Overview

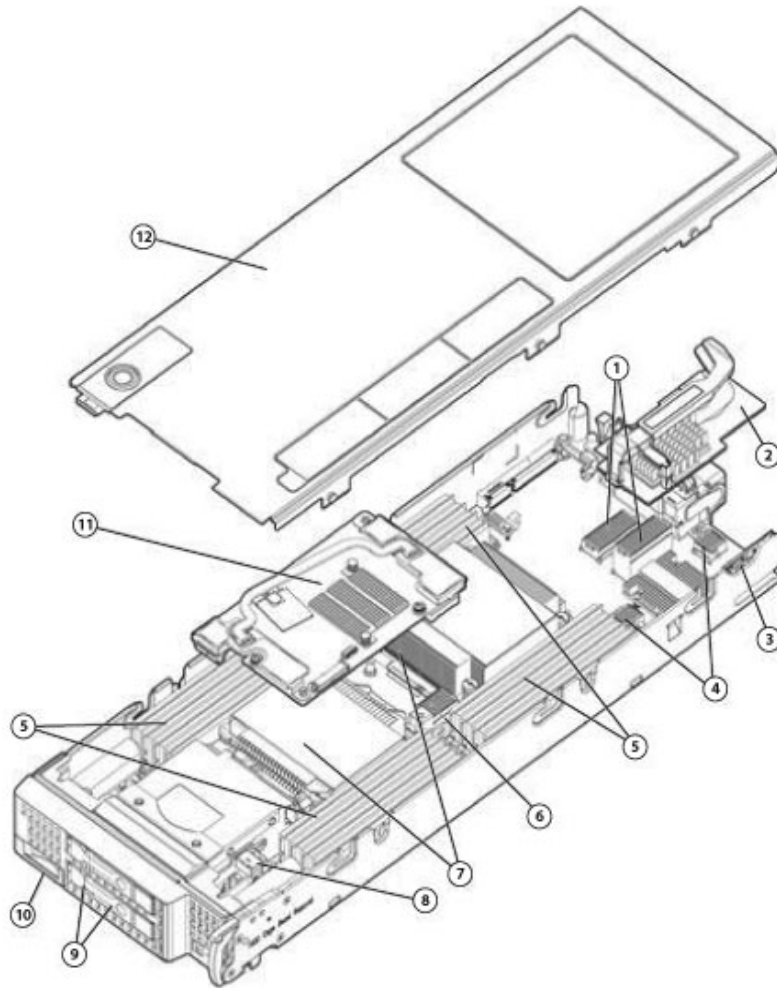### HP ProLiant BL460c Generation 8 (Gen8) Server Blade - NEBS (GR-63 & GR-1089) and ETSI 300 386-2 certified.

HP ProLiant BL460c Generation 8 (Gen8) Server Blade

1. Two (2) PCIe 3.0 mezzanine I/O expansion slots
2. FlexibleLOM adapter

3. MicroSDHC card connector
4. FlexibleLOM connectors (supporting one (1) FlexibleLOM)
5. Sixteen (16) DDR3 DIMM memory slots (8 per processor)
6. HP Smart Array P220i Controller connector

7. Up to two (2) Intel® Xeon® E5-2600 family processors
8. Internal USB 2.0 and Trusted Platform Module (TPM) connectors
9. Two (2) small form factor (SFF) hot-plug drive bays
10. HP c-Class Blade SUV (Serial, USB, VGA) connector
11. HP Smart Array P220i Controller with 512MB FBWC
12. Access panel

Standard Features

NOTE: This document covers the HP ProLiant BL460c Gen8 server blade only. For information on HP BladeSystems c-Class Enclosures and HP BladeSystem c-Class Interconnect and Mezzanine Components, please see the following:

HP BladeSystem c-Class Enclosures QuickSpecs:

- HP BladeSystem c7000 Enclosure - Carrier Grade Supplement QuickSpecs at http://h18000.www1.hp.com/products/quickspecs/13181_na/13181_na.HTML

NOTE: For proper BladeSystem operation, the minimum required versions of HP Onboard Administrator and HP Virtual Connect are required and available via the HP Service Pack for ProLiant, please see http://www.hp.com/go/spp/download

NOTE: The following Processors are considered NEBS certified, either by testing or Compliant by Similarity

Processor One of the following depending on Model	**E5-2600 v2 series Processors**
	Intel® Xeon® E5-2695 v2 (2.4GHz/12-core/30MB/8.0GT-s QPI/115W, DDR3-1866, HT, Turbo2-4/4/4/4/4/4/4/4/5/6/7/8)
	Intel® Xeon® E5-2680 v2 (2.8GHz/10-core/25MB/8.0GT-s QPI/115W, DDR3-1866, HT, Turbo2-3/3/3/3/3/4/5/6/7/8)
	Intel® Xeon® E5-2670 v2 (2.5GHz/10-core/25MB/8.0GT-s QPI/115W, DDR3-1866, HT, Turbo2-4/4/4/4/4/4/5/6/7/8)
	Intel® Xeon® E5-2660 v2 (2.2GHz/10-core/25MB/8.0GT-s QPI/95W, DDR3-1866, HT, Turbo2-4/4/4/4/4/4/5/6/7/8)
	Intel® Xeon® E5-2650 v2 (2.6GHz/8-core/20MB/8.0GT-s QPI/95W, DDR3-1866, HT, Turbo2-4/4/4/4/5/6/7/8)
	Intel® Xeon® E5-2650L v2 (1.7GHz/10-core/25MB/8.0GT-s QPI/70W, DDR3-1600, HT, Turbo2-2/2/2/2/2/2/2/2/3/4)
	Intel® Xeon® E5-2640 v2 (2.0GHz/8-core/20MB/7.2GT-s QPI/95W, DDR3-1600, HT, Turbo2-3/3/3/3/3/3/4/5)
	Intel® Xeon® E5-2630 v2 (2.6GHz/6-core/15MB/7.2GT-s QPI/80W, DDR3-1600, HT, Turbo2-3/3/3/3/4/5)
	Intel® Xeon® E5-2630L v2 (2.4GHz/6-core/15MB/7.2GT-s QPI/60W, DDR3-1600, HT, Turbo2-2/2/2/2/3/4)
	Intel® Xeon® E5-2620 v2 (2.1GHz/6-core/15MB/7.2GT-s QPI/80W, DDR3-1600, HT, Turbo2-3/3/3/3/4/5)
	Intel® Xeon® E5-2609 v2 (2.5GHz/4-core/10MB/6.4GT-s QPI/80W)
	Intel® Xeon® E5-2603 v2 (1.8GHz/4-core/10MB/6.4GT-s QPI/80W)
	E5-2600 series Processors
	Eight-Core Processors
	Intel® Xeon® E5-2670 (2.60GHz/8-core/20MB/115W) Processor
	Intel® Xeon® E5-2665 (2.40GHz/8-core/20MB/115W) Processor
	Intel® Xeon® E5-2660 (2.20GHz/8-core/20MB/95W) Processor
	Intel® Xeon® E5-2650 (2.0GHz/8-core/20MB/95W) Processor
	Six-Core Processors
	Intel® Xeon® E5-2640 (2.50GHz/6-core/15MB/95W) Processor
	Intel® Xeon® E5-2630 (2.30GHz/6-core/15MB/95W) Processor
	Intel® Xeon® E5-2620 (2.0GHz/6-core/15MB/95W) Processor
	Dual-Core Processors
	Intel® Xeon® E5-2637 (3.0GHz/2-core/5MB/80W) Processor

QuickSpecs

Standard Features

Cache Memory One of the following depending on Model	30MB (1x30MB) L3 cache **NOTE:** For Twelve-core processors. 25MB (1x25MB) L3 cache **NOTE:** For Six, Eight or Ten-core processors. 20MB (1x20MB) L3 cache **NOTE:** For Eight-core processors. 15MB (1x15MB) L3 cache **NOTE:** For Six-core processors. 5MB (1x5MB) Level 3 cache **NOTE:** For Dual-core processors.
Chipset	Intel® C600 Series Chipset Intel® E5-2600 and 2600v2 Processor Families **NOTE:** For more information regarding Intel chipsets, please see the following: http://www.intel.com/products/server/chipsets/.
Upgradeability	Upgradeable to two (2) processors
On System Management Chipset	HP iLO (Firmware: HP iLO 4) **NOTE:** For more information, visit: http://www.hp.com/go/ilo
Memory Protection	Advanced ECC Memory Online Spare Mode (Rank Spare Mode) Lockstep Mode

Memory
One of the following depending on Model

Type	HP SmartMemory
Maximum (RDIMM)	DDR3 Load Reduced (LRDIMM), Registered (RDIMM), or Unbuffered ECC (UDIMM)
Standard (Pre-configured Models)	64GB (8 x 8GB) DDR3 1600MHz RDIMMs at 1.5V 64GB (4 x 16GB) DDR3 1866MHz RDIMMs at 1.5V 32GB (4 x 8GB) DDR3 1600MHz RDIMMs at 1.5V 32GB (2 x 16GB) DDR3 1866MHz RDIMMs at 1.5V 32GB (4 x 8GB) DDR3 1333MHz RDIMMs at 1.35V 32GB (2 x 16GB) DDR3 1600MHz RDIMMs at 1.35V 16GB (2 x 8GB) DDR3 1866MHz RDIMMs at 1.5V 16GB (4 x 4GB) DDR3 1333MHz RDIMMs at 1.35V 16GB (2 x 8GB) DDR3 1600MHz RDIMMs at 1.35V

Network Controller
One of the following depending on Model

One (1) HP FlexFabric 10Gb 2-port 534FLB FlexibleLOM or HP FlexFabric 10Gb 2-port 554FLB FlexibleLOM
NOTE: Supports FCoE, Flex-10, TCP/IP offload engine, hardware-based accelerated iSCSI, iSCSI boot, and autosensing 10Gb/1Gb Ethernet.
NOTE: Each port is autosensing 1Gb/10Gb, and can interoperate with 1Gb HP BladeSystem c-Class interconnect components. Both ports will operate at the same speed.
NOTE: FlexFabric capabilities require the use of an HP Virtual Connect FlexFabric module. Fibre Channel over Ethernet (FCoE) is supported with the HP 10GbE Pass-Thru Module, HP 6120XG Blade Switch with the CEE license installed, HP Cisco B22HP Fabric Extender and HP Cisco B22HP Fabric Extender with 16 FET for BladeSystem c-Class. Learn more at:
http://www.hp.com/go/bladesystem/interconnects
One (1) HP Flex-10 10Gb 2-port 530FLB FlexibleLOM
One (1) HP Ethernet 10Gb 2-port 560FLB FlexibleLOM

Standard Features

NOTE: FlexibleLOMs are not compatible with prior generation c-Class server blades
Standard iLO Network Controller:
One (1) 10/100 Mbps port for the HP iLO 4 to Onboard Administrator link. The Onboard Administrator (with 10/100/1000 Mbps) to BladeSystem link is 1Gbps

Expansion Slots	Two (2) I/O expansion mezzanine slots:

- x16 PCIe 3.0 Type A (supports Type A mezzanine cards) (expansion slot 1).
  NOTE: This expansion slot supports dual-port mezzanine cards: one port is routed to interconnect module bay 3 and the other to bay 4.
- x16 PCIe 3.0 Type B (supports Type A and Type B mezzanine cards (expansion slot 2).
  NOTE: This expansion slot supports dual-port and quad-port mezzanine cards. For dual-port cards, one port is routed to interconnect module bay 5 and the other to bay 6. For quad-port cards, one port is routed to interconnect module bay 5, one to bay 6, one to bay 7, and one to bay 8.
  NOTE: A second processor must be installed (in processor slot 2) to have access to the second expansion slot (expansion slot 2).

Mezzanine card options include:

- Dual-port 10Gb FlexFabric, 10Gb Flex-10, 10GbE options, and quad-port 1Gb Ethernet server adapter mezzanine options for additional network ports.
- Dual-port 8Gb Fibre Channel HBA for SAN connectivity.

HP Server ROM	HP ROM (read only memory) is now digitally signed using HP's Corporate Signing Service. This signature is verified before the flash process starts, reducing accidental programming and preventing malicious efforts to corrupt system ROM.

HP ROM provides for essential initialization and validation of hardware components before control is passed to the customer-installed operating system. The ROM also provides the capability of booting from various fixed media (HDD, CD-ROM) and removable media (USB), to continue operation to the operating system.

HP ROM performs very early configuration of the video controller, to allow monitoring of initialization progress via an attached monitor. If configuration or hardware errors are discovered during this early phase of hardware initialization, suitable messages are now displayed on the connected monitor. Additionally, these configuration or hardware errors are logged to the Integrated Management Log (IML) to assist in diagnosis.

HP's ProLiant ROM is used to configure the following:

- Processor and chipset status registers
- System memory, memory map, and memory initialization
- System hardware configuration (integrated PCI devices and optional PCIe cards).
- Customer-specific BIOS configuration using the HP ROM-Based Setup Utility (RBSU).

NOTE: For further information, please refer to HP's RBSU (ROM based setup utility) user guide: www.hp.com/support/rbsu

Storage Controller	All Models	One (1) HP Smart Array P220i Controller with 512MB Flash-Backed Write Cache (FBWC) supporting RAID 0 and RAID 1. **NOTE:** Upgradeable firmware with recovery ROM.

Standard Features

NOTE: The HP Smart Array P220i supports two (2) small form factor (SFF) hot plug drive bays.
NOTE: The server supports up to a combined total of two (2) FBWC supercap options.
NOTE: The HP Smart Array P220i Controller FIO Kit (690164-B21) comes included with the HP ProLiant BL460c Gen8 10Gb/20Gb FlexibleLOM Configure-to-order Blade Server (641016-B21). However when choosing the HP ProLiant BL460c Gen8 E5-v2 10Gb/20Gb FlexibleLOM Configure-to-order Blade Server (735151-B21), the HP Smart Array P220i Controller FIO Kit (690164-B21) must be added separately as part of the Server Blade Configuration Process.

Available Options: Smart Array Advanced Pack Software for enhanced performance, reliability, availability, and security of system data

Maximum Internal Storage One of the following depending on Model	Hot Plug SFF SAS	1.8TB	2 x 900GB
	Hot Plug SFF SAS SSD	1.6TB	2 x 800GB

NOTE: The ProLiant BL460c Gen8 server includes the new HP hot plug small form factor (SFF) SmartDrive carrier for enhanced management and reduced maintenance errors. HP drives from previous generation servers are not compatible with the ProLiant BL460c Gen8 drive bays.

Interfaces	Micro SDHC Slot	One (1) internal Micro Secure Digital High Capacity (Micro SDHC) card slot
	USB 2.0 Port	One (1) internal USB 2.0 connector for USB flash media drive keys

NOTE: The above options are for integrated hypervisor virtualization environments needing a low cost boot solution with the highest performance and reliability.

Industry Standard Compliance

ACPI 2.0
Microsoft® Logo certifications
USB 2.0 Support
IPMI 2.0
Secure Digital 2.0
TPM 1.2 Support
IEEE (specific IEEE standards depending on Ethernet adapter card(s) installed)
Advanced Encryption Standard (AES)
Triple Data Encryption Standard (3DES)
SNMP
SSL 2.0
DMTF Systems Management Architecture for Server Hardware Command Line Protocol (SMASH CLP)
Active Directory v1.0
PCIe 3.0

Graphics

Integrated Matrox G200 video standard

- 1280 x 1024 (32 bpp)
- 1920 x 1200 (16 bpp)

Form Factor

NEBS certified HP ProLiant BL460c Gen8 is a half-height server blade that plugs into the HP BladeSystem c7000 -48VDC enclosure.

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

Standard Features

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 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.

Optional Features

Fibre Channel Support	Up to two (2) optional Fibre Channel mezzanine HBAs are supported on the HP ProLiant BL460c Gen8.
HP OneView	The HP OneView architecture combines server, storage, and networking with control of datacenter environmentals into a single, integrated management platform. Architected to deliver lifecycle management for the complete Converged Infrastructure, it facilitates collaboration, removes friction, collapses cycle times, eliminates error-prone work, and accelerates time to value. HP OneView v1.0 combines management of servers and virtual connect with open integration to automate and customize existing tools and processes. With OneView, you'll work smarter-with greater visibility and control-and fully capitalize on the benefits of a Converged Infrastructure. For more information on HP OneView management, see: http://www.hp.com/go/oneview.

Service and Support

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

Configuration Information - Factory Integrated Models

NOTE: This section lists some of the steps required to configure a Factory Integrated Model (configure-to-order or CTO server). 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: Configure-to-order server blades must start with a CTO Blade Server.
NOTE: FIO indicates that this option is only available as a factory installable option.
NOTE: All Factory Integrated Models will be populated with sufficient hard drive blanks based on the number of initial hard drives ordered with the server.

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

Models	HP ProLiant BL460c Gen8 E5-v2 10Gb FlexibleLOM Configure-to-order Blade Server	735151-B21

Configurable Models ship with:

One (1) FlexibleLOM connector providing a choice for one (1) of the supported 10Gb FlexibleLOMs (see Step 2)
Two (2) HP small form factor hot-plug SAS/SSD hard drive bays
Two (2) x16 PCIe I/O expansion slots (one Type A, one Type A/B)
One (1) integrated USB connector and one (1) MicroSDHC connector
One (1) TPM connector
HP iLO Management Engine (standard)

	HP ProLiant BL460c Gen8 10Gb FlexibleLOM Configure-to-order Blade Server	641016-B21

Configurable Models ship with:

One (1) FlexibleLOM connector providing a choice for one (1) of the supported 10Gb FlexibleLOMs (see Step 2)
One (1) HP Smart Array P220i Controller with 512MB FBWC and RAID 0 and 1 support
Two (2) HP small form factor hot-plug SAS/SSD hard drive bays
Two (2) x16 PCIe I/O expansion slots (one Type A, one Type A/B)
One (1) integrated USB connector and one (1) MicroSDHC connector
One (1) TPM connector
HP iLO Management Engine (standard)
NOTE: The HP ProLiant BL460c Gen8 10Gb/20Gb FlexibleLOM Configure-to-order Blade Server (641016-B21) cannot be configured the new 1866MHz HP Smart Memory or the new 1600MHz Low Voltage (1.35v) HP Smart Memory.
NOTE: The HP Smart Array P220i Controller FIO Kit (690164-B21) comes included with the HP ProLiant BL460c Gen8 10Gb/20Gb FlexibleLOM Configure-to-order Blade Server (641016-B21). However, when choosing the HP ProLiant BL460c Gen8 E5-v2 10Gb/20Gb FlexibleLOM Configure-to-order Blade Server (735151-B21), the HP Smart Array P220i Controller FIO Kit (690164-B21) must be added separately as part of the Server Blade Configuration Process.

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

HP Processors	**NOTE:** All configure-to-order processor kits (i.e. xxxxxx-L21) contain one (1) processor.
NOTE: If two processors are desired, select one xxxxxx-L21 here in Step 2 and one xxxxxx-B21 in Step 4.	
	E5-2600 v2 series Processors	
	HP BL460c Gen8 Intel® Xeon® E5-2695v2 (2.4GHz/12-core/30MB/115W) FIO Processor Kit	718054-L21
	HP BL460c Gen8 Intel® Xeon® E5-2680v2 (2.8GHz/10-core/25MB/115W) FIO Processor Kit	718056-L21
	HP BL460c Gen8 Intel® Xeon® E5-2670v2 (2.5GHz/10-core/25MB/115W) FIO Processor Kit	718057-L21
	HP BL460c Gen8 Intel® Xeon® E5-2660v2 (2.2GHz/10-core/25MB/95W) FIO	718058-L21

Configuration Information - Factory Integrated Models

Processor Kit

HP BL460c Gen8 Intel® Xeon® E5-2650v2 (2.6GHz/8-core/20MB/95W) FIO Processor Kit	718358-L21
HP BL460c Gen8 Intel® Xeon® E5-2650Lv2 (1.7GHz/10-core/25MB/70W) FIO Processor Kit	718364-L21
HP BL460c Gen8 Intel® Xeon® E5-2640v2 (2.0GHz/8-core/20MB/95W) FIO Processor Kit	718359-L21
HP BL460c Gen8 Intel® Xeon® E5-2630v2 (2.6GHz/6-core/15MB/80W) FIO Processor Kit	718360-L21
HP BL460c Gen8 Intel® Xeon® E5-2630Lv2 (2.4GHz/6-core/15MB/60W) FIO Processor Kit	718365-L21
HP BL460c Gen8 Intel® Xeon® E5-2620v2 (2.1GHz/6-core/15MB/80W) FIO Processor Kit	718361-L21
HP BL460c Gen8 Intel® Xeon® E5-2609v2 (2.5GHz/4-core/10MB/80W) FIO Processor Kit	718362-L21
HP BL460c Gen8 Intel® Xeon® E5-2603v2 (1.8GHz/4-core/10MB/80W) FIO Processor Kit	718363-L21

E5-2600 series Processors

HP BL460c Gen8 Intel® Xeon® E5-2670 (2.6GHz/8-core/20MB/115W) FIO Processor Kit	662064-L21
HP BL460c Gen8 Intel® Xeon® E5-2665 (2.4GHz/8-core/20MB/115W) FIO Processor Kit	667803-L21
HP BL460c Gen8 Intel® Xeon® E5-2660 (2.2GHz/8-core/20MB/95W) FIO Processor Kit	662065-L21
HP BL460c Gen8 Intel® Xeon® E5-2650 (2.0GHz/8-core/20MB/95W) FIO Processor Kit	662066-L21
HP BL460c Gen8 Intel® Xeon® E5-2640 (2.5GHz/6-core/15MB/95W) FIO Processor Kit	662067-L21
HP BL460c Gen8 Intel® Xeon® E5-2637 (3.0GHz/2-core/5MB/80W) FIO Processor Kit	662077-L21
HP BL460c Gen8 Intel® Xeon® E5-2630 (2.3GHz/6-core/15MB/95W) FIO Processor Kit	662068-L21
HP BL460c Gen8 Intel® Xeon® E5-2620 (2.0GHz/6-core/15MB/95W) FIO Processor Kit	662069-L21

NOTE: The Intel Xeon E5-2600 Processor Family cannot be configured with the new 1866MHz HP Smart Memory or the new 1600MHz Low Voltage (1.35v) HP Smart Memory.
NOTE: DIMM slots 4 and 5 are not accessible when either the E5-2690, the E5-2643, the E5-2643 v2, the E5-2637 v2, or the E5-2667 v2 is used. In a 2 processor configuration, there are twelve (12) total available DIMM slots.
NOTE: For the maximum supported memory speeds for each processor listed above, please reference the 'Memory Speed by Processor Model' table in the Memory section of the QuickSpecs.
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 8, 7, 6, 5, 4, 3, 2 or 1 core(s) 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: Up to 2 processors supported. Mixing different processor models is not supported.
NOTE: For the Intel® C600 Chipset E5-2600 Series, the letter preceding the model

Configuration Information - Factory Integrated Models

number indicates the Product Line (E3, E5, E7); 2600x, 2 = number of CPUs in a Node, 6 is socket/segment designation, 00 = Processor SKU, and x = L for low power SKUs.
NOTE: The BL460c Gen8 supports one or two processors.
NOTE: The BL460c Gen8 includes two I/O mezzanine expansion slots. A processor must be installed in processor slot 1 for access to the first mezzanine expansion slot (expansion slot 1). A processor must be installed in processor slot 2 for access to the second mezzanine expansion slot (expansion slot 2).
NOTE: All processors within the server must be identical.
NOTE: All processors support Intel® Hyper-Threading and Intel® Turbo Boost Technologies except the E5-2603 and E5-2609.
NOTE: The letter "L" following the model number indicates denotes lower wattage.
NOTE: The processor model as well as the memory configuration determines the maximum speed memory can operate. Please see the see the "Memory" section later in this document.
NOTE: The Intel Xeon E5-2620 processor does not support DIMMs at 1.35V. Using the HP RBSU, 1.35V DIMMs can be changed to operate at 1.5V.

HP Memory

NOTE: The HP ProLiant BL460c Gen8 10Gb/20Gb FlexibleLOM Configure-to-order Blade Server (641016-B21) cannot be configured the new 1866MHz HP Smart Memory or the new 1600MHz Low Voltage (1.35v) HP Smart Memory.
NOTE: HP memory from previous generation servers are not qualified or warranted with this HP ProLiant BL460c Server. HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen8. For additional information, please see the HP SmartMemory QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html
NOTE: LRDIMM, RDIMM and UDIMMs are all distinct memory technologies and cannot be mixed within a server. The majority of ProLiant Gen8 servers support RDIMM, UDIMM and LRDIMM.
NOTE: A minimum of one DIMM is required per server.
NOTE: For additional memory rules and guidelines, see the "Memory" section later in this document.

HP SmartMemory

Registered DIMMs (RDIMMs) - E5-2600 v2 series Processors

HP 4GB (1x4GB) Single Rank x4 PC3L-12800R (DDR3-1600) Registered CAS-11 Low Voltage Memory Kit	713981-B21
HP 4GB (1x4GB) Single Rank x4 PC3-14900R (DDR3-1866) Registered CAS-13 Memory Kit	708637-B21
HP 8GB (1x8GB) Single Rank x4 PC3L-12800R (DDR3-1600) Registered CAS-11 Low Voltage Memory Kit	731765-B21
HP 8GB (1x8GB) Single Rank x4 PC3-14900R (DDR3-1866) Registered CAS-13 Memory Kit	731761-B21
HP 16GB (1x16GB) Dual Rank x4 PC3L-12800R (DDR3-1600) Registered CAS-11 Low Voltage Memory Kit	713985-B21
HP 16GB (1x16GB) Dual Rank x4 PC3-14900R (DDR3-1866) Registered CAS-13 Memory Kit	708641-B21

Registered DIMMs (RDIMMs) - E5-2600 series Processors

HP 4GB (1x4GB) Single Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647893-B21
HP 4GB (1x4GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	647895-B21
HP 8GB (1x8GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647897-B21

Configuration Information - Factory Integrated Models

HP 8GB (1x8GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	647899-B21
HP 8GB (1x8GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	690802-B21
HP 16GB (1x16GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647901-B21
HP 16GB (1x16GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	672631-B21
Unbuffered with ECC DIMMs (UDIMMs) - E5-2600 v2 series Processors	
HP 4GB (1x4GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit	713977-B21
HP 4GB (1x4GB) Dual Rank x8 PC3-14900E (DDR3-1866) Unbuffered CAS-13 Memory Kit	708633-B21
HP 8GB (1x8GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit	713979-B21
HP 8GB (1x8GB) Dual Rank x8 PC3-14900E (DDR3-1866) Unbuffered CAS-13 Memory Kit	708635-B21
Unbuffered with ECC DIMMs (UDIMMs) - E5-2600 series Processors	
HP 2GB (1x2GB) Single Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit	669320-B21
HP 2GB (1x2GB) Single Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647905-B21
HP 4GB (1x4GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit	669322-B21
HP 4GB (1x4GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647907-B21
HP 8GB (1x8GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit	669324-B21
HP 8GB (1x8GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647909-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: Depending on the memory configuration and processor model, 1600MHz and 1333MHz memory may operate at a lower speed. Please see the see the "Memory" section later in this document and the Online Memory Configuration Tool for details at: www.hp.com/go/ddr3memory-configurator.
NOTE: For additional memory rules and guidelines, see the "Memory" section later in this document.
NOTE: For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient
NOTE: PC3L is a low voltage memory.

HP Networking

FlexibleLOM Adapters
NOTE: The server requires one (1) FlexibleLOM that is installed in the FlexibleLOM connectors. All FlexibleLOMs are dual port: One port is routed to interconnect module bay 1 and the other to bay 2.

10Gb FlexibleLOM Adapters

HP Ethernet 10Gb 2-port 560FLB FIO Adapter	684214-B21
HP FlexFabric 10Gb 2-port 554FLB FIO Adapter	684212-B21
HP FlexFabric 10Gb 2-port 534FLB FIO Adapter	700742-B21

Configuration Information - Factory Integrated Models

	HP Flex-10 10Gb 2-port 530FLB FIO Adapter	684211-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: www.hp.com/go/ProLiantNICs

Step 3: Choose Additional Factory Integration Options

HP Insight Software	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Single Server FIO License	C6N36A

NOTE: The HP Smart Array P220i Controller FIO Kit (690164-B21) comes included with the HP ProLiant BL460c Gen8 10Gb/20Gb FlexibleLOM Configure-to-order Blade Server (641016-B21). However when choosing the HP ProLiant BL460c Gen8 E5-v2 10Gb/20Gb FlexibleLOM Configure-to-order Blade Server (735151-B21), the HP Smart Array P220i Controller FIO Kit (690164-B21) must be added separately as part of the Server Blade Configuration Process.

Converged Infrastructure Management Software	**HP OneView with iLO Advanced - Server hardware required on same purchase order**	
	HP OneView incl 3yr 24x7 Supp Bundle 1 Svr E-LTU	E5Y43AAE
	HP OneView for Blade Server incl 3yr 24x7 Supp FIO Bundle Physical 1 Svr Lic	F6Q89A
	HP OneView for Blade Server incl 3yr 24x7 Supp FIO Bundle 1 Svr E-LTU	F6Q89AAE
HP Storage Controllers	HP Smart Array P220i Controller FIO Kit	690164-B21

NOTE: When ordering the HP ProLiant BL460c Gen8 E5v2 10Gb/20Gb Flexible LOM Configure-to-order Blade Server (PN 735151-B21) please choose the HP Smart Array P220i/512 FIO Controller (PN 690164-B21) or the HP Smart Array P230i/512 6Gb FIO Controller (PN 735062-B21). When ordering the HP ProLiant BL460c Gen8 10Gb/20Gb FlexibleLOM Configure-to-order Blade Server (PN 641016-B21) the HP Smart Array P220i FIO Controller (PN 690164-B21) ships standard.

Step 4: 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, mezzanine options and power subsystem options; please see the Core Options and Additional sections below; or the following:

- HP BladeSystem c3000 Enclosure QuickSpecs:
  http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html
  NOTE: The c3000 HP c-Class enclosures have full backwards and forwards compatibility, existing server blades are supported in the new enclosures and any future server blades will be supported in the existing enclosures.
- HP BladeSystem c7000 Enclosure QuickSpecs:
  http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html
  NOTE: The c7000 HP c-Class enclosures have full backwards and forwards compatibility, existing server blades are supported in the new enclosures and any future server blades will be supported in the existing enclosures.
- HP BladeSystem c-Class Interconnect and Mezzanine Components:
  http://h18004.www1.hp.com/products/blades/components/c-class-interconnects.html and
  http://h18004.www1.hp.com/products/blades/components/c-class-adapters.html

Core Options

HP Networking	**NOTE:** Each 10 Gigabit Ethernet adapter requires a minimum of 2GB of server memory. **NOTE:** A 10 Gigabit Ethernet adapter supports linking at 1Gbps or 10Gbps when connected to an interconnect module with 10Gb Ethernet downlinks. **NOTE:** A 10 Gigabit Ethernet adapter supports linking at only 1Gbps when connected to an interconnect module with 1Gb Ethernet downlinks. **NOTE:** The 10 Gigabit Ethernet adapters on each server blade connect to a 10Gb interconnect in bays 3-6 (HP BladeSystem c7000 Enclosure) or bays 2-4 (HP BladeSystem c3000 Enclosure).	

10 Gigabit Ethernet Mezzanines

HP Ethernet 10Gb 2-port 560M Adapter **NOTE:** Please see QuickSpecs for technical specifications and additional information at: http://h18000.www1.hp.com/products/quickspecs/14478_div/14478_div.html.	665246-B21
HP Flex-10 10Gb 2-port 530M Adapter **NOTE:** Please see QuickSpecs for technical specifications and additional information at http://h18000.www1.hp.com/products/quickspecs/14217_div/14217_div.html.	631884-B21
HP FlexFabric 10Gb 2-port 534M Adapter **NOTE:** Please see QuickSpecs for technical specifications and additional information at: http://h18000.www1.hp.com/products/quickspecs/14619_div/14619_div.html	700748-B21
HP Flex-10 10Gb 2-port 552M Adapter **NOTE:** Please see QuickSpecs for technical specifications and additional information at: http://h18000.www1.hp.com/products/quickspecs/14218_div/14218_div.html	674764-B21
HP FlexFabric 10Gb 2-port 554M Adapter **NOTE:** Please see QuickSpecs for technical specifications and additional information at http://h18000.www1.hp.com/products/quickspecs/14221_div/14221_div.html.	647590-B21

1 Gigabit Ethernet Mezzanines

HP Ethernet 1Gb 4-port 366M Adapter **NOTE:** Please see QuickSpecs for technical specifications and additional information at: http://h18000.www1.hp.com/products/quickspecs/14335_div/14335_div.html	615729-B21

FlexibleLOM Adapters
NOTE: The server supports one (1) FlexibleLOM that is installed in the FlexibleLOM connectors and is already included in the pre-configured models. However, it must be added in Step 2 for Configure-to-Order Models. The FlexibleLOM options below are used to change these original FlexibleLOMs.

10Gb FlexibleLOM Adapters

HP Flex-10 10Gb 2-port 530FLB Adapter **NOTE:** Please see QuickSpecs for technical specifications and additional information at http://h18000.www1.hp.com/products/quickspecs/14216_div/14216_div.html.	656590-B21
HP FlexFabric 10Gb 2-port 534FLB Adapter **NOTE:** Please see QuickSpecs for technical specifications and additional information at: http://h18000.www1.hp.com/products/quickspecs/14617_div/14617_div.html	700741-B21
HP FlexFabric 10Gb 2-port 554FLB Adapter **NOTE:** Please see QuickSpecs for technical specifications and additional information at: http://h18000.www1.hp.com/products/quickspecs/14219_div/14219_div.html.	647586-B21
HP Ethernet 10Gb 2-port 560FLB Adapter **NOTE:** Please see QuickSpecs for technical specifications and additional information at http://h18000.www1.hp.com/products/quickspecs/14331_div/14331_div.html	655639-B21

1Gb FlexibleLOM Adapters

HP Ethernet 1Gb 2-port 361FLB Adapter	652500-B21
NOTE: Please see QuickSpecs for technical specifications and additional information at: http://h18000.www1.hp.com/products/quickspecs/14333_div/14333_div.html	

Core Options

	HP Ininiband Mezzanine Adapters	
	NOTE: When an InfiniBand adapter is installed in mezzanine slot 1, only one port is active (regardless of operating mode). When installed in any other mezzanine slot, both ports are active.	
	HP Infiniband FDR/Ethernet 10Gb/40Gb 2-port 544M Adapter	644161-B22
	NOTE: The FDR InfiniBand adapter must be installed in mezzanine slot 1 for FDR mode and may be installed in any mezzanine slot if operated in any other mode.	
HP Fibre Channel	HP QMH2572 8Gb Fibre Channel Host Bus Adapter for BladeSystem c-Class	651281-B21
	NOTE: Please see QuickSpecs for technical specifications and additional information at http://h18000.www1.hp.com/products/quickspecs/14230_div/14230_div.html	
HP Processors	**E5-2600 v2 series Processors**	
	HP BL460c Gen8 Intel® Xeon® E5-2695v2 (2.4GHz/12-core/30MB/115W) FIO Processor Kit	718054-L21
	HP BL460c Gen8 Intel® Xeon® E5-2680v2 (2.8GHz/10-core/25MB/115W) FIO Processor Kit	718056-L21
	HP BL460c Gen8 Intel® Xeon® E5-2670v2 (2.5GHz/10-core/25MB/115W) FIO Processor Kit	718057-L21
	HP BL460c Gen8 Intel® Xeon® E5-2660v2 (2.2GHz/10-core/25MB/95W) FIO Processor Kit	718058-L21
	HP BL460c Gen8 Intel® Xeon® E5-2650v2 (2.6GHz/8-core/20MB/95W) FIO Processor Kit	718358-L21
	HP BL460c Gen8 Intel® Xeon® E5-2650Lv2 (1.7GHz/10-core/25MB/70W) FIO Processor Kit	718364-L21
	HP BL460c Gen8 Intel® Xeon® E5-2640v2 (2.0GHz/8-core/20MB/95W) FIO Processor Kit	718359-L21
	HP BL460c Gen8 Intel® Xeon® E5-2630v2 (2.6GHz/6-core/15MB/80W) FIO Processor Kit	718360-L21
	HP BL460c Gen8 Intel® Xeon® E5-2630Lv2 (2.4GHz/6-core/15MB/60W) FIO Processor Kit	718365-L21
	HP BL460c Gen8 Intel® Xeon® E5-2620v2 (2.1GHz/6-core/15MB/80W) FIO Processor Kit	718361-L21
	HP BL460c Gen8 Intel® Xeon® E5-2609v2 (2.5GHz/4-core/10MB/80W) FIO Processor Kit	718362-L21
	HP BL460c Gen8 Intel® Xeon® E5-2603v2 (1.8GHz/4-core/10MB/80W) FIO Processor Kit	718363-L21
	E5-2600 series Processors	
	HP BL460c Gen8 Intel® Xeon® E5-2670 (2.6GHz/8-core/20MB/115W) FIO Processor Kit	662064-L21
	HP BL460c Gen8 Intel® Xeon® E5-2665 (2.4GHz/8-core/20MB/115W) FIO Processor Kit	667803-L21
	HP BL460c Gen8 Intel® Xeon® E5-2660 (2.2GHz/8-core/20MB/95W) FIO Processor Kit	662065-L21
	HP BL460c Gen8 Intel® Xeon® E5-2650 (2.0GHz/8-core/20MB/95W) FIO Processor Kit	662066-L21
	HP BL460c Gen8 Intel® Xeon® E5-2640 (2.5GHz/6-core/15MB/95W) FIO Processor Kit	662067-L21
	HP BL460c Gen8 Intel® Xeon® E5-2637 (3.0GHz/2-core/5MB/80W) FIO Processor Kit	662077-L21

Core Options

	HP BL460c Gen8 Intel® Xeon® E5-2630 (2.3GHz/6-core/15MB/95W) FIO Processor Kit	662068-L21
	HP BL460c Gen8 Intel® Xeon® E5-2620 (2.0GHz/6-core/15MB/95W) FIO Processor Kit	662069-L21

NOTE: The Intel Xeon E5-2600 Processor Family cannot be configured with the new 1866MHz HP Smart Memory or the new 1600MHz Low Voltage (1.35v) HP Smart Memory.

NOTE: DIMM slots 4 and 5 are not accessible when either the E5-2690, the E5-2643, the E5-2643 v2, the E5-2637 v2, or the E5-2667 v2 is used. In a 2 processor configuration, there are twelve (12) total available DIMM slots

NOTE: For the maximum supported memory speeds for each processor listed above, please reference the 'Memory Speed by Processor Model' table in the Memory section of the QuickSpecs.

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 8, 7, 6, 5, 4, 3, 2 or 1 core(s) 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: Up to 2 processors supported. Mixing different processor models is not supported.

NOTE: For the Intel® C600 Chipset E5-2600 Series, the letter preceding the model number indicates the Product Line (E3, E5, E7); 2600x, 2 = number of CPUs in a Node, 6 is socket/segment designation, 00 = Processor SKU, and x = L for low power SKUs.

NOTE: The BL460c Gen8 supports one or two processors.

NOTE: The BL460c Gen8 includes two I/O mezzanine expansion slots. A processor must be installed in processor slot 1 for access to the first mezzanine expansion slot (expansion slot 1). A processor must be installed in processor slot 2 for access to the second mezzanine expansion slot (expansion slot 2).

NOTE: All processors within the server must be identical.

NOTE: All processors support Intel® Hyper-Threading and Intel® Turbo Boost Technologies except the E5-2603 and E5-2609.

NOTE: The letter "L" following the model number indicates denotes lower wattage.

NOTE: The processor model as well as the memory configuration determines the maximum speed memory can operate. Please see the see the "Memory" section later in this document.

NOTE: The Intel Xeon E5-2620 processor does not support DIMMs at 1.35V. Using the HP RBSU, 1.35V DIMMs can be changed to operate at 1.5V.

HP Memory

NOTE: The HP ProLiant BL460c Gen8 10Gb/20Gb FlexibleLOM Configure-to-order Blade Server (641016-B21) cannot be configured the new 1866MHz HP Smart Memory or the new 1600MHz Low Voltage (1.35v) HP Smart Memory.

NOTE: HP memory from previous generation servers are not qualified or warranted with this HP ProLiant BL460c Gen8 Server. HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen8. For additional information, please see the HP SmartMemory QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html

NOTE: LRDIMM, RDIMM and UDIMMs are all distinct memory technologies and cannot be mixed within a server. The majority of ProLiant Gen8 servers support RDIMM, UDIMM and LRDIMM.

NOTE: A minimum of one DIMM is required per server.

NOTE: For additional memory rules and guidelines, see the "Memory" section later in this document.

Core Options

HP SmartMemory

Registered DIMMs (RDIMMs)

Registered DIMMs (RDIMMs) - E5-2600 v2 series Processors

HP 4GB (1x4GB) Single Rank x4 PC3L-12800R (DDR3-1600) Registered CAS-11 Low Voltage Memory Kit	713981-B21
HP 4GB (1x4GB) Single Rank x4 PC3-14900R (DDR3-1866) Registered CAS-13 Memory Kit	708637-B21
HP 8GB (1x8GB) Single Rank x4 PC3L-12800R (DDR3-1600) Registered CAS-11 Low Voltage Memory Kit	731765-B21
HP 8GB (1x8GB) Single Rank x4 PC3-14900R (DDR3-1866) Registered CAS-13 Memory Kit	731761-B21
HP 16GB (1x16GB) Dual Rank x4 PC3L-12800R (DDR3-1600) Registered CAS-11 Low Voltage Memory Kit	713985-B21

Registered DIMMs (RDIMMs) - E5-2600 series Processors

HP 4GB (1x4GB) Single Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647893-B21
HP 4GB (1x4GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	647895-B21
HP 8GB (1x8GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647897-B21
HP 8GB (1x8GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	647899-B21
HP 8GB (1x8GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	690802-B21
HP 16GB (1x16GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647901-B21
HP 16GB (1x16GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	672631-B21

Unbuffered with ECC DIMMs (UDIMMs) - E5-2600 v2 series Processors

HP 4GB (1x4GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit	713977-B21
HP 4GB (1x4GB) Dual Rank x8 PC3-14900E (DDR3-1866) Unbuffered CAS-13 Memory Kit	708633-B21
HP 8GB (1x8GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit	713979-B21
HP 8GB (1x8GB) Dual Rank x8 PC3-14900E (DDR3-1866) Unbuffered CAS-13 Memory Kit	708635-B21

Unbuffered with ECC DIMMs (UDIMMs) - E5-2600 series Processors

HP 2GB (1x2GB) Single Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit	669320-B21
HP 2GB (1x2GB) Single Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647905-B21
HP 4GB (1x4GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit	669322-B21
HP 4GB (1x4GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647907-B21
HP 8GB (1x8GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit	669324-B21
HP 8GB (1x8GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low	647909-B21

Core Options

Voltage Memory Kit

NOTE: Depending on the memory configuration and processor model, 1600MHz and 1333MHz memory may operate at a lower speed. Please see the see the "Memory" section later in this document and the Online Memory Configuration Tool for details at www.hp.com/go/ddr3memory-configurator.

HP Hard Drives

NOTE: The ProLiant BL460c Gen8 server includes the new HP hot-plug small form factor (SFF) SmartDrive carrier for enhanced management and reduced maintenance errors. HP drives from previous generation servers are not compatible with the BL460c Gen8 drive bays.
NOTE: The mixing of standard SAS drives with SAS SSD is supported within the server, but limits the RAID configuration to two separate RAID 0 volumes. Mixing of other drives types is not supported.
NOTE: HP hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.
NOTE: The hard drive options are not required when configuring a drive-less model.
NOTE: 12G SAS hard drives will only operate at 6G speeds in a ProLiant BL460c Gen8

SAS Hot Plug with SmartDrive SFF (2.5-inch) Enterprise Drives

HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) SC Dual Port Enterprise 3yr Warranty Hard Drive	718162-B21
HP 900GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652589-B21
HP 600GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652583-B21
HP 450GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652572-B21
HP 300GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652564-B21
HP 300GB 6G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652611-B21
HP 146GB 6G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652605-B21

NOTE: Please see QuickSpecs for technical specifications and additional information at http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html.

6G SAS MLC Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives

HP 800GB 6G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	690829-B21
HP 400GB 6G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	690827-B21

6G SATA ME Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives

HP 800GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691868-B21
HP 400GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691866-B21

NOTE: The mixing of standard SAS drives with SAS SSD is supported within the server, but limits the RAID configuration to two separate RAID 0 volumes. Mixing of other drives types is not supported

NOTE: Please see the QuickSpecs for technical specifications and information at http://h18000.www1.hp.com/products/quickspecs/14038_div/14038_div.html.

Additional Options

HP Insight software	**HP Insight Control**	
	HP Insight Control including 1yr 24x7 Technical Support and Updates Single Server License	C6N27A
	HP Insight Control including 1yr 24x7 Technical Support and Updates Electronic License	C6N28ABE
	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle FIO Electronic License	C6N36ABE
	HP Insight Control Server Provisioning Media Kit	BD883A
	HP Insight Management Media Kit	C6N31A

NOTE: HP Insight Management Media Kit contains DVDs without licenses. Contains HP Systems Insight Manager, HP Insight Control, HP Matrix Operating Environment, and Virtual Connect Enterprise Manager software. Uses an integrated installer to perform quick and accurate software installation and updates.

NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single activation key.

NOTE: Customer will receive a license entitlement certificate, 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: Licenses ship without media. The HP Insight Management Media Kit can be ordered separately, or can be downloaded at http://www.hp.com/go/insightupdates

NOTE: For additional license kits, please see the QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/12631_div/12631_div.html

HP iLO Advanced License	**HP Integrated Lights-Out (iLO) Advanced for ProLiant BladeSystem Remote Management**	
	HP iLO Advanced for BladeSystem including 3yr 24x7 Technical Support and Updates E-LTU	E6U63ABE
	HP iLO Advanced Blade 1 Server License with 3yr 24x7 Tech Support and Updates	BD502A
	HP iLO Advanced for BladeSystem including 1yr 24x7 Technical Support and Updates E-LTU	E6U60ABE
	HP iLO Advanced for BladeSystem including 1yr 24x7 Support Single Server License	512488-B21
	HP Integrated Lights-Out (iLO)	
	HP iLO Scale Out	
	HP Integrated Lights-Out Scale-Out 3yr 24x7 Tech Support and Updates Flex Quantity License	BD776A
	HP Integrated Lights-Out Scale-Out 1yr 24x7 Tech Support and Updates Flex Quantity License	BD778A
	HP Integrated Lights-Out Scale-Out including 3yr 24x7 Tech Support and Updates Flex Qty E-LTU	BD776AAE
	HP Integrated Lights-Out Scale-Out including 1yr 24x7 Tech Support and Updates Flex Qty E-LTU	BD778AAE
	HP Integrated Lights-Out Scale-Out including 3yr 24x7 Tech Support and Updates Tracking License	BD777A
	HP Integrated Lights-Out Scale-Out including 1yr 24x7 Tech Support and Updates Tracking License	BD779A

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 or three years of 24 x 7 HP Software Technical Support Service.
NOTE: For additional license kits, including electronic delivery options, please see the iLO QuickSpecs at http://www.hp.com/go/iLO

Additional Options

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 or three year of 24 x 7 HP Software Technical Support Service.
NOTE: For additional license kits, please see the QuickSpecs at:
http://h18004.www1.hp.com/products/quickspecs/14276_div/14276_div.html

Converged Infrastructure Management Software	**HP OneView**	
	HP OneView with iLO Advanced	
	HP OneView incl 3yr 24x7 Supp Phys 1 Svr Lic	E5Y34A
	HP OneView incl 3yr 24x7 Supp Flex Qty E-LTU	E5Y35AAE
	HP OneView Media Kit Phys No Lic	E5Y37A
	HP OneView without iLO Advanced	
	HP OneView w/o iLO Adv incl 3yr 24x7 Supp Phys 1 Svr Lic	E5Y38A
	HP OneView w/o iLO Adv inc 3yr 24x7 Supp Flex Qty E-LTU	E5Y39AAE

NOTE: For additional license kits please see the QuickSpecs at http://h18004.www1.hp.com/products/quickspecs/14621_div/14621_div.html.

High Performance Clusters	**HP Cluster Management Utility**	
	HP Insight Cluster Management Utility 1yr 24x7 Flexible License	QL803B
	HP Insight Cluster Management Utility 3yr 24x7 Flexible License	BD476A

NOTE: These part numbers can be used to purchase one certificate for multiple licenses and support with a single activation key. Each license is for one node (server). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key. Customer also will receive a support agreement.

	HP Insight Cluster Management Utility Media	BD477A

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

HP I/O Accelerator Options	HP 1.2TB Multi Level Cell IO Accelerator for BladeSystem c-Class	QK763A
	HP 785GB Multi Level Cell IO Accelerator for BladeSystem c-Class	QK762A
	HP 365GB Multi Level Cell IO Accelerator for BladeSystem c-Class	QK761A

HP Security	HP Trusted Platform Module Option	488069-B21

NOTE: 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.

HP Storage	**Optional Upgrades**	

Additional Options

Controllers	HP Smart Array Advanced Pack 2.0 No Media 1 Server 1yr 24x7 Support Software	BC377A
	HP Smart Array Advanced Pack 2.0 No Media Electronic Lic 1yr 24x7 Support Software	BC390AAE
	NOTE: Please see the Smart Array Advanced Pack QuickSpecs for Technical Specifications and additional information at http://h18000.www1.hp.com/products/quickspecs/13200_div/13200_div.html. (Smart Array Advanced Pack)	
HP Secure Encryption	HP Secure Encryption No Media E-LTU per Drive	D8S85AAE
	HP Secure Encryption No Media Flexible License per Drive	D8S84A
	NOTE: HP Secure Encryption is supported on the HP Smart Array P731m and the P230i as an option. HP Secure Encryption licensing is based on the number of physical drives requiring encryption.	
	NOTE: For more information about HP Secure Encryption, go to www.hp.com/go/hpsecureencryption.	
HP InfiniBand Mezzanines	**NOTE:** When an InfiniBand adapter is installed in mezzanine slot 1, only one port is active (regardless of operating mode). When installed in any other mezzanine slot, both ports are active.	
	NOTE: InfiniBand QDR and FDR speeds are only supported on the HP BladeSystem c7000 Enclosure. For additional information, please see the HP BladeSystem c7000 Enclosure and InfiniBand QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/12586_div/12586_div.html http://h18000.www1.hp.com/products/quickspecs/13078_div/13078_div.html	
	HP Infiniband FDR/Ethernet 10Gb/40Gb 2-port 544M Adapter	644161-B22
HP Flash Media Kits for USB Drives	**HP Flash Media Kits for USB Drives**	
	HP 2GB USB Flash Media Drive Key Kit	608447-B21
	NOTE: HP qualified blank USB key for use with HP ProLiant servers that support the VMware virtualization environment. 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 Enterprise Mainstream Flash Media Kits for Memory Cards	
	HP 8GB USB Enterprise Mainstream Flash Media Drive Key Kit	737953-B21
	HP 8GB microSD Enterprise Mainstream Flash Media Kit	726116-B21
	HP 32GB microSD Enterprise Mainstream Flash Media Kit	700139-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13971_div/13971_div.html	
HP Care Pack Services	**Proactive Care** - Collaborative Support plus Proactive services delivered by the on shore/near shore Advanced Solution Center (ASC) and backed by the global delivery organization, end-to-end case ownership from a Technical Solution Specialists and Technical Account Manager who remotely delivers firmware/software revision management, proactive scans and incident trend reports. Recommended for customers running a virtualized infrastructure and/or customers who desire an enhanced call support experience.	
	HP 3 year 4 hour 24x7 ProLiant BL4xxc Proactive Care Service	U3B14E
	HP 3 year 4 hour 24x7 with Defective Media Retention ProLiant BL4xxc Proactive Care Service	U3B17E
	HP 3 year 6 hour Call To Repair 24x7 ProLiant BL4xxc Proactive Care Service	U3B20E

Additional Options

HP 3 year 6hr Call To Repair 24x7 with Defective Media Retention ProLiant BL4xxc Proactive Care SVC		U3B23E
Proactive Care Personalized Support Environmental Option - to add an onsite Account Support Manager (ASM) to Proactive Care. ASM is an assigned resource who delivers support planning and brings technical expertise and best practices advice for the customer's environment.		
HP 3 year ISS ProactiveCare Personalized Support		U6W98E
Installation Services - reduce the time required to get your system up and running and help minimize disruptions to your business.		
HP Install c-Class Server Blade Service		UE493E
HP Hardware Installation during Non Standard Hours c-Class Server Blade Service		UG869E

Additional HP Care Pack services can be found at: http://www.hp.com/go/cpc

Technical Specifications

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

Memory Subsystem Architecture
Each Intel® Xeon® E5-2600 family or Intel® Xeon® E5-2600 family processor socket contains four memory channels that support two DIMMs each for a total of eight (8) DIMM per installed processor or a grand total of sixteen (16) DIMMs for the server. Up to 32GB capacity DIMMs are supported for 512GB of memory (16 DIMM slots x 32GB per DIMM).

Memory Population Rules and Guidelines:

- A minimum of one DIMM is required per processor.
- Install DIMMs only if the corresponding processor is installed.
- If only one processor is installed in a two processor system, only half of the DIMM slots are available.
- DIMM sizes can be mixed in channel. To maximize performance, it is recommended to balance the total memory capacity between all installed processors and to load the channels similarly whenever possible.
- RDIMMs operating at either 1.35V or 1.5V may be mixed in any order, but the system will power them at the higher voltage.
- LRDIMM, RDIMM and UDIMMs are all distinct memory technologies and cannot be mixed within a server. The majority of ProLiant Gen8 servers support RDIMM, UDIMM and LRDIMM.
- The Intel Xeon E5-2620 processor does not support DIMMs at 1.35V.
- DIMMs of different speeds may be mixed in any order; the server will select a common optimal speed.
- The maximum memory speed is a function of the memory type, memory configuration, and processor model.
- The maximum memory capacity is a function of the memory type and number of installed processors.
- HP memory from previous generation servers is not compatible with the BL460c Gen8 Server Blade.
- To realize the performance memory capabilities listed in this document, HP SmartMemory is required. For additional information, please see the HP SmartMemory QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html.
- For memory population rules and additional memory guidelines, please see the BL460c Gen8 user guide at http://www.hp.com/support.

Registered DIMMS (RDIMMs)							Load Reduced (LRDIMMs)	Unbuffered with ECC DIMMs (UDIMMs)					
Single Rank (1R)	Dual Rank (2R)		Single Rank (1R)	Dual Rank (2R)	Dual Rank (2R)		Quad Rank (4R)	Single Rank (1R)		Dual Rank (2R)			
4GB	4GB	8GB	8GB	8GB	16GB	16GB	32GB	2GB	2GB	4GB	4GB	8GB	8GB
1333	1600	1333	1600	1600	1333	1600	1333	1333	1600	1333	1600	1600	1333
LV	Std	LV	Std	Std	LV	Std	LV	LV	Std	LV	Std	Std	LV
16	16	16	16	16	16	16	16	16	16	16	16	16	16
64	64	128	128	128	256	256	512	32	32	64	64	128	128
1333	1600	1333	1600	1600	1333	1600	1333**	1333	1600	1333	1600	1600	1333
1333	1600	1333	1600	1600	1333	1600	1333**	1333**	1600	1333**	1600	1600	1333***

Technical Specifications

System Unit			
	Dimensions (H x W x D) (with bezel)	7.11 x 2.18 x 20.37 in (18.07 x 5.54 x 51.76 cm)	
	Weight (approximate)	Maximum: all processors, 16 DIMMs, hard drives, mezzanine cards, and two flash cache batteries installed)	14.00 lb (6.33 kg)
		Minimum: one processor and 2 DIMMs installed	10.50 lb (4.75 kg)
	Power Specifications	For power specifications including input requirements, BTU rating, and power supply output, please see the:	

- HP BladeSystem c3000 Enclosure QuickSpecs at http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html.
- HP BladeSystem c7000 Enclosure QuickSpecs at http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html.

To review typical system power ratings use the HP Power Advisor which is available via the online tool located at www.hp.com/go/hppoweradvisor.

	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 1,000 ft) above sea level to a maximum of 3,050 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	3,050 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 (1,500 ft/min).
		Non-operating	9,144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1,500 ft/min).
	Acoustic Noise	For acoustic noise specifications, please see the HP BladeSystem c-Class Enclosures QuickSpecs located at: HP BladeSystem c3000 Enclosure QuickSpecs:	

Technical Specifications

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 Smart Array P220i Controller	**Disk Drive Interface**	6Gb/s SAS (Serial Attached SCSI)
	Server Interface	x4 PCI Express host interface
	Cache Memory	512MB flash backed write cache (FBWC) cache standard
	Logical Drives Supported	64 (with included 512MB cache)
	Host Memory Addressing	64-bit, supporting servers memory space greater than 4GB
	RAID Support	RAID 1 (mirroring) and RAID 0 (striping)
	Other	Upgradeable firmware with recovery ROM Online drive flash (with SAS drives)
HP FlexFabric 10Gb 2-port 554FLB FlexibleLOM	**Type**	Integrated dual-port KR 10Gb FlexibleLOM with FlexFabric (Flex-10, FCoE, hardware-based iSCSI, iSCSI boot, TCP/IP offload engine, and autosencing 1Gb/10Gb Ethernet capability)
	Network Processor	Emulex BE3
	Data Transfer Method	x8 PCI Express 2.0
	Network Transfer Rate	Two ports, each at 20Gbps full duplex; 40Gbps aggregate full duplex theoretical bandwidth **NOTE:** Each port is autosensing 1Gb/10Gb, and can interoperate with 1Gb or 10Gb HP BladeSystem c-Class interconnect components. Both ports will operate at the same speed. **NOTE:** Each port on the 554FLB adapter transmits from the server at 20Gbps (theoretical) full duplex.
	IEEE Compliance	802.1p, 802.1q, 802.1qau, 802.3ad, 802.3ae, 802.3ap (10GBase-KX4) and 802.3x
	Standard Features	ProLiant Teaming including Network Fault Tolerance, Transmit Load Balancing, and Switch-Assisted Load Balancing 9K Jumbo frames (4K Jumbo frames when in FCoE mode) Microsoft Windows Receive Side Scaling (RSS) Hardware-based accelerated iSCSI iSCSI boot Flex-10 capability Fibre Channel over Ethernet (FCoE) TCP/IP offload engine (stateless TCP/IP) Autosencing 1Gb/10Gb Ethernet
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

Technical Specifications

as well as HP OEM customers who integrate and re-sell HP equipment.

Summary of Changes

Date	Version History	Action	Description of Change:
30-May-2012	From Version 8 to 9	Changed	Changes made throughout the QuickSpec
06-Jul-2012	From Version 7 to 8	Changed	Change made in the Standard Features section.
15-Jun-2012	From Version 6 to 7	Removed	Removed items in Configuration Information and Core Options.
04-Jun-2012	From Version 5 to 6	Changed	Changes made throughout the QuickSpec.
26-Mar-2012	From Version 3 to 5	Changed	Changes made throughout the QuickSpec.
15-Mar-2012	From Version 1 to 3	Changed	Changes made in the Standard Features, Models and Step 1 of the Configuration Information section.

Summary of Changes

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For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.