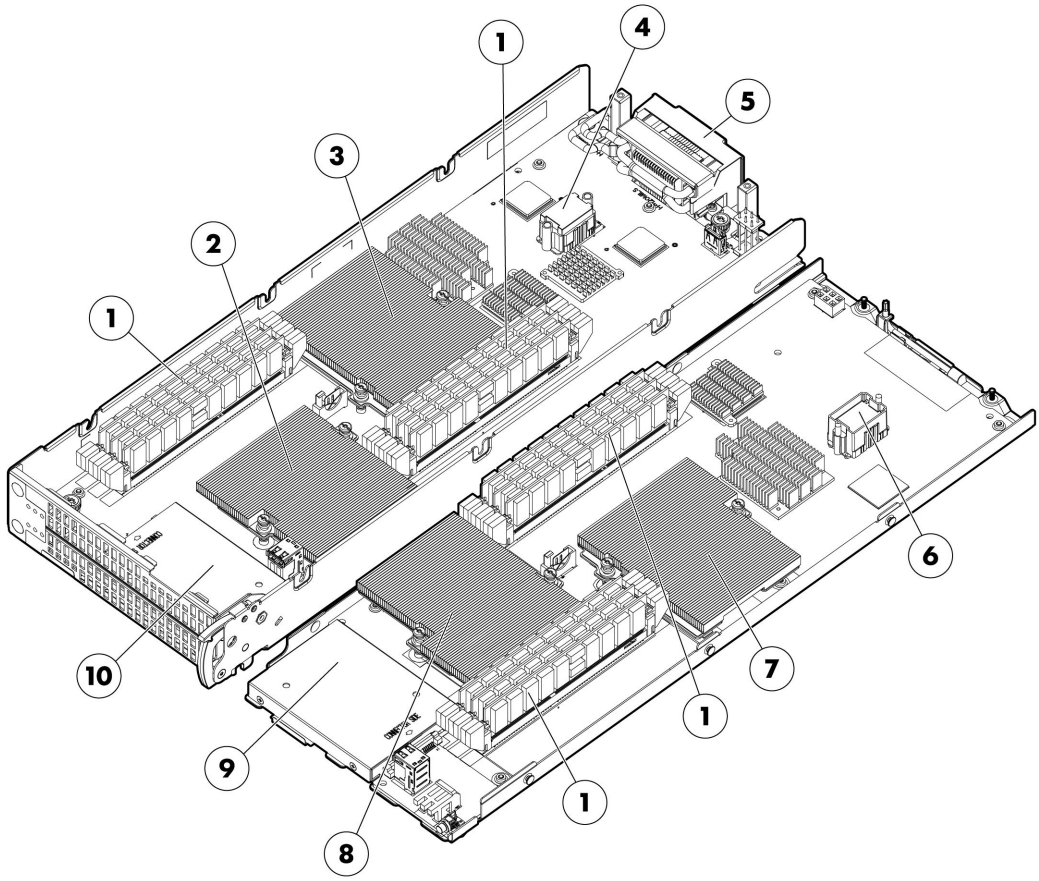
Overview



HP ProLiant BL2x220c Generation 7 (G7) Server Blade

1. Six (6) PC3-10600 (DDR3) Registered or Unbuffered DIMM Memory Slots per node
2. Intel® Xeon® 5600 series processor
3. Intel® Xeon® 5600 series processor
4. Server Interconnection
5. GBX Connector
6. Server Interconnection
7. Intel® Xeon® 5600 series processor
8. Intel® Xeon® 5600 series processor
9. One (1) small form factor (SFF) non-hot plug drive bay
10. One (1) small form factor (SFF) non-hot plug drive bay

What's New

- Support for HP 500GB 3G SATA 7.2K rpm SFF (2.5-inch) Non-hot Plug Entry 1y Wty Hard Drive

At A Glance

This document covers the HP ProLiant BL2x220c G7 server blade only. For more information on HP BladeSystems c-Class Enclosures

Overview

and HP BladeSystem c-Class Interconnect and Mezzanine Components, please see the following:

HP BladeSystem c-Class c7000 Enclosure QuickSpecs:
http://h18004.www1.hp.com/products/quickspecs/12810_div/12810_div.html

HP BladeSystem c-Class Interconnect and Mezzanine Components:
http://h18004.www1.hp.com/products/blades/components/c-class-interconnects.html
http://h18004.www1.hp.com/products/blades/components/c-class-adapters.html

The HP ProLiant BL2x220c provides maximum 2-socket x86 server blade density with benchmark leading power efficiency. HP ProLiant BL2x220c server blade includes 2 server nodes per blade providing up to 256 processor sockets/1536 processor cores in 40U of rack space. All specifications listed per node (2 nodes per blade chassis).

HP ProLiant BL2x220c G7 includes:

- **Processor**:
  - Up to two (2) Intel® Xeon® 5600 Series processors
  - Intel® 5500 chipset
- **Memory**:
  - Six (6) DIMM slots
  - Up to 96GB of memory with PC3-10600 or PC3-8500 (DDR3-1333) Registered DIMMs, or up to 24GB memory with PC3-10600 (DDR3-1333) Unbuffered DIMMs
  - Advanced ECC memory support
- **Internal Drive Support**:
  - 1 non-hot plug small form factor SATA per node (SATA: 500GB)
    NOTE: SAS and/or SATA drives cannot be mixed within the server.
- **Network Controller**:
  - Embedded Dual-port NC362i Gigabit Server Adapter
  - Embedded One-port NC543i 1-port 4xQDR IB/10Gb Flex-10 Adapter
  - One (1) additional 10/100 network adapter dedicated to iLO 3 Management
- **Mezzanine Support**:
  - No mezzanine slots in the BL2x220c G7 Server Blade.
- **Internal USB Support**:
  - One (1) internal USB 2.0 connector for security key devices and USB drive keys
  - One (1) optional internal SD-HC card slot
    NOTE: Internal USB 2.0 not available when SD-HC card slot option is installed
- **Form Factor**:
  - Half height c-Class Server Blade
- **Infrastructure Management**:
  - This server blade requires the latest version of the Onboard Administrator firmware. This firmware release may also require other subsystem firmware upgrades. For information on the latest firmware versions, please see the Blades Firmware Maintenance website at: http://h18004.www1.hp.com/products/blades/components/c-class-compmatrix.html
  - HP Integrated Lights-Out 3 (iLO 3) management processor for simplified server setup, health monitoring and recovery, power and thermal control, and lights-out remote administration.
  - HP Insight Control, 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. Insight Control support both Windows and Linux-based central management server
  - HP Insight Dynamics 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.

Overview

- **Operating Systems**:
  - Supports Windows, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, Oracle Solaris Operating Systems
- **Enclosures**:
  - The BL2x220c G7 supports the following enclosure:
    - The HP BladeSystem c7000 rack enclosure is 10U high and holds up to 16 ProLiant BL2x220c Blades (32 server nodes) plugged vertically.
      NOTE: Ten (10) fans are required in the c7000 enclosure.
      NOTE: N + N power supply redundancy is not supported. N + 1 power supply redundancy is supported.
      NOTE: The BL2x220c G7 is not supported in the c3000 enclosure.
  - Server blades, storage blades, interconnect modules, power supplies, fans, and redundant Onboard Administrator modules are all designed to fit into the c7000 enclosures
  - 95 Watt Processor Configuration Requirements and Limitations
    - When 95W processors are installed the following configuration requirements and limitations apply:
    - All six (6) DIMM slots must be populated on each server node.
    - Six (6) enclosure power supplies are required.
    - Ten (10) fans are required in the c7000 enclosure.
    - N + N power supply redundancy is NOT supported. N + 1 power supply redundancy is supported.
  - For additional enclosure information, please see:
    http://h18004.www1.hp.com/products/blades/components/enclosures/c-class/index.html
- **Warranty**:
  - This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for one year 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 Next Day Parts replacement, 0-Years Labor, 0-Years Onsite support. Additional information regarding worldwide limited warranty and technical support is available at:
    http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html.

Standard Features

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

Processor

NOTE: If selecting a 95W processor configuration, there are specific enclosure configuration requirements and limitations. Please see page 3 for these requirements and limitations.

Six-Core Processor Option Kits

Intel® Xeon® Processor X5675 (3.06GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3)
Intel® Xeon® Processor X5670 (2.93GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3)
Intel® Xeon® Processor X5660 (2.80GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3)
Intel® Xeon® Processor X5650 (2.66GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3)
Intel® Xeon® Processor E5649 (2.53GHz/6-core/12MB/80W, DDR3-1333, HT, Turbo 1/1/1/1/2/2)
Intel® Xeon® Processor E5645 (2.40GHz/6-core/12MB/80W, DDR3-1333, HT, Turbo 1/1/1/1/2/2)
Intel® Xeon® Processor L5640 (2.26GHz/6-core/12MB/60W, DDR3-1333, HT, Turbo 2/2/3/3/4/4)

Four-Core Processor Option Kits

Intel® Xeon® Processor X5672 (3.20GHz/4-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/3/3)
Intel® Xeon® Processor E5640 (2.66GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2)
Intel® Xeon® Processor E5620 (2.40GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2)
Intel® Xeon® Processor L5630 (2.13GHz/4-core/12MB/40W, DDR3-1066, HT, Turbo 1/1/2/2)

NOTE: HT indicates that the processor model supports Intel® Hyper-Threading Technology.
NOTE: Turbo indicates the maximum potential frequency increment when using Intel® Turbo Boost Technology, with 6, 5, 4, 3, 2, and 1 cores active.
NOTE: DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed.
NOTE: For the Intel® 5600 Series, the letter preceding the model number indicates the performance/wattage of the processor. "X" denotes High Performance/Wattage; "E" denotes Enterprise Performance/Wattage (Mainstream); and "L" denotes Lower Wattage.

Upgradeability

2 processors per server node standard

Cache Memory

12MB shared L3 cache

Chipset

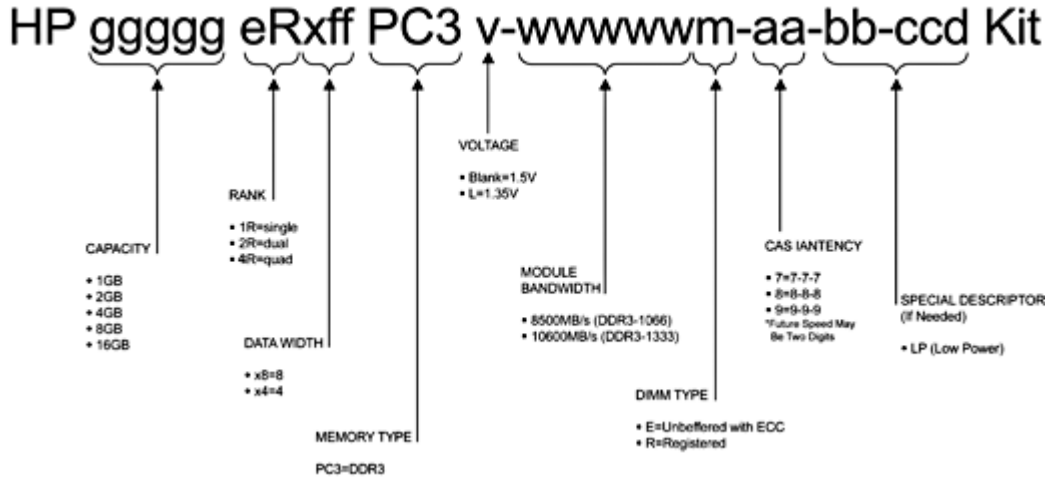
Intel® 5500 chipset

Memory Protection

Advanced ECC (multi-bit error protection)
Memory Mirroring Mode
Memory Lock-Step Mode
Memory Online Spare Mode supported on Xeon 5600 Series processors

Standard Features

Memory	Type	PC3-10600 (DDR3-1333) Registered or Unbuffered DIMMS
	Standard	24 GB (6 x 4GB) per server node
	Maximum (RDIMM)	96 GB (6 x 16GB) per server node
	Maximum (UDIMM)	24 GB (6 x 2GB) per server node



Network Controller	Embedded NC362i Dual Port Gigabit Server Adapter Embedded One-port NC543i 1-port 4xQDR IB/10Gb Flex-10 Adapter One (1) additional 10/100 network adapter dedicated to iLO 3 Management per server node		
Integrated Manageability	HP Integrated Lights-Out 3 (iLO 3) management processor		
Storage Controller	HP Embedded SATA Controller		
Maximum Internal Storage	Non-Hot Plug Serial ATA (SATA)	500GB SATA	1 x 500GB Serial ATA (Per server node)
	NOTE: SAS and/or SATA, drives cannot be mixed within the server.		
Graphics	Graphics are integrated in iLO 3.		

Standard Features

Graphics Resolution Supported	Resolution Color Depths	Depths 1920x1200, 64K, 256, 16 1600x1280, 64K, 256, 16 1280 x 1024, 16.7M, 64k, 256,16 1024 x 768, 16.7M, 64k, 256,16 800 x 600, 16,7M, 64k, 256, 16 640 x 480, 16,7M, 64k, 256, 16
		NOTE: Maximum resolution available via HP Integrated Lights-Out 3 (iLO 3) remote console is 1920 x 1200.
Partner Blade Support		Partner blades such as the PCI Expansion Blade, Tape Blade and SB40c are not supported on the BL2x220c.
Onboard Administrator		The BL2x220c is supported with Onboard Administrator firmware version 3.11 or later. This firmware release may also require other subsystem firmware upgrades please consult: http://h18004.www1.hp.com/products/blades/components/c-class-compmatrix.html for more information.
HP Virtual Connect		HP Virtual Connect is an interconnection option for HP BladeSystem c-Class that simplifies server connectivity to data and storage networks, and reduces costs. Unique HP Flex-10 and FlexFabric technologies make maximum use of network bandwidths, provide dynamic tuning and enable extreme flexibility to meet individual server and infrastructure requirements. HP Virtual Connect Enterprise Manager (VCEM) provides a central console to administer network connections and workloads for thousands of servers. For more information on Virtual Connect Ethernet, Fibre Channel, Converged Network and management options see: www.hp.com/go/virtualconnect
HP Insight management software	HP Insight Foundation	Managing the growing number of servers can be complex and expensive for your organization. IT managers need to address changing business needs with tools that meet the challenges of managing today's complex Datacenters. HP provides management solutions that are designed to simplify a server's installation, configuration and maintenance throughout the entire server lifecycle. This provides the customer with higher levels of operational efficiency and highly reliable systems: www.hp.com/go/foundation. The foundation pack includes: • HP SmartStart • HP Management DVD • HP ProLiant Smart Update Firmware DVD • SmartStart version supported (minimum): SmartStart 8.60 http://www.hp.com/servers/smartstart **NOTE:** In an effort to support reducing our environmental impact, the HP Insight Foundation Suite for ProLiant media will be available as a selectable option for this server at time of order of a Factory Integrated Model. This will allow customers to order the number of media kits that best meet their needs and eliminate receiving unnecessary duplicate media.
	HP Integrated Lights-Out	HP Integrated Lights-Out (iLO) simplifies server setup, health monitoring,

Standard Features

(iLO)	power and thermal control, and lights-out remote administration of ProLiant ML, DL, and BL servers. HP iLO functions without additional software and can be accessed from any location via a web browser. HP iLO works hand-in-hand with HP Systems Insight Manager, Insight Control suites, and Insight Dynamics for ProLiant, helping customers unleash the value of the ProLiant platform and deliver the highest possible quality of IT service. For more information, visit: www.hp.com/go/iLO
HP Insight Control	HP Insight Control, 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. Insight Control installs and licenses software modules that are integrated into HP System Insight Manager. Two Insight Control suites are available, to serve environments requiring either a Linux-based or a Windows-based central management server: HP Insight Control for Linux, and HP Insight Control. See www.hp.com/go/insightcontrol HP Insight Control 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	HP Insight Dynamics for ProLiant, a product option, is advanced infrastructure management software that enables IT staff to instantly adjust their environments to meet dynamic business demands by provisioning, optimizing and protecting complex infrastructure in minutes. It's a powerful toolkit, integrated-by-design, that accelerates complex technology projects and simplifies daily operations, transforming data center economics. With Insight Dynamics IT professionals can plan capacity and power continuously, balance workloads across physical and virtual resources, and ensure cost-effective high availability. It also enables IT organizations to provision infrastructure consistently and automatically from pools of shared resources using a self-service portal. Resources provisioned can range from a single virtual machine to complex multi-tier environments and their associated physical and virtual resource requirements. In addition to the previous functional benefits, it also provides a cost-effective disaster recovery for physical and virtual environments that works with HP Continuous Access software for both the Enterprise Virtual Array and the XP storage array allowing application environments to be reactivated in minutes with the touch of a button to a remote location. **NOTE:** For more information, visit: http://www.hp.com/go/insightdynamics **NOTE:** You need to have two licenses of each Insight Software product (including ProLiant Onboard Administrator, Insight Control and Insight Dynamics) for using these products on double density server blades like ProLiant BL2x220c G7.

Standard Features

High Performance Clusters	HP Cluster Platforms	HP Cluster Platforms are specifically engineered, factory-integrated large-scale ProLiant clusters optimized for High Performance Computing, with a choice of servers, networks and software. Operating system options include specially priced offerings for Red Hat Enterprise Linux and SUSE Linux Enterprise Server, as well as Microsoft Windows HPC Server. A Cluster Platform Configurator simplifies ordering. http://www.hp.com/go/clusters
	HPC Interconnects	High Performance Computing (HPC) interconnect technologies are available for this server as part of the HP Cluster Platform portfolio. These high-speed InfiniBand and Gigabit interconnects are fully supported by HP when integrated within an HP cluster. Flexible, validated solutions can be defined with the help of configuration tools. http://www.hp.com/techservers/clusters/ucp/index.html
	HP Cluster Management Utility	HP Cluster Management Utility (CMU) is an HP-licensed and HP-supported suite of tools that are used to manage large-scale Linux ProLiant systems. CMU includes software for the centralized provisioning, management and monitoring of nodes. CMU makes the administration of clusters user friendly, efficient, and effective. http://www.hp.com/go/cmu
	HP HPC Linux Value Pack	HP HPC Linux Value Pack (Value Pack) is an HP-licensed and HP-supported specially priced software bundle for the development and deployment of applications on HPC Cluster Platforms. Value Pack includes the Platform HPC Enterprise Edition suite of tools including the LSF workload scheduler, the HP-MPI parallelization library. Also included are the HP Unified Parallel C compiler and the HP Shmem library, as well as the execution environments for the libraries and compiler. HP HPC Linux Value Pack

Operating Systems and Virtualization Software Support for ProLiant Servers

Microsoft Windows Server
Red Hat Enterprise Linux (RHEL)
SUSE Linux Enterprise Server (SLES)
Oracle Solaris

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

Availability

- Two (2) embedded Gigabit Ethernet adapters per server node for redundant LAN connections
- One (1) embedded QDR InfiniBand/10GbE adapter per server node
- Advanced ECC Memory - can correct a multi-bit error (up to 4 bits) that occurs within one memory chip
- Network adapter teaming (network fault tolerance, transmit load balancing, switch-assisted load balancing)
- Emergency Recovery ROM

Industry Standard Compliance

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

Standard Features

Security

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

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 Simple Configurator

SCE is a guided self service tool to help sales and non technical people provide customers with initial configurations in 3 to 5 minutes. You may then send the configuration on for configuration help, or use in your existing ordering processes. If you require "custom" rack configuration or configuration for products not available in SCE, please contact HP's Customer Business Center or an Authorized Partner for assistance. http://www.hp.com/products/configurator

Service and Support

Service and Support

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

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

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

Optimized Care Package

Supports maintaining servers at optimum performance availability

HP Installation and Startup Service for HP BladeSystem c-Class Infrastructure for c3000/c7000 enclosure
Provides for the installation and startup of a BladeSystem c3000 Infrastructure in a single blade enclosure including hardware and software, including deployment of OS, HP SIM, RDP, RDP, PMP and VPM. http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-5964ENW

3-Year HP Critical Advantage L3 for c3000/c7000 enclosure + 3-Year HP Critical Advantage for Blade server
Provides end-to-end infrastructure support solution for business critical applications running on virtualized/x86 infrastructures, enabling the customers to cost effectively build, operate, and continuously improve their IT environment. http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA3-1772ENW

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

Service and Support

Standard Care Package

Package that maintains high level of server availability

HP Installation and Startup Service for HP BladeSystem c-Class Infrastructure for c3000/c7000 enclosure
Provides for the installation and startup of a BladeSystem c3000 Infrastructure in a single blade enclosure including hardware and software, including deployment of OS, HP SIM, RDP, RDP, PMP and VPM.
http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-5964ENW

HP Installation and Startup Service for HP BladeSystem c-Class Enhanced Network
HP Provides for the configuration and testing of BladeSystem Ethernet interconnect switches to facilitate proper implementation of network protocols and access to advanced features.
http://h20195.www2.hp.com/V2/GetPDF.aspx/4aa0-5969ENW

3-Year, HP 6 hour Hardware Support Onsite Call-to-Repair Service for c3000/c7000 enclosure + 3-Year, HP 6 hour Hardware Support Onsite Call-to-Repair Service for Blade server
Provides an IT manager with a team of support specialists who will quickly begin troubleshooting the system to help return the hardware to operating condition within 6 hours of the initial service request to the HP Global Solution Center.
http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EN.pdf

3-Year , HP 24x7 Software Support for Insight Control
Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers.
http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6645EEE.pdf

1-Year HP Proactive Select 30 Credit
Provides a flexible way to purchase HP best-in-class consultancy and technical services
http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA2-3842ENN.pdf

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

Basic Care Package

Delivers minimum recommended support service level

HP Installation and Startup Service for HP BladeSystem c-Class Infrastructure for c3000/c7000 enclosure
Provides for the installation and startup of a BladeSystem c3000 Infrastructure in a single blade enclosure including hardware and software, including deployment of OS, HP SIM, RDP, RDP, PMP and VPM.
http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-5964ENW

3-Year, HP 24x7 4 hour Response, Hardware Support Onsite Service for c3000/c7000 enclosure + 3-Year, HP 24x7 4 hour Response, Hardware Support Onsite Service for Blade server
Provides you with rapid remote support and if required an HP authorized representative who will arrive on site any time and day of the year to begin hardware maintenance service within 4 hours of the service request being logged.
http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EEE

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

Service and Support

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers.
http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6645EEE.pdf

1-Year HP Proactive Select 10 Credit
Provides a flexible way to purchase HP best-in-class consultancy and technical services
http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA2-3842ENN.pdf

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

Insight Remote Support

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

For more information

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

Models

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

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

NOTE: The BL2x220c supports 2 server nodes in each Blade. All options listed are per server node.

HP ProLiant BL2x220c G7 X5670 2x2P 48GB-R Non-hot Plug SATA 500GB SFF Server 661103-B21 **HP ProLiant BL2x220c G7 E5649 2x2P 48GB-R Non-hot Plug SATA 500GB SFF Server** 661101-B21 **HP ProLiant BL2x220c G7 E5640 2x2P 48GB-R Non-hot Plug SATA 500GB SFF Server** 661102-B21 **HP ProLiant BL2x220c G7 L5640 2x2P 48GB-R Non-hot Plug SATA 500GB SFF Server** 661104-B21	**Processor(s)** Two of the following depending on model	(2) Intel® Xeon® processor E5649 (2.53GHz/6-core/12MB/80W, DDR3-1333, HT, Turbo1/1/1/1/2/2) (2) Intel® Xeon® processor E5640 (2.66GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) (2) Intel® Xeon® processor X5670 (2.93GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) (2) Intel® Xeon® processor L5640 (2.26GHz/6-core/12MB/60W, DDR3-1333, HT, Turbo 2/2/3/3/4/4)
	Cache Memory	12MB L3 cache
	Memory	24 GB (6 x 4GB) PC3-10600 (DDR3-1333) Registered DIMMs **NOTE:** Actual memory speed is limited by the maximum supported processor memory speed.
	Network Adapter	Embedded NC362i Dual Port Gigabit Server Adapter Embedded Single Port NC543i 4xQDR IB/10Gb Flex-10 Adapter and one (1) additional 10/100 network adapter dedicated to iLO 3 Management
	Storage Controller	HP Embedded SATA Controller
	Hard Drives	One (1) 500GB SATA Non-Hot Plug Hard Drive
	Internal Storage	SATA: 500GB Maximum
	Optical Drive	None
	Form Factor	Up to 16 half-height blades (32 server nodes) supported in HP BladeSystem c7000 Enclosure

Configuration Information - Factory Integrated Models

NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on CTO product offerings and requirements.
NOTE: HP does not allow factory integration of options into standard models listed above.
Configure-to-order server blades must start with a CTO Blade.
NOTE: FIO indicates that this option is a Factory Installable Option.

Step 1: Base Server Blade Configuration (Select CTO Server, Node A and Node B Servers)

Models	HP ProLiant BL2x220c G7 Configure-to-order Server	605069-B21
	HP ProLiant BL2x220c G7 Configure-to-order Node-A Server	611118-B21
	HP ProLiant BL2x220c G7 Configure-to-order Node-B Server	611119-B21
	NOTE: When ordering a BL2x220c all three parts CTO Server, Node-A Server and Node-B Server must be included on the order. The Server A and Server B blades allow for configuration of each server node with CPUs, Memory and other options. It is not possible to order any of these 3 parts independently.	
	Configurable Model ships with:	
	Embedded 1GbE NC362i Dual-port Gigabit Server Adapter per server node, Embedded NC543i Single-port 4xQDR IB/10Gb Flex-10 Adapter per server node plus one (1) additional 10/100 network adapter dedicated to iLO 3 Management	
	Integrated Lights-Out 3 Standard Blade Edition	

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

HP Processors	**NOTE:** Two (2) processors per server node required.	
	NOTE: Processor kits listed below include 2 processors per kit.	
	NOTE: If selecting a 95W processor configuration, there are specific enclosure configuration requirements and limitations. Please see page 3 for these requirements and limitations.	
	Six-Core Processor Option Kits	
	HP BL2x220c G7 Intel® Xeon® X5675 (3.06GHz/6-core/12MB/95W) FIO Processor Kit	632682-L21
	HP BL2x220c G7 Intel® Xeon® X5670 (2.93GHz/6-core/12MB/95W) FIO Processor Kit	611120-L21
	HP BL2x220c G7 Intel® Xeon® X5660 (2.80GHz/6-core/12MB/95W) FIO Processor Kit	611121-L21
	HP BL2x220c G7 Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W) FIO Processor Kit	611122-L21
	HP BL2x220c G7 Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W) FIO Processor Kit	632684-L21
	HP BL2x220c G7 Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W) FIO Processor Kit	632685-L21
	HP BL2x220c G7 Intel® Xeon® L5640 (2.26GHz/6-core/12MB/60W) FIO Processor Kit	611127-L21
	Four-Core Processor Option Kits	
	HP BL2x220c G7 Intel® Xeon® X5672 (3.20GHz/4-core/12MB/95W) FIO Processor Kit	632683-L21
	HP BL2x220c G7 Intel® Xeon® E5640 (2.66GHz/4-core/12MB/80W) FIO Processor Kit	611123-L21
	HP BL2x220c G7 Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W) FIO Processor Kit	611125-L21
	HP BL2x220c G7 Intel® Xeon® L5630 (2.13GHz/4-core/12MB/40W) FIO Processor Kit	611128-L21

Configuration Information - Factory Integrated Models

HP Memory	**NOTE:** 4 DIMMs minimum per server node required on 80W or lower processors. 6 DIMMs minimum per server node required on 95W processors. **NOTE:** Must choose four memory part numbers below for 80W processors or lower. Must choose six memory part numbers below for 95W processors.	
	Registered DIMMs (RDIMMs)	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
	HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
	HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
	HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit **NOTE:** Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.	604504-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3L-10600 (DDR3-1333) Unbuffered CAS-9 Low Power Memory Kit	619488-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit **NOTE:** Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.	604506-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500662-B21
	HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
	HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit	627812-B21
	Unbuffered with ECC DIMMs (UDIMMs)	
	HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-B21
	NOTE: All DDR3 memory option kits consist of one DIMM per kit. **NOTE:** PC3L is a low voltage memory.	

Step 3: Choose Additional Options for Factory Integration (One per server node)

Hard Drives	**SATA Non-Hot Plug SFF (2.5-inch) Entry (ETY) Drives**	
	HP 500GB 3G SATA 7.2K rpm SFF (2.5-inch) Non-hot plug Entry 1yr Warranty Hard Drive **NOTE:** Supports server nodes A and B (PN 611118-B21 and 611119-B21) referenced in Step1of Configure to Order section above. **NOTE:** SAS and/or SATA drives cannot be mixed within the server.	628033-B21

NOTE: For additional options, including server blade enclosures interconnect and mezzanine options and power subsystem options; please see the options section below; or the following:
HP BladeSystem c-Class Enclosures QuickSpecs:
HP BladeSystem c-Class c7000 Enclosure QuickSpecs:
http://h18004.www1.hp.com/products/quickspecs/12810_div/12810_div.html
and HP BladeSystem c-Class Interconnect and Mezzanine Components:
http://h18004.www1.hp.com/products/blades/components/c-class-interconnects.html
http://h18004.www1.hp.com/products/blades/components/c-class-adapters.html

Core Options

HP Memory	**Registered DIMMs (RDIMMs)**	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
	HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
	HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
	HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit **NOTE:** Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.	604504-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3L-10600 (DDR3-1333) Unbuffered CAS-9 Low Power Memory Kit	619488-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit **NOTE:** Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.	604506-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500662-B21
	HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
	HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit	627812-B21
	Unbuffered with ECC DIMMs (UDIMMs)	
	HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-B21
	NOTE: All DDR3 memory option kits consist of one DIMM per kit. **NOTE:** Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient. **NOTE:** PC3L is a low voltage memory.	
HP Hard Drive	**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. **NOTE:** Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details. **NOTE:** SAS and/or SATA drives cannot be mixed within the server. **NOTE:** One non-hot plug drive per server node.	
	SATA Non-Hot Plug SFF (2.5-inch) Entry (ETY) Drives	
	HP 500GB 3G SATA 7.2K rpm SFF (2.5-inch) Non-hot plug Entry 1yr Warranty Hard Drive	628033-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html **NOTE:** One non-hot plug drive per server node.	

Additional Options

HP Insight software	**HP Insight Control**	
	HP Insight Control including 1yr 24x7 Technical Support and Updates Electronic License	T9074BAE
	NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single activation key. **NOTE:** Customer will receive a license entitlement certificate. 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:** Licenses ship without media. The Insight Software Media Kit can be ordered separately, or can be downloaded at: http://www.hp.com/go/insightcontrol (click on Download button). **NOTE:** For additional license options please see the Insight Control QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12631_div/12631_div.html	
	HP Insight Software Media Kit	436222-B21
	NOTE: Insight Software DVD media without licenses. Contains Insight software licensed by Insight Control and Insight Dynamics. Uses an integrated installer to perform quick and accurate software installation and updates.	
	HP Insight Control for Linux	
	HP Insight Control for Linux including 1yr 24x7 Support Electronic License	TC213AAE
	NOTE: This part number can be purchased as a single license or as multiple licenses with a single activation key. Customer will receive a license entitlement certificate via e-mail. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service. **NOTE:** Electronic LTUs are only available through limited points of sales; if not available, order a printed license entitlement certificate instead.	
	HP Insight Control for Linux including 1yr 24x7 Support Single Server License	TC209A
	HP Insight Control for Linux Media Kit	TC208A
	NOTE: This optional Media pack DVD contains the ISO image for HP Insight Control for Linux, HP Systems Insight Manager, HP Insight Control power management, HP Insight Control virtual machine management, and an integrated installer. Servers must be acquired separately. **NOTE:** This Media pack is optional because the latest ISO image and latest updates may be downloaded at no cost from: http://www.hp.com/go/ic-linux (click on Download button). **NOTE:** Media pack DVD contains the ISO image for HP Insight Control for Linux, HP Systems Insight Manager, HP Insight Control power management, HP Insight Control virtual machine management, and an integrated installer. Servers must be acquired separately.	
	NOTE: Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: http://www.hp.com/go/ic-linux (click on Download button). **NOTE:** Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single set of activation keys. **NOTE:** For additional License Kits, including electronic licensing options, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/13019_div/13019_div.html	
	HP iLO Advanced for BladeSystem	

Additional Options

	HP iLO Advanced for BladeSystem including 1yr 24x7 Support Electronic License	TA851AAE
	HP iLO Advanced for BladeSystem including 1yr 24x7 Support Single Server License	512488-B21
	NOTE: Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: http://www.hp.com/go/insightupdates. **NOTE:** Customer will receive a license entitlement certificate, which must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service **NOTE:** For additional license kits, including electronic delivery options, please see the ProLiant 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 including 1yr 24x7 Support Electronic License	T9082AAE
	NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single activation key. **NOTE:** Customer will receive a license entitlement certificate. 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:** Licenses ship without media. The Insight Software Media Kit can be ordered separately, or can be downloaded at: http://www.hp.com/go/insightcontrol (click on Download button). **NOTE:** For additional license options please see the Insight Control QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12631_div/12631_div.html	
	HP Insight Control Server Deployment including 1yr 24x7 Support Single Server License	452151-B21
	NOTE: This license allows 1 server to be deployed. 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 Insight Rapid Deployment software QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11053_div/11053_div.html	
High Performance Clusters	**HP Insight Cluster Management Utility**	
	HP Insight Cluster Management Utility Compute Node Flexible License **NOTE:** This part number can be used to purchase one certificate for multiple licenses with a single activation key. Each license is for one node (server). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key.	QL803B
	HP Insight Cluster Management Utility License and Media **NOTE:** Order a minimum of one license per cluster to purchase media including software and documentation, which will be delivered to the customer, and also licenses CMU management. No license key is delivered or required.	BD477A
	HP Insight Cluster Management Utility Flexible License with 3 years of 24x7 updates and technical support **NOTE:** These part numbers can be used to purchase one certificate for multiple licenses and support with a single activation key. Each license is for one node (server). Customer will receive a printed end user license agreement and license entitlement certificate via	BD476A

Additional Options

	physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key. Customer also will receive a support agreement. **NOTE:** For additional license kits please see the QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/12612_div/12612_div.html	
	HP HPC Linux Value Pack	
	HP High Performance Computing Linux Value Pack 1 Processor Flexible License **NOTE:** This part number can be used to purchase one certificate for multiple licenses with a single activation key. Each license is for one socket (a.k.a. processor). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key.	TC293B
	HP High Performance Computing Linux Value Pack Media Kit **NOTE:** This part number can be used to purchase media including software and documentation, which will be delivered to the customer. **NOTE:** For additional license kits please see the QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/13485_div/13485_div.html	TC294A
HP InfiniBand Interconnects	HP 4X QDR InfiniBand Switch Module for c-Class BladeSystem **NOTE:** These InfiniBand Interconnects are supported on the NC543i 1-port 4xQDR IB/10Gb Flex-10 Adapter. **NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12586_div/12586_div.html	489184-B21
HP Ethernet Interconnects	HP 1/10Gb-F Virtual Connect Ethernet Module for c-Class BladeSystem	447047-B21
	HP 1GB Ethernet Pass-Thru Module for c-Class BladeSystem	406740-B21
	Cisco Catalyst 1/10GbE 3120X Blade Switch	451439-B21
	Cisco Catalyst Blade Switch 3020 for HP c-Class BladeSystem	410916-B21
	Cisco Catalyst 1GbE 3120G Blade Switch	451438-B21
	HP GbE2c Layer 2/3 Ethernet Blade Switch	438030-B21
	HP 6120G/XG Ethernet Blade Switch	498358-B21
	NOTE: The interconnects listed above are supported with the NC362i Gigabit Server Adapter but are not supported with the NC543i 4xQDR IB/10Gb Flex -10 Adapter.	
	HP 10GbE Ethernet Pass-Thru Module for c-Class BladeSystem	538113-B21
	HP Virtual Connect Flex-10 10Gb Ethernet Module for c-Class BladeSystem	455880-B21
	HP Virtual Connect FlexFabric 10Gb/24-port Module for c-Class BladeSystem	571956-B21
	HP 6120XG Blade Switch	516733-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: www.hp.com/products/blades/components/c-class-components.html	

Additional Options

HP USB and SD Options	HP 4GB Secure Digital High Capacity Flash Media Kit	580387-B21
	NOTE: Blank SD media devices are supported for use with ProLiant iVirtualization. SD media must be installed in the internal slot of the ProLiant server. Learn more at: http://www.hp.com/go/proliantvirtualization	
	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	
	HP 3 year 4 hour 13x5 BL2x2xxc Server Blade Hardware Support	UK144E
	HP 3 year 4 hour 24x7 BL2x2xxc Server Blade Hardware Support	UK145E
	HP 3 year 6 hour 24x7 Call to Repair BL2x2xxc Server Blade Hardware Support	UK146E

Memory

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

Memory Population Guidelines

Some DIMM installation guidelines are summarized below:

- For the HP ProLiant BL2x220c G7 server with six (6) memory slots per node:
  - There are three (3) channels per processor; six (6) channels per server node.
  - There is one (1) DIMM slot for each memory channel; six (6) total slots per node.
  - Memory channel 1 consists of one (1) DIMM that is closest to the processor
  - Memory channel 3 consists of the one (1) DIMM that is furthest from the processor
- BL2x220c G7 requires a minimum 2 DIMMs per cpu (4 per server node) to be populated when using 80W, 60W or 40W processors. 3 DIMMs per cpu must be populated when using 95W processors (6 per server node).
- Do not mix Unbuffered memory (UDIMMs) with Registered memory (RDIMMs).
- Do not install DIMMs if the corresponding processor is not installed
- To maximize performance, balance the total memory capacity between all installed processors
- It is not required, but it is recommended to load the channels similarly if possible
- Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.
- If mixing DIMM voltage is a requirement, please note that the DIMMs will run at 1.5V since all 1.35V are capable of supporting 1.5V operations

DIMM slot/capacity/populated speed table											
DIMM Type	Registered DIMMS (RDIMMs)								Unbuffered with ECC DIMMs (UDIMMs)		
DIMM Rank	Single Rank (1R)	Dual Rank (2R)					Quad Rank (4R)		Single Rank (1R)	Dual Rank (2R)	
DIMM Capacity	4GB	2GB	4GB	8GB	8GB	16GB	4GB	16GB	1GB	2GB	4GB
DIMM Native Speed (MHz)	1333	1333	1333	1066	1333	1333	1066	1066	1333	1333	1333
Voltage	LV/Reg	Reg	Reg	Reg	LV/Reg	LV	Reg	Reg	Reg	Reg	Reg
	SLOTS THAT CAN BE POPULATED										
6 slot servers	6	6	6	6	6	6	6	6	6	6	6
	MAXIMUM CAPACITY (GB)										
	24	12	24	48	48	96	24	96	6	12	24
	POPULATED DIMM SPEED (MHz)										
1 DIMM Per Channel	1333	1333	1333	1066	1333	1333	1066	1066	1333	1333	1333

NOTES:

- Mixing DIMM speeds is allowed, but the system processor speed rules always override the DIMM capabilities
- DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed
- If you do mix DIMM speeds, the memory bus will default to the minimum clock rate of all DIMMs in the system - even if the slower DIMM is on the other processor
- If you install 1x 1066MHz DIMM in channel 1 and 1x 1333MHz DIMM in channel 2, you still run at 1066MHz
- If you install 1x 1066MHz DIMM in channel 1 and 2x 1333MHz DIMMs with 1 DIMM Per Channel (DPC) in each of the other channels you run at 1066MHz

Memory

- Maximum memory speed will also depend on the processor installed
- References to the above MHz speeds are for the various speeds of DDR3 DIMMs; 1333 refers to DDR3-1333, etc.

HP ProLiant BL2x220cc G7 Server Blade DIMM slot and configuration diagrams

Basic memory slot and population diagram

- Population order; start with "A" first, "B" second, "C" third, etc.
- **NOTE:** BL2x220c G7 requires a minimum 2 DIMMs per cpu (4 per server node) to be populated

6 DIMM SLOTS per node (3 per CPU)					
	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A	1	A	Chnl 1
Chnl 2	2	B	2	B	Chnl 2
Chnl 3	3	C	3	C	Chnl 3

HP ProLiant BL2x220c G7 Server Blade

Standard memory configuration (2 CPU model)

- 24GB (6 x 4GB) of PC3-10600 (DDR3-1333) RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A: 4GB DIMM	1	A: 4GB DIMM	Chnl 1
Chnl 2	2	B: 4GB DIMM	2	B: 4GB DIMM	Chnl 2
Chnl 3	3	C: 4GB DIMM	3	C: 4GB DIMM	Chnl 3

RDIMM maximum configuration (2 CPU model)

- 192GB, consisting of twelve (12) 16GB dual-rank PC3-10600 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A: 16GB DIMM	1	A: 16GB DIMM	Chnl 1
Chnl 2	2	B: 16GB DIMM	2	B: 16GB DIMM	Chnl 2
Chnl 3	3	C: 16GB DIMM	3	C: 16GB DIMM	Chnl 3

UDIMM maximum configuration (2 CPU model)

- 24GB, consisting of six (6) 2GB dual-rank PC3-10600 UDIMMs

Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A: 4GB DIMM	1	A: 4GB DIMM	Chnl 1
Chnl 2	2	B: 4GB DIMM	2	B: 4GB DIMM	Chnl 2
Chnl 3	3	C: 4GB DIMM	3	C: 4GB DIMM	Chnl 3

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

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

Following are memory options available from HP:

HP Memory	**Registered DIMMs (RDIMMs)**	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
	HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
	HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
	HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit **NOTE:** Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.	604504-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3L-10600 (DDR3-1333) Unbuffered CAS-9 Low Power Memory Kit	619488-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit **NOTE:** Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.	604506-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500662-B21
	HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
	HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit	627812-B21
	Unbuffered with ECC DIMMs (UDIMMs)	
	HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-B21
	NOTE: All DDR3 memory option kits consist of one DIMM per kit. **NOTE:** PC3L is a low voltage memory.	

HP ProLiant BL2x220c Server Blade

The BL2x220c Blade has a different I/O mapping for server I/O ports to expansion bays than existing half-height servers. The BL2x220c contains 2 server nodes that share a single half-height bay. Each server has 2x 1-Gbit Ethernet ports, so each half-height bay must therefore support 4 1Gbit Ethernet connections to the Interconnect bays. Full access to all embedded Ethernet ports therefore requires 64 Ethernet connections in the HP BladeSystem c7000 Enclosure. Single server half-height devices, such as the HP ProLiant BL460c and HP ProLiant BL465c Server Blades, only require 32 connections (c7000)

As each Ethernet Interconnect device only supports 16 downlinks to the servers it is necessary to dedicate additional bays to Ethernet. To gain access to all embedded Ethernet connections users must install 4 Ethernet Interconnects in Bays 1,2,3,4 for the c7000 enclosure.

When installing a BL2x220c into an existing enclosure the following rules must be followed otherwise the Blade will not boot due to an e-keying error.

c7000 Enclosure

- Interconnect bays 1,2,3,4 are reserved for Ethernet
- InfiniBand or Ethernet Interconnects (depending on desired configuration) must be placed in bays 5 & 6 and 7 & 8

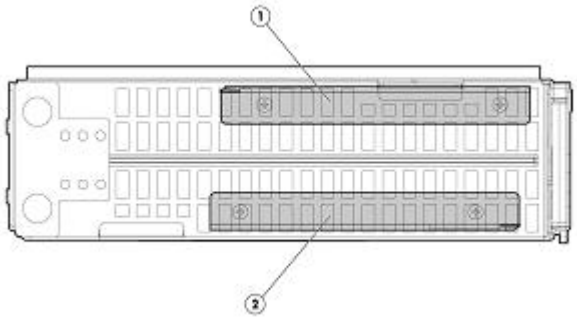
Mixing BL2x220c and other Blades in the same enclosure

Mixing of BL2x220c and other Server Blades in the same enclosure is supported but not recommended. The unique I/O mapping used by the BL2x220c requires that the I/O requirements of other blades in the enclosure conform to the rules defined for the BL2x220c.

c7000 Enclosure Notes:

- The NC543i automatically configures itself to match the personality of the switch module installed in bays 5 -8 (InfiniBand or Ethernet).
- InfiniBand routes to Interconnect bay 5&6 for Server A and bay 7&8 for Server B.
- The c7000 can accommodate two double-wide 4X InfiniBand switches. One occupies bays 5&6; the other occupies bays 7&8.
- Embedded NIC port 1 for each server (Server A and Server B) is mapped to Interconnect bays 1&2 which support only Ethernet switch devices.
- Embedded NIC port 2 for each server (Server A and Server B) is mapped to Interconnect bays 3&4 which support only Ethernet switch devices.
- 10Gb Ethernet routes to Interconnect bays 5&7. Bays 6&8 are not usable for Ethernet.

Storage



1 1 x SFF SATA Non-Hot Plug Hard Drives
2 1 x SFF SATA Non-Hot Plug Hard Drives

Hard Drives

NOTE: SAS and/or SATA drives cannot be mixed within the server.

SATA Non-Hot Plug SFF (2.5-inch) Entry (ETY) 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.

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

	Quantity Supported	Position Supported	Controller
500GB 3G SATA 7.2K	1 per server node	1	Embedded SATA

Technical Specifications

System Unit	**Dimensions** (H x W x D) (with bezel)	7.154 x 2.19 x 20.058 in (18.17 x 5.56 x 50.95 cm)	
	Weight (approximate)	Maximum (all hard drives and processors installed)	15.5 lbs (7.03 kg)
		Minimum (one hard drive and processor installed)	12.79 lbs (5.8 kg)
	Power Specifications	For power specifications including Input Requirements, BTU Rating, and Power Supply Output, please see the HP BladeSystem c-Class Enclosures QuickSpecs located at URL: HP BladeSystem c-Class c7000 Enclosure QuickSpecs: http://h18004.www1.hp.com/products/quickspecs/12810_div/12810_div.html To review typical system power ratings use the HP BladeSystem Power Sizer which is available via the online tool located at URL: http://www.hp.com/go/bladesystem/powercalculator	
	System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).
		Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
	Relative Humidity (non-condensing)	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
		Non-operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
	Altitude	Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
		Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Acoustic Noise	For acoustic noise specifications, please see the HP BladeSystem c-Class Enclosures QuickSpecs located at URL: HP BladeSystem c-Class c7000 Enclosure QuickSpecs: http://h18004.www1.hp.com/products/quickspecs/12810_div/12810_div.html	

HP 500GB 3G SATA 7.2K rpm SFF (2.5-inch) Non-hot Plug Entry 1y Wty Hard Drive	628033-B21	**Capacity**	500,107MB	
		Height	0.37 in (9.5 mm)	
		Width	2.75 in (69.85 mm)	
		Depth	3.94 in (100.0 mm)	
		Interface	Serial ATA	
		Transfer Rate (Maximum)	3Gb/s	
		Native Command Queuing	Supported	
		Seek Time (typical reads, including settling)	Single Track	1 ms
			Average	11 ms
			Full-Stroke	19ms
			Rotational Speed	7200 rpm
		Physical Configuration	Bytes/Sector	512
			Logical Blocks	976,773,168
		Operating Temperature (system inlet air temperature)	50° to 95° F (10° to 35° C)	

Embedded Dual-port NC362i Gigabit Server Adapter	**Network Processor**	NC362i
	Data Transfer Method	Four lane (x4) PCI Express
	Network Transfer Rate	2000 Mb/s full duplex (theoretical maximum value)
	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) • 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 Single-Port NC543i 4xQDR IB/10Gb Flex -10 Adapter	**Network Processor**	NC543i (Mellanox ConnectX-2)
	Data Transfer Method	PCI Express v2.0 (Gen 2) x8
	Network Transfer Rate	InfiniBand: 40Gbps (32Gbps data rate) Ethernet: 10 Gigabit Ethernet (20Gbps full duplex)
	Standard Compliance	InfiniBand: IBTA 1.2.1 Ethernet: IEEE 802.1p, 802.1q, 802.3ad, 802.3ae, 802.3ap (10GBase-KX), 802.3x and 802.3z

	Standard Features	• InfiniBand
		  ○ RDMA, Send/Receive semantics
		  ○ Hardware-based congestion control
		  ○ Atomic operations
		  ○ 16 million I/O channels
		  ○ 256 to 4 Kbyte MTU, 1Gbyte messages
		  ○ 9 virtual lanes: 8 data + 1 management
		• Ethernet
		  ○ ProLiant Teaming including Network Fault Tolerance, Transmit Load Balancing, and Switch-Assisted Load Balancing
		  ○ 4K Jumbo frames
		  ○ Microsoft Windows Receive Side Scaling (RSS)
		  ○ Optional Accelerated iSCSI
		
		NOTE: Flex-10 functionality will be available when Virtual Connect version 3.15 is available.

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.