Overview

HP ProLiant BL490c G6 Server Blade

1. Access Panel
2. Internal USB connector
3. Internal SD card slot

6. Two (2) SATA Solid State Drive (SSD) bays
7. Up to two (2) Intel® Xeon® 5600 or 5500 series processors
8. Local I/O connector

Overview

4. Two (2) mezzanine I/O expansion slots
5. Embedded Dual Port Flex-10 10GbE Multifunction Server Adapter

9. Eighteen (18) DDR3 Registered or Unbuffered DIMM Memory Slots

What's New

- Support for 4GB UDIMM, single-rank 4GB RDIMM, and low-voltage RDIMM Memory Kits
- Support for Intel® 5600 series processors

At A Glance

The HP ProLiant BL490c Virtualization Blade raises the bar for memory capacity and I/O bandwidth in a half-height blade. Coupling up to 2 Intel® Xeon® processors with 18 DIMM slots and support for up to 24 NICs, the BL490c gives enterprise data center managers the ideal server platform for hosting virtual machines.

This document covers the HP ProLiant BL490c G6 server blade only. For more information on HP BladeSystems c-Class Infrastructure and HP BladeSystem c-Class Interconnect Components, please see the following QuickSpecs:

HP BladeSystem c-Class Enclosures QuickSpecs:
HP BladeSystem c3000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html

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

HP BladeSystem c-Class Interconnect Components QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12524_div/12524_div.html

The HP ProLiant BL490c G6 is a 2-processor server blade optimized for virtualization with high memory capacity and high bandwidth and flexible networking.

HP ProLiant BL490c G6 server blade includes:

- **Processor**:
    - Up to two (2) Intel® Xeon® 5500 or 5600 Series processors, up to 2.93GHz
    - Intel® 5500 Chipset
- **Memory**:
    - Eighteen (18) DIMM slots
    - Up to 192GB, using PC3-8500R DDR3 Registered (RDIMM) memory, operating at 800MHz when fully populated at 2 DIMMs per Channel in 12 slots
    - Up to 48GB, using PC3-10600E DDR3 Unbuffered (UDIMM) memory, operating at 1066MHz when fully populated at 2 DIMMs per Channel in 12 slots
- **Storage Controller**:
    - HP Integrated SATA Controller
    NOTE: RAID functionality requires the use of an optional Smart Array mezzanine card. See the Storage Controller options section below.
- **Internal Drive Support**:
    - Up to two (2) non-hot plug SATA Solid State Drives (SSD)
    - With an attached SB40c Storage Blade, up to six (6) hot plug SFF Serial Attached SCSI (SAS) or SATA Hard Drives (optional)
- **Network Controller**:

Overview

- ○ Embedded NC532i Dual Port Flex-10 10GbE Multifunction Server Adapter
  NOTE: Flex-10 capability requires the use of an HP Virtual Connect Flex-10 10Gb Ethernet module. Learn more at: www.hp.com/go/virtualconnect.
  NOTE: Each port is autosensing 1 Gb/ 10Gb, and can interoperate with 1Gb HP BladeSystem c-Class interconnect components.
  - ○ One (1) additional 10/100 server adapter dedicated to iLO 2 Management
- **Mezzanine Support**:
  - ○ Two (2) I/O expansion mezzanine slots
  - ○ Supports up to two (2) mezzanine cards
    - ▪ Dual-Port Fibre Channel Mezzanine options for SAN connectivity (Choice of Emulex or QLogic)
    - ▪ iSCSI Ethernet mezzanine option for optimized iSCSI connectivity
    - ▪ Ethernet server adapter mezzanine options for additional network ports
    - ▪ 4X QDR (40Gbps) and DDR (20Gbps) InfiniBand (IB) Mezzanine options for low latency and high bandwidth server interconnectivity
    - ▪ Storage Controller mezzanine options for additional internal and external storage connectivity
    - ▪ I/O Accelerator mezzanine options for high transaction rate local 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 BL490c G6 is a half-height server blade that plugs into the HP BladeSystem c3000 and c7000 enclosures
- **Infrastructure Management**:
  - ○ HP Integrated Lights-Out 2 (iLO 2) management processor for simplified server setup, health monitoring and recovery, power and thermal control, and lights-out remote administration.
  - ○ HP Insight Control, a product option, delivers essential infrastructure management that can help save time and money 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, RHEL, SLES, OEL, Solaris, VMware, and Citrix XenServer
- **Enclosures**:
  - ○ HP offers three different c-Class server blade enclosures to meet your individual needs:
    - ▪ The HP BladeSystem c7000 rack enclosure is 10U high and holds up to 16 ProLiant BL490c G6 servers plugged vertically.
    - ▪ The HP BladeSystem c3000 rack enclosure is 6U high and holds up to 8 HP ProLiant BL490c G6 servers plugged horizontally.
    - ▪ The HP BladeSystem c3000 tower enclosure is designed with casters for sites without racks and holds up to 8 HP ProLiant BL490c G6 servers plugged vertically.
  - ○ 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 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. Certain restrictions

Overview

and exclusions apply. Hard drives have either a one year or three year warranty; refer to 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

QuickSpecs

Standard Features

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

Processor	Intel® Xeon® Processor X5670 (2.93 GHz, 12MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3)
	Intel® Xeon® Processor X5650 (2.66 GHz, 12MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3)
	Intel® Xeon® Processor X5570 (2.93 GHz, 8M L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3)
	Intel® Xeon® Processor E5540 (2.53 GHz, 8M L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)
	Intel® Xeon® Processor L5530 (2.40 GHz, 8MB L3 cache, 60W, DDR3-1066, HT, Turbo 1/1/2/2)
	Intel® Xeon® Processor E5504 (2.00 GHz, 4M L3 Cache, 80W, DDR3-800)

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 4, 3, 2, and 1 cores active (on 5500 series processors), or with 6,5,4,3,2,1 cores active (on 5600 series processors).
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 5500 and 5600 Series, the letter preceding the model number indicates the performance/wattage of the processor. "X" denotes High Performance/Wattage; "E" denotes Enterprise Performance/Wattage (Mainstream); and "L" denotes Lower Wattage.

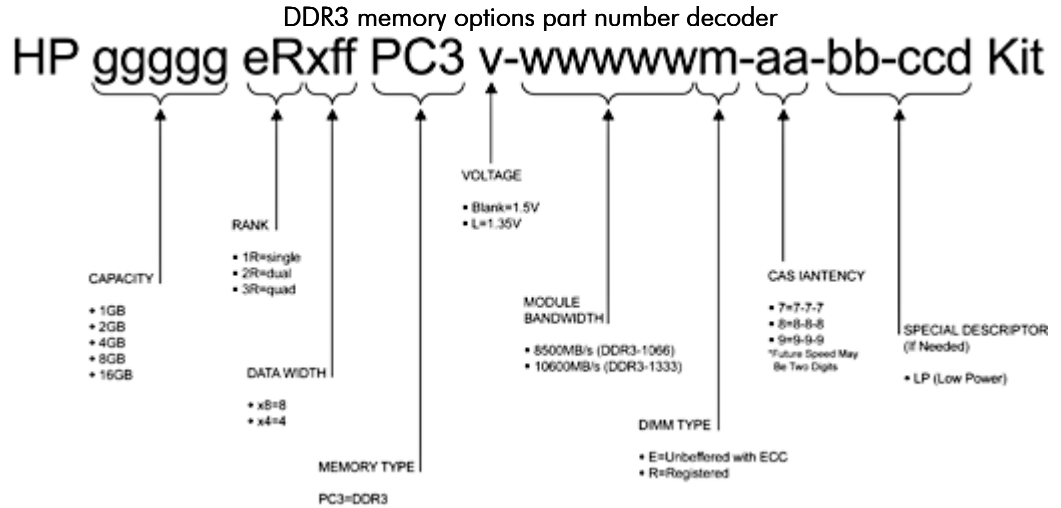|	
Upgradeability	Upgradeable to two (2) processors

Cache Memory	4MB shared L3 cache
	8MB shared L3 cache
	12MB shared L3 cache

Chipset	Intel® 5500 Chipset

Standard Features

Memory		
	Type	DDR3 Registered (RDIMM) or Unbuffered (UDIMM)
	Standard	6 GB (3 x 2GB) RDIMM
	Maximum (RDIMM)	192 GB (12 x 16 GB) for Registered Memory configurations
	Maximum (UDIMM)	48 GB (12 x 4 GB) for Unbuffered Memory configurations

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

<div align="center">DDR3 memory options part number decoder</div>

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

VOLTAGE
- Blank=1.5V
- L=1.35V

RANK
- 1R=single
- 2R=dual
- 3R=quad

CAPACITY
- 1GB
- 2GB
- 4GB
- 8GB
- 16GB

DATA WIDTH
- x8=8
- x4=4

MEMORY TYPE
PC3=DDR3

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

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

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

SPECIAL DESCRIPTOR (If Needed)
- LP (Low Power)

Network Controller

Embedded NC532i Dual Port Flex-10 10GbE Multifunction Server Adapter
NOTE: Flex-10 capability requires the use of an HP Virtual Connect Flex-10 10Gb Ethernet module. Learn more at: www.hp.com/go/virtualconnect.

NOTE: The iSCSI offload feature of the embedded multifunction adapter requires the HP Accelerated iSCSI Pack. For more information, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12466_div/12466_div.html

One (1) additional 10/100 NIC dedicated to iLO 2 Management

I/O Expansion Slots

Two (2) I/O expansion mezzanine slots (x8 PCI Express)

Integrated Manageability

HP Integrated Lights-Out 2 (iLO 2) management processor

Storage Controller

HP Integrated SATA Controller
NOTE: RAID functionality requires the use of an optional Smart Array mezzanine card. See the Storage Controller options section below.

QuickSpecs

Standard Features

Maximum Internal Storage	Non-Hot Plug SATA SSD	128GB	2 x 64GB
	Hot Plug SFF SAS	1.8TB	6 x 300GB

NOTE: Hot Plug SFF SAS maximum internal storage supported with optional SB40c Storage Blade attached.

Graphics   Integrated ATI-RN50 with 32MB video memory

Graphics Resolution Supported   Resolution Color Depths   1600 x 1200, 64K, 256, 16
1280 x 1024, 16.7M, 64k, 256, 16
1024 x 768, 16.7M, 64k, 256, 16
800 x 600, 16.7M, 64k, 256, 16
640 x 480, 16.7M, 64k, 256, 16
NOTE: Maximum resolution available via HP Integrated Lights-Out 2 (iLO 2) remote console is 1280 x 1024.

Fibre Channel Support   Two (2) optional Fibre Channel HBAs are supported by the HP ProLiant BL490c 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.

HBA mezzanine card option kits:

Emulex LPe1105-HP 4Gb FC HBA (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 LPe 1205-HP 8Gb FC HBA (456972-B21)

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

QLogic QMH2462 4Gb FC HBA (403619-B21)

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

QLogic QMH2562 8Gb FC HBA (451871-B21)

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

Emulex and QLogic Fibre Channel HBAs for HP BladeSystem c-Class feature:

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

QuickSpecs

Standard Features

Compatible SAN	HP ProLiant BL490c G6 server blades are optimized for HP StorageWorks MSA, EVA and XP
	HP ProLiant BL490c G6 server blades are compatible with select 3rd party SANs (please see blade storage page for more details: http://h18004.www1.hp.com/products/blades/components/c-class-sans.html
HP Virtual Connect	HP Virtual Connect simplifies server connectivity to data and storage networks, and reduces costs. Unique HP Flex-10 and FlexFabric technologies make maximum use of network bandwidths, provide dynamic tuning and enable extreme flexibility to meet individual server and infrastructure requirements. HP Virtual Connect Enterprise Manager (VCEM) provides a central console to administer network connections and workloads for thousands of servers. For more information on Virtual Connect Ethernet, Fibre Channel, Converged Network and management options see: www.hp.com/go/virtualconnect

HP Insight management software	HP Insight Foundation	Managing the growing number of servers can be complex and expensive for your organization. IT managers need to address changing business needs with tools that meet the challenges of managing today's complex Datacenters.
		HP provides management solutions that are designed to simplify a server's installation, configuration and maintenance throughout the entire server lifecycle. This provides the customer with higher levels of operational efficiency and highly reliable systems: http://www.hp.com/go/foundation.
		The foundation pack includes:
		• HP SmartStart • HP Management • HP ProLiant Firmware Maintenance
		NOTE: SmartStart version supported (minimum): SmartStart 8.20 http://www.hp.com/servers/smartstart
	HP Integrated Lights-Out 2	HP Integrated Lights-Out (iLO) simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration of ProLiant ML, DL, and BL servers. HP iLO functions without additional software and can be accessed from any location via a web browser. HP iLO works hand-in-hand with HP Systems Insight Manager, Insight Control suites, and Insight Dynamics for ProLiant, helping customers unleash the value of the ProLiant platform and deliver the highest possible quality of IT service. For more information, visit: www.hp.com/go/iLO
	HP Insight Control	HP Insight Control, 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.
		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

Standard Features

	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 StorageWorks Continuous Access software for both the Enterprise Virtual Array and the XP storage array allowing application environments to be reactivated in minutes with the touch of a button to a remote location.

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

Operating Systems and Virtualization Software Support for ProLiant Servers	Microsoft Windows Server Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) Oracle Enterprise Linux (OEL) 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, please visit our Support Matrix at: http://www.hp.com/go/ossupport and our driver download page http://www.hp.com/support/BL490cG6

Availability	• Dual-Port Fibre Channel Mezzanine Card for redundant SAN connection • Dual-port embedded 10 Gigabit Ethernet adapters for redundant LAN connections • Redundant ROM • Advanced ECC Memory • Support for Memory Mirroring and Memory Lock-Step Mode • Network adapter teaming (network fault tolerance, transmit load balancing, switch-assisted load balancing)

QuickSpecs

Standard Features

Industry Standard Compliance	ACPI V2.0 Compliant PCI 2.2 Compliant WOL Support Microsoft® Logo certifications USB 2.0 Support

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Security

- 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

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

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

HP 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. For additional information please visit: http://www.hp.com/products/configurator

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Standard Features

Service and Support

HP Care Pack services provide total care and support expertise with committed response designed to meet your IT and business needs.

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

To fully capitalize on your HP BladeSystem servers' capabilities requires a service partner who thoroughly understands your server technology and systems environment. HP Services, an industry leader in provision of multi vender support solutions provides a range of support services designed to meet the varying needs of business. Whether an SMB or large global corporation HP has a HP BladeSystem server support offer to help you speedily deploy and maximize system uptime.

Recommended Service - Simplify ProLiant solution implementation, maintenance and management.

- **Support Service** - 4-Hour Response Coverage, 3-Year, 24 x 7, Same Business Day
- **Deployment Service** - Installation and Start Up for HP BladeSystem Infrastructure

Enhanced Service - Optimize service level to increase IT performance and availability

- **Support Service** - HP Proactive BladeSystem Service, 1-Year
- **Deployment Service** - Enhanced Network Installation and Start-up for HP BladeSystem Switches

Installation & Start-Up service for HP BladeSystem Infrastructure plus HP BladeSystem Enhanced Network Installation and Start-UP as per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excluding HP holidays.

For a complete listing of service offerings and information visit:
http://www.hp.com/services/bladesystemservices
http://h20219.www2.hp.com/services/us/en/warranty/carepack-servers-proliant.html

QuickSpecs

Models

Models

HP ProLiant BL490c G6 X5650 2.66GHz (1P) 595825-B21	**Processor(s)** One of the following depending on model	One (1) Intel ® Xeon® Processor X5650 (2.66 GHz, 12MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3)
HP ProLiant BL490c G6 X5570 2.93GHz (1P) 509314-B21		One (1) Intel® Xeon® Processor X5570 (2.93 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo, 2/2/3/3) One (1) Intel® Xeon® Processor E5540 (2.53 GHz, 8MB L3 Cache, 80W, DDR4-1066, HT Turbo, 1/1/2/2/)
HP ProLiant BL490c G6 E5540 2.53GHz (1P) 509315-B21	**Cache Memory**	One (1) Intel® Xeon® Processor E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800) 4MB Shared L3 Cache 8MB Shared L3 Cache 12MB Shared L3 Cache
HP ProLiant BL490c G6 E5504 2.0GHz (1P) 509316-B21	**Memory**	6 GB (3 x 2 GB) PC3-10600 (DDR3-1333) Registered DIMMs
	Network Adapter	Embedded NC532i Dual Port Flex-10 10GbE Multifunction Server Adapter and one (1) additional 10/100 server adapter dedicated to iLO 2 management
	Storage Controller	HP Integrated SATA Controller
	Hard Drives	No drives included
	Internal Storage	SSD: Up to 128GB (2 x 64GB) SATA
	Optical Drive	None
	Power Supply	None
	Form Factor	Up to eight (8) half-height blades supported in the HP BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HP BladeSystem c7000 Enclosure

Configuration Information - Factory Integrated Models

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

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

Models	HP ProLiant BL490c G6 CTO Blade	498357-B21
	Configurable Model ships with:	
	Embedded NC532i Dual Port Flex-10 10GbE Multifunction Server Adapter and one (1) additional 10/100 server 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)

HP Processors	For single processor configuration choose:	
	Six-Core Processor Option Kits	
	Intel® Xeon® Processor X5670 (2.93 GHz, 12MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) BL490c G6 FIO Kit NOTE: If two processors are desired, select one 595826-L21 and one 595826-B21.	595826-L21
	Intel® Xeon® Processor X5650 (2.66 GHz, 12MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) BL490c G6 FIO Kit NOTE: If two processors are desired, select one 595827-L21 and one 595827-B21.	595827-L21
	Quad-Core Processor Option Kits	
	Intel® Xeon® Processor X5570 (2.93 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3) BL490c G6 FIO Kit NOTE: If two processors are desired, select one 509319-L21 and one 509319-B21.	509319-L21
	Intel® Xeon® Processor E5540 (2.53 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) BL490c G6 FIO Kit NOTE: If two processors are desired, select one 509322-L21 and one 509322-B21.	509322-L21
	Intel® Xeon® Processor L5530 (2.40 GHz, 8MB L3 cache, 60W, DDR3-1066, HT, Turbo 1/1/2/2) BL490c G6 FIO Kit NOTE: If two processors are desired, select one 576216-L21 and one 576216-B21.	576216-L21
	Intel® Xeon® processor HP E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800) BL490c G6 FIO Kit NOTE: If two processors are desired, select one 509327-L21 and one 509327-B21.	509327-L21
HP Memory	**Registered DIMMS (RDIMMs)**	
	HP 2GB 2Rx8 PC3-10600R-9 Kit	500656-B21
	HP 4GB 2Rx4 PC3-10600R-9 Kit	500658-B21
	HP 4GB 4Rx8 PC3-8500R-7 LP Kit	500660-B21
	HP 4GB 1Rx4 PC3-10600R-9 Kit	593339-B21
	HP 4GB 1Rx4 PC3L-10600R-9 Kit	604504-B21
	NOTE: Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.	
	HP 8GB 2Rx4 PC3-10600R-9 Kit	500662-B21

Configuration Information - Factory Integrated Models

HP 8GB 2Rx4 PC3-8500R-7 Kit	516423-B21
HP 8GB 2Rx4 PC3L-10600R-9 Kit	604506-B21

NOTE: Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.

HP 16GB PC3-8500R-7 4Rx4 Kit	500666-B21
Unbuffered with ECC DIMMs (UDIMMs)	
HP 1GB 1Rx8 PC3-10600E-9 Kit	500668-B21
HP 2GB 2Rx8 PC3-10600E-9 Kit	500670-B21
HP 4GB 2Rx8 PC3-10600E-9 Kit	500672-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.
NOTE: Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient.
NOTE: PC3L is a low voltage memory.

Step 3: Choose Additional Options for Factory Integration

NOTE: For additional options, please refer to the "Core Options" and "Additional Options" section below. For additional options, including server blade enclosures interconnect options and power subsystem options; please see the Core Options and Additional Options sections below; or the following QuickSpecs:
HP BladeSystem c-Class Enclosures QuickSpecs:
HP BladeSystem c3000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html
HP BladeSystem c7000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html
and HP BladeSystem c-Class Interconnect Components QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12524_div/12524_div.html.

QuickSpecs

Core Options

NOTE: Some options may not be available for factory integration. Please contact an HP sales representative for additional information.

HP Ethernet Mezzanine Options	**Gigabit Ethernet Mezzanines**	
	HP NC325m PCI Express Quad Port Gigabit Server Adapter NOTE: If the NC325m is installed in mezzanine slot 1 of a half-height server, connectivity will be provided on 2 of the 4 ports.	416585-B21
	HP NC326m PCI Express Dual Port 1Gb Server Adapter	406771-B21
	HP NC360m Dual Port 1GbE BL-c Adapter	445978-B21
	HP NC364m Quad Port 1GbE BL-c Adapter NOTE: If the NC364m is installed in mezzanine slot 1 of a half-height server, connectivity will be provided on only 2 of the 4 ports.	447883-B21
	HP NC382m PCI Express Dual Port Multifunction Gigabit Server Adapter	453246-B21
	HP BLc QLogic iSCSI Dual Port Adapter	488074-B22

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

10 Gigabit Ethernet Mezzanines

HP NC522m Dual Port 10GbE Multifunction BL-c Adapter — 467801-B21
NOTE: The NC522m network adapter card is required for each server blade connecting to a 10Gb interconnect in bays 3-8 (HP BladeSystem c7000 Enclosure) or bays 3-4 (HP BladeSystem c3000 Enclosure).
NOTE: The NC522m requires a minimum of 2 GB of server memory.
NOTE: The NC522m supports linking at 1000Mbps or 10000Mbps when not connected to a Flex-10 enabled module and will link with all current 1Gb switches at 1Gb.

HP NC532m Dual Port 10GbE BL-c Adapter — 467799-B21
NOTE: The NC532m network adapter card is required for each server blade connecting to a 10Gb interconnect in bays 3-8 (HP BladeSystem c7000 Enclosure) or bays 3-4 (HP BladeSystem c3000 Enclosure).
NOTE: The NC532m requires a minimum of 2 GB of server memory.
NOTE: The NC532m 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.

HP NC542m Dual Port Flex-10 10GbE Multifunction BL-c Adapter — 539857-B21
NOTE: The NC542m network adapter card is required for each server blade connecting to a 10Gb interconnect in bays 3-8 (HP BladeSystem c7000 Enclosure) or bays 3-4 (HP BladeSystem c3000 Enclosure).
NOTE: The NC542m requires a minimum of 2 GB of server memory.
NOTE: The NC542m supports linking at 1000Mbps or 10000Mbps when not connected to a Flex-10 device. The NC542m will only support 1000Mbps when connected to a 1Gb Ethernet interconnect.

HP NC550m 10GbE 2-port PCIe x8 Flex-10 Ethernet Adapter — 581204-B21
NOTE: The NC550m network adapter card is required for each server blade connecting to a 10Gb interconnect in bays 3-8 (HP BladeSystem c7000 Enclosure) or bays 3-4 (HP BladeSystem c3000 Enclosure)
NOTE: The NC550m requires a minimum of 2 GB of server memory.
NOTE: The NC550m supports linking at 1000Mbps or 10000Mbps when not

Core Options

connected to a Flex-10 device. The NC550m will only support 1000Mbps when connected to a 1Gb Ethernet interconnect.

HP Fiber Channel Mezzanine Options	Emulex LPe1205 8Gb Fibre Channel Host Bus Adapter	456972-B21
	Emulex LPe1105 Fibre Channel Host Bus Adapter	403621-B21
	QLogic QMH2562 8Gb Fibre Channel Host Bus Adapter	451871-B21
	QLogic QMH2462 4Gb Fibre Channel Host Bus Adapter	403619-B21

HP Processors	**Six-Core Processors**	
	Intel® Xeon® Processor X5670 (2.93 GHz, 12MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) BL490c G6 Processor Option Kit	595826-B21
	Intel ® Xeon® Processor X5650 (2.66 GHz, 12MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) BL490c G6 Processor Option Kit	595827-B21
	Quad-Core Processors	
	Intel® Xeon® X5570 (2.93 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3) BL490c G6 Processor Option Kit	509319-B21
	Intel® Xeon® E5540 (2.53 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) BL490c G6 Processor Option Kit	509322-B21
	Intel® Xeon® Processor L5530 (2.40 GHz, 8MB L3 cache, 60W, DDR3-1066, HT, Turbo 1/1/2/2) BL490c G6 Processor Option Kit	576216-B21
	Intel® Xeon® E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800) BL490c G6 Processor Option Kit	509327-B21

HP Memory	**Registered DIMMs (RDIMMs)**	
	HP 2GB 2Rx8 PC3-10600R-9 Kit	500656-B21
	HP 4GB 2Rx4 PC3-10600R-9 Kit	500658-B21
	HP 4GB 4Rx8 PC3-8500R-7 LP Kit	500660-B21
	HP 4GB 1Rx4 PC3-10600R-9 Kit	593339-B21
	HP 4GB 1Rx4 PC3L-10600R-9 Kit	604504-B21
	NOTE: Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.	
	HP 8GB 2Rx4 PC3-10600R-9 Kit	500662-B21
	HP 8GB 2Rx4 PC3-8500R-7 Kit	516423-B21
	HP 8GB 2Rx4 PC3L-10600R-9 Kit	604506-B21
	NOTE: Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.	
	HP 16GB PC3-8500R-7 4Rx4 Kit	500666-B21
	Unbuffered with ECC (UDIMMs)	
	HP 1GB 1Rx8 PC3-10600E-9 Kit	500668-B21
	HP 2GB 2Rx8 PC3-10600E-9 Kit	500670-B21
	HP 4GB 2Rx8 PC3-10600E-9 Kit	500672-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.

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Core Options

NOTE: Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see:
http://h18004.www1.hp.com/products/servers/platforms/energyefficient/

NOTE: PC3L is a low voltage memory.

HP Hard Drives

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

Solid State Drives (SSD)

HP 32GB 1.5G SATA NHP SFF SP ENT SSD	461201-B21
HP 64GB 1.5G SATA NHP SFF SP ENT SSD	461203-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13121_div/13121_div.html

QuickSpecs

Additional Options

HP Insight software	**HP Insight Control**	
	HP Insight Control suite, No Media, Electronic License including 1 year of 24x7 Technical Support and Updates	T9074BAE
	HP Insight Control suite, No Media 1-Server License including 1 year of 24x7 Technical Support and Updates	452148-B22
	HP Insight Software Media Kit	436222-B21

HP Insight Control

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

HP Insight Control suite, No Media 1-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 Insight Control, Insight Dynamics and Virtual Connect Enterprise Manager. Uses an integrated installer to perform quick and accurate software installation and updates.

NOTE: Licenses ship without media. The HP 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 & Update Service.

NOTE: For additional license kits, including bundles with HP BladeSystem enclosures, please see the Insight Control QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/12631_div/12631_div.html

HP Insight Control for Linux

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

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

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

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

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

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

NOTE: For additional License Kits, including electronic licensing options, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/13019_div/13019_div.html

HP Integrated Lights-Out (iLO) Advanced for BladeSystem

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

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

Additional Options

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 Integrated Lights-Out 2 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 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

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HP Security - TPM	HP Trusted Platform Module Option	488069-B21

HP Storage Controller	**HP Smart Array P700m Controller**	
	HP Smart Array P700m/512 Controller	508226-B21
	HP Smart Array P700m/256 Controller	507925-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional configuration information at:
http://h18000.www1.hp.com/products/quickspecs/13175_div/13175_div.html (Worldwide)

Smart Array P712m Controller

HP Smart Array P712m Controller	484299-B21

NOTE: Provides RAID support on internal non-hot plug SSDs.

Optional Upgrade

HP 650 mAh P-Series Low Pro Battery	575031-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information at:
http://h18000.www1.hp.com/products/quickspecs/13296_div/13296_div.html (Worldwide)

QuickSpecs

HP ProLiant BL490c Generation 6 (G6) Server Blade

Additional Options

HP I/O Expansion Options	HP StorageWorks 80GB IO Accelerator for BladeSystem c-Class	AJ876A
	HP StorageWorks 160GB IO Accelerator for BladeSystem c-Class	AJ877A
	HP StorageWorks 320GB IO Accelerator for BladeSystem c-Class	AJ878A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13220_div/13220_div.html

HP c-Class Mezzanine Options	QLogic 4X QDR IB Mezzanine HCA for HP BladeSystem c-Class	583210-B21
	HP 4X QDR IB CX2 Dual Port Mezz HCA	592519-B21
	HP 4X DDR InfiniBand Dual Port Mezzanine HCA for c-Class BladeSystem	448262-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/12586_div/12586_div.html

HP Ultrium Tape Blades	HP StorageWorks SB1760c Tape Blade	AQ697A
	NOTE: LTO-4 Ultrium tape technology.	
	HP StorageWorks SB920c Tape Blade	AJ401A
	NOTE: LTO-3 Ultrium technology.	
	HP StorageWorks Ultrium 448c Tape Blade	440947-B21
	NOTE: LTO-2 Ultrium technology.	

NOTE: 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.
NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/12729_div/12729_div.html

HP StorageWorks SB40c Storage Blade	HP StorageWorks SB40c Storage Blade	411243-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional configuration information at:
http://h18000.www1.hp.com/products/quickspecs/12587_div/12587_div.html (Worldwide)

HP Expansion Blade	HP BLc PCI Expansion Blade	448018-B21

NOTE: Ships with one pre-installed PCI-X connect board. Also includes one PCIe connect board which requires installation.
NOTE: Please see the QuickSpecs for Technical Specifications and additional configuration information:
http://h18000.www1.hp.com/products/quickspecs/12753_div/12753_div.html

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Additional Options

HP USB and SD Options	HP USB 2-Button Optical Scroll Mouse	DC172B
	HP USB Standard Keyboard	DT528A#ABA
	HP 2GB USB Flash Media Drive Key	608447-B21

NOTE: HP qualified blank USB key for use with HP ProLiant servers that support the VMware virtualization environment and other HP value-add software like SmartStart. HP recommends this industry standard USB flash device for use with VMware ESXi. USB device must be installed in the internal slot of the ProLiant server for use with VMware ESXi. Refer to **HP VMware Getting Started Guide** for installation instructions.

HP 4GB SD Flash Media	580387-B21

NOTE: 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: http://www.hp.com/go/proliantvirtualization

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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	UK065E
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UK066E
6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UK067E

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

Some DIMM installation guidelines are summarized below;

- For the BL490c G6 server with eighteen (18) memory slots:
  - There are three (3) channels per processor; six (6) channels per server
  - There are three (3) DIMM slots for each memory channel; eighteen (18) total slots
  - Memory channel 1 consists of the three (3) DIMMs that are closest to the processor
  - Memory channel 3 consists of the three (3) 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; 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 1,4; 2,5; 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	8GB	4GB	16GB	1GB	2GB	4GB
DIMM Native Speed (MHz)	1333	1333	1333	1066	1333	1066	1066	1333	1333	1333
DIMM Voltage	LV/Reg	Reg	Reg	Reg	LV/Reg	Reg	Reg	Reg	Reg	Reg
SLOTS THAT CAN BE POPULATED										
18 slot servers	18	18	18	18	18	12	12	12	12	12
MAXIMUM CAPACITY (GB)										
	72	36	72	144	144	48	192	12	24	48
POPULATED DIMM SPEED (MHz)										
1 DIMM Per Channel	1333	1333	1333	1066	1333	1066	1066	1333	1333	1333
2 DIMM Per Channel	1333*	1333*	1333*	1066	1333*	800	800	1066	1066	1066

Memory

3 DIMM Per Channel	800	800	800	800	800	n/a	n/a	n/a	n/a	n/a

*Supported at 1333 via setting in ROM Based Setup Utility (RBSU)

NOTES:

- PC3-10600 DIMMs have a maximum speed of 1333MHz. PC3-8500 DIMMs have a maximum speed of 1066MHz
- 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, the maximum speed will be 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, the maximum speed will be 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 the processor installed
- References to the above MHz speeds are for the various speeds of DDR3 DIMMs; 1333 refers to DDR3-1333, etc

HP ProLiant BL490c G6 Server Blade DIMM slot and configuration diagrams

Basic memory slot & population diagram

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

18 DIMM SLOTS (9 per CPU node)					
	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G	1	G	Chnl 1
	2	D	2	D	
	3	A	3	A	
Chnl 2	4	H	4	H	Chnl 2
	5	E	5	E	
	6	B	6	B	
Chnl 3	7	I	7	I	Chnl 3
	8	F	8	F	
	9	C	9	C	

HP ProLiant BL490c G6 Server Blade (1P Model)

Standard memory configuration (1 CPU model)

- 6GB (3 x 2GB) of PC3-10600 (DDR3-1333) RDIMMs

Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G: empty	1	G: empty	Chnl 1
	2	D: empty	2	D: empty	
	3	A: 2GB DIMM	3	A: empty	
Chnl 2	4	H: empty	4	H: empty	Chnl 2
	5	E: empty	5	E: empty	
	6	B: 2GB DIMM	6	B: empty	
Chnl 3	7	I: empty	7	I: empty	Chnl 3
	8	F: empty	8	F: empty	
	9	C: 2GB DIMM	9	C: empty	

Standard memory plus optional memory (1 CPU model)

- 54GB, consisting of three (3) 2GB RDIMMs plus six (6) 8GB RDIMMs
    - 3x 2GB dual-rank PC3-10600 RDIMMs
    - 6x 8GB dual-rank PC3-8500 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G: 8GB DIMM	1	G: empty	Chnl 1
	2	D: 8GB DIMM	2	D: empty	
	3	A: 2GB DIMM	3	A: empty	
Chnl 2	4	H: 8GB DIMM	4	H: empty	Chnl 2
	5	E: 8GB DIMM	5	E: empty	
	6	B: 2GB DIMM	6	B: empty	
Chnl 3	7	I: 8GB DIMM	7	I: empty	Chnl 3
	8	F: 8GB DIMM	8	F: empty	
	9	C: 2GB DIMM	9	C: empty	

Standard Memory Replaced with Optional Memory (1 CPU model)
RDIMM maximum configuration

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

Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G: empty	1	G: empty	Chnl 1
	2	D: 16GB DIMM	2	D: empty	
	3	A: 16GB DIMM	3	A: empty	
Chnl 2	4	H: empty	4	H: empty	Chnl 2
	5	E: 16GB DIMM	5	E: empty	
	6	B: 16GB DIMM	6	B: empty	
Chnl 3	7	I: empty	7	I: empty	Chnl 3
	8	F: 16GB DIMM	8	F: empty	
	9	C: 16GB DIMM	9	C: empty	

UDIMM maximum configuration (1 CPU model)

- 24GB, consisting of six (6) 4GB dual-rank PC3-10600 UDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G: empty	1	G: empty	Chnl 1
	2	D: 4GB DIMM	2	D: empty	
	3	A: 4GB DIMM	3	A: empty	
Chnl 2	4	H: empty	4	H: empty	Chnl 2
	5	E: 4GB DIMM	5	E: empty	
	6	B: 4GB DIMM	6	B: empty	
Chnl 3	7	I: empty	7	I: empty	Chnl 3
	8	F: 4GB DIMM	8	F: empty	
	9	C: 4GB DIMM	9	C: empty	

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

- 192GB, consisting of twelve (12) 16GB quad-rank PC3-8500 RDIMMs

Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G: empty	1	G: empty	Chnl 1
	2	D: 16GB DIMM	2	D: 16GB DIMM	
	3	A: 16GB DIMM	3	A: 16GB DIMM	
Chnl 2	4	H: empty	4	H: empty	Chnl 2
	5	E: 16GB DIMM	5	E: 16GB DIMM	
	6	B: 16GB DIMM	6	B: 16GB DIMM	
Chnl 3	7	I: empty	7	I: empty	Chnl 3
	8	F: 16GB DIMM	8	F: 16GB DIMM	
	9	C: 16GB DIMM	9	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	G: empty	1	G: empty	Chnl 1
	2	D: 4GB DIMM	2	D: 4GB DIMM	
	3	A: 4GB DIMM	3	A: 4GB DIMM	
Chnl 2	4	H: empty	4	H: empty	Chnl 2
	5	E: 4GB DIMM	5	E: 4GB DIMM	
	6	B: 4GB DIMM	6	B: 4GB DIMM	
Chnl 3	7	I: empty	7	I: empty	Chnl 3
	8	F: 4GB DIMM	8	F: 4GB DIMM	
	9	C: 4GB DIMM	9	C: 4GB DIMM	

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

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

QuickSpecs

Memory

Following are memory options available from HP:

HP Memory	Registered DIMMs (RDIMMs)	
	HP 2GB 2Rx8 PC3-10600R-9 Kit	500656-B21
	HP 4GB 2Rx4 PC3-10600R-9 Kit	500658-B21
	HP 4GB 4Rx8 PC3-8500R-7 LP Kit	500660-B21
	HP 4GB 1Rx4 PC3-10600R-9 Kit	593339-B21
	HP 4GB 1Rx4 PC3L-10600R-9 Kit	604504-B21

NOTE: Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.

	HP 8GB 2Rx4 PC3-10600R-9 Kit	500662-B21
	HP 8GB 2Rx4 PC3-8500R-7 Kit	516423-B21
	HP 8GB 2Rx4 PC3L-10600R-9 Kit	604506-B21

NOTE: Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.

	HP 16GB PC3-8500R-7 4Rx4 Kit	500666-B21
	Unbuffered with ECC (UDIMMs)	
	HP 1GB 1Rx8 PC3-10600E-9 Kit	500668-B21
	HP 2GB 2Rx8 PC3-10600E-9 Kit	500670-B21
	HP 4GB 2Rx8 PC3-10600E-9 Kit	500672-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.
NOTE: PC3L is a low voltage memory.

Storage

1   Non Hot Plug Solid State Drive (SSD) Bay 1

2   Non Hot Plug Solid State Drive (SSD) Bay 2

Hard Drives

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

SATA Non-Hot Plug Solid State Drives

	Quantity Supported	Position Supported	Controller
32GB 1.5G SATA SSD	2	1-2	HP Integrated SATA Controller HP Smart Array P712m Controller
64GB 1.5G SATA SSD	2	1-2	HP Integrated SATA Controller HP Smart Array P712m Controller

External Storage

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

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

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

Storage

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

QuickSpecs

HP ProLiant BL490c Generation 6 (G6) Server Blade

Technical Specifications

System Unit	Dimensions (H x W x D) (with bezel)	7.154 x 2.19 x 20.058 in (18.17 x 5.56 x 50.95 cm)	
	Weight (approximate)	Maximum (all hard drives and processors installed)	14.20 lb (6.44 kg)
		Minimum (one hard drive and processor installed)	10.75 lb (4.87 kg)

Power Specifications

For power specifications including Input Requirements, BTU Rating, and Power Supply Output, please see the HP BladeSystem c-Class Enclosures QuickSpecs located at URL:
HP BladeSystem c3000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html
HP BladeSystem c7000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html

To review typical system power ratings use the HP BladeSystem Power Sizer which is available via the online tool located at URL:
http://www.hp.com/go/bladesystem/powercalculator

System Inlet Temperature

Operating: 10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed.

System performance may be reduced if operating with a fan fault or above 30°C (86°F).

Non-operating: -30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).

Relative Humidity (non-condensing)

Operating: 10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.

Non-operating: 5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.

Altitude

Operating: 3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).

Non-operating: 9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).

Acoustic Noise

For acoustic noise specifications, please see the HP BladeSystem c-Class Enclosures QuickSpecs located at URL:

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Technical Specifications

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

Embedded NC532i Dual Port Flex-10 10GbE Multifunction Server Adapter	Type	Integrated dual-port KR 10GbE
	Network Processor	Broadcom 57711
	Data Transfer Method	x4 PCI Express Generation 2
	Network Transfer Rate	Two ports, each at 20 Gbps full duplex; 40 Gbps aggregate full duplex theoretical bandwidth **NOTE:** Each port is autosensing 1 Gb / 10 Gb, and can interoperate with 1 Gb HP BladeSystem c-Class interconnect components. **NOTE:** Each port on the NC532i adapter transmits from the server at only 20 Gbps (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	• ProLiant Teaming including Network Fault Tolerance, Transmit Load Balancing, and Switch-Assisted Load Balancing • 4K Jumbo frames • Microsoft Windows Receive Side Scaling (RSS) • Optional Accelerated iSCSI

| Environment-friendly Products and Approach | End-of-life Management and Recycling | Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment. |

Technical Specifications