QuickSpecs

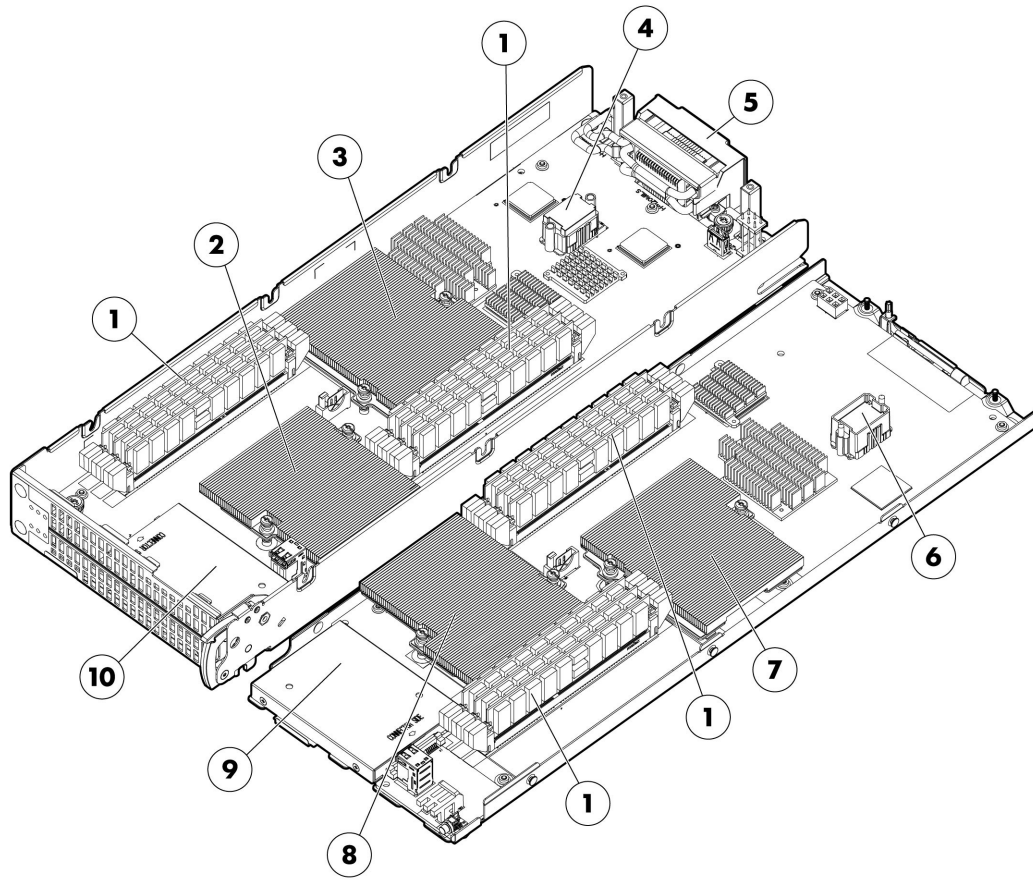*Overview*

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

At A Glance

This document covers the HP ProLiant BL2x220c G7 server blade only. For more information on HP BladeSystems c-Class Enclosures and HP BladeSystem c-Class Interconnect Components, please see the following QuickSpecs:

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

QuickSpecs

HP ProLiant BL2x220c Generation 7 (G7) Server Blade

Overview

http://h18000.www1.hp.com/products/quickspecs/12524_div/12524_div.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, up to 2.93 GHz
  - Intel® 5500 chipset
- **Memory**:
  - Six (6) DIMM slots
  - Up to 96GB 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 or SSD drive per node (SATA: 120GB or 250GB SSD: 32GB or 64GB)
- **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**:
  - 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.
- **Operating Systems**:
  - Supports Windows, Linux, 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

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Overview

- 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 X5670 (2.93 GHz, 12MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3)

Intel® Xeon® Processor X5660 (2.80 GHz, 12MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3)

Intel® Xeon® Processor X5650 (2.66 GHz, 12MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3)

Intel® Xeon® Processor L5640 (2.26 GHz, 12MB L3 Cache, 60W, DDR3-1333, HT, Turbo 2/2/3/3/4/4)

Quad-Core Processor Option Kits

Intel® Xeon® Processor E5640 (2.66 GHz, 12MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)

Intel® Xeon® Processor E5620 (2.40 GHz, 12MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)

Intel® Xeon® Processor L5630 (2.13 GHz, 12MB L3 Cache, 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

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

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

CAPACITY
• 1GB
• 2GB
• 4GB
• 8GB
• 16GB

RANK
• 1R=single
• 2R=dual
• 4R=quad

DATA WIDTH
• x8=8
• x4=4

MEMORY TYPE
PC3=DDR3

VOLTAGE
• Blank=1.5V
• L=1.35V

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

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

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

SPECIAL DESCRIPTOR (If Needed)
• LP (Low Power)
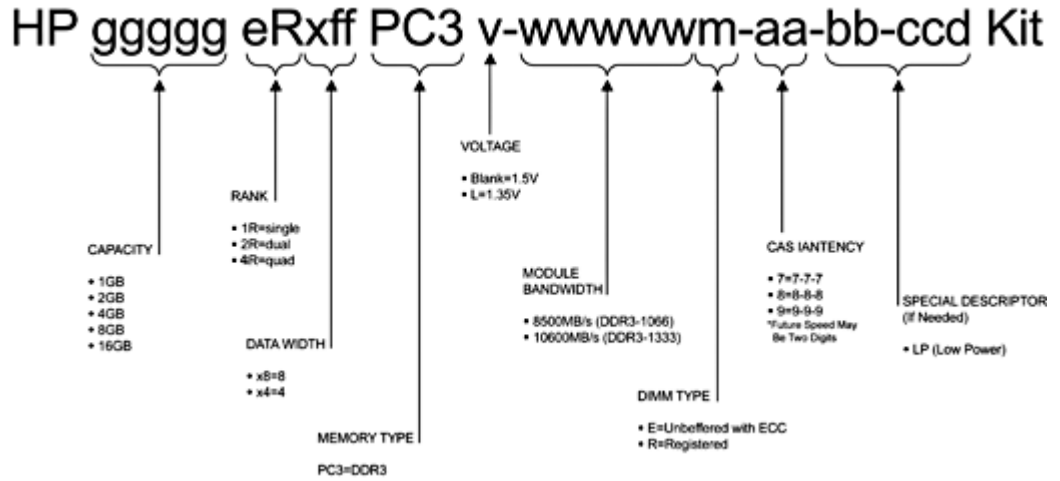
Network Controller	Embedded NC362i Dual Port Gigabit Server Adapter
	Embedded One-port NC543i 1-port 4xQDR IB/10Gb Flex-10 Adapter
	One (1) additional 10/100 network adapter dedicated to iLO 3 Management per server node

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)	250GB SATA	1 x 250GB Serial ATA (Per server node)
	Non-Hot Plug SSD (SATA)	64GB SATA	1 x 64GB SATA (Per server node)

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.

QuickSpecs

HP ProLiant BL2x220c Generation 7 (G7) Server Blade

Standard Features

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

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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
- HP ProLiant Firmware Maintenance

SmartStart version supported (minimum): SmartStart 8.60
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 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.

Standard Features

	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 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

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. |
High Performance Clusters	HP Cluster Platforms	HP Cluster Platforms are specifically engineered, factory-integrated large-scale ProLiant clusters optimized for High Performance Computing, with a choice of servers, networks and software. Operating system options include specially priced offerings for Red Hat Enterprise Linux and Novell SLES, as well as Microsoft Windows HPC Server. A Cluster Platform Configurator simplifies ordering. http://www.hp.com/go/clusters
	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 LSF workload scheduler, the HP-MPI parallelization library, 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

QuickSpecs

Standard Features

OS Support	Microsoft Windows Server Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) Oracle Enterprise Linux (OEL) Solaris 10 for x86/x64 based Systems **NOTE:** For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, including how to purchase from HP, please visit our OS Support Site at: http://www.hp.com/go/supportos or our driver download page http://www.hp.com/support/BL2x220cG7
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
Security	- Power-on password - Administrator's password - Integrated Lights-Out 3 has 12 customizable user accounts and SSL encryption - Integrated Lights-Out 3 can be disabled via a Global Setting
Factory Express Portfolio for Servers and Storage	HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed. Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSAxxxx, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches. For more information on Factory Express services on your specific server model please contact your sales representative or go to: http://www.hp.com/go/factory-express.

Standard Features

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. htttp://www.hp.com/products/configurator.

Service and Support

Service and Support	**HP Care Pack Services: Packaged server and storage services for increased uptime, productivity and ROI** When you buy HP server and storage products and solutions, it's also a good time to think about what levels of support you may need. Our portfolio of service options reduce deployment and management worries while helping you get the most out of your server and storage investments. We take a holistic approach to your environment, bridging servers, blades, storage, software and network infrastructures with our packaged HP Care Pack Services for servers and storage.

Protect your business beyond warranty
When it comes to robustness and reliability, standard computing equipment warranties have matured along with technology. Good news that can also create problems stemming from depending on standard warranties designed to only protect against product defects and some downtime causes. Using a standard approach to warranty uplifts, such as HP Care Pack Services, helps reduce downtime risks and provides operational consistency for mission-critical and standard business computing.

HP Care Pack Services: Upgrading or extending standard server and storage warranties cost effectively
HP Care Pack Services offer a standard reactive hardware and software support services suite sold separately, or combined with our Support Plus and Support Plus 24 services. The portfolio also provides a combination of integrated proactive and reactive services, such as Proactive 24 Service and Critical Service. In addition with HP Proactive Select, you can acquire the specific proactive constancy and technical services. HP Proactive Select menu offers a broad set of service options that you can mix and match depending on your specific requirements. Proactive service options include offers for server, storage, network, SAN device, software, environment and education services.

HP server and storage lifecycle support services offers a full spectrum of customer care-from technology support to complex migrations to complete managed services. HP Factory Express provides customization, integration and deployment services for turnkey solutions. HP Education Services offer flexible, comprehensive training on to help your IT staff get the most out of your server and storage investments. HP Financial solutions extend innovative financing and cost-effective asset management programs-from purchase to equipment retirement.

Learn more: www.hp.com/services/servers and www.hp.com/services/storage

NOTE: Care Pack Services availability may vary by product and country.

HP Care Pack Services are sold by HP and HP Authorized Service Partners:

- Services for customers purchasing from HP or an enterprise reseller are quoted using HP order configuration tools.
- Customers purchasing from a commercial reseller can find HP Care Pack Services at http://www.hp.com/go/lookuptool

QuickSpecs

Service and Support

Recommended HP Care Pack Services for optimal satisfaction with your HP product

Recommended Services

3-Year HP Hardware Support Onsite Call-to-Repair (CTR) Service, 6- or 24-hour
Provides your 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 or 24 hours of the initial service request to the HP Global Solution Center.

HP is committed to repairing your hardware within a maximum of six or twenty four hours. The benefits include:

- Improved system uptime
- Predictable repair times
- More effective IT resource planning
- Consistent level of hardware support across your multi-technology systems

http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6636ENN

3-Year HP Hardware Support Onsite Service, 4-hour response, 24x7
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.

This service provides a trained HP service specialist to perform an installation that meets HP quality standards, for:

- Help improve or maintain system uptime
- Convenient onsite support
- Committed response time

http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EEE

HP ProLiant Server Hardware Installation
Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner.

- Expedited installation, with all service prerequisites met before the installation is performed
- Installation in accordance with manufacturer's specifications, enhancing the supportability of your HP-installed hardware and software
- Service delivery at a mutually scheduled time
- Allows your IT resources to stay focused on their core tasks and priorities
- Availability of an HP service specialist to answer questions during the onsite delivery of this service

http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN

QuickSpecs

Service and Support

Optional HP Care Pack Services that will enhance your HP product experience

Optional Services

HP Enhanced Network Installation & Startup for BladeSystem Switches
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 Proactive 24
As an alternative to our recommended support level, for customers who want enhanced operational effectiveness and proactive problem identification:

Provides improved stability, availability and operational effectiveness with an integrated hardware and software support service that combines industry-leading reactive technical assistance with proactive account services, giving your IT manage support from a team of service specialists.

http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-1614ENUC

HP Proactive Select Service
Customer needs on demand access to consulting, technical proactive services and education courses

Provides a flexible way to purchase HP best-in-class consultancy and technical services. You can buy Proactive Select Service Credits when you purchase your hardware and then use the credits over the next 12 months.

http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-3842ENN

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eSupport

HP eSupport is a portfolio of technology-based services that assist you with managing your business environment - from the desktop to the data center.

Support Portal
The HP support portal provides one-stop access to the information, tools and services you need to manage the daily operations of your IT environment.

Features include:

- Access to self-solve tools (including search technical knowledge base)
- Efficient logging and tracking of support cases
- Collaboration with other business and IT professionals
- Download of patches and drivers
- Access to diagnostic tools
- Proactive notification of relevant information

Access to certain features of the support portal requires an HP service agreement. To access the support portal, visit: http://www.hp.com/support

HP Insight Remote Support software delivers secure remote support for your HP Servers and Storage, 24 X 7, so you can spend less time solving problems and more time focused on your business. You can have your systems remotely monitored for hardware failure using secure technology that's been proven at thousands of companies around the world. In many cases, you can avoid problems before they occur.

QuickSpecs

Service and Support

Customer Technical Training	In today's cost-conscious business environment, IT professionals, developers, consultants and users face an interesting challenge: how to keep up with the latest technologies and expand important skills while delivering profitable results on current projects. To help address this challenge, HP offers innovative training solutions that help keep you up-to-date on virtualization, server, storage, Insight Control, Citrix, Microsoft® and open source/Linux-related topics-while spending less time away from business-critical activities.
HP Services Awards	HP Technology Services continues to be recognized for service and support excellence by customers, partners, industry organizations and publications around the world. Recent honors and award reflect our services team's dedications, technical expertise, professionalism and uncompromising commitment to customer satisfaction.
Additional Services Information	To learn more on HP ProLiant servers, HP BladeSystem servers and HP StorageWorks storage products, please contact your HP sales representative or HP Authorized Channel Partner. Or visit: www.hp.com/services/proliant or www.hp.com/services/bladesystem or http://www.hp.com/hps/storage

QuickSpecs

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 BL2x220c G7 X5670 2x2P 24G Svr 611116-B21 HP BL2x220c G7 E5640 2x2P 24G Svr 611115-B21 HP BL2x220c G7 L5640 2x2P 24G Svr 611117-B21	Processor(s) Two of the following depending on model	(2) Intel® Xeon® processor HP 2x220c G7 X5670 (2.93 GHz, 12MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) (2) Intel® Xeon® processor HP 2x220c G7 E5640 (2.66 GHz, 12MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) (2) Intel® Xeon® processor HP 2x220c G7 L5640 (2.26 GHz, 12MB L3 Cache, 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 i LO 3 Management
	Storage Controller	HP Embedded SATA Controller
	Hard Drives	One (1) 250GB SATA Non-Hot Plug Hard Drive
	Internal Storage	SATA: 250GB Maximum
	Optical Drive	None
	Form Factor	Up to 16 half-height blades (32 server nodes) supported in HP BladeSystem c7000 Enclosure

QuickSpecs

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 Blade, Server A and Server B)

Models		
	HP BL2x220c G7 CTO Blade	605069-B21
	HP BL2x220c G7 CTO Node-A Svr	611118-B21
	HP BL2x220c G7 CTO Node-B Svr	611119-B21

NOTE: When ordering a BL2x220c all three parts CTO Blade, Server A and Server B 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

Intel® Xeon® Processor X5670 (2.93 GHz, 12MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) BL2x220c G7 Kit, FIO	611120-L21
Intel® Xeon® Processor X5660 (2.80 GHz, 12MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) BL2x220c G7 Kit, FIO	611121-L21
Intel® Xeon® Processor X5650 (2.66 GHz, 12MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) BL2x220c G7 Kit, FIO	611122-L21
Intel® Xeon® Processor L5640 (2.26 GHz, 12MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3/4/4) BL2x220c G7 Kit, FIO	611127-L21

Quad-Core Processor Option Kits

Intel® Xeon® Processor E5640 (2.66 GHz, 12MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) BL2x220c G7 Kit, FIO	611123-L21
Intel® Xeon® Processor E5620 (2.40 GHz, 12MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) BL2x220c G7 Kit, FIO	611125-L21
Intel® Xeon® Processor HP BL2x220c G7 L5630 (2.13 GHz, 12MB L3 Cache, 40W, DDR3-1066, HT, Turbo 1/1/2/2) BL2x220c G7 Kit, FIO	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	604504-B21
NOTE: Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.	
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	604506-B21
NOTE: Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.	
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

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)

NOTE: For additional options, including server blade enclosures interconnect options and power subsystem options; please see the options section below; or the following QuickSpecs:
HP BladeSystem c-Class Enclosures QuickSpecs:
HP BladeSystem c-Class c7000 Enclosure QuickSpecs:
http://h18004.www1.hp.com/products/quickspecs/12810_div/12810_div.html
and HP BladeSystem c-Class Interconnect Components QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12524_div/12524_div.html.

QuickSpecs

Core Options

HP Unique Options	HP BL2x220c SD Card Reader Kit	584518-B21

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
	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.	

Core Options

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.

SATA Non-Hot Plug Solid State Drive (SSD)

HP 64GB 1.5G SATA SFF (2.5-inch) Non-hot Plug Entry 3yr Warranty Solid State Drive	461203-B21
HP 32GB 1.5G SATA SFF (2.5-inch) Non-hot Plug Entry 3yr Warranty Solid State Drive	461201-B21

NOTE: One non-hot plug drive per server node.

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

HP 250GB 3G SATA 5.4K rpm SFF (2.5-inch) Non-hot Plug Entry 1yr Warranty Hard Drive	460357-B21
HP 120GB 1.5G SATA 5.4K rpm SFF (2.5-inch) Non-hot Plug Entry 1yr Warranty Hard Drive	459357-B21

NOTE: One non-hot plug drive per server node.

Additional Options

HP Insight software	**HP Insight Control**	

HP Insight Control

HP Insight Control, Electronic License, including 1 year of 24x7 Technical Support and Updates, Electronic — T9074BAE

NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single activation key.
NOTE: Electronic software 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. 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, 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, No Media, 1-Server license, including one year of 24x7 Technical Support and Updates — TC209A

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

NOTE: Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: http://www.hp.com/go/ic-linux (click on Download button).
NOTE: Electronic software is available in all countries except China and Japan.

Additional Options

Customers in China and Japan should order the physical equivalent.
NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single set of activation keys.
NOTE: For additional License Kits, including electronic licensing options, please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/13019_div/13019_div.html

HP iLO Advanced for BladeSystem

HP Integrated Lights-Out (iLO) Advanced for BladeSystem, No Media, Electronic License, including 1 year of 24x7 Technical Support and Updates	TA851AAE
HP Integrated Lights-Out (iLO) Advanced for BladeSystem, No Media, 1-Server License, including 1 year of 24x7 Technical Support and Update	512488-B21

NOTE: Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: http://www.hp.com/go/insightupdates.
NOTE: Electronic licenses can be used to purchase multiple licenses with a single activation key, and is available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent.
NOTE: Customer will receive a license entitlement certificate, which must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service

NOTE: For additional license kits, including electronic delivery options, please see the 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, Electronic License including 1 year of 24x7 Technical Support and Updates	T9082AAE

NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single activation key.
NOTE: Electronic software 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. 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 Rapid Deployment software No Media 1-Server License including 1 year of 24x7 Technical Support and Updates	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

QuickSpecs

Additional Options

High Performance Clusters	**HP Cluster Management Utility**

HP Cluster Management Utility Compute Node Flexible License   436284-B21
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.

HP Cluster Management Utility License and Media   433257-B21
NOTE: Order a minimum of one license per cluster to purchase media including software and documentation, which will be delivered to the customer, and also licenses CMU management. No license key is delivered or required.

NOTE: For additional license kits please see the QuickSpecs at:
http://h18004.www1.hp.com/products/quickspecs/12612_div/12612_div.html

HP HPC Linux Value Pack

HP High Performance Computing Linux Value Pack 1 Processor Flexible License   TC293A
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.

HP High Performance Computing Linux Value Pack Media Kit   TC294A
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

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HP InfiniBand Interconnects	HP 4X DDR InfiniBand Generation2 Switch Module for c-Class BladeSystem	489183-B21
	HP 4X QDR InfiniBand Switch Module for c-Class BladeSystem	489184-B21

NOTE: These are the Infiniband Interconnects that are supported on the NC543i 1-port 4xQDR IB/10Gb Flex-10 Adapter.

Additional Options

HP Ethernet Interconnects	HP 10GbE Pass-Thru Module	538113-B21
	HP 1/10Gb-F Virtual Connect Ethernet Module for c-Class BladeSystem*	447047-B21
	Ethernet Pass-Through Module for HP BladeSystem	406740-B21
	Cisco Catalyst Blade Switch 3120X for HP*	451439-B21
	Cisco Catalyst 3020 Blade Switch for HP*	410916-B21
	Cisco Catalyst Blade Switch 3120G for HP*	451438-B21
	HP GbE2c Layer2/3 Ethernet Blade Switch for c-Class BladeSystem*	438030-B21
	HP Virtual Connect Flex-10 10Gb Ethernet Module for the c-Class BladeSystem	455880-B21
	HP BLc Virtual Connect FlexFabric 10Gb/24-port Module Option	571956-B21
	HP ProCurve 6120XG Blade Switch	516733-B21
	HP ProCurve 6120G/XG Blade Switch*	498358-B21

NOTE: The interconnects with the"*" are not supported with the NC543i 4xQDR IB/10Gb Flex -10 Adapter. They are supported with the NC362i Gigabit Server Adapter.

HP USB and SD Options	HP BL2x220c SD Card Reader Kit	584518-B21
	HP 4GB SD Flash Media	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	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 Year, Electronic	UK144E
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Year, Electronic	UK145E
6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Year, Electronic	UK146E

Memory

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	4GB	16GB	1GB	2GB	4GB
DIMM Native Speed (MHz)	1333	1333	1333	1066	1333	1066	1066	1333	1333	1333
Voltage	LV/Reg	Reg	Reg	Reg	LV/Reg	Reg	Reg	Reg	Reg	Reg
SLOTS THAT CAN BE POPULATED										
6 slot servers	6	6	6	6	6	6	6	6	6	6
MAXIMUM CAPACITY (GB)										
	24	12	24	48	48	24	96	6	12	24
POPULATED DIMM SPEED (MHz)										
1 DIMM Per Channel	1333	1333	1333	1066	1333	1066	1066	1333	1333	1333

- 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
- Maximum memory speed will also depend on the processor installed

Memory

- 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)

- 96GB, consisting of twelve (6) 16GB quad-rank PC3-8500 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

QuickSpecs

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
	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 alow voltage memory.

I/O Map

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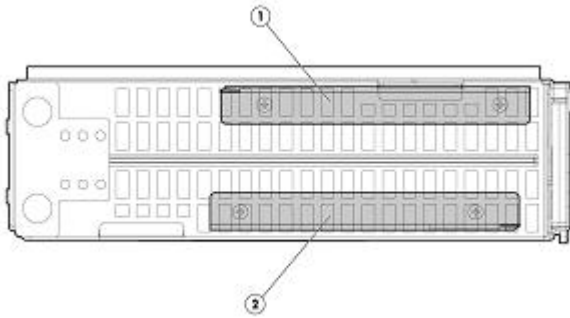
1	1 x SFF SATA Non-Hot Plug Hard Drives
2	1 x SFF SATA Non-Hot Plug Hard Drives

Hard Drives

SATA Non-Hot Plug Solid State Drive (SSD)

	Quantity Supported	Position Supported	Controller
64GB 1.5G SATA 32GB 1.5G SATA	1 per server node	1	Embedded SATA

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
250GB 3G SATA 5.4K 120GB 1.5G SATA 5.4K	1 per server node	1	Embedded SATA

External Storage

	Quantity Supported	Position Supported	Host Controller or Adapter
XP Disk Array Systems	Please see the XP Disk Array Systems QuickSpecs below to determine configuration requirements	External	Please see the XP Disk Array Systems Quick Specs for the latest list of supported HBAs

HP StorageWorks XP10000 Disk Array:
http://h18006.www1.hp.com/products/storageworks/xp10000/index.html (Worldwide)

	Quantity Supported	Position Supported	Host Controller or Adapter
Enterprise Virtual Array Systems	Please see the XP Disk Array Systems QuickSpecs below to determine configuration	External	Please see the XP Disk Array Systems Quick Specs for the latest list of supported HBAs

Storage

requirements

HP StorageWorks Enterprise Virtual Array Family
http://h18006.www1.hp.com/products/quickspecs/12408_div/12408_div.html (Worldwide)

QuickSpecs

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

Technical Specifications

HP 250GB 3G SATA 5.4K rpm SFF (2.5-inch) Non-hot Plug Entry 1yr Warranty Hard Drive	460357-B21	Capacity	250,059MB	
		Height	0.591 in (15.0 mm)	
		Width	2.750 in (69.85 mm)	
		Depth	3.937 in (100.0 mm)	
		Interface	Serial ATA	
		Transfer Rate (Maximum)	3Gb/s	
		Native Command Queuing	Supported	
		Seek Time (typical reads, including settling)	Single Track	1.5 ms
			Average	12 ms
			Full-Stroke	22ms
			Rotational Speed	5400 rpm
		Physical Configuration	Bytes/Sector	512
			Logical Blocks	488,397,168
		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.