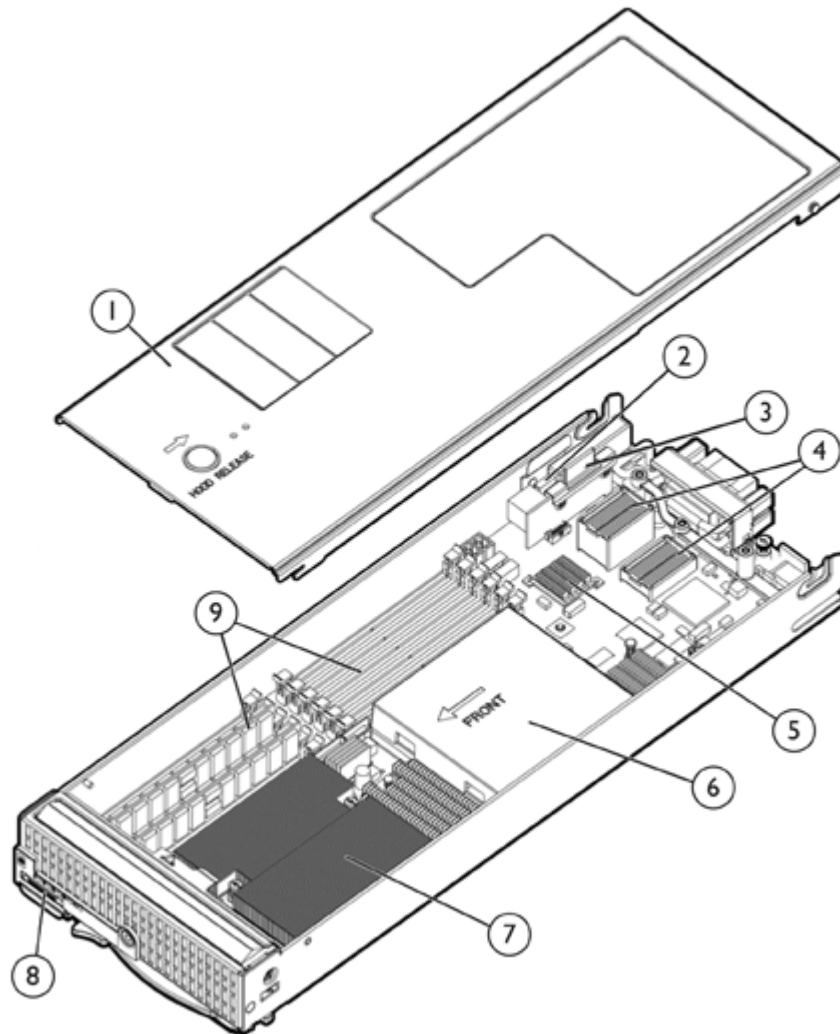


### Overview



### HP ProLiant BL280c G6 Server Blade

- |  |  |
|--|--|
| 1. Access panel                          | 6. Processor socket 2 (with blank)   |
| 2. Internal USB connector                | 7. Processor socket 1 (populated)  |
| 3. Internal SD card slot                 | 8. HP c-Class Blade SUV Cable connector                                    |
| 4. Two (2) mezzanine I/O expansion slots | 9. Twelve (12) PC3-10600 (DDR3) Registered or Unbuffered DIMM Memory Slots |
| 5. Graphics controller chip              |  |

### What's New

- Support for HP Smart Array P711m/1G FBWC Controller
- Support for HP Smart Array P712m/ZM 2-ports Int PCIe x8 SAS Controller
- Support for HP 500GB 3G SATA 7.2K rpm SFF (2.5-inch) Non-hot Plug Entry Hard Drive

### At A Glance

This document covers the HP ProLiant BL280c G6 server blade only. For more information on HP BladeSystem c-Class Enclosures and HP BladeSystem c-Class Interconnect and Mezzanine Components, please see the following:

HP BladeSystem c3000 Enclosure QuickSpecs:

[http://h18000.www1.hp.com/products/quickspecs/12790\\_div/12790\\_div.html](http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html)

### Overview

HP BladeSystem c7000 Enclosure QuickSpecs:

[http://h18000.www1.hp.com/products/quickspecs/12810\\_div/12810\\_div.html](http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html)

HP BladeSystem c-Class Interconnect and Mezzanine Components:

<http://h18004.www1.hp.com/products/blades/components/c-class-interconnects.html>

<http://h18004.www1.hp.com/products/blades/components/c-class-adapters.html>

HP ProLiant BL280c G6 server blade includes:

- **Processor:**
  - Up to two (2) Intel® Xeon® 5600 or 5500 series processors
  - Intel® 5500 chipset
- **Memory:**
  - Twelve (12) DIMM slots
  - Up to 192GB memory with PC3-10600 (DDR3) Registered (RDIMM) memory, operating at 1066MHz when fully populated at 2 DIMMs per Channel in 12 slots.
  - Up to 48GB, using PC3-10600 DDR3 Unbuffered (UDIMM) memory, operating at 1066MHz when fully populated at 2 DIMMs per Channel in 12 slots
  - 1333MHz available when fully populated 2 DIMMs per Channel with ROM update via ROM Based Setup Utility (RBSU).
- **Internal Drive Support:**
  - Up to two (2) small form factor (SFF) HP Solid State Drives (SSD) For ProLiant Server Blades
  - Up to two (2) small form factor (SFF) SATA or SAS Non-Hot Plug hard disk drives
- **Storage Controller:**
  - HP Embedded SATA RAID Controller
    - NOTE: This is a chip set SATA RAID controller. It supports RAID 0 and 1 only and no Battery Backed Write Cache. User needs to enable the RAID option through HP RBSU (ROM Base Setup Utility) first before the RAID can be activated. Users also need to download the OS driver from the <http://www.hp.com/support/BL280cG6> website for OS Array Monitoring.
- **Network Controller:**
  - One (1) HP Integrated NC362i Dual Port Gigabit Server Adapter
  - Additional Ethernet adapter ports available via the mezzanine expansion slot
  - One (1) additional 10/100 network adapter dedicated to iLO 2 Management
- **Mezzanine Support:**
  - Two (2) I/O expansion mezzanine slots
  - Supports up to two (2) additional mezzanine cards of your choice:
    - Dual-Port FlexFabric Adapter mezzanine options
    - Dual-Port Fibre Channel Mezzanine (4-Gb or 8-Gb) options for SAN connectivity
    - Ethernet server adapter mezzanine options for additional network ports
    - InfiniBand (IB) Mezzanine options for low latency and high bandwidth server interconnectivity
    - I/O Accelerator mezzanine options for high transaction rate local storage
    - SAS mezzanine option for external direct attach and shared SAS storage
- **Internal USB Support:**
  - One (1) internal USB 2.0 connector for security key devices and USB drive keys
  - One (1) internal SD-HC card slot
- **Security - Trusted Platform Module:**
  - One (1) internal TPM 1.2 module connector
- **Form Factor:**
  - HP ProLiant BL280c is a half-height server blade that plugs into the BladeSystem c3000 and c7000 enclosures
    - 16 blades per c7000 (10u) enclosure
    - 8 blades per c3000 (6U) enclosure
- **Infrastructure Management:**
  - This server blade requires the latest version of the Onboard Administrator firmware. This firmware release may also require other subsystem firmware upgrades. For information on the latest firmware versions, please see the Blades Firmware Maintenance website at: <http://h18004.www1.hp.com/products/blades/components/c-class-compmatrix.html>
  - Convenient slide-out Systems Insight Display for quick and easy front view server diagnostics, along with status LEDs, Automatic Server Recovery (ASR), ROM Based Setup Utility (RBSU)

### Overview

- HP Integrated Lights-Out 2 (iLO 2) management processor for simplified server setup, health monitoring and recovery, power and thermal control, and lights-out remote administration.
- HP Insight Control, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, migrate, 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 Systems:**
  - Supports Windows, Linux, VMware, Solaris, and Citrix XenServer
- **Enclosures:**
  - HP offers two different c-Class server blade enclosures to meet your individual needs:
    - The HP BladeSystem c7000 rack enclosure is 10U high and holds up to 16 ProLiant BL280c G6 servers plugged vertically.
    - The HP BladeSystem c3000 rack enclosure is 6U high and holds up to 8 HP ProLiant BL280c G6 servers plugged horizontally.
  - Server blades, storage blades, interconnect modules, power supplies, fans, and redundant Onboard Administrator modules are all designed to fit into the c3000 and c7000 enclosures.
  - For additional enclosure information, please see:  
<http://h18004.www1.hp.com/products/blades/components/enclosures/c-class/index.html>.
- **Warranty:**
  - This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and parts replacement 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 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

One of the following depending on Model

#### Six-Core Processors

Intel® Xeon® X5675 (3.06GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) Processor

Intel® Xeon® X5670 (2.93GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) Processor

Intel® Xeon® processor X5660 (2.80GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) Processor

Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) Processor

Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W, DDR3-1333, HT, Turbo 1/1/1/1/2/2) Processor

Intel® Xeon® Processor E5645 (2.40GHz/6-core/12MB/80W, DDR3-1333, HT, Turbo 1/1/1/1/2/2) Processor

Intel® Xeon® processor L5640 (2.26GHz/6-core/12MB/60W, DDR3-1066, HT, Turbo 2/2/3/3/4/4) Processor

#### Quad-Core Processors

Intel® Xeon® X5672 (3.20GHz/4-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/3/3) Processor

Intel® Xeon® E5640 (2.66GHz/4-core/12MB/80W, DDR3-1333, HT, Turbo 1/1/2/2) Processor

Intel® Xeon® Processor E5630 (2.53GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2)

Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W, DDR3-1333, HT, Turbo 1/1/2/2) Processor

Intel® Xeon® E5540 (2.53GHz/4-core/8MB/80W) Processor

Intel® Xeon® E5530 (2.40GHz/4-core/8MB/80W) Processor

Intel® Xeon® E5520 (2.26GHz/4-core/8MB/80W) Processor

Intel® Xeon® E5506 (2.13GHz/4-core/4MB/80W, DDR3-800) Processor

Intel® Xeon® E5504 (2.00GHz/4-core/4MB/80W, DDR3-800) Processor

Intel® Xeon® L5630 (2.13GHz/4-core/12MB/40W, DDR3-1333, HT, Turbo 1/1/2/2) Processor

#### Dual-Core Processors

Intel® Xeon® E5502 (1.86GHz/2-core/4MB/80W) Processor

Intel® Xeon® E5503 (2.0GHz/2-core/4MB/80W, DDR3-800) Processor

**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 and 5500 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

Upgradeable to two (2) processors

#### Cache Memory

One of the following depending on Model

4MBshared L3 cache

8MB shared L3 cache

12MB shared L3 cache

#### Chipset

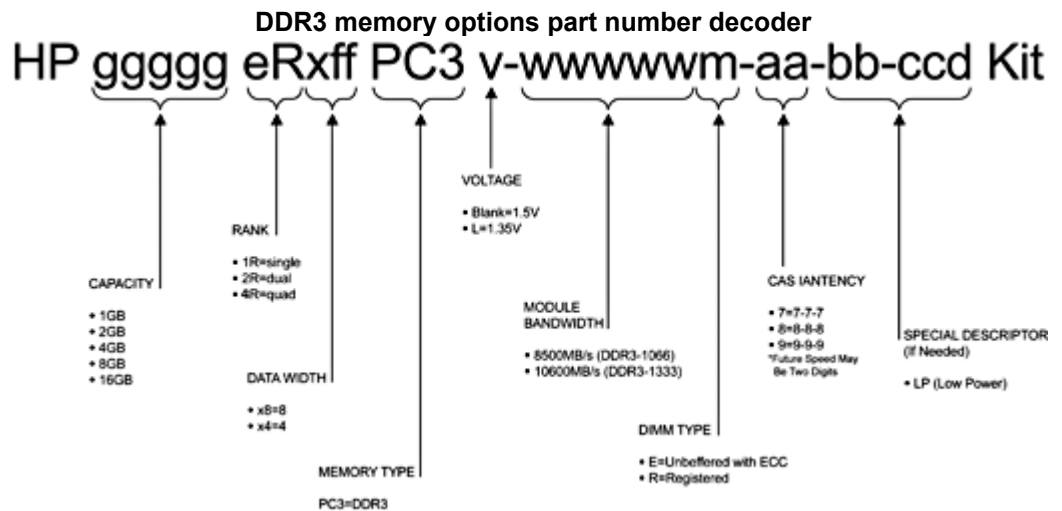
Intel® 5500 chipset



### Standard Features

<b>Memory</b>	Type	PC3-10600 (DDR3-1333) Registered or Unbuffered DIMMS
	Standard	2GB (1 x 2GB) RDIMM 4GB (2 x 2GB) RDIMM 6GB (3 x 2GB) RDIMM
	Maximum	Up to 192GB memory with Registered DIMMs Up to 48GB memory with Unbuffered DIMMs

**NOTE:** Depending on the memory configuration and processor model the memory speed may run at 1333MHz, 1066MHz or 800MHz. Please see the Online Memory Configuration Tool for details; [www.hp.com/go/ddr3memory-configurator](http://www.hp.com/go/ddr3memory-configurator)



<b>Memory Protection</b>	Advanced ECC (multi-bit error protection) Memory Mirroring Mode Memory Lock-Step Mode Memory Online Spare Mode supported on Xeon 5600 Series processors
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<b>Network Controller</b>	Embedded NC362i Dual Port Gigabit Server Adapter One (1) additional 10/100 network adapter dedicated to iLO 2 Management
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<b>I/O Expansion Slots</b>	Two (2) I/O expansion mezzanine slots (x8 PCI Express)
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<b>Integrated Manageability</b>	HP Integrated Lights-Out 2 (iLO 2) management processor
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<b>Storage Controller</b>	HP Embedded SATA RAID Controller <b>NOTE:</b> This is a chip set SATA RAID controller. It supports RAID 0 and 1 only and no BBWC. User needs to enable the RAID option through HP RBSU (ROM Base Setup Utility) first before the RAID can be activated. Users also need to download the OS driver from the <a href="http://www.hp.com/support/BL280cG6">http://www.hp.com/support/BL280cG6</a> website for OS Array Monitoring
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### Standard Features

<b>Maximum Internal Storage</b> One of the following depending on Model	Non Hot-Plug Serial ATA (SATA)	1TB SATA	2 x 500GB SATA
	Non Hot-Plug SAS	1.2TB SAS	2 x 600GB SAS
	Non-Hot Plug SSD (SATA)	240GB SATA	2 x 120GB SATA

<b>Graphics</b>	Integrated ATI RN-50 1280 x 1024 x 16M color (32 MB DDR1 memory)
Resolution Color Depths	1280 x 1024, 16.7M, 64k, 256, 16 1024 x 768, 16.7M, 64k, 256, 16 800 x 600, 16,7M, 64k, 256, 16 640 x 480, 16,7M, 64k, 256, 16

**Fibre Channel Support** Two (2) optional Fibre Channel HBAs are supported by the HP ProLiant BL280c G6. Both mezzanine circuit boards connect directly to the server blade system board. These Fibre Channel HBAs are available via option kits and must be ordered separately.

Emulex LPe1105 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem (PN 403621-B21)

- Based on the same field-proven ASIC, firmware, and driver technology as Emulex's renowned LPe1150 HBA, the Emulex LPe1105-HP is fully driver compatible with all Emulex HBAs

Emulex LPe1205 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem (PN 456972-B21)

- Exceptional performance, enhanced security, and scalable management for virtual server and enterprise-class applications

QLogic QMH2462 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem (PN 403619-B21)

- Uses common drivers which means that customers can standardize on one QLogic driver whether they are using the QMH2462 or other 4Gb and 2Gb HBAs powered by QLogic

QLogic QMH2562 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem (PN 451871-B21)

- Provides a first step into the 8Gb future, advanced, embedded support for virtualized environments and reduced power consumption

HP BLc Brocade 804 8Gb Fibre Channel Host Bus Adapter (PN 590647-B21)

- Application oriented Quality of Service (AQoS) providing the ability to configure, prioritize, and optimize traffic flows from virtual machines and/or applications to the target port

Brocade, Emulex and QLogic Fibre Channel HBAs feature:

- Optimal performance utilizing PCI Express
- 4/2/1Gb/s auto negotiating speeds (4 Gb HBAs)
- 8/4/2Gb/s auto negotiating speeds (8 Gb HBAs)
- Dual-ports for redundant path connections
- Up to two FC HBAs per server blade providing redundant FC HBA support
- Optimized for HP Storage products and supported by third party SAN vendors
- Support for Microsoft® Windows® and Linux operating systems environments



### Standard Features

<b>Compatible SAN</b>	<p>HP ProLiant BL280c G6 server blades are optimized for HP MSA, EVA and XP</p> <p>HP ProLiant BL280c G6 server blades are compatible with select 3rd party SANs Please see blade storage page for more details: <a href="http://h18004.www1.hp.com/products/ blades/ components/ c- class- sans. html">http://h18004.www1.hp.com/products/ blades/ components/ c- class- sans. html</a></p>
<b>HP Virtual Connect</b>	<p>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: <a href="http://www.hp.com/go/virtualconnect">www.hp.com/go/virtualconnect</a></p>
<b>HP Insight management software</b>	<p>HP Insight Foundation</p> <p>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.</p> <p>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: <a href="http://www.hp.com/go/foundation">http://www.hp.com/go/foundation</a>.</p> <p>The foundation pack includes:</p> <ul style="list-style-type: none"><li>● HP SmartStart</li><li>● HP Management DVD</li><li>● HP ProLiant Smart Update Firmware DVD</li><li>● SmartStart version supported (minimum): SmartStart 8.20. <a href="http://www.hp.com/servers/smartstart">http://www.hp.com/servers/smartstart</a></li></ul> <p><b>NOTE:</b> In an effort to support reducing our environmental impact, the HP Insight Foundation Suite for ProLiant media will be available as a selectable option for this server at time of order of a Factory Integrated Model. This will allow customers to order the number of media kits that best meet their needs and eliminate receiving unnecessary duplicate media.</p> <p>HP Integrated Lights-Out (iLO)</p> <p>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 Advanced can be purchased as a stand-alone product but also comes included with the purchase of HP Insight Control. 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: <a href="http://www.hp.com/go/iLO">www.hp.com/go/iLO</a></p> <p>HP Insight Control</p> <p>HP Insight Control, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, migrate, monitor, remote control, and optimize your IT infrastructure through a single, simple management console.</p>

Two versions of Insight Control are available, to serve environments



### Standard Features

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](http://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 advanced infrastructure management software that enables IT staff to instantly adjust their environments to meet dynamic business demands by provisioning, optimizing and protecting complex infrastructure in minutes. It's a powerful toolkit, integrated-by-design, that accelerates complex technology projects and simplifies daily operations, transforming data center economics. With Insight Dynamics IT professionals can plan capacity and power continuously, balance workloads across physical and virtual resources, and ensure cost-effective high availability. It also enables IT organizations to provision infrastructure consistently and automatically from pools of shared resources using a self-service portal. Resources provisioned can range from a single virtual machine to complex multi-tier environments and their associated physical and virtual resource requirements. In addition to the previous functional benefits, it also provides a cost-effective disaster recovery for physical and virtual environments that works with HP Continuous Access software for both the Enterprise Virtual Array and the XP storage array allowing application environments to be reactivated in minutes with the touch of a button to a remote location.

**NOTE:** For more information, visit: <http://www.hp.com/go/insightdynamics>

### 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>

HP HPC Interconnects

High Performance Computing (HPC) interconnect technologies are available for this server as part of the HP Cluster Platform portfolio. These high-speed InfiniBand and Gigabit interconnects are fully supported by HP when integrated within an HP cluster. Flexible, validated solutions can be defined with the help of configuration tools. <http://www.hp.com/techservers/clusters/ucp/index.html>

HP Cluster Management Utility

HP Cluster Management Utility (CMU) is an HP-licensed and HP-supported suite of tools that are used to manage large-scale Linux ProLiant systems. CMU includes software for the centralized provisioning, management and monitoring of nodes. CMU makes the administration of clusters user friendly, efficient, and effective. <http://www.hp.com/go/cmu>

HP HPC Linux Value Pack

HP HPC Linux Value Pack (Value Pack) is an HP-licensed and HP-supported specially priced software bundle for the development and deployment of applications on HPC Cluster Platforms. Value Pack includes the Platform HPC Enterprise Edition suite of tools including the LSF workload scheduler, the HP-MPI parallelization library. Also included are the HP Unified Parallel C compiler and the HP Shmem





### Standard Features

library, as well as the execution environments for the libraries and compiler. [HP HPC Linux Value Pack](#)

#### Operating Systems and Virtualization Software

[Microsoft Windows Server](#)  
[Red Hat Enterprise Linux \(RHEL\)](#)  
[SUSE Linux Enterprise Server \(SLES\)](#)  
[Solaris](#)  
[VMware](#)  
[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/BL280cG6>

#### Availability

- Dual port Fibre Channel Mezzanine card for redundant SAN connection
- Advanced ECC memory - can correct a multi-bit error (up to 4 bits) that occurs within one memory chip
- Support for Memory Mirroring and Memory Lock-Step Mode
- Network adapter teaming (network fault tolerance, transmit load balancing, switch-assisted load balancing)

#### Industry Standard Compliance

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

#### Security

- One (1) internal USB 2.0 connector for security key devices and USB drive keys
- Power-on password
- Administrator's password
- Integrated Lights-Out 2 has 12 customizable user accounts and SSL encryption
- Integrated Lights-Out 2 can be disabled via a Global Setting

#### Security - Trusted Platform Module

The TPM (Trusted Platform Module) 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 a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2008 has not been tampered with while the system was offline.

**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.

### Standard Features

#### **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>.

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#### **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 Technology Services for Industry Standard Servers and BladeSystem

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

#### **What HP ProLiant and BladeSystem Services can do for you**

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

#### **HP Technology Services meets business challenges with services offered in three packages**

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

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#### **Optimized Care Package**

#### **Supports maintaining servers at optimum performance availability**

##### **HP Installation and Startup Service for HP BladeSystem c-Class Infrastructure for c3000/c7000 enclosure**

Provides for the installation and startup of a BladeSystem c3000 Infrastructure in a single blade enclosure including hardware and software, including deployment of OS, HP SIM, RDP, RDP, PMP and VPM.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-5964ENW>

##### **3-Year HP Critical Advantage for c3000/c7000 enclosure + 3-Year HP Critical Advantage for Blade server**

Provides end-to-end infrastructure support solution for business critical applications running on virtualized/x86 infrastructures, enabling the customers to cost effectively build, operate, and continuously improve their IT environment. <http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA3-1772ENW>

##### **HP Installation and Startup Service for HP BladeSystem c-Class Enhanced Network**

HP Provides for the configuration and testing of BladeSystem Ethernet interconnect switches to facilitate proper implementation of network protocols and access to advanced features.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4aa0-5969ENW>

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

### Service and Support

#### Standard Care Package

**Package that maintains high level of server availability**

**HP Installation and Startup Service for HP BladeSystem c-Class Infrastructure for c3000/c7000 enclosure**

Provides for the installation and startup of a BladeSystem c3000 Infrastructure in a single blade enclosure including hardware and software, including deployment of OS, HP SIM, RDP, RDP, PMP and VPM.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-5964ENW>

**HP Installation and Startup Service for HP BladeSystem c-Class Enhanced Network**

HP Provides for the configuration and testing of BladeSystem Ethernet interconnect switches to facilitate proper implementation of network protocols and access to advanced features.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4aa0-5969ENW>

**3-Year, HP 6 hour Hardware Support Onsite Call-to-Repair Service for c3000/c7000 enclosure + 3-Year, HP 6 hour Hardware Support Onsite Call-to-Repair Service for Blade server**

Provides an IT manager with a team of support specialists who will quickly begin troubleshooting the system to help return the hardware to operating condition within 6 hours of the initial service request to the HP Global Solution Center.

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

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

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6645EEE.pdf>

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

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#### Basic Care Package

**Delivers minimum recommended support service level**

**HP Installation and Startup Service for HP BladeSystem c-Class Infrastructure for c3000/c7000 enclosure**

Provides for the installation and startup of a BladeSystem c3000 Infrastructure in a single blade enclosure including hardware and software, including deployment of OS, HP SIM, RDP, RDP, PMP and VPM.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-5964ENW>

**3-Year, HP 24x7 4 hour Response, Hardware Support Onsite Service for c3000/c7000 enclosure + 3-Year, HP 24x7 4 hour Response, Hardware Support Onsite Service for Blade server**

Provides you with rapid remote support and if required an HP authorized representative who will arrive on site any time and day of the year to begin hardware maintenance service within 4 hours of the service request being logged.

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

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

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6645EEE.pdf>

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

### *Service and Support*

**Insight Remote Support**

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

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**For more information**

To learn more on HP ProLiant servers and HP BladeSystem servers, please contact your HP sales representative or HP Authorized Channel Partner. Or visit:

[www.hp.com/services/bladesystem](http://www.hp.com/services/bladesystem)

### Models

#### 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 models below support Intel® Xeon® 5600 or 5500 series processors.

<p><b>HP ProLiant BL280c G6 E5649 1P 6GB-R Server</b> 632693-B21</p>	<p><b>Processor(s)</b> One of the following depending on Model</p>	<p>(1) Intel® Xeon® Processor X5650 (2.66GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) (1) Intel® Xeon® Processor E5649 (2.53GHz/6-core/12MB/80W, DDR3-1333, HT, Turbo1/1/1/1/2/2) (1) Intel® Xeon® Processor E5630 (2.53GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) (1) Intel® Xeon® Processor E5506 (2.13GHz/4-core/4MB/80W, DDR3-800) (1) Intel® Xeon® Processor L5640 (2.26GHz/6-core/12MB/60W, DDR3-1333, HT, Turbo 2/2/3/3/4/4)</p>
<p><b>HP ProLiant BL280c G6 X5650 1P 6GB-R Emb SATA Non-hot Plug SAS/SATA 2 SFF Server</b> 598129-B21</p>	<p><b>Cache Memory</b> One of the following depending on Model</p>	<p>12MB shared L3 cache 8MB shared L3 cache 4MB shared L3 cache</p>
<p><b>HP ProLiant BL280c G6 E5630 1P 4GB-R Emb SATA Non-hot Plug SAS/SATA 2 SFF Server</b> 598130-B21</p>	<p><b>Memory</b> One of the following depending on Model</p>	<p>2GB PC3-10600 (DDR3-1333) Registered DIMMs 4GB PC3-10600 (DDR3-1333) Registered DIMMs 6GB PC3-10600 (DDR3-1333) Registered DIMMs</p>
<p><b>HP ProLiant BL280c G6 E5506 1P 2GB-R Emb SATA Non-hot Plug SAS/SATA 2 SFF Server</b> 598132-B21</p>	<p><b>Network Adapter</b></p>	<p>Embedded NC362i Dual Port Gigabit Server Adapter and one (1) additional 10/100 network adapter dedicated to iLO 2 Management</p>
<p><b>HP ProLiant BL280c G6 L5640 1P 4GB-R Emb SATA Non-hot Plug SAS/SATA 2 SFF Server</b> 598131-B21</p>	<p><b>Storage Controller</b></p>	<p>HP Embedded SATA RAID Controller</p>
	<p><b>Hard Drives</b></p>	<p>No drives included; Two (2) SFF Non-Hot Plug SATA or SAS drive bays</p>
	<p><b>Internal Storage</b></p>	<p>SATA: 1TB (2x500GB SATA) SAS: 1.2TB (2x600GB SAS)</p>
	<p><b>Optical Drive</b></p>	<p>None</p>
	<p><b>Form Factor</b></p>	<p>Up to 8 half-height blades supported in HP BladeSystem c3000 Enclosure Up to 16 half-height blades supported in HP BladeSystem c7000 Enclosure</p>



### 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 a configurable Blade)

<b>Models</b>	<b>HP ProLiant BL280c G6 Configure-to-order Blade</b>	507865-B21
	<b>Configurable Model ships with:</b>	
	One (1) HP NC362i Integrated dual-port Gigabit Ethernet Adapter plus one (1) additional 10/100 network adapter dedicated to iLO 2 Management	
	Integrated Lights-Out 2 Standard Blade Edition	

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

<b>HP Processors</b>	<b>NOTE:</b> If two processors are desired, select one xxxxxx-L21 and one xxxxxx-B21	
	<b>Six-Core Processors</b>	
	HP BL280c G6 Intel® Xeon® X5675 (3.06GHz/6-core/12MB/95W) FIO Processor Kit	632694-L21
	HP BL280c G6 Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W) FIO Processor Kit	632698-L21
	HP BL280c G6 Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W) FIO Processor Kit	632700-L21
	HP BL280c G6 Intel® Xeon® X5670 (2.93GHz/6-core/12MB/95W) FIO Processor Kit	598135-L21
	HP BL280c G6 Intel® Xeon® X5660 (2.80GHz/6-core/12MB/95W) FIO Processor Kit	598136-L21
	HP BL280c G6 Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W) FIO Processor Kit	598137-L21
	<b>Quad-Core Processors</b>	
	HP BL280c G6 Intel® Xeon® X5672 (3.20GHz/4-core/12MB/95W) FIO Processor Kit	632696-L21
	HP BL280c G6 Intel® Xeon® E5640 (2.66GHz/4-core/12MB/80W) FIO Processor Kit	598138-L21
	HP BL280c G6 Intel® Xeon® E5630 (2.53GHz/4-core/12MB/80W) FIO Processor Kit	598139-L21
	HP BL280c G6 Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W) FIO Processor Kit	598140-L21
	HP BL280c G6 Intel® Xeon® E5506 (2.13GHz/4-core/4MB/80W) FIO Processor Kit	507825-L21
	<b>Dual-Core Processors</b>	
	HP BL280c G6 Intel® Xeon® E5503 (2.0GHz/2-core/4MB/80W) FIO Processor Kit	598144-L21
	HP BL280c G6 Intel® Xeon® L5640 (2.26GHz/6-core/12MB/60W) FIO Processor Kit	598141-L21
	HP BL280c G6 Intel® Xeon® L5630 (2.13GHz/4-core/12MB/40W) FIO Processor Kit	598142-L21
<b>HP Memory</b>	<b>Registered DIMMS (RDIMMs)</b>	

### Configuration Information - Factory Integrated Models

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
<b>NOTE:</b> Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.	
HP 4GB (1x4GB) Quad Rank x8 PC3-8500 (DDR3-1066) Registered CAS-7 Low Power Memory Kit	500660-B21
HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604506-B21
<b>NOTE:</b> Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.	
HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit	627812-B21
<b>Unbuffered with ECC DIMMs (UDIMMs)</b>	
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
<b>NOTE:</b> All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: <a href="http://www.hp.com/go/ddr3memory-configurator">www.hp.com/go/ddr3memory-configurator</a> .	
<b>NOTE:</b> Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: <a href="http://www.hp.com/go/proliant-energy-efficient">www.hp.com/go/proliant-energy-efficient</a>	
<b>NOTE:</b> PC3L is a low voltage memory	

### 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 options section below; or the following:

HP BladeSystem c-Class Enclosures QuickSpecs:

HP BladeSystem c3000 Enclosure QuickSpecs:

[http://h18000.www1.hp.com/products/quickspecs/12790\\_div/12790\\_div.html](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](http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html)

and HP BladeSystem c-Class Interconnect and Mezzanine Components:

<http://h18004.www1.hp.com/products/blades/components/c-class-interconnects.html>

<http://h18004.www1.hp.com/products/blades/components/c-class-adapters.html>

### Core Options

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

#### HP Ethernet Mezzanine Gigabit Ethernet Mezzanines

<b>Options</b>	HP NC325m PCI Express Quad Port Gigabit Server Adapter	416585-B21
	HP NC360m Dual Port 1GbE BL-c Adapter	445978-B21
	HP NC364m Quad Port 1GbE BL-c Adapter	447883-B21
	HP NC382m PCI Express Dual Port Multifunction Gigabit Server Adapter	453246-B21

**NOTE:** The Gigabit Ethernet adapters above transmit from the server only at 2000 Mbps, full duplex per port. For more information, see the "Network Controller" segment in the Standards Features section for more information.

#### 10 Gigabit 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:** Each 10 Gigabit Ethernet adapter supports linking at 1000Mbps or 10000Mbps when not connected to a Flex-10 enabled module and will link with all current 1Gb switches at 1Gb.

**NOTE:** The ROM Based Setup Utility (RBSU) feature allows for the configuring of a FlexFabric Adapter to any of the supported protocols. For example iSCSI to FCoE (Fibre Channel over Ethernet). Note that a HP Virtual Connect profile takes precedence over the setting in this menu. Also, some FlexFabric Adapters may require that network boot be enabled in order to configure the protocol. If the protocol is configured without enabling network boot with certain FlexFabric Adapters, the protocol may not take effect. Once the protocol has taken effect on the first boot after configuring this option, network boot may be disabled if desired.

	HP NC532m Dual Port 10GbE Multifunction BL-c Adapter	467799-B21
	HP NC542m Dual Port Flex-10 10GbE BL-c Adapter	539857-B21
	HP NC550m 10Gb 2-port PCIe x8 Flex-10 Ethernet Adapter	581204-B21
	HP BLc NC551m Dual Port FlexFabric 10Gb Converged Network Adapter	580151-B21
	HP NC552m 10Gb 2-port Flex-10 Ethernet Adapter	610609-B21
	HP NC553m 10Gb 2-port FlexFabric Adapter	613431-B21

#### HP Fibre Channel Mezzanine Options

#### 4Gb Fibre Channel Mezzanines

	Emulex LPe1105 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	403621-B21
	QLogic QMH2462 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	403619-B21

#### 8Gb Fibre Channel Mezzanines

	Emulex LPe1205 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	456972-B21
	QLogic QMH2562 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	451871-B21
	HP BLc Brocade 804 8Gb Fibre Channel Host Bus Adapter	590647-B21

### Core Options

#### HP Processors

#### Six-Core Processor Option Kits

HP BL280c G6 Intel® Xeon® X5675 (3.06GHz/6-core/12MB/95W) Processor Kit	632694-B21
HP BL280c G6 Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W) Processor Kit	632698-B21
HP BL280c G6 Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W) Processor Kit	632700-B21
HP BL280c G6 Intel® Xeon® X5670 (2.93GHz/6-core/12MB/95W) Processor Kit	598135-B21
HP BL280c G6 Intel® Xeon® X5660 (2.80GHz/6-core/12MB/95W) Processor Kit	598136-B21
HP BL280c G6 Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W) Processor Kit	598137-B21
HP BL280c G6 Intel® Xeon® L5640 (2.26GHz/6-core/12MB/60W) Processor Kit	598141-B21

#### Quad-Core Processor Option Kits

HP BL280c G6 Intel® Xeon® X5672 (3.20GHz/4-core/12MB/95W) Processor Kit	632696-B21
HP BL280c G6 Intel® Xeon® E5640 (2.66GHz/4-core/12MB/80W) Processor Kit	598138-B21
HP BL280c G6 Intel® Xeon® E5630 (2.53GHz/4-core/12MB/80W) Processor Kit	598139-B21
HP BL280c G6 Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W) Processor Kit	598140-B21
HP BL280c G6 Intel® Xeon® E5540 (2.53GHz/4-core/8MB/80W) Processor Kit	507820-B21
HP BL280c G6 Intel® Xeon® E5530 (2.40GHz/4-core/8MB/80W) Processor Kit	507822-B21
HP BL280c G6 Intel® Xeon® E5520 (2.26GHz/4-core/8MB/80W) Processor Kit	507824-B21
HP BL280c G6 Intel® Xeon® E5506 (2.13GHz/4-core/4MB/80W) Processor Kit	507825-B21
HP BL280c G6 Intel® Xeon® E5504 (2.00GHz/4-core/4MB/80W) Processor Kit	507826-B21
HP BL280c G6 Intel® Xeon® L5630 (2.13GHz/4-core/12MB/40W) Processor Kit	598142-B21

#### Dual-Core Processor Option Kits

HP BL280c G6 Intel® Xeon® E5502 (1.86GHz/2-core/4MB/80W) Processor Kit	507827-B21
HP BL280c G6 Intel® Xeon® E5503 (2.0GHz/2-core/4MB/80W) Processor Kit	598144-B21

### Core Options

<b>HP Memory</b>	<p><b>Registered DIMMS (RDIMMs)</b></p> <p>HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 500656-B21</p> <p>HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 500658-B21</p> <p>HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 593339-B21</p> <p>HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit 604504-B21</p> <p><b>NOTE:</b> Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.</p> <p>HP 4GB (1x4GB) Quad Rank x8 PC3-8500 (DDR3-1066) Registered CAS-7 Low Power Memory Kit 500660-B21</p> <p>HP 4GB (1x4GB) Dual Rank x8 PC3L-10600 (DDR3-1333) Unbuffered CAS-9 Low Power Memory Kit 619488-B21</p> <p>HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 500662-B21</p> <p>HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit 604506-B21</p> <p><b>NOTE:</b> Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.</p> <p>HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit 500666-B21</p> <p>HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit 627812-B21</p> <p><b>Unbuffered with ECC DIMMs (UDIMMs)</b></p> <p>HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500668-B21</p> <p>HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500670-B21</p> <p>HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500672-B21</p> <p><b>NOTE:</b> All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: <a href="http://www.hp.com/go/ddr3memory-configurator">www.hp.com/go/ddr3memory-configurator</a>.</p> <p><b>NOTE:</b> Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: <a href="http://www.hp.com/go/proliant-energy-efficient">www.hp.com/go/proliant-energy-efficient</a></p> <p><b>NOTE:</b> PC3L is a low voltage memory</p>
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### 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.

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

HP 500GB 3G SATA 7.2K rpm SFF (2.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive 507753-B21

HP 160GB 3G SATA 7.2K rpm SFF (2.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive 530891-B21

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

HP 500GB 3G SATA 7.2K rpm SFF (2.5-inch) Non-hot plug Entry 1yr Warranty Hard Drive 628033-B21

**NOTE:** SATA drives have a 1 year warranty. Please see the SATA Hard Drive QuickSpecs for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature:

[http://h18000.www1.hp.com/products/quickspecs/13021\\_div/13021\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html) (Worldwide)

#### HP Solid State Drives (SSD) For ProLiant Server Blades

HP 60GB 3G SATA SFF (2.5-inch) Non-hot plug Midline 1yr Wty Solid State Drive 572075-B21

HP 120GB 3G SATA SFF (2.5-inch) Non-hot plug Midline 1yr Wty Solid State Drive 572077-B21

**NOTE:** Please see the for Technical Specifications and additional information: [http://h18000.www1.hp.com/products/quickspecs/13121\\_div/13121\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13121_div/13121_div.html) (Worldwide)

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

HP 600GB 6G SAS 10K rpm SFF (2.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive 590698-B21

HP 300GB 6G SAS 10K rpm SFF (2.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive 537809-B21

HP 146GB 6G SAS 10K rpm SFF (2.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive 537807-B21

HP 72GB 6G SAS 15K rpm SFF (2.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive 537805-B21

**NOTE:** SAS drives are only supported with the use of the HP Smart Array P712m Controller.

**NOTE:** Please see the for Technical Specifications and additional information: [http://h18000.www1.hp.com/products/quickspecs/12244\\_div/12244\\_div.html](http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html) (Worldwide)



### Additional Options

<b>HP Insight Software</b>	<b>HP Insight Control</b>	
	HP Insight Control including 1yr 24x7 Technical Support and Updates Electronic License	T9074BAE
	HP Insight Control including 1yr 24x7 Technical Support and Updates Single Server License	452148-B22
	HP Insight Software Media Kit	436222-B21
	<p><b>NOTE:</b> Insight Software DVD media without licenses. Contains Insight Control, Insight Dynamics and Virtual Connect Enterprise Manager. Uses an integrated installer to perform quick and accurate software installation and updates.</p> <p><b>NOTE:</b> Licenses ship without media. The HP Insight Control Media Kit can be ordered separately, or can be downloaded at: <a href="http://www.hp.com/go/insightupdates">http://www.hp.com/go/insightupdates</a>.</p> <p><b>NOTE:</b> 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.</p> <p><b>NOTE:</b> 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 &amp; Update Service.</p> <p><b>NOTE:</b> For additional license kits, including bundles with HP BladeSystem enclosures, please see the Insight Control QuickSpecs at: <a href="http://h18004.www1.hp.com/products/quickspecs/12631_div/12631_div.html">http://h18004.www1.hp.com/products/quickspecs/12631_div/12631_div.html</a></p>	
	<b>HP Insight Control for Linux</b>	
	HP Insight Control for Linux including 1yr 24x7 Support Electronic License	TC213AAE
	<p><b>NOTE:</b> 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.</p> <p><b>NOTE:</b> Electronic LTUs are only available through limited points of sales; if not available, order a printed license entitlement certificate instead.</p>	
	HP Insight Control for Linux including 1yr 24x7 Support Single Server License	TC209A
	HP Insight Control for Linux Media Kit	TC208A
	<p><b>NOTE:</b> 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.</p> <p><b>NOTE:</b> This Media pack is optional because the latest ISO image and latest updates may be downloaded at no cost from: <a href="http://www.hp.com/go/ic-linux">http://www.hp.com/go/ic-linux</a> (click on Download button).</p> <p><b>NOTE:</b> Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: <a href="http://www.hp.com/go/ic-linux">http://www.hp.com/go/ic-linux</a> (click on Download button).</p> <p><b>NOTE:</b> 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.</p> <p><b>NOTE:</b> 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.</p> <p><b>NOTE:</b> For additional License Kits, please see the Insight Control for Linux QuickSpecs at: <a href="http://h18000.www1.hp.com/products/quickspecs/13019_div/13019_div.html">http://h18000.www1.hp.com/products/quickspecs/13019_div/13019_div.html</a></p>	
	<b>HP Integrated Lights-Out (iLO) Advanced for BladeSystem</b>	
	HP iLO Advanced for BladeSystem including 1yr 24x7 Support Electronic License	TA851AAE

### Additional Options

HP iLO Advanced for BladeSystem including 1yr 24x7 Support Single Server License 512488-B21

**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 HP ProLiant Onboard Administrator (OA), powered by the Integrated Lights-Out 2 QuickSpecs at: [http://h18000.www1.hp.com/products/quickspecs/12362\\_div/12362\\_div.html](http://h18000.www1.hp.com/products/quickspecs/12362_div/12362_div.html)

#### HP Insight Control server deployment software

HP Insight Control Server Deployment including 1yr 24x7 Support Electronic License T9082AAE

HP Insight Control Server Deployment including 1yr 24x7 Support Single Server License 452151-B21

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

### High Performance Clusters

#### HP Cluster Management Utility

HP Cluster Management Utility Compute Node Flexible License QL803A

**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](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 TC293B

**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](http://h18004.www1.hp.com/products/quickspecs/13485_div/13485_div.html)



### Additional Options

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<b>HP Security - TPM</b>	HP Trusted Platform Module Option <b>NOTE:</b> The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.	488069-B21
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### HP Storage Controllers **HP Smart Array 700m Controller**

HP Smart Array P700m/256 4-ports Ext PCIe x8 SAS Controller	507925-B21
HP Smart Array P700m/512 4-ports Ext PCIe x8 SAS Controller	508226-B21

**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information at:

[http://h18000.www1.hp.com/products/quickspecs/13175\\_div/13175\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13175_div/13175_div.html)  
(Worldwide)

#### **Smart Array P711m Controller**

HP Smart Array P711m/1G 6Gb FBWC 4-ports Ext Mezzanine SAS Controller	513778-B21
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#### **Smart Array P712m Controller**

HP Smart Array P712m/256 6Gb 2-ports Int/2-ports Ext Mezzanine SAS Controller	488348-B21
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HP Smart Array P712m/ZM 2-ports Int PCIe x8 SAS Controller	484299-B21
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**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information at:

[http://h18000.www1.hp.com/products/quickspecs/13296\\_div/13296\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13296_div/13296_div.html)  
(Worldwide)

#### **Optional Upgrade**

HP 256MB P-series Cache Upgrade	462968-B21
HP 1GB Flash Backed Cache	534562-B21
HP 512MB Flash Backed Write Cache	534916-B21
HP Smart Array P-Series Low Profile Battery	452348-B21
HP 650 mAh P-series Low Profile Battery	575031-B21
HP Smart Array Advanced Pack including 1yr 24x7 Technical Support and Updates Single Server License	516471-B21

**NOTE:** This part number can be used to purchase a single license or to order multiple licenses with a single activation key. Customers 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). Include one year of 24x7 HP Software Technical Support Services.

**NOTE:** Please see the QuickSpecs for additional information:

[http://h18000.www1.hp.com/products/quickspecs/13200\\_div/13200\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13200_div/13200_div.html)

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<b>HP I/O Expansion Options</b>	HP StorageWorks 320GB IO Accelerator for BladeSystem c-Class HP 640GB IO Accelerator for BladeSystem c-Class	AJ878B BK836A
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**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information:

[http://h18000.www1.hp.com/products/quickspecs/13220\\_div/13220\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13220_div/13220_div.html)

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### Additional Options

<b>HP c-Class Mezzanine Options</b>	HP 4X QDR QLogic InfiniBand Dual Port Mezzanine HCA for c-Class BladeSystem	583210-B21
	HP 4X QDR InfiniBand ConnectX-2 Dual Port Mezzanine HCA for c-Class BladeSystem	592519-B21
<p><b>NOTE:</b> Please see the QuickSpecs for Technical Specifications and additional information at:  <a href="http://h18000.www1.hp.com/products/quickspecs/12586_div/12586_div.html">http://h18000.www1.hp.com/products/quickspecs/12586_div/12586_div.html</a>            (Worldwide)</p>		
<b>HP Ultrium Tape Blades</b>	HP StorageWorks SB1760c Tape Blade	AQ697A
	<p><b>NOTE:</b> LTO-4 Ultrium technology.</p> <p><b>NOTE:</b> The HP PCI Express Mezzanine Pass-Thru Card for HP BladeSystem (431643-B21) is required when installing a tape blade adjacent to a full-height server blade.</p> <p><b>NOTE:</b> Please see the for Technical Specifications and additional information at: <a href="http://h18000.www1.hp.com/products/quickspecs/12729_div/12729_div.html">http://h18000.www1.hp.com/products/quickspecs/12729_div/12729_div.html</a></p>	
<b>HP Storage Blades</b>	HP StorageWorks LTO-5 SB3000c Tape Blade	BS580A
	<p><b>NOTE:</b> Please see the for Technical Specifications and additional information at: <a href="http://h18000.www1.hp.com/products/quickspecs/12729_div/12729_div.html">http://h18000.www1.hp.com/products/quickspecs/12729_div/12729_div.html</a>            (Worldwide)</p>	
	HP StorageWorks SB40c with Virtual SAN Appliance Software Bundle	AT459A
	<p><b>NOTE:</b> Please see the for Technical Specifications and additional information at: <a href="http://h18000.www1.hp.com/products/quickspecs/12587_div/12587_div.html">http://h18000.www1.hp.com/products/quickspecs/12587_div/12587_div.html</a>            (Worldwide)</p>	
<b>HP Expansion Blade</b>	HP D2200sb Storage Blade	AP880A
	<p><b>NOTE:</b> Please see the HP D2200sb PCIe Storage Blade QuickSpecs for technical specifications and additional information at:  <a href="http://h18006.www1.hp.com/storage/bladesystem/index.html">http://h18006.www1.hp.com/storage/bladesystem/index.html</a>.</p>	
<b>HP Expansion Blade</b>	HP BLc PCI Expansion Blade	448018-B21
	<p><b>NOTE:</b> Ships with one pre-installed PCI-X connect board. Also includes one PCIe connect board which requires installation.</p> <p><b>NOTE:</b> Please see the for Technical Specifications and additional information at: <a href="http://h18000.www1.hp.com/products/quickspecs/12753_div/12753_div.html">http://h18000.www1.hp.com/products/quickspecs/12753_div/12753_div.html</a></p>	
<b>HP USB and SD Options</b>	HP USB 2-Button Optical Scroll Mouse	DC172B
	HP 2GB USB Flash Media Drive Key Kit	608447-B21
	<p><b>NOTE:</b> 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 <a href="#">HP VMware Getting Started Guide</a> for installation instructions.</p>	
	HP USB Standard Keyboard	DT528A#ABA
	HP 4GB Secure Digital High Capacity Flash Media Kit	580387-B21
<p><b>NOTE:</b> Blank SD media devices are supported for use with VMware and Citrix. SD media must be installed in the internal slot of the ProLiant server. Learn more at: <a href="http://www.hp.com/go/proliantvirtualization">http://www.hp.com/go/proliantvirtualization</a></p>		

### *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**

HP 3 year 4 hour 13x5 BL2xxc Server Blade Hardware Support	UK042E
HP 3 year 4 hour 24x7 BL2xxc Server Blade Hardware Support	UK043E
HP 3 year 6 hour 24x7 Call to Repair BL2xxc Server Blade Hardware Support	UK044E

### Memory

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

#### Memory Population Guidelines

For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool:

[www.hp.com/go/ddr3memory-configurator](http://www.hp.com/go/ddr3memory-configurator)

Some DIMM installation guidelines are summarized below:

- For the HP ProLiant BL280c G6 server with twelve (12) memory slots:
  - There are three (3) channels per processor; six (6) channels per server
  - There are two (2) DIMM slots for each memory channel; twelve (12) total slots.
  - Memory channel 1 consists of the two (2) DIMMs that are closest to the processor
  - Memory channel 3 consists of the two (2) DIMMs that are furthest from the processor
- DIMM slots that are white should be populated first
- Do not mix Unbuffered memory (UDIMMs) with Registered memory (RDIMMs).
- Do not install DIMMs if the corresponding processor is not installed
- If only one processor is installed in a 2CPU system, only half of the DIMM slots are available
- 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
- If any Quad rank DIMMs are installed, all channels are limited to only 2 DIMMs per channel
- You can only install two quad-rank DIMMs per channel
- You can only install two UDIMMs per channel; if available, the third slot in the channel must remain empty
- Populate DIMMs from heaviest load (quad-rank) to lightest load (single-rank) within a channel
- Heaviest load (DIMM with most ranks) within a channel goes furthest from the processor
- For memory mirroring mode, channel 3 must be unpopulated. Channels 1 and 2 are populated identically
- For lock-step mode, channel 3 must be unpopulated. DIMMs in channels 1 and 2 will be installed in pairs. The paired slots will be 1,4; 2,5; 3,6 on a 3DPC system or 1,3, 2, 4; on a 2DPC system
- 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	16GB	4GB	16GB	1GB	2GB	4GB
DIMM Native Speed (MHz)	1333	1333	1333	1333	1333	1066	1066	1333	1333	1333
Voltage	LV/Std	Std	Std	LV/Std	LV/Std	Std	Std	Std	Std	Std
<b>SLOTS THAT CAN BE POPULATED</b>										
12 slot servers	12	12	12	12	12	12	12	12	12	12
<b>MAXIMUM CAPACITY (GB)</b>										
	48	24	48	96	192	48	192	12	24	48
<b>POPULATED DIMM SPEED (MHz)</b>										
1 DIMM Per Channel	1333	1333	1333	1333	1333	1066	1066	1333	1333	1333
2 DIMM Per Channel	1333	1333*	1333*	1333*	1066/ 1333**	800	800	1333*	1333*	1333*

\*Supported at 1333 via setting in ROM based setup utility (RBSU).

\*\*2DPC: LV runs at 1066, Std voltage runs at 1333

#### NOTES:





### Memory

- PC3-10600 DIMMs have a maximum speed of 1333MHz. PC3-8500 DIMMs have a maximum speed of 10600MHz.
- Mixing DIMM speeds is allowed, but the system processor speed rules always override the DIMM capabilities
- 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 5x 1333MHz DIMMs with 1 DIMM Per Channel (DPC) in each of the other channels, you run at 1066MHz
- If you install 3DPC in one channel (if applicable) and 1DPC in all other channels, you run at 800MHz
- Maximum memory speed will also depend on processor installed.
- References to the above MHz speeds are for the various speeds of DDR3 DIMMs; 1333 refers to DDR3-1333, etc.

### HP ProLiant BL280c G6 Server Blade DIMM slot and configuration diagrams

#### Basic memory slot and population diagram

- Population order; start with "A" first, "B" second, "C" third, etc.

12 DIMM SLOTS (6 per CPU node)					
	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D	1	D	Chnl 1
	2	A	2	A	
Chnl 2	3	E	3	E	Chnl 2
	4	B	4	B	
Chnl 3	5	F	5	F	Chnl 3
	6	C	6	C	

### HP ProLiant BL280c G6 Server Blade (1P Model)

#### Standard memory configuration (1 CPU model)

- 2GB (1 x 2GB) of PC3-10600 (DDR3-1333) ECC RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D: empty	1	D: empty	Chnl 1
	2	A: 2GB DIMM	2	A: empty	
Chnl 2	3	E: empty	3	E: empty	Chnl 2
	4	B: empty	4	B: empty	
Chnl 3	5	F: empty	5	F: empty	Chnl 3
	6	C: empty	6	C: empty	

#### Standard Memory Plus Optional Memory (1 CPU model)

- 82GB
  - 1x 2GB dual-rank PC3-10600 RDIMMs
  - 5x 16GB quad-rank PC3-10600 or PC3-8500 RDIMMs

### Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D: 2GB DIMM	1	D: empty	Chnl 1
	2	A: 16GB DIMM	2	A: empty	
Chnl 2	3	E: 16GB DIMM	3	E: empty	Chnl 2
	4	B: 16GB DIMM	4	B: empty	
Chnl 3	5	F: 16GB DIMM	5	F: empty	Chnl 3
	6	C: 16GB DIMM	6	C: empty	

#### Standard Memory Replaced with Optional Memory (1 CPU model)

- 96GB, consisting of six (6) 16GB quad-rank PC3-10600 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D: 16GB DIMM	1	D: empty	Chnl 1
	2	A: 16GB DIMM	2	A: empty	
Chnl 2	3	E: 16GB DIMM	3	E: empty	Chnl 2
	4	B: 16GB DIMM	4	B: empty	
Chnl 3	5	F: 16GB DIMM	5	F: empty	Chnl 3
	6	C: 16GB DIMM	6	C: empty	

#### UDIMM maximum configuration (1CPU model)

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

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D: 4GB DIMM	1	D: empty	Chnl 1
	2	A: 4GB DIMM	2	A: empty	
Chnl 2	3	E: 4GB DIMM	3	E: empty	Chnl 2
	4	B: 4GB DIMM	4	B: empty	
Chnl 3	5	F: 4GB DIMM	5	F: empty	Chnl 3
	6	C: 4GB DIMM	6	C: empty	

#### Standard Memory Replaced with Optional Memory (2 CPU Model) RDIMM maximum configuration

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

### Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D: 16GB DIMM	1	D: 16GB DIMM	Chnl 1
	2	A: 16GB DIMM	2	A: 16GB DIMM	
Chnl 2	3	E: 16GB DIMM	3	E: 16GB DIMM	Chnl 2
	4	B: 16GB DIMM	4	B: 16GB DIMM	
Chnl 3	5	F: 16GB DIMM	5	F: 16GB DIMM	Chnl 3
	6	C: 16GB DIMM	6	C: 16GB DIMM	

### UDIMM maximum configuration (2 CPU model)

- 48GB, consisting of twelve (12) 4GB dual-rank PC3-10600 UDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D: 4GB DIMM	1	D: 4GB DIMM	Chnl 1
	2	A: 4GB DIMM	2	A: 4GB DIMM	
Chnl 2	3	E: 4GB DIMM	3	E: 4GB DIMM	Chnl 2
	4	B: 4GB DIMM	4	B: 4GB DIMM	
Chnl 3	5	F: 4GB DIMM	5	F: 4GB DIMM	Chnl 3
	6	C: 4GB DIMM	6	C: 4GB DIMM	

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

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

### HP Memory

Following are memory options available from HP:

#### 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) Quad Rank x8 PC3-8500 (DDR3-1066) Registered CAS-7 Low Power Memory Kit 500660-B21

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



### Memory

HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit	627812-B21
<b>Unbuffered with ECC DIMMs (UDIMMs)</b>	
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
HP 4GB (1x4GB) Dual Rank x8 PC3L-10600 (DDR3-1333) Unbuffered CAS-9 Low Power Memory Kit	619488-B21

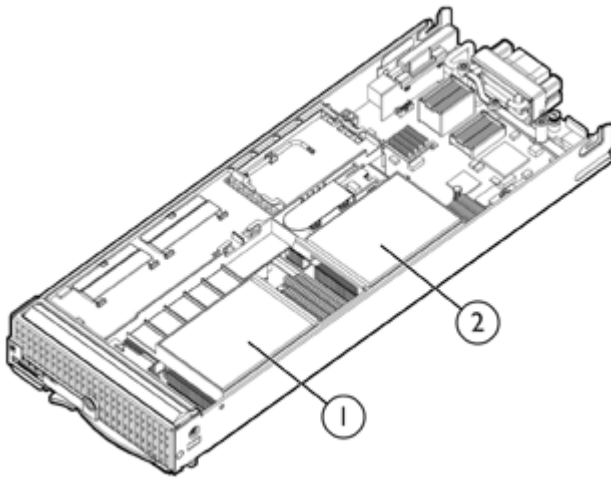
**NOTE:** All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: [www.hp.com/go/ddr3memory-configurator](http://www.hp.com/go/ddr3memory-configurator).

**NOTE:** Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: <http://www.hp.com/go/proliant-energy-efficient>

**NOTE:** PC3L is a low voltage memory

### Storage

1-2 2 x SFF SAS/SATA/SSD Non-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:** Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

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

	Quantity Supported	Position Supported	Controller
500GB 3G SATA 7.2K	2	1-2	HP Embedded SATA RAID Controller
160GB 3G SATA 7.2K			

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

	Quantity Supported	Position Supported	Controller
500GB 3G SATA 7.2K	2	1-2	HP Embedded SATA RAID Controller

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

	Quantity Supported	Position Supported	Controller
600GB 6G SAS 10K	2	1-2	HP Smart Array P712m Controller
300GB 6G SAS 10K			
146GB 6G SAS 10K			
72GB 6G SAS 15K			

#### HP Solid State Drives (SSD) For ProLiant Server Blades

	Quantity Supported	Position Supported	Controller
60GB 3G SATA	2	1-2	HP Embedded SATA RAID Controller
120GB 3G SATA			

### Storage

#### External Storage

	<b>Quantity Supported</b>	<b>Position Supported</b>	<b>Host Controller or Adapter</b>
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 XP10000 Disk Array:	<a href="http://h18006.www1.hp.com/products/storageworks/xp10000/index.html">http://h18006.www1.hp.com/products/storageworks/xp10000/index.html</a> (Worldwide)		
Enterprise Virtual 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 Enterprise Virtual Array Family:	<a href="http://h18006.www1.hp.com/products/quickspecs/12408_div/12408_div.html">http://h18006.www1.hp.com/products/quickspecs/12408_div/12408_div.html</a> (Worldwide)		



### Technical Specifications

<b>System Unit</b>	<b>Dimensions</b> (H x W x D) 7.11 in x 2.03 in x 20.06 in (18.06 cm x 5.14 cm x 50.95 cm) (with bezel)									
	<b>Weight</b> (approximate)	<table border="0"> <tr> <td style="padding-right: 20px;">Maximum</td> <td>14.5 lb (6.58 kg)</td> </tr> <tr> <td colspan="2">(all hard drives and processors installed)</td> </tr> <tr> <td>Minimum</td> <td>9.4 lb (4.26 kg)</td> </tr> <tr> <td colspan="2">(one hard drive and processor installed)</td> </tr> </table>	Maximum	14.5 lb (6.58 kg)	(all hard drives and processors installed)		Minimum	9.4 lb (4.26 kg)	(one hard drive and processor installed)	
Maximum	14.5 lb (6.58 kg)									
(all hard drives and processors installed)										
Minimum	9.4 lb (4.26 kg)									
(one hard drive and processor installed)										
	<b>Power Specifications</b>	<p>For power specifications including Input Requirements, BTU Rating, and Power Supply Output, please see the HP BladeSystem c-Class Enclosure QuickSpecs located at URL:            HP BladeSystem c3000 Enclosure QuickSpecs:  <a href="http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html">http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html</a>            HP BladeSystem c7000 Enclosure QuickSpecs:  <a href="http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html">http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html</a></p> <p>To review typical system power ratings use the HP BladeSystem Power Sizer which is available via the online tool located at URL:  <a href="http://www.hp.com/go/bladesystem/powercalculator">http://www.hp.com/go/bladesystem/powercalculator</a></p>								
	<b>System Inlet Temperature</b>	<table border="0"> <tr> <td style="padding-right: 20px;">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.</td> </tr> <tr> <td></td> <td>System performance may be reduced if operating with a fan fault or above 30°C (86°F).</td> </tr> <tr> <td style="padding-right: 20px;">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).		
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Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).									
	<b>Relative Humidity</b> (non-condensing)	<table border="0"> <tr> <td style="padding-right: 20px;">Operating</td> <td>10 to 85% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.</td> </tr> <tr> <td style="padding-right: 20px;">Non-operating</td> <td>5 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	5 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.									
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	<b>Altitude</b>	<table border="0"> <tr> <td style="padding-right: 20px;">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 style="padding-right: 20px;">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).				
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	<b>Acoustic Noise</b>	<p>For acoustic noise specifications, please see the HP BladeSystem c-Class Enclosures QuickSpecs located at URL:            HP BladeSystem c3000 Enclosure QuickSpecs:  <a href="http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html">http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html</a>            HP BladeSystem c7000 Enclosure QuickSpecs:  <a href="http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html">http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html</a></p>								

## Technical Specifications

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<b>HP Integrated NC362i Dual Port Gigabit Server Adapter Network Processor</b>	<b>Network Processor</b>	NC362i
	<b>Data Transfer Method</b>	Four lane (x4) PCI Express
	<b>Network Transfer Rate</b>	2000 Mb/s full duplex (theoretical maximum value)
	<b>IEEE Compliance</b>	802.1p, 802.1Q, 802.3, 802.3ad, and 802.3x
	<b>Standard Features</b>	<ul style="list-style-type: none"><li>● 9K jumbo frames</li><li>● TCP/IP checksum offload (TCO)</li><li>● Large send offload (LSO)</li><li>● Interrupt coalescence</li><li>● Dual address cycles (DAC)</li><li>● Wake-on-LAN (WOL)</li><li>● Pre-boot execution environment (PXE)</li><li>● ProLiant Teaming including Network Fault Tolerance, Transmit Load Balancing, and Switch-Assisted Load Balancing</li><li>● IPv6 packet transmit and receive (excluding all offload capabilities); IPv6 aware SNMPv1 agents for Windows</li></ul>
	<b>Architecture</b>	32-bit PCI-based health and remote management ASIC
	<b>Processor</b>	32-bit RISC processor core running at 66MHz
<b>HP Integrated Lights-Out 2 (iLO 2) integrated on system board</b>	<b>Upgradeability</b>	Option firmware upgradeable via Flash ROM
	<b>Video Support</b>	Utilizes the host server's embedded video chip - supports VGA/SVGA, 640 x 480 (256 to 16.7M colors), 800 x 600 (256 to 16.7M colors), 1024 x 768 (256 to 65K colors), 1280 x 1024 (256 colors)
	<b>Interfaces</b>	One Ethernet network connection (10/100 Mb/s)
	<b>Memory</b>	4-MB Flash ROM 16-MB SDRAM
	<b>Operating System Support</b>	Microsoft Windows Server 2008 Standard Edition (32bit and 64bit) Microsoft Windows Server 2008 Enterprise Edition (32bit and 64bit) Microsoft Windows Server 2003 and Windows Server 2003 R2, and Windows Server 2003 for Extended Systems Standard Edition, Enterprise Edition Red Hat Enterprise Linux 5.4 (32bit and 64bit) SUSE LINUX Enterprise Server 11 (32bit and 64bit) SUSE LINUX Enterprise Server 10 (32bit and 64bit) VMware ESX 4.0 VMware ESX 3.5.0
	<b>Client System Support</b>	Microsoft Windows XP Professional Edition Microsoft Windows Vista Business and Ultimate Editions Red Hat Enterprise Linux Desktop 5.00 SUSE Linux Enterprise Desktop 11 SUSE Linux Enterprise Desktop 10
	<b>Client Browser Support</b>	Microsoft Internet Explorer 7 Microsoft Internet Explorer 6 Firefox 3.5 (on supported Windows and Linux systems) Firefox 3.0 (on supported Windows and Linux systems)
	<b>Command Line Support</b>	Telnet, Secure Shell and serial port access Secure Socket Layer

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### Technical Specifications

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

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<b>Environment-friendly Products and Approach</b>	<b>End-of-life Management and Recycling</b>	<p>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: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a>. To recycle your product, please go to: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.</p> <p>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: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a>. 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.</p>
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For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.