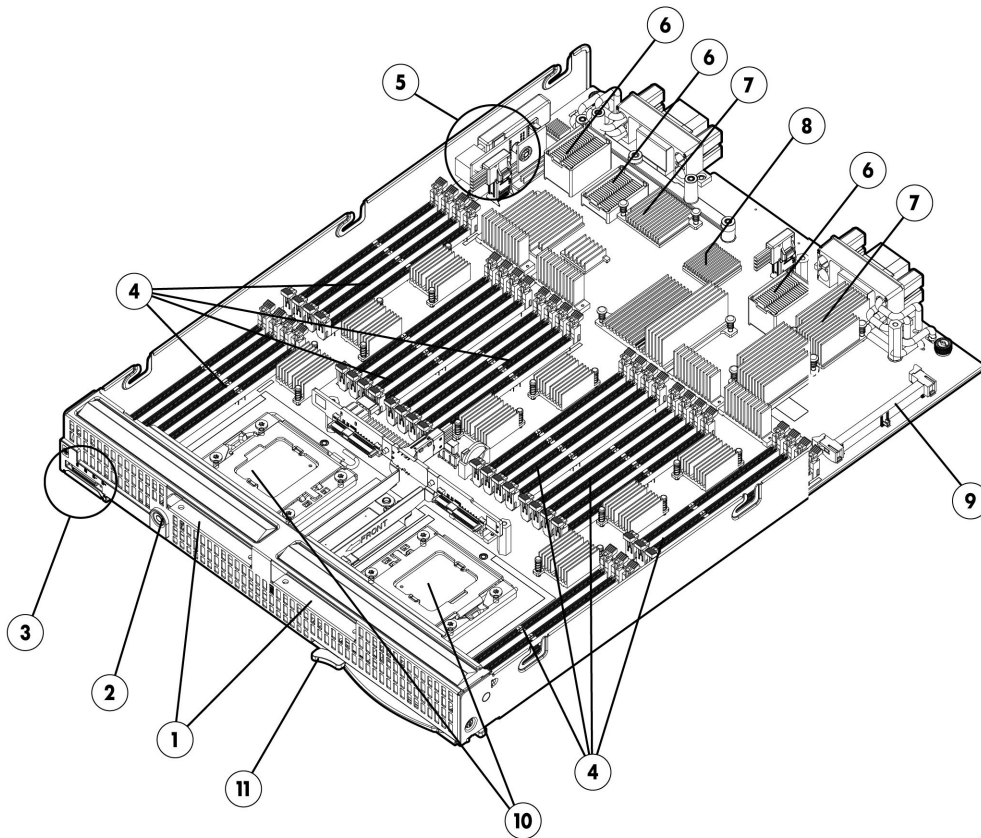


Overview



HP ProLiant BL620c Generation 7 (G7) Server Blade

- | | |
|---|---|
| 1. Two hot-plug small form factor (SFF) SAS/SATA/SSD bays | 7. Four NC553i 10Gb FlexFabric adapter ports |
| 2. Power on/standby button | 8. iLO 3 Management adapter port |
| 3. UID, health, and network adapter LEDs | 9. HP P410i Smart Array flash cache connector |
| 4. 32 RDIMM slots supporting up to 1.0TB of DDR3-1333 memory (operating up to 1066 MHz) | 10. One or two Intel® Xeon® 6500 or 7500 Series processors up to eight-cores each (below the hard drives) |
| 5. One USB 2.0 port, one MicroSD high capacity (SDHC) port, and one TPM 1.2 connector | 11. Server release lever |
| 6. Three PCIe Gen2 I/O expansion mezzanine slots | |

At A Glance

This document covers the HP ProLiant BL620c G7 server blade only. For more information on the HP BladeSystem c-Class for Telco, please reference:

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

The NEBS certified HP ProLiant BL620c G7 Server Blade offers unmatched scalability, performance, and economics in a two-processor Intel Xeon 7500 Series server blade. Fully utilizing the design architecture of the Intel Xeon 7500 chipset, two top performing 95W

Overview

processors are supported along with 32 DIMM slots providing 256GB of memory for ultimate virtualization efficiency. The four 10Gb FlexFabric ports with built-in FCoE, Flex-10, accelerated iSCSI, and TCP/IP offload engine combined with the three mezzanine expansion slots yield an outstanding 96Gb of I/O bandwidth.

The BL620c G7 is also perfect for 2P applications requiring performance and features greater than typical dual processor (DP) Intel Xeon 5000 offerings. The scalability of the BL620c G7 offers up to 4x memory capacity and increased memory performance along with an extensive list of memory RAS features, 40x embedded Ethernet bandwidth, and 50% more on-board I/O slots than other 2P Intel Xeon 5500 and 5600 Series servers available today.

Traditional multi-processor (MP) class server blades are typically unbalanced providing processor performance and density at the expense of proportional memory capacity and I/O bandwidth. As such, these unbalanced servers fail when faced with larger databases and higher-density virtualization applications. Today, you have a better alternative. By designing a balanced architecture, the BL620c G7 is a very unique 2P MP blade offering that ensures that all subsystems can be used effectively under a broad range of enterprise applications and workloads. The 2P BL620c G7 along with the 4P BL680c G7 together provide a complete Intel Xeon 7500 portfolio that is a new class of scale-up HP ProLiant servers that deliver the reliability and performance you need to handle demanding workloads with confidence- while simplifying management and driving down operating costs.

This document covers the NEBS Level 3 certified BL620 G7. These blades, with the associated c7000 enclosure, and interconnects, etc. which have passed the NEBS Level 3 (GR-63 and GR-1089) and ETSI EN 300 386-2 certifications. Testing and certification is limited to -48VDC powered enclosures. For more information on HP ProLiant Server Blades and HP BladeSystem c-Class Interconnect Components please see the following QuickSpecs:

HP ProLiant c-Class Server Blades:

<http://h18000.www1.hp.com/products/quickspecs/division/12534.html>

HP BladeSystem c-Class Interconnect QuickSpecs:

http://h18000.www1.hp.com/products/quickspecs/12524_div/12524_div.html

● Processor:

- One or two, Intel Xeon 7500 Series processors each up to 8 cores and 105 watts.
NOTE: All processors within the server must be identical.
- Intel 7500 chipset with two integrated memory controllers and four Intel® Scalable Memory Buffers (SMI) per processor supporting sixteen 16GB DIMMs per processor
- Meshed network of Intel® QuickPath Interconnects (Intel QPI) each up to 6.4GT/s (25.6GB/s data bandwidth) for point-to-point high speed links increasing bandwidth and lowering latency
- Intel® Hyper-threading resulting in higher processing throughput and improved multi-threaded application performance
- Intel® Turbo Boost Technology that can automatically operate the processor(s) at a faster frequency than the base operating frequency under certain circumstances.
- Up to 24MB of L3 cache per processors increasing efficiency of cache-to-cache data transfers maximizing memory bandwidth while reducing latency through storing greater amount of data thus reducing data transfers to memory.
- Intel® Virtualization Technology that assist virtualization software in generating more efficient virtualization solutions.
- PCI Gen2 increasing bandwidth up to 48 GB/s on each x8 PCI Express Gen2 connection.
- Extensive list of advanced reliability, serviceability, and availability (RAS) features

● Memory:

- Thirty-two (32) DDR-3 RDIMM slots
- 256GB of DDR3-1033 and DD3-1066 registered DIMMs (RDIMMs) operating up to 1066MHz.
NOTE: DDR3 memory speed is a function of the processor Intel QPI speed. See the "Memory" section below for details.
- Memory RAS features including:
 - Data bus ECC protection and advanced ECC / Chip Spare / SDDC
 - Patrol and demand scrubbing
 - DIMM address/control bus parity protection
 - Memory mirroring and memory failover
 - Rank sparring (online spare)
 - Intel SMI lane and clock failover

Overview

- Intel SMI packet retry
 - Failed DIMM isolation
 - Memory On-lining
 - Memory error injection
- **Storage Controller:**
 - Integrated SAS version 2.0 (6Gb) HP Smart Array P410i Controller with RAID 0 and 1.

NOTE: The P410i is configured with no cache allowing the end user to select what cache option of the three different options they want (if cache is desired in the first place).
 - HP Smart Array P410i flash backed write cache (FBWC) options to 1GB.
 - Two (2) cache slots for FBWC battery options.

NOTE: The server supports up to a total of two (2) cache FBWC battery options including one added to the P410i
- **Internal Drive Support:**
 - Two (2) hot-plug small form factor (SFF) drive bays
 - Support for SAS, and SSD hot-plug hard drives
- **Network Controller:**
 - Four (4) embedded HP NC553i 10Gb FlexFabric Converged Network Adapters routed interconnect bays 1 and 2 supporting autosensing 10Gb/1Gb Ethernet, FCoE, Flex-10, TCP/IP offload engine, and hardware-based accelerated iSCSI
 - One (1) 10/100 network adapter dedicated to iLO 3 Management
- **Mezzanine Support:**
 - Three (3) mezzanine expansion slots as follows:
 - Two (2) Type II (25 watts) x8 PCIe Gen2; mezzanine slots 2 and 3 supporting 4Gb and 8Gb FC, 10G FlexFabric, 10G Flex10, 10GbE, 1GbE and the PCI Pass-thru Expansion card.
 - One (1) Type I (15 watts) x4 PCIe Gen2; mezzanine slot 1 supporting 4Gb and 8Gb FC, 1GbE
- **Expansion Blade Support:**
 - Up to two HP BladeSystem Expansion Blades (PCI Expansion Blade) are supported using the HP PCI Expansion Pass-thru mezzanine Card. One HP PCI Express Mezzanine Pass-Thru Card is required per Expansion Blade.

NOTE: The PCI Express Mezzanine Pass-Thru Card(s) must be installed in mezzanine slots 2 and/or 3.
- **Internal USB and SD Support (Not NEBS tested):**
 - One (1) internal USB 2.0 connector for USB flash media drive keys
 - One (1) internal micro secure digital high capacity (SDHC) card slot for planned future use
- **Trusted Platform Module (Not NEBS tested)**
 - One (1) internal TPM 1.2 module connector
- **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, a product option, delivers 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 supports both Windows and Linux-based central management servers.
 - HP Insight Dynamics for ProLiant, a product option, is an integrated command center that enables IT Staff personnel to continuously analyze and optimize a converged infrastructure, while automating and reducing the cost of common data center tasks by as much as 40 percent. This ultimately enables them to dynamically keep pace with the organization's changing business requirements.
- **Operating System Support:**
 - Microsoft Windows, RHEL, SLES, OEL, VMware, and Citrix XenServer
- **Form Factor:**
 - Full height, single wide server blade that plugs into the HP BladeSystem c7000 enclosures
- **Carrier Grade Enclosure:**
 - The Carrier Grade HP BladeSystem c7000 rack enclosure is 11U high and holds up to 8 HP ProLiant BL620c G7 servers plugged vertically.
- **Warranty:**
 - This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP

Overview

Authorized Channel Partners resellers. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

NOTE: Server warranty includes 3 year Parts, 3 year Labor, 3-year on-site support. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at:

<http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

Standard Features

Processors

NOTE: All processors within the server must be identical.

NOTE: The server supports one or two processors.

NOTE: If upgrading an existing BL620c G7 server to a different processor, the server's ROM must be flashed to the latest BIOS prior to the upgrade.

NOTE: All processors support Intel® Hyper-threading.

NOTE: All processors support Intel® Turbo Boost Technology except the E6510.

8 Core Processors

Intel Xeon L7555 (8 core, 1.86GHz, 24MB L3 cache, 6.40GT/s QPI, 95W)

6 Core Processors

Intel Xeon E7530 (6 core 1.86GHz, 12MB L3 cache, 5.86GT/s QPI, 105W)

NOTE: Offered as Configure-To-Order. See the Factory Integrated Models section for more details.

Upgradeability

Upgradeable to two processors

NOTE: All processors within the server must be identical.

NOTE: The server supports one or two processors.

NOTE: If upgrading an existing BL620c G7 server to a different processor, the server's ROM must be flashed to the latest BIOS prior to the upgrade.

Cache Memory

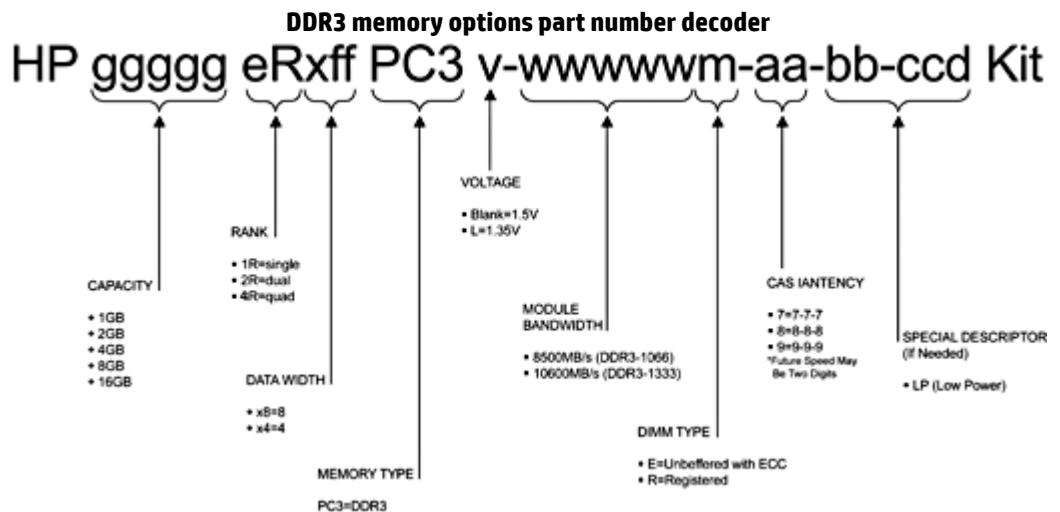
Up to 24MB level 3 cache memory

Chipset

Intel® 7500 chipset

Memory

Type DDR3-1033 and DD3-1066 Registered (RDIMM)
 Standard 8GB (2 x 4GB) (pre-configured models only)
 NEBS Maximum 256GB (32 x 16GB DIMMs)



Standard Features

NOTE: See the "Memory" section for memory guidelines, installation rules, and additional general information.

Network Controllers Four (4) integrated HP NC553i 10Gb FlexFabric Converged Network Adapters supporting 10Gb/1Gb autosensing Ethernet, FCoE, Flex-10, TCP/IP offload engine, and hardware-based accelerated iSCSI

NOTE: The Fibre Channel over Ethernet (FCoE) capability requires the use of an HP Virtual Connect FlexFabric 10Gb/24-port Module. Learn more at www.hp.com/go/virtualconnect.

NOTE: The Flex-10 capability requires the use of an HP Virtual Connect Flex-10 10Gb Ethernet module. Learn more at www.hp.com/go/virtualconnect.

One (1) 10/100 network adapter dedicated to iLO 3 Management

I/O Expansion Slots Three (3) mezzanine expansion slots as follows:

- Two (2) Type II (25 watts) x8 PCIe Gen2
- One (1) Type I (15 watts) x4 PCIe Gen2

Integrated Manageability HP Integrated Lights-Out 3 (iLO 3)

Storage Controller Integrated SAS version 2.0 (6Gb) HP Smart Array P410i Controller with RAID 0 and 1.

NOTE: The P410i is configured with no cache allowing the end user to select what cache option of the three different options they desire (if cache is desired in the first place).

P410i flash backed write cache (FBWC) options to 1GB.

NOTE: The server supports up to a total of two (2) FBWC options including one added to the P410i

Maximum Internal Storage	Hot-plug SAS	1.2TB	2 x 600GB drives
	Hot-plug SSD	240GB	2 x 120GB drives

Graphics Integrated ATI RN-50 1280 x 1024 x 16M color

Graphics Resolution	Resolution	1280 x 1024, 16.7M, 64k, 256, 16
	Color	1024 x 768, 16.7M, 64k, 256, 16
	Depths	800 x 600, 16.7M, 64k, 256, 16
		640 x 480, 16.7M, 64k, 256, 16

Fibre Channel Up to three (3) optional 4Gb and/or 8Gb Fibre Channel HBA mezzanine adapters (Brocade, Emulex and QLogic options).

Standard Features

Compatible SAN

HP ProLiant BL620c G7 server blades are optimized for HP MSA, EVA, and XPHP and are compatible with select third party SANs. See the blade storage page for more details at <http://h18004.www1.hp.com/products/blades/components/c-class-sans.html>.

HP Insight management software

HP Insight Foundation

Managing the growing number of servers can be complex and expensive for your organization. IT managers need to address changing business needs with tools that meet the challenges of managing today's complex Datacenters.

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

- HP SmartStart
- HP Management
- HP ProLiant Firmware Maintenance

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

HP Integrated Lights-Out (iLO)

HP Integrated Lights-Out (iLO) simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration of ProLiant ML, DL, and BL servers. HP iLO functions without additional software and can be accessed from any location via a web browser. HP iLO works hand-in-hand with HP Systems Insight Manager, Insight Control, and Insight Dynamics for ProLiant, helping customers unleash the value of the ProLiant platform and deliver the highest possible quality of IT service. For more information, visit: www.hp.com/go/iLO

HP Insight Control

HP Insight Control, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, monitor, remote control, and optimize your IT infrastructure through a single, simple management console.

Two versions of Insight Control are available, to serve environments requiring either a Linux-based or a Windows-based central management server: HP Insight Control for Linux, and HP Insight Control. See www.hp.com/go/insightcontrol

HP Insight Control includes one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: <http://www.hp.com/services/insight>

HP Insight Dynamics for ProLiant

HP Insight Dynamics for ProLiant, a product option, is an integrated command center that enables IT Staff personnel to continuously analyze and optimize a converged infrastructure, while automating and reducing the cost of common data center tasks by as much as 40 percent. As a powerfully integrated by design toolkit to accelerate complex technology projects and simplify daily operations that ultimately enable IT Staff personnel to dynamically keep pace with the organizations changing business requirements. It enables them to plan capacity and power continuously, balance across physical and virtual

Standard Features

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>

Operating Systems and Virtualization Software Support for ProLiant Servers

[Microsoft Windows Server](#)
[Red Hat Enterprise Linux \(RHEL\)](#)
[SUSE Linux Enterprise Server \(SLES\)](#)
[Oracle Solaris](#)
[VMware Server](#)
[Citrix XenServer](#)

NOTE: For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, including how to purchase from HP, please visit our OS Support Site at: <http://www.hp.com/go/supportos> and our driver download page <http://www.hp.com/support/BL620cG7>.

Availability

Memory

- Data Bus ECC protection for automatic correction from a single data bit error and detection of double data error bits.
- Advanced ECC / Chip Spare / SDDC provides continued memory operation in the event of a single memory device failure and allows removal of a single DRAM from the memory map if it exhibits a failure and recovers its data into a new device.
 - Supports for both x4 and x8 Intel SDDC.
- Patrol Scrubbing proactively searches the system memory, repairing correctable errors.
- Demand Scrubbing writes corrected data back to the memory once a correctable error is detected on a read transaction.
- DIMM Address/Control Bus Parity Protection provides a means to detect and protect command and address errors.
- Memory Failover uses a mirrored DIMM once a failed DIMM in a mirrored set is detected.
- Memory Mirroring provides a copy of memory stored with dynamic failover in case of failure within socket (intra-socket) memory mirroring.
 - The system will operate in non-hemisphere mode when mirroring is enabled.
- Rank Sparring (On Line Spare) provides dynamic failover to a spare DIMM pair or spare rank pair behind the same memory controller. Cannot be enabled concurrently with memory mirroring.
NOTE: HP offers the rank sparing rather than DIMM sparing as rank sparing uses less spare memory resulting in less overhead.
- Memory On-lining allows already inserted memory devices added to the available system resources without downtime with OS support assistance.

Standard Features

- Memory Error Injection adds bit errors into memory arrays for memory error troubleshooting.
- Failed DIMM Isolation identifies a specific failing DIMM channel pair thereby enabling the user to replace only the failed DIMM pair. Identifies a single DIMM for correctable errors and DIMM pair for uncorrectable errors.

Virtualization

- Intel VT-x (FlexMigration, FlexPriority, and Extended Page Tables) provides:
 - Platform control between the VMM and guest OSs for faster, more reliable and secure transfers.
 - VM migration features that enhance flexibility for failover, load balancing, disaster recovery, and maintenance.
- Intel VT-d (Intel Virtualization Technology for Directed I/O) enables the VMM to assign specific I/O devices to specific guest OSs improving security and availability.

Mezzanine options and I/O

- Optional dual-port Fibre Channel mezzanine cards for redundant SAN connections.
- Up to eight embedded Ethernet adapters for redundant LAN connections.
- Multiple mezzanine I/O expansion slots each supported multiple data paths routed to redundant interconnect modules.
- Network Adapter Teaming (Bonding) provides network fault tolerance; transmit load balancing, and switch-assisted load balancing.

Processor/Chipset

- Cache-line Deletion disables a faulty cache line during BIOS initialization when all cache lines are checked or while the processors is processing.
- Processor Internal Sensors & Thermal Control protection against over-temperature conditions.
- Cache parity/ECC protects cache data from accidental data corruption due to particle hits.
- Machine Check Architecture (MCA) detects and captures hardware errors such as system bus, ECC, parity, cache, other.
- Enhanced MCA handling & error logging builds upon the original Machine Check Architecture to: offers more "banks" and increased "resolution" for reporting errors that cause MCA events and 2) sets check flags for the OS to poll.
- External Bus Error Recovery (ECC) enables automatic correction from a single data bit error and detection of double data error bits on the memory data bus.
- De-allocate Processor on Reboot detects faulty processors during system initialization, de-allocates them, and reports the condition.
- Corrupt Data Containment tags faulty data before it is consumed (often called data poisoning) to limit the impact to the currently running program and to greatly reduce the need to reset the system.
- On-Die Error Protection protects registers from particle hits.

Storage

- Two hot-plug SAS/SSD drive bays.
- Integrated HP Smart Array P410i Controller with RAID 0 and 1 standard
- Integrated HP Smart Array P410i Controller upgradeable firmware with recovery ROM capability
- HP Smart Array P410i flash backed write cache (FBWC) options to 1GB.

Intel® QuickPath Interconnect (QPI)

Standard Features

- QPI Link Retry restarts as cycle when a failure is detected on the link.
- QPI Clock Failover redirects the forwarded clock to one of the two failover clock lanes in the event of a forwarded clock failure.
- QPI Self-Healing enables a QPI link to map a failed lane and downshift from full to ½ width (or ½ width to ¼ width) QPI link if there are errors on the link.
- QPI Cycle Redundancy Checking (CRC) automatically detects data errors using a checksum of either 8 bits or 16 bits.
- QPI Poisoning tags an erroneous packet with a "poisoned bit" on the QPI fabric.
- QPI Lane Failover identifies a faulty lane within data paths removing them from operation reducing command/address errors.

Server Blade Enclosure Infrastructure

- Up to 10 hot-plug redundant Active Cool fans per enclosure.
- Up to 6 hot-plug high efficiency redundant power supplies per enclosure.
- Dual grid power providing redundant rack enclosure power feeds to the enclosure.
- Up to eight interconnect modules per enclosure providing four simultaneous redundant fabrics for FlexFabric, Virtual Connect Ethernet, Fibre Channel, InfiniBand, iSCSI, SAS, etc.
- Optional enclosure redundant Onboard Administrator system management module.

Industry Standard Compliance

- ACPI 2.0 Compliant
- PCI 2.2 Compliant
- WOL Support
- Microsoft® Logo certifications
- USB 2.0
- Secure Digital 2.0
- TMP 1.2
- PXE 2.1
- IEEE (see the NC553i Technical Specifications section)
- Advanced Encryption Standard (AES)
- Triple Data Encryption Standard (3DES)
- SNMP
- SSL 2.0
- Active Directory v1.0 (Windows 2003)
- IPMI 2.0
- DMTF Systems Management Architecture for Server Hardware Command Line Protocol (SMASH CLP)

Standard Features

Security

- Power-on password
- Administrator's password
- 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
- Keyboard password
- External USB port enable/disable
- Network server mode
- Serial interface control
- TPM (Trusted Platform Module) 1.2 option

Security - Trusted Platform Module

The BL620c G7 server includes a Trusted Platform Module (TPM) connector for an optional TPM 1.2 upgrade. The TPM 1.2 option is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008. BitLocker leverages the enhanced security capabilities of TPM version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server operating Windows Server 2008 has not been tampered with while the system was offline.

NOTE: For more information about TPM, including a white paper, go to: <http://www.hp.com/go/TPM>.

NOTE: ProLiant OS pre-installed units will come with the partition required for TPM deployment.

NOTE: The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.

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 MSxxxx, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches.

For more information on Factory Express services on your specific server model please contact your sales representative or go to: <http://www.hp.com/go/factory-express>.

HP Enterprise Configurator

The HP eConfigure Enterprise Configurator now provides factory default racking for our HP hardware portfolio. This approach is aligned with our strategic direction to meet the needs and expectations of our valued customers. If you require "custom" rack configuration, please contact HP's Customer Business Center or an Authorized Partner for assistance. <http://www.hp.com/products/configurator>

Service and Support

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: <http://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>

Service and Support

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

Recommended Services **HP Hardware Support - 3-Year Onsite Call to Repair (CTR) Service - 6 or 24-hour CTR**

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>

Hardware Support - 3 - Years HP Support Plus 24

For a higher return on your server and storage technology, our 3-year combined reactive support service delivers integrated onsite hardware/software support services available 24x7x365, including access to HP technical resources, 4-hour response onsite hardware support and software updates.

The benefits include:

- Improve uptime with responsive hardware and software services
- Enjoy consistent service coverage across geographically dispersed sites
- Update HP software at a predictable cost
- Increase customer satisfaction-with no interoperability gaps

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6638EEE>

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.

The benefits include:

- 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>

Service and Support

Optional Services

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>

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

As an alternative to our recommended support level, for customers who need same day response service level 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.

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

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.

Service and Support

Customer Technical Training

HP Education Services

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 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 www.hp.com/services/storage

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 Factory Integrated Model product offerings and requirements.

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

Configure-to-order servers must start with a Factory Integrated Model (CTO) Blade.

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

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

HP Models	HP ProLiant BL620c G7 CTO Blade	600332-B21
	Configurable model ships with:	
	<ol style="list-style-type: none"> 1. Four (4) integrated HP NC553i 10Gb FlexFabric Converged Network Adapters supporting 10Gb/1Gb autosensing Ethernet, FCoE, Flex-10, TCP/IP offload engine, and hardware-based accelerated iSCSI 2. One (1) 10/100 network adapter dedicated to iLO 3 Management 3. One (1) Integrated SAS version 2.0 (6Gb) HP Smart Array P410i Controller with RAID 0 and 1 NOTE: The P410i is configured with no cache allowing the end user to select what cache option of the three different options they desire (if cache is desired in the first place). 4. Two (2) cache slots for FBWC battery options. NOTE: The server supports up to a total of two (2) FBWC options including one added to the P410i 5. Two (2) small form factor hot-plug SAS/SATA/SSD hard drive bays 6. Three (3) I/O expansion slots 7. One (1) integrated Lights-Out 3 8. Integrated USB, MicroSDHC, and TPM connectors 	

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

HP Processors	<p>NOTE: The BL620c G7 supports one or two processors.</p> <p>NOTE: All processors within the server must be identical.</p> <p>NOTE: All Configure-to-Order processor kits contain one (1) processor.</p> <p>NOTE: If two processors are desired, select one xxxxxx-L21 kit and one xxxxxx-B21 kit.</p> <p>8 core processors</p> <p>Intel Xeon L7555 (8 core, 1.86 GHz, 24MB L3 cache, 6.40GT/s QPI, 95W) BL620c G7 1P FIO Kit, 603612-B21 for second processor</p> <p>6 core processors</p> <p>Intel Xeon E7530 (6 core 1.86 GHz, 12MB L3 cache, 5.86GT/s QPI, 105W) BL620c G7 1P FIO Kit, 603610-B21 for second processor</p>	<p>603612-L21</p> <p>603610-L21</p>
HP Memory	<p>NOTE: All DDR3 memory option kits consist of one RDIMM per kit.</p> <p>NOTE: See the "Memory" section for memory guidelines, installation rules, and additional general information.</p> <p>HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit</p> <p>HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit</p>	<p>500658-B21</p> <p>500662-B21</p>

Configuration Information - Factory Integrated Models

Step 3: Choose Additional Options for Factory Integration

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

HP BladeSystem c3000 Enclosure QuickSpecs:

http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html

Core Options

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

HP Ethernet Mezzanine Options	Gigabit Ethernet Mezzanines		
		HP NC325m PCI Express Quad Port 1Gb Server Adapter for c-Class BladeSystem	416585-B21
		HP NC364m Quad Port 1GbE BL-c Adapter	447883-B21
		HP NC382m Dual Port 1GbE Multifunction BL-c Adapter	453246-B21
		10 Gigabit Ethernet Mezzanines	
		NOTE: A 10 Gigabit Ethernet adapter is required for each server blade connecting to a 10Gb interconnect in bays 3-8 (HP BladeSystem c7000 Enclosure) or bays 2-4 (HP BladeSystem c3000 Enclosure).	
		NOTE: Each 10 Gigabit Ethernet adapter requires a minimum of 2GB of server memory.	
		NOTE: A 10 Gigabit Ethernet adapter will down speed to 1Gb if paired with a 1GbE interconnect.	
		NOTE: A 10 Gigabit Ethernet adapter will down speed to 1Gb if paired with a 1GbE interconnect.	
			HP NC532m Dual Port Flex-10 10GbE Multifunction BL-c Adapter
		HP NC542m Dual Port Flex-10 10GbE Multifunction BL-c Adapter	539857-B21
		HP NC552m 10Gb 2-port Flex-10 Ethernet Adapter	610609-B21
		HP NC553m 10Gb Flex-Fabric Adapter	539857-B21

HP Fibre Channel Mezzanine Options	4Gb Fibre Channel mezzanine adapters		
		QLogic QMH2462 4Gb FC HBA for HP c-Class BladeSystem	403619-B21
	8Gb Fibre Channel mezzanine adapters		
		HP BLc Emulex LPe1205- 8Gb FC HBA for HP c-Class BladeSystem	456972-B21
		QLogic QMH2562 8Gb FC HBA for HP BladeSystem c-Class	451871-B21

HP Memory	NOTE: All DDR3 memory option kits consist of one RDIMM per kit.		
	NOTE: See the "Memory" section for memory guidelines, installation rules, and additional general information.		
		HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
		HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500662-B21

Core Options

HP Hard Drives

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

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

NOTE: Different hard drives types may be mixed, but logical drive partitioning (i.e. RAID capability) is not supported.

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

HP 600GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581286-B21
HP 450GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581284-B21
HP 300GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507127-B21
HP 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512547-B21
HP 72GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512545-B21

SATA Hot Plug Midline (MDL) Solid State Drives

HP 120GB 3G SATA SFF (2.5-inch) Midline 1yr Warranty Solid State Drive	572073-B21
HP 60GB 3G SATA SFF (2.5-inch) Midline 1yr Warranty Solid State Drive	572071-B21

6G SAS Hot Plug Enterprise Performance Solid State Drives

HP 400GB 6G SAS SLC SFF (2.5-inch) Enterprise Performance 3yr Warranty Solid State Drive	632494-B21
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NOTE: Please see the QuickSpecs for additional information:

http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html

Additional Options

HP Insight Software

Insight Control

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

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

HP Insight Software Media Kit 436222-B21

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

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

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

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

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

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

HP Insight Control for Linux

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

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

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

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

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

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

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

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

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

NOTE: Customer will receive a license entitlement certificate, which must be redeemed

Additional Options

online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service.

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

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

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

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

TA851AAE

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

512488-B21

NOTE: This license allows 1 server to be managed via HP iLO Advanced for BladeSystem. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service.

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

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

HP Insight Control server deployment

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

T9082AAE

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

452151-B21

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

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

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

NOTE: For additional license kits please see the Insight Control QuickSpecs at:

http://h18004.www1.hp.com/products/quickspecs/12631_div/12631_div.html
(Worldwide)

Additional Options

HP Storage Controllers	<p>NOTE: NOTE: The P410i is configured with no cache allowing the end user to select what cache option of the three different options they desire (if cache is desired in the first place).</p> <p>NOTE: The server supports up to a total of two (2) FBWC options including one added to the P410i</p> <p>HP integrated Smart Array P410i Controller option</p> <p>P410i 512MB Flash Backed Write Cache (FBWC) Module Upgrade 534916-B21</p> <p>P410i 1GB Flash Backed Cache (FBWC) Module Upgrade 534562-B21</p> <p>HP Smart Array Advanced Pack (SAAP) No Media 1-Server license including 1yr 24x7 Technical Support 516471-B21</p> <p>NOTE: The above SAAP license and any above cache option is required to enable Smart Array Advanced Pack features on the P410i. For more information go to: http://www.hp.com/go/saap.</p> <p>NOTE: The Smart Array Advanced Pack is hosted on the P410i Smart Array Controller hardware firmware stack.</p>
<hr/>	
HP Expansion Blade	<p>HP BLc PCI Expansion Blade 448018-B21</p> <p>NOTE: Ships with one pre-installed PCI-X connect board. Also includes one PCIe connect board which requires installation.</p> <p>NOTE: The HP PCI Express Mezzanine Pass-Thru Card for HP BladeSystem c-Class (P/N 431643-B21) is required to support the HP Expansion Blade with the BL620c G7. Up to two expansion blades are supported per server (D2200sb, table blades, and/or PCI Expansion Blade). The PCI Express Mezzanine Pass-Thru Card(s) must be installed in mezzanine slots 2 and/or 3. Please see the D2200sb QuickSpecs for technical specifications and additional information at http://h18000.www1.hp.com/products/quickspecs/12753_div/12753_div.html.</p>
<hr/>	
HP USB and SD Options	<p>HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver) DC172B</p> <p>HP USB 04 Standard Keyboard DT528A#ABA</p> <p>HP 2GB USB Flash Media Drive Key Kit 608447-B21</p> <p>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.</p>
<hr/>	
HP Security - TPM (Not NEBS certified)	<p>HP Trusted Platform Module (TPM) Kit 488069-B21</p> <p>NOTE: The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.</p>
<hr/>	

Additional Options

HP Care Pack Services

NOTE: The HP Care Pack service part numbers below for ProLiant BL c-Class server blades, cover the server blade and all HP branded hardware options qualified for the server, purchased at the same time or afterwards, internal to the server.

Hardware Services On-site Service

4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	UK108E
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UK109E
6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UK110E

Memory

Memory Subsystem Architecture

Xeon EX memory architecture is designed to take advantage of multiple stages of memory interleaving to reduce latency and increase bandwidth.

Each Intel Xeon 6500 and 7500 Series processor socket contains two Memory Controllers. Each Memory controller has two Intel Scalable Memory Interface (SMI) buses operating in lockstep. Each SMI in turn bus connects to a memory buffer. The purpose of the buffer is to convert SMI to DDR3. Each memory buffer has two DDR3 channels and can support up to four DIMMs for a total of sixteen DIMMs per processor socket (32 DIMMs per server).

All DIMMs will operate at the highest possible speed for a given processor. Memory speed is not affected by number of DIMMs or ranks. However, memory speed is a function of the processors QPI bus speed per the following:

- Processors with a QPI speed of 6.40GT will operate memory at 1066MHz
- Processors with a QPI speed of 5.86GT will operate memory at 978MHz
- Processors with a QPI speed of 4.80GT will operate memory at 800MHz

DDR3 Memory Population Guidelines

An overview of the DIMM installation guidelines are summarized below: For detailed memory configuration rules and guidelines, please see the BL620c G7 user guide at www.hp.com and the Online DDR3 Memory Configuration Tool at www.hp.com/go/ddr3memory-configurator.

1. All memory must be DDR3-1066 or DDR3-1033 RDIMMs per the options listed in this document.
2. Each processor socket has 16 DIMM sockets. DIMM sockets are available to the system when a processors socket is populated with a processor.
3. The minimum allowable configuration is two DIMMs per processor.
4. DIMMs must be installed in pairs with identical characteristics. For configuration simplicity HP recommends using identical part numbered DIMMs throughout when possible.
5. DIMM pairs MUST be populated in sequence by letter designation. Install DIMM pair A first followed by DIMM pair B, pair C, etc.
6. Maximum performance is achieved by balancing DIMM pairs.
7. Advanced memory protection (AMP) modes Online Sparing and Memory Mirroring have further requirements beyond these listed here. Please refer to the user guide for additional memory configuration requirements

Pre-configured Model Standard Memory

8GB (2 x 4GB) of dual-rank DDR3-1066 RDIMMs

Pre-configured Model Standard Memory Plus Optional Memory

Up to 464GB of memory is available with the installation of optional DDR3 RDIMM memory expansion kits.

Pre-configured Model Standard Memory Replaced with Optional Memory

Up to 512MB of memory is available with the removal of standard memory and the installation of optional DDR3 RDIMM memory expansion kits.

Memory

Memory		Processor 1 DIMM Slots (Processor 2 has the same DIMM slot numeration, but all slots are empty)							
Standard	8GB total	1G	2C	3E	4A	5A	6E	7C	8G
		Empty	Empty	Empty	8GB	8GB	Empty	Empty	Empty
		9H	10D	11F	12B	13H	14D	15F	16B
		Empty	Empty	Empty	Empty	Empty	Empty	Empty	Empty
		Processor 1 DIMM Slots (Processor 2 has the same DIMM configuration)							
Optional	232GB per CPU (464TB total)	1G	2C	3E	4A	5A	6E	7C	8G
		16GB	16GB	16GB	4GB	4GB	16GB	16GB	16GB
		9H	10D	11F	12B	13H	14D	15F	16B
		16GB	16GB	16GB	16GB	16GB	16GB	16GB	16GB
		Processor 1 DIMM Slots (Processor 2 has the same DIMM configuration)							
Maximum	256GB per CPU (512GB total)	1G	2C	3E	4A	5A	6E	7C	8G
		16GB	16GB	16GB	16GB	16GB	16GB	16GB	16GB
		9H	10D	11F	12B	13H	14D	15F	16B
		16GB	16GB	16GB	16GB	16GB	16GB	16GB	16GB

HP ProLiant BL620c G7 memory options:

HP Memory

Following are the BL620c G7 memory options available from HP:

HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 500658-B21

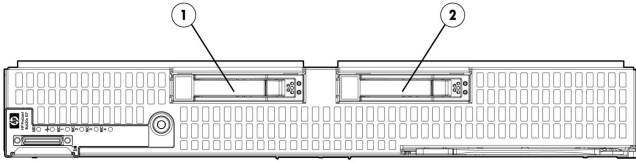
HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 500662-B21

NOTE: All DDR3 memory option kits consist of one DIMM per kit.

NOTE: For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator.

Storage

1-2 2 x SFF SAS/SATA/SSD hot-plug hard drives



Hard Drives

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

NOTE: Different hard drives types may be mixed, but logical drive partitioning (i.e. RAID capability) is not supported.

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

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

	Quantity Supported	Position Supported	Controller
600GB 6G SAS 10K	2	1-2	Smart Array P410i Controller
450GB 6G SAS 10K			
300GB 6G SAS 10K			
146GB 6G SAS 15K			
72GB 6G SAS 15K			

SATA Hot Plug Midline (MDL) Solid State Drives

	Quantity Supported	Position Supported	Controller
120GB 3G SATA SSD	2	1-2	HP Smart Array P410i Controller
60GB 3G SATA SSD			

Technical Specifications

System Unit	Dimensions (H x W x D)	Full height, single-wide server blade: 14.42 x 2.03 x 20.06 in (36.17 x 5.16 x 50.95 cm)							
	Weight (approximate)	<table border="0"> <tr> <td>Maximum</td> <td>17.9lbs (8.12kg)</td> </tr> <tr> <td colspan="2">(all hard drives, DIMMs, mezzanine cards, and processors installed)</td> </tr> <tr> <td>Minimum</td> <td>24.24lbs (11.00kg)</td> </tr> <tr> <td colspan="2">(two hard drives, four DIMMs, no mezzanine cards, and two processors installed)</td> </tr> </table>	Maximum	17.9lbs (8.12kg)	(all hard drives, DIMMs, mezzanine cards, and processors installed)		Minimum	24.24lbs (11.00kg)	(two hard drives, four DIMMs, no mezzanine cards, and two processors installed)
Maximum	17.9lbs (8.12kg)								
(all hard drives, DIMMs, mezzanine cards, and processors installed)									
Minimum	24.24lbs (11.00kg)								
(two hard drives, four DIMMs, no mezzanine cards, and two processors installed)									
	Power Specifications	<p>For power specifications including input requirements, BTU rating, and power supply output, please see the HP BladeSystem c-Class Enclosures QuickSpecs located at:</p> <p>HP BladeSystem c3000 Enclosure QuickSpecs: http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html (Worldwide)</p> <p>HP BladeSystem c7000 Enclosure QuickSpecs: http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html (Worldwide)</p> <p>To review typical system power ratings use the HP BladeSystem Power Sizer available at: http://www.hp.com/go/bladeSystem/powercalculator.</p>							
	System Inlet Temperature	<table border="0"> <tr> <td>Operating</td> <td>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).</td> </tr> <tr> <td>Non-Operating</td> <td>-30° to 60°C (-22° to 140°F), maximum rate of change is 20°C/hr (36°F/hr).</td> </tr> </table>	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).			
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)	<table border="0"> <tr> <td>Operating</td> <td>10 to 85% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.</td> </tr> <tr> <td>Non-Operating</td> <td>10 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.</td> </tr> </table>	Operating	10 to 85% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.	Non-Operating	10 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.			
Operating	10 to 85% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.								
Non-Operating	10 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.								
	Altitude	<table border="0"> <tr> <td>Operating</td> <td>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).</td> </tr> <tr> <td>Non-operating</td> <td>9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).</td> </tr> </table>	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).			
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).								

Technical Specifications

Acoustic Noise	For acoustic noise specifications, please see the HP BladeSystem c-Class Enclosures QuickSpecs located at: HP BladeSystem c3000 Enclosure QuickSpecs: http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html HP BladeSystem c7000 Enclosure QuickSpecs: http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html
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Smart Array P410i Controller	Disk Drive and Enclosure Interface	6G SAS (Serial Attached SCSI) 3G SATA (Serial Advanced Technology Attachment)
	SAS Connectors	Two (2) internal (SFF8484) x4 wide port connectors
	Cache Memory Speed	DDR2-533MHz with 40 or 72-bit wide bus provides up to 4.2 GB/s maximum bandwidth.
	Server Interface	x4 5G PCIe Gen2 provides 2GB/s maximum bandwidth.
	SAS Speed	x2 6G SAS provides 1.2GB/s maximum bandwidth.
	Cache Memory	72-bit 1GB cache; ECC protection, capacitor-backed
	Logical Drives Supported	Up to 32 logical drives
	Maximum Logical Drive Capacity	2 TB (2 x 1 TB)
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space
	RAID Support	RAID 0 (Striping) RAID 1 (Mirroring) NOTE: The RAID support available is dependent on the number of drives installed in the server.
Upgradeable Firmware	Upgradeable firmware with recovery ROM capability	

Integrated HP NC553i 10Gb FlexFabric Converged Network Adapter	Type	Integrated KR 10GbE with FlexFabric (Flex-10, FCoE, accelerated iSCSI, iSCSI boot, 10GbE, 1GbE, TCP/IP offload engine)
	Network Processor	Blade Engines 3 (BE3)
	Data Transfer Method	x8 PCI Express 2.0
	Network Transfer Rate	20Gbps per port full duplex only (theoretical maximum value) NOTE: Each port is autosensing 1Gb / 10Gb, and can interoperate with 1Gb HP BladeSystem c-Class interconnect components. NOTE: Each port on the NC553i adapter transmits from the server at 20Gbps (theoretical) full duplex.
	IEEE Compliance	802.1p QoS, 802.1Q VLAN tagging, 802.3ad link aggregation, 802.3ap 10GBase-KR, and 802.3x flow control
	Standard Features	<ul style="list-style-type: none"> ProLiant Teaming including Network Fault Tolerance, Transmit Load Balancing, and Switch-Assisted Load Balancing 9K Jumbo frames (4K Jumbo frames when in FCoE mode) Microsoft Windows Receive Side Scaling (RSS) FCoE or accelerated iSCSI mode Flex-10 support TCP/IP offload engine

Technical Specifications

- 10Gb Ethernet or 1Gb Ethernet autosensing

HP Integrated Lights-Out 3 (iLO 3)	Architecture	PCI Express based health and remote management ASIC	
	Processor	PCI Express RISC processor core operating at 250MHz	
	Upgradeability	Option firmware upgradeable via Flash ROM	
	Video Support	1600 x 1200 DVR max resolution	
	Interfaces	One Ethernet network connection (10/100Mb/s)	
	Memory	128-MB DDR with ECC	
	Operating System Support		Microsoft Windows 2008 R2
			Microsoft Windows 2008 (32 bit and 64 bit)
			Microsoft Windows Server 2008 Standard Edition (32bit and 64bit)
			Microsoft Windows Server 2008 Enterprise Edition (32bit and 64bit)
			Microsoft Windows Server 2003 and Windows Server 2003 R2, and Windows Server 2003 for Extended Systems Standard Edition, Enterprise Edition
			Red Hat Enterprise Linux 5.4 (32 bit and 64 bit)
			SUSE LINUX Enterprise Server 11 (32bit and 64bit)
			SUSE LINUX Enterprise Server 10 (32bit and 64bit)
		VMware ESX 4.0	
		VMware ESX 3.5.0	
Client System Support		Microsoft Windows 2008 R2	
		Microsoft Windows 7	
		Microsoft Windows XP Professional Edition	
		Microsoft Windows Vista Business and Ultimate Editions	
		Red Hat Enterprise Desktop 5.00	
		SUSE Linux Enterprise Desktop 11	
Client Browser Support		SUSE Linux Enterprise Desktop 10	
		Microsoft Internet Explorer 8	
		Microsoft Internet Explorer 7	
		Microsoft Internet Explorer 6	
		Firefox 3.5 (on supported Windows and Linux systems)	
Command Line Support		Firefox 3.0 (on supported Windows and Linux systems)	
		Secure Shell and serial port access	
		Secure Socket Layer	
Security		Secure Shell version 2	
		Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, CLP and XML scripting interface	
		AES encryption of video	
		RC4 encryption of video	
Directory Support Services		Active Directory v1.0 (Windows 2003)	
	Driver Support	HP ProLiant iLO3 Management Controller Driver Package	

Technical Specifications

Management protocols supported	SNMP, IPMI 2.0 (system and LAN interface), DMTF Systems Management Architecture for Server Hardware Command Line Protocol (SMASH CLP), HP RIBCL XML
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Environment-friendly Products and Approach	End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green . To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.
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The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/green>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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For hard drives, 1GB = 1 billion bytes (1,000 MB). Actual formatted capacity is less.