit	466440-B21
16 GB FBD PC2-5300 2 x 8 GB Dual Rank Kit	413015-B21
64 GB FBD PC2-5300 8x 8 GB Dual Rank Kit	495604-B21

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 300GB 6G SAS 10K SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507127-B21
HP 300GB 3G SAS 10K SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	492620-B21
HP 146GB 6G SAS 15K SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512547-B21
HP 146GB 6G SAS 10K SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507125-B21
HP 146GB 3G SAS 15K SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	504062-B21
HP 146GB 3G SAS 10K SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	418367-B21
HP 72GB 6G SAS 15K SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512545-B21
HP 72GB 3G SAS 15K SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	418371-B21

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

HP 500GB 6G SAS 7.2K rpm SFF (2.5inch) Midline 1yr Warranty Hard Drive	507610-B21
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NOTE: SAS Enterprise drives have a 3 year warranty.

NOTE: Please see the QuickSpecs for additional information:

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



Core Options

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

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

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

SATA Hot Plug SFF (2.5-inch) Entry (ETY) Drives

HP 250GB 3G SATA 5.4K rpm SFF (2.5-inch) Entry 1yr Warranty Hard Drive 460355-B21

HP 120GB 1.5G SATA 5.4K rpm SFF (2.5-inch) Entry 1yr Warranty Hard Drive 458924-B21

NOTE: Please see the [QuickSpecs](#) for additional information:

http://h18004.www1.hp.com/products/quickspecs/13021_div/13021_div.html



Additional Options

HP Insight Software

Insight Control

HP Insight Control, No Media, Electronic License including 1 year of 24x7 Technical Support and Updates T9074BAE

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

HP Insight Software Media Kit 436222-B21

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

NOTE: Licenses ship without media. The Insight Control Media Kit can be ordered separately, or can be downloaded at: <http://www.hp.com/go/insightupdates>.

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

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

NOTE: For additional License Kits, please see the QuickSpecs at:

http://h18000.www1.hp.com/products/quickspecs/12631_div/12631_div.html

HP Insight Control for Linux

HP Insight Control for Linux, No Media, 1-Server license, including one year of 24x7 Technical Support and Updates TC209A

HP Insight Control for Linux, 1-server license, including one year of 24x7 Technical Support and Updates, Electronic TC213AAE

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

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

HP Insight Control for Linux, Media pack (DVD) - No licenses included TC208A

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

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

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

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

NOTE: Customer will receive a license entitlement certificate, which must be redeemed online or via fax in order to obtain the license activation key(s). Includes



Additional Options

one year of 24 x 7 HP Software Technical Support Service.

NOTE: For additional License Kits, please see the QuickSpecs at:

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

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

HP Integrated Lights-Out Advanced for BladeSystem, No Media, Electronic License, including 1 year of 24x7 Technical Support and Updates TA851AAE

HP Integrated Lights-Out (iLO) Advanced for ProLiant BladeSystem (1) Server License/(1) Key for BladeSystem, No Media, including 1 year of 24x7 Technical Support and Updates 512488-B21

NOTE: This license allows 1 server to be managed via HP iLO Advanced for BladeSystem. 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 Service.

NOTE: For additional license kits, including electronic delivery options, please see the iLO QuickSpecs at:

http://h18000.www1.hp.com/products/quickspecs/12362_div/12362_div.html

HP Insight Control server deployment

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

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

NOTE: Licenses ship without media. The 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 Storage Controllers HP Smart Array P700m Controller with 256MB Cache Module 507925-B21

HP Smart Array P700m Controller with 512MB Cache Module 508226-B21

Optional Upgrades

512MB Battery-backed write cache upgrade 405148-B21

NOTE: Supports Smart Array P400 Controller and Smart Array P400i Controller.

Battery-backed write cache upgrade 383280-B21

NOTE: Supports Smart Array P400 Controller and Smart Array P400i Controller.

HP Smart Array P700m/512 Battery Option Kit 452348-B21



Additional Options

HP I/O Expansion 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

HP c-Class Mezzanines	HP InfiniBand Mezzanine Options	
	HP 4X DDR IB DUAL PORT Mezzanine HCA for HP BladeSystem c-Class	448262-B21
	HP Pass Thru Card for HP BladeSystem c-Class	
	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.	

HP Ultrium Tape Blades	HP StorageWorks SB1760c Tape Blade	AQ697A
	HP StorageWorks SB920c Tape Blade	AJ401A
	HP StorageWorks Ultrium 448c Tape Blade	440947-B21
	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 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:	
	http://h18000.www1.hp.com/products/quickspecs/12729_div/12729_div.html	

HP StorageWorks SB40c Storage Blade	HP StorageWorks SB40c Storage Blade	411243-B21
	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. The PCI Express Mezzanine Pass-Thru Card must be installed in mezzanine slot 3. Please see the QuickSpecs for technical specifications and additional information:	
	http://h18000.www1.hp.com/products/quickspecs/12587_div/12587_div.html	

HP Expansion Blade	HP 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: 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:	
	http://h18000.www1.hp.com/products/quickspecs/12753_div/12753_div.html	



Additional Options

HP USB and SD Options	HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver)	DC172B
	HP USB 04 Standard Keyboard	DT528A#xxx
	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 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	UK108E
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UK109E
6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UK110E



Memory

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

NOTE: For a specific memory level, the best performance is achieved using a homogenous memory configuration.

DIMM installation guidelines:

1. All memory must be PC2-5300 fully buffered DDR2 DIMMs operating at 667 MHz.
2. Both DIMM slots in a memory bank must be populated.
3. Banks must be populated in sequential alphabetic order, starting with bank A.
4. Both DIMMs in a memory bank must be identical. Install identical DIMMs as pairs only, starting with DIMM socket 1, bank A.
5. Standard memory and lower power DIMMs may be mixed within the same server, but not within the same memory bank (see #4 above).
6. Low power DIMM kits save approximately 2 watts per server DIMM, plus any datacenter power savings resulting from reduced cooling of heat dissipated from the lower server watt usage.
7. Multiple advanced memory protection (AMP) modes are supported based on fully buffered DIMM population and RBSU selection. The server blade defaults to advanced ECC.

Standard Memory

8GB (2 x 4GB) of PC2-5300, FBD DDR2-667 ECC DIMMs

Standard Memory Plus Optional Memory

Up to 116GB of 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 128GB of 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	4G	5A	6C	7E	8G
Standard	8GB	4 GB	Empty	Empty	Empty	4 GB	Empty	Empty	Empty
		9B	10D	11F	12H	13B	14D	15F	16H
		Empty	Empty	Empty	Empty	Empty	Empty	Empty	Empty
Optional	116GB	4 GB	8 GB	8 GB	8 GB	4 GB	8 GB	8 GB	8 GB
		9B	10D	11F	12H	13B	14D	15F	16H
		8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB
Maximum	128GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB
		9B	10D	11F	12H	13B	14D	15F	16H
		8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB



Memory

HP ProLiant BL680c G5 memory options:

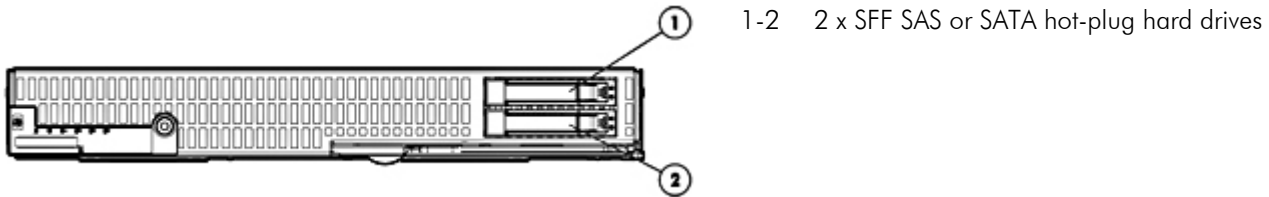
HP Memory

Following are memory options available from HP:

2 GB FBD PC2-5300 2 x 1 GB Kit Dual Rank Kit	397411-B21
2 GB FBD PC2-5300 2 x 1 GB Low Power Single Rank Kit	461826-B21
4 GB FBD PC2-5300 2 x 2 GB Dual Rank Kit	397413-B21
4 GB FBD PC2-5300 2 x 2 GB Low Power Dual Rank Kit	461828-B21
8 GB FBD PC2-5300 2 x 4 GB Dual Rank Kit	397415-B21
8 GB FBD PC2-5300 2 x 4 GB Low Power Dual Rank Kit	466440-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



Storage



Hard Drives

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

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

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

	Quantity Supported	Position Supported	Controller
300GB 6G SAS 10K	2	1-2	Smart Array P400i Controller
300GB 3G SAS 10K			
146GB 6G SAS 10K			
146GB 3G SAS 10K			
146GB 3G SAS 15K			
146GB 6G SAS 15K			
72GB 3G SAS 15K			
72GB 6G SAS 15K			

SAS Hot Plug SFF (2.5-inch) 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 (2.5-inch) 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 (2.5-inch) Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
250GB 3G SATA 5.4K	2	1-2	Smart Array P400i Controller
120GB 1.5G SATA 5.4K			

Technical Specifications

System Unit	Dimensions (H x W x D)	Full height server blade: 14.42 x 2.03 x 20.06 in (36.17 x 5.16 x 50.95 cm)
	Weight (approximate)	Maximum 21 lb (9.5 kg) (all hard drives and processors installed) Minimum 19 lb (8.6 kg) (one hard drive and processor installed)
	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	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 85% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
	Non-Operating	10 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: HP BladeSystem c3000 Enclosure QuickSpecs: http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html



Technical Specifications

HP BladeSystem c7000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html

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 (72-bit 512MB module upgrades available); ECC protection, battery-backed, and transportable
	Logical Drives Supported	Up to 32 logical drives
	Maximum Logical Drive Capacity	1.0 TB (2 x 500 GB) SAS 1.0 TB (2 x 500 GB) SATA
	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

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 2000 Mb/s full duplex only (theoretical maximum)
	IEEE Compliance	802.1p, 802.1Q, 802.3, 802.3ad, and 802.3x
	Standard Features	<ul style="list-style-type: none">● 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) v2.1● 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



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 per port full duplex only (theoretical maximum value)
	IEEE Compliance	802.1p, 802.1Q, 802.3, 802.3ad, and 802.3x
	Standard Features	<ul style="list-style-type: none">• TCP/IP offload engine (TOE) for Microsoft Windows• iSCSI boot• 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) v2.1• 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

HP Integrated Lights-Out 2 (iLO 2) integrated on system board	Architecture	32-bit PCI-based health and remote management ASIC
	Processor	32-bit RISC processor core running at 66MHz
	Upgradeability	Option firmware upgradeable via Flash ROM
	Operating System Support	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 (32bit and 64bit)
		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	
	Microsoft Windows XP Professional Edition	
	Microsoft Windows Vista Business and Ultimate Editions	
	Red Hat Enterprise Linux Desktop 5.00	
	SUSE Linux Enterprise Desktop 11	
	SUSE Linux Enterprise Desktop 10	
Client Browser Support	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	Telnet, Secure Shell and serial port access	
	Secure Socket Layer	
	Secure Shell version 2 (Password and certificate)	



Technical Specifications

Security	Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, CLP and XML scripting interface RC4 encryption of video
Directory Support Services	Active Directory v1.0 (Windows 2003)
Driver Support	Health Driver (HP ProLiant iLO 2 Management Controller Driver) iLO Management Channel Interface Driver
Management protocols supported	SNMP 2, IPMI 2.0 (KCS interface), DMTF Server Management Command Line Protocol Specification (SM CLP), DMTF Web Services Management Specification (WS Management)

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.
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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 (1,000 MB). Actual formatted capacity is less.

