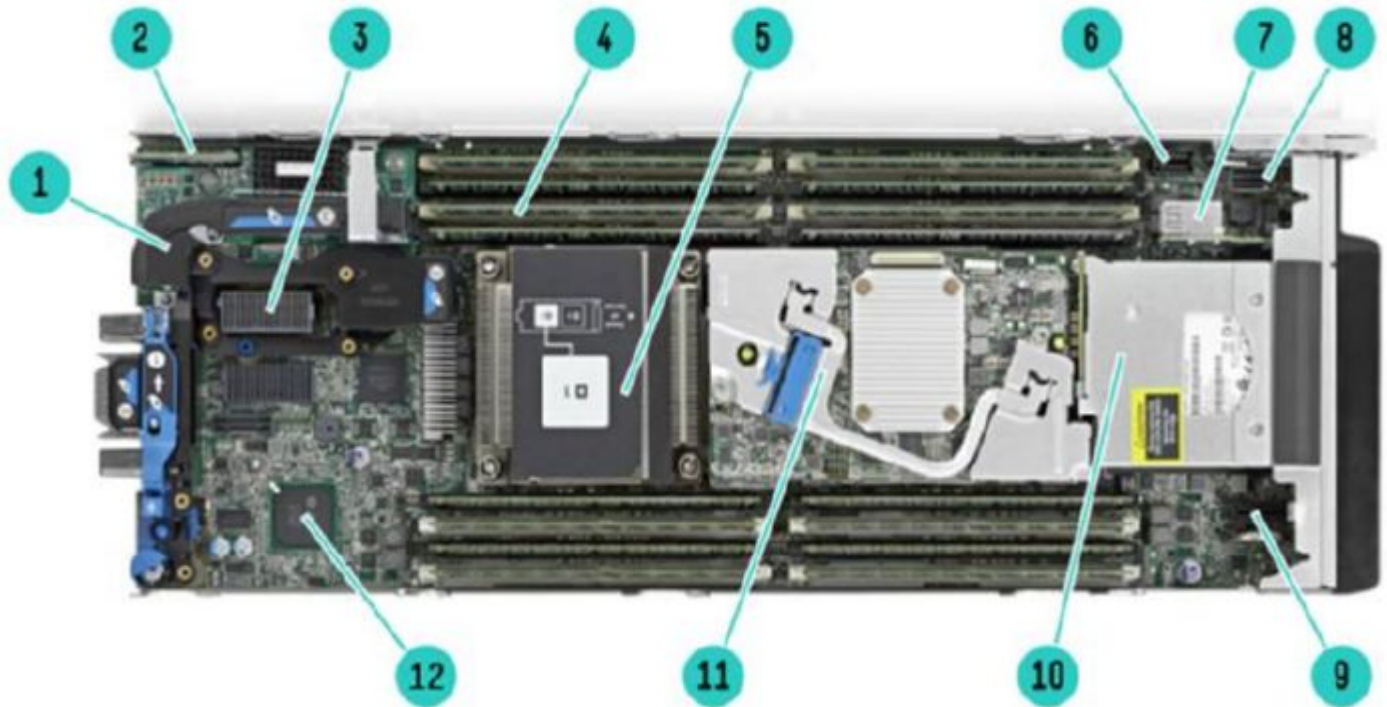


Overview

HPE ProLiant BL460c Gen9 Server Blade



HPE ProLiant BL460c Gen9 Server Blade – Internal View

- | | |
|--|---|
| 1. FlexibleLOM adapter | 7. USB 3.0 and TPM |
| 2. Nand Flash & Micro SD | 8. Embedded SATA Connector |
| 3. Mezzanine Slots (x16 PCI 3.0) | 9. Solid State Device Connector |
| 4. Sixteen (16) DDR4 DIMM slots (8 per processor) | 10. Two hot-plug drive bays |
| 5. Up to two (2) Intel® Xeon® E5-2600 v3 or v4 family processors | 11. HPE Smart Array P244br Controller with 1GB FBWC |
| 6. HPE BLc 12W Smart Storage Battery connector | 12. iLO Management Engine |

What's New

- Workload acceleration with NVMe SSDs and Persistent Memory
- Support for 2400MT/s DDR4 memory
- Support for the Intel E5-2600 v4 Product Family

Standard Features

NOTE: This document covers the HPE ProLiant BL460c Gen9 server blade only. For information on HPE BladeSystem Class Enclosures and HPE BladeSystem c-Class Interconnect and Mezzanine Components, please see the following HPE BladeSystem c-Class Enclosures QuickSpecs:

- HPE BladeSystem c3000 Enclosure QuickSpecs at <http://www8.hp.com/h20195/v2/GetDocument.aspx?docname=c04123379>

NOTE: The c3000 HPE c-Class enclosures have full backwards and forwards compatibility, existing server supported in the new enclosures and any future server blades will be supported in the existing enclosures.

- HPE BladeSystem c7000 Enclosure QuickSpecs at <http://www8.hp.com/h20195/v2/GetDocument.aspx?docname=c04229580>

NOTE: The c7000 HPE c-Class enclosures have full backwards and forwards compatibility, existing server supported in the new enclosures and any future server blades will be supported in the existing enclosures.

- HPE BladeSystem c-Class Interconnect and Mezzanine Components at <http://h18004.www1.hp.com/products/blades/components/c-class-interconnects.html>
<http://h18004.www1.hp.com/products/blades/components/c-class-adapters.html>

NOTE: For optimal cooling and system performance the BL460c Gen9 Server Blade requires the c7000 enclosure configured with 10 fans and the c3000 enclosure to be configured with 6 fans.

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

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

Processor	E5-2600 v4 series Processors
One of the following depending on Model	HPE BL460c Gen9 Intel® Xeon® E5-2690v4 (2.6GHz/14-core/35MB/135W)
	HPE BL460c Gen9 Intel® Xeon® E5-2683v4 (2.1GHz/16-core/40MB/120W)
	HPE BL460c Gen9 Intel® Xeon® E5-2680v4 (2.4GHz/14-core/35MB/120W)
	HPE BL460c Gen9 Intel® Xeon® E5-2660v4 (2.0GHz/14-core/35MB/105W)
	HPE BL460c Gen9 Intel® Xeon® E5-2650v4 (2.2GHz/12-core/30MB/105W)
	HPE BL460c Gen9 Intel® Xeon® E5-2650Lv4 (1.7GHz/14-core/35MB/65W)
	HPE BL460c Gen9 Intel® Xeon® E5-2640v4 (2.4GHz/10-core/25MB/90W)
	HPE BL460c Gen9 Intel® Xeon® E5-2630v4 (2.2GHz/10-core/20MB/85W)
	HPE BL460c Gen9 Intel® Xeon® E5-2630Lv4 (1.8GHz/10-core/25MB/55W)
	HPE BL460c Gen9 Intel® Xeon® E5-2623v4 (2.6GHz/4-core/10MB/85W)
	HPE BL460c Gen9 Intel® Xeon® E5-2620v4 (2.1GHz/8-core/20MB/85W)
	HPE BL460c Gen9 Intel® Xeon® E5-2609v4 (1.7GHz/8-core/20MB/85W)
	HPE BL460c Gen9 Intel® Xeon® E5-2603v4 (1.7GHz/6-core/15MB/85W)
	HPE BL460c Gen9 Intel® Xeon® E5-2699v4 (2.2GHz/22-core/55MB/145W)
	HPE BL460c Gen9 Intel® Xeon® E5-2698v4 (2.2GHz/20-core/50MB/135W)
	HPE BL460c Gen9 Intel® Xeon® E5-2697v4 (2.3GHz/18-core/45MB/145W)
	HPE BL460c Gen9 Intel® Xeon® E5-2697Av4 (2.6GHz/16-core/40MB/145W)
	HPE BL460c Gen9 Intel® Xeon® E5-2695v4 (2.1GHz/18-core/45MB/120W)
	HPE BL460c Gen9 Intel® Xeon® E5-2667v4 (3.2GHz/8-core/25MB/135W)
	HPE BL460c Gen9 Intel® Xeon® E5-2643v4 (3.4GHz/6-core/20MB/135W)
	HPE BL460c Gen9 Intel® Xeon® E5-2637v4 (3.5GHz/4-core/15MB/135W)

Standard Features

E5-2600 v3 series Processors

HPE BL460c Gen9 Intel® Xeon® E5-2690v3 (2.6GHz/12-core/30MB/135W)

HPE BL460c Gen9 Intel® Xeon® E5-2680v3 (2.5GHz/12-core/30MB/120W)

HPE BL460c Gen9 Intel® Xeon® E5-2670v3 (2.3GHz/12-core/30MB/120W)

HPE BL460c Gen9 Intel® Xeon® E5-2660v3 (2.6GHz/10-core/25MB/105W)

HPE BL460c Gen9 Intel® Xeon® E5-2650v3 (2.3GHz/10-core/25MB/105W)

HPE BL460c Gen9 Intel® Xeon® E5-2640v3 (2.6GHz/8-core/20MB/90W)

HPE BL460c Gen9 Intel® Xeon® E5-2683v3 (2GHz/14-core/35MB/120W)

HPE BL460c Gen9 Intel® Xeon® E5-2630v3 (2.4GHz/8-core/20MB/85W)

HPE BL460c Gen9 Intel® Xeon® E5-2620v3 (2.4GHz/6-core/15MB/85W)

HPE BL460c Gen9 Intel® Xeon® E5-2623v3 (3GHz/4-core/10MB/105W)

HPE BL460c Gen9 Intel® Xeon® E5-2609v3 (1.9GHz/6-core/15MB/85W)

HPE BL460c Gen9 Intel® Xeon® E5-2603v3 (1.6GHz/6-core/15MB/85W)

HPE BL460c Gen9 Intel® Xeon® E5-2650Lv3 (1.8GHz/12-core/30MB/65W)

HPE BL460c Gen9 Intel® Xeon® E5-2698v3 (2.3GHz/16-core/40MB/135W)

HPE BL460c Gen9 Intel® Xeon® E5-2630Lv3 (1.8GHz/8-core/20MB/55W)

HPE BL460c Gen9 Intel® Xeon® E5-2695v3 (2.3GHz/14-core/35MB/120W)

HPE BL460c Gen9 Intel® Xeon® E5-2637v3 (3.5GHz/4-core/15MB/135W)

HPE BL460c Gen9 Intel® Xeon® E5-2697v3 (2.6GHz/14-core/35MB/145W)

HPE BL460c Gen9 Intel® Xeon® E5-2667v3 (3.2GHz/8-core/20MB/135W)

HPE BL460c Gen9 Intel® Xeon® E5-2643v3 (3.4GHz/6-core/20MB/135W)

HPE BL460c Gen9 Intel® Xeon® E5-2699v3 (2.3GHz/18-core/45MB/145W)

NOTE: All processors within the server must be identical.

NOTE: DIMM slots 4 and 5 are not accessible when the E5-2699 v4, E5-2697 v4, E5-2697A 2667 v4, E5-2643 v4, E5-2637 v4, E5-2699 v3, the E5-2697 v3, the E5-2643 v3, the E5-263 E5-2667 v3 is used. In a 2 processor configuration, there are twelve (12) total available DIMM

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

NOTE: All processors support Intel® Hyper-Threading and Intel® Turbo Boost Technologies: E5-2609 v4, E5-2603 v4, E5-2603 v3 and E5-2609 v3.

NOTE: DDR4 speed is the maximum memory speed of the processor. Actual memory speeds depend on the quantity and type of DIMMs installed.

NOTE: Supports 1 or 2 processors. Mixing different processor models is not supported.

NOTE: For the Intel® C610 Chipset E5-2600 v3 and v4 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/ designator, 00 = Processor SKU, and x = L for low power SKUs.

NOTE: The BL460c Gen9 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: The letter "L" following the model number indicates denotes lower wattage.

Cache Memory 55MB (1x55MB) L3 cache

One of the following depending on Model

NOTE: For Twenty two-core processors.

50MB (1x50MB) L3 cache

Standard Features

NOTE: For Twenty-core processors.

45MB (1x45MB) L3 cache

NOTE: For Eighteen-core processors.

40MB (1x40MB) L3 cache

NOTE: For Sixteen-core processors.

35MB (1x35MB) L3 cache

NOTE: For Fourteen-core processors.

30MB (1x30MB) L3 cache

NOTE: For Twelve-core processors.

25MB (1x25MB) L3 cache

NOTE: For Ten or Eight-core processors.

20MB (1x20MB) L3 cache

NOTE: For Six, Eight, or Ten-core processors.

15MB (1x15MB) L3 cache

NOTE: For Quad or Six-core processors.

10MB (1x10MB) L3 cache

NOTE: For Quad-core processors.

Chipset	Intel® C610 Series Chipset Intel® E5-2600 v3 or v4 Processor Family NOTE: For more information regarding Intel chipsets, please see the following: http://www.intel.com/products/server/chipsets/ .
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Upgradeability	Upgradeable to two (2) processors
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On System Management Chipset	HPE iLO (Firmware HPE iLO4 2.0), 4GB NAND with 1GB USB user space configurable via accessible via iLO. Read and learn more in the iLO QuickSpecs . NOTE: For more information, visit: http://www.hp.com/go/ilo
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Memory Protection	Advanced ECC Memory Mirroring Memory Online Spare Mode (Rank Spare Mode)
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Memory	Type	HPE SmartMemory
One of the following depending on Model		DDR4 Load Reduced (LRDIMM), or Registered (RDIMM)
	Standard (Pre-configured Models)	256GB (8 x 32GB) DDR4 2400MT/s LDIMMs at 1.2V 128GB (4x 32GB) DDR4 2400MT/s LDIMMs at 1.2V

Standard Features

	64GB (4 x 16GB) DDR4 2400MT/s RDIMMs at 1.2V
	32GB (2 x 16GB) DDR4 2400MT/s RDIMMs at 1.2V
	16GB (2 x 8GB) DDR4 2400MT/s RDIMMs at 1.2V
	128GB (4 x 32GB) DDR4 2133MT/s RDIMMs at 1.2V
	64GB (4 x 16GB) DDR4 2133MT/s RDIMMs at 1.2V
	32GB (2 x 16GB) DDR4 2133MT/s RDIMMs at 1.2V
	32GB (2 x 16GB) DDR4 2133MT/s RDIMMs at 1.2V
	16GB (2 x 8GB) DDR4 2133MT/s RDIMMs at 1.2V
	16GB (2 x 8GB) DDR4 2133MT/s RDIMMs at 1.2V
Maximum (LRDIMM)	2TB (16 x 128GB) up to 2400MT/s at 1.2V
Maximum (RDIMM)	512GB (16 x 32GB) up to 2133MT/s at 1.2V

NOTE: 128GB DIMMs available in Summer 2016

NOTE: HPE memory from previous generation servers (DDR3) is not compatible with this server. SmartMemory is required to realize the memory performance improvements and enhanced features listed in this document for Gen9. For additional information, please see the HPE SmartMemory QuickSpecs at: <https://www.hpe.com/h20195/v2/GetHTML.aspx?docname=c04111535>

NOTE: LRDIMM and RDIMM are distinct memory technologies and cannot be mixed within a server. **NOTE:** Depending on the memory configuration and processor model, the memory speed is 2400MT/s, 2133MT/s, 1866MT/s, or 1600MT/s. Please see [Memory Population Table](#) or the [Memory Configuration Tool](http://h22195.www2.hp.com/DDR4memoryconfig/Home/Log) at: <http://h22195.www2.hp.com/DDR4memoryconfig/Home/Log>

Network Controller One (1) 20Gb 2-port FlexFabric FLB, 10Gb 2-port HPE FlexFabric FLB, or 10Gb 2-port Ethernet
One of the following depending on Model **NOTE:** Supports FCoE, TCP/IP offload engine, hardware-based accelerated iSCSI, iSCSI boot, and autosensing 10Gb/1Gb Ethernet.
NOTE: Each port is autosensing the speed, and can interoperate with 1Gb HPE BladeSystem interconnect components. Both ports will operate at the same speed.
NOTE: FlexFabric capabilities require the use of an HPE Virtual Connect FlexFabric or FlexFabric module module.
Fibre Channel over Ethernet (FCoE) is supported with HPE interconnects. Learn more at: <http://www.hp.com/go/bladeSystem/interconnects>

One (1) HPE FlexFabric 10Gb 2-port 536FLB FlexibleLOM
One (1) HPE FlexFabric 20Gb 2-port 650FLB FlexibleLOM

NOTE: FlexibleLOMs are not compatible with prior generation c-Class server blades

Standard iLO Network Controller:

One (1) 10/100 Mbps port for the HPE 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 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 processor.

Standard Features

expansion slot (expansion slot 2).

Mezzanine card options include:

- Dual-port 20Gb FlexFabric, Dual-port 10Gb FlexFabric, 10GbE options, and quad-port Ethernet server adapter mezzanine options for additional network ports.
- Dual-port 16Gb Fibre Channel HBA for SAN connectivity.
- QDR and FDR InfiniBand for low latency and high bandwidth server interconnectivity.
- I/O accelerator mezzanine options for high transaction rate local storage

HPE Server ROM HPE ROM (read only memory) is now digitally signed using the HPE Corporate Signing Ser signature is verified before the flash process starts, reducing accidental programming and p malicious efforts to corrupt system ROM.

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

HPE ROM performs very early configuration of the video controller, to allow monitoring of ini progress via an attached monitor. If configuration or hardware errors are discovered during phase of hardware initialization, suitable messages are now displayed on the connected mc Additionally, these configuration or hardware errors are logged to the Integrated Managemen to assist in diagnosis.

The HPE 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 HPE ROM-Based Setup Utility (RBSU)

NOTE: For further information, please refer to the [HPE RBSU \(ROM based setup utility\) user guide](http://www.hp.com/support/rbsu) at <http://www.hp.com/support/rbsu>

HPE Server UEFI /Legacy ROM Unified Extensible Firmware Interface (UEFI) is an industry standard that provides better ma and more secured configuration while interacting with your server at boot time. HPE ProLiar platform defaults to UEFI and can be factory or field configured for Legacy BIOS Boot Mode. **NOTE:** The UEFI System Utilities function is analogous to the HPE ROM-Based Setup Utilit legacy BIOS. For more information, please visit <http://www.hp.com/go/proliantuefi/docs>

UEFI enables numerous new capabilities specific to HPE ProLiant servers such as:

- Secure Boot
- Operating system specific functionality
- Support for > 2.2 TB (using GPT) boot drives
- USB 3.0 Stack
- Embedded UEFI Shell
- Mass Configuration Deployment Tool using HPE RESTful API
- PXE boot support for IPv6 networks
- Boot support for option cards that only support a UEFI option ROM

NOTE: For more information please visit <http://www.hp.com/go/proliant/uefi>

NOTE: For UEFI Boot Mode, boot environment and OS image installations should be config properly to support UEFI.

NOTE: HPE UEFI FIO Setting (758959-B22) can be selected to configure the system in Leg

Standard Features

in the factory.

Storage Controller	All BTO Models	One (1) HPE Smart Array P244br Controller with 1GB Flash-Backed (FBWC) supporting RAID 0 and RAID 1, or HPE H244br Smart HBA. NOTE: The HPE Smart Array P244br, the HPE H244br Smart HBA, a B140i (chipset SATA). Support two (2) small form factor (SFF) hot plu NOTE: For NVMe support, please select the NVMe FIO setting (8255! available on CTO models only.
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Maximum Internal Storage One of the following depending on Model	Hot Plug SFF SAS	4.0TB	2 x 2.0TB
	Hot Plug SFF SATA	4.0TB	2 x 2.0TB
	Hot Plug SFF SAS SSD	7.68TB	2 x 3.84TB
	Hot Plug SFF SATA SSD	7.68TB	2 x 3.84TB
	Hot Plug SFF NVMe SSD	4.0TB	2 x 2.0TB

NOTE: The ProLiant BL460c Gen9 server includes the HPE hot plug small form factor (SFF) SmartDrive carrier for enhanced management and reduced maintenance errors. HPE drive previous generation servers (prior to Gen8) are not compatible with the ProLiant BL460c Ge bays.

Interfaces	Micro SDHC Slot	One (1) internal Micro Secure Digital High Capacity (Micro SDHC) c
	USB 3.0 Port	One (1) internal USB 3.0 connector for USB flash media drive keys

NOTE: The above options are intended for integrated hypervisor virtualization environments

Industry Standard Compliance	<p>ACPI 2.0</p> <p>Microsoft® Logo certifications</p> <p>USB 3.0 Support</p> <p>IPMI 2.0</p> <p>Secure Digital 2.0</p> <p>TPM 1.2 Support</p> <p>IEEE (specific IEEE standards depending on Ethernet adapter card(s) installed)</p> <p>Advanced Encryption Standard (AES)</p> <p>Triple Data Encryption Standard (3DES)</p> <p>SNMP</p> <p>SSL 2.0</p> <p>DMTF Systems Management Architecture for Server Hardware Command Line Protocol (SI Active Directory v1.0</p> <p>PCIe 3.0</p> <p>ASHRAE A3</p> <p>FIPS 140-2 Level-1 certification</p> <p>Energy Star</p> <p>NOTE: Energy Star Family level certification covering all BL460c Gen9 E5-2600 v3 configur</p>
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Standard Features

do not include the Intel Xeon E5-2699v3 processor. For more information, visit <http://www.hp.com/hpinfo/globalcitizenship/environment/productdata/energystarservers.htm>

Operating Systems and Virtualization Software Support for ProLiant Servers

- [Microsoft Windows Server](#)
- [Red Hat Enterprise Linux \(RHEL\)](#)
- [SUSE Linux Enterprise Server \(SLES\)](#)
- [Canonical Ubuntu](#)
- [Oracle Solaris](#)
- [VMware](#)

NOTE: For more information on the HPE Certified and Supported ProLiant Servers for OS : Virtualization Software and latest listing of software drivers available for your server, please Support Matrix at: <http://www.hp.com/go/ossupport> and our driver download page: <http://www.hp.com/servers/BL460cGen9>

Enclosures

Hewlett Packard Enterprise offers two different c-Class server blade enclosures to meet your needs:

- The HPE BladeSystem c7000 rack enclosure is 10U high and holds up to sixteen (16) BL460c Gen9 servers plugged vertically.
- The HPE BladeSystem c3000 rack enclosure is 6U high and holds up to eight (8) HPE BL460c Gen9 servers plugged horizontally.

Server blades, interconnect modules, power supplies, fans, and redundant Onboard Admini modules are all designed to fit into the c3000 and c7000 enclosures.

NOTE: For additional enclosure information, please see: <http://h18004.www1.hp.com/products/blades/components/enclosures/c-class/index.html>

Graphics

Integrated Matrox G200eh video controller

- 1600 x 1200 (32 bpp)
- 1920 x 1200 (16 bpp)

HPE iLO Management On System Management Memory

- 16 MB Flash Video Memory
- 256 MB DDR 3 with ECC (112 MB after ECC and video)

Form Factor

HPE ProLiant BL460c Gen9 is a half-height server blade that plugs into the HPE BladeSystem and c7000 enclosures.

Embedded Management

HPE Integrated Lights Out Monitor your servers for ongoing management, service alerting, remote management with iLO. Learn more at <http://www.hp.com/go>

Standard Features

UEFI	Configure and boot your servers securely with industry standard Unified Extensible Firmware Interface (UEFI). Learn more at http://www.hp.com/go/ProLiant/uefi .
HPE RESTful API	RESTful API is an application programming interface. RESTful Web served by iLO's web server. http://www.hp.com/go/restfulapi .
Intelligent Provisioning	Provision servers by discovering and deploying 1 to few servers with Provisioning. Learn more at http://www.hp.com/go/intelligentprovisio
Server Utilities	
HPE Smart Update	Optimize firmware and driver updates with HPE Smart Update solution more at http://www.hp.com/go/smartupdate .
HPE Systems Insight Manager (HPE SIM)	HPE SIM allows you to monitor the health of your HPE ProLiant Server HPE Integrity Servers, and also provides you with basic support for HP Packard Enterprise servers. HPE SIM also integrates with HPE SUM for quick and seamless firmware updates. Learn more at http://www.hp.com/go/sim
Scripting Tool Kit and Windows PowerShell	Provision 1 to many servers using your own scripts to discover and with HPE Scripting Tool Kit for Windows and Linux or HPE Scripting Windows PowerShell. Learn more at http://www.hp.com/go/ProLiant http://www.hp.com/go/powershell .
HPE RESTful Interface Tool	HPE RESTful API tool is a scripting tool to provision servers using RESTful Interface to discover and deploy servers at scale. Learn more at http://www.hp.com/go/restfulapi .
HPE iLO Mobile Application	Enables the ability to access, deploy, and manage your server anytime anywhere from select smartphones and mobile devices. For additional information please visit: http://www.hp.com/go/ilo/mobileapp .
HPE Insight Online	HPE Insight Online, available at no additional cost as part of your HP Care Pack or contractual support agreement with Hewlett Packard Enterprise, is a personalized dashboard for simplified tracking of IT operations and information from anywhere, anytime. Learn more at http://www.hp.com/go/insightonline/info .

Security

- Power-on password
- Administrator's password
- Keyboard password (QuickLock)
- HPE iLO Management On System Management Chipset with:
 - SSL encryption
 - Secure Shell version 2
 - Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) browser, CLP and XML scripting interface
 - AES and RC4 encryption of video
- External USB port enable/disable
- Network server mode
- Serial interface control
-
-
- DA - 15052 Worldwide QuickSpecs — Version 19 — 6.6.2016

Standard Features

- TPM (Trusted Platform Module) 2.0 option
- Advanced Encryption Standard (AES)
- Intel® Advanced Encryption Standard-New Instructions (AES-NI)
- FIPS 140-2 Level-1 certification

Availability

Memory

- Advanced ECC uses single device data correction (SDDC) to detect and correct single multi-bit error that occurs within a single DRAM chip. Both x4 and x8 SDDC are supported (SDDC requires lockstep mode).
- Memory online spare mode (also known as rank spare mode) detects a rank that is defective and switches operation to the spare rank.
- Memory demand and patrol scrubbing to prevent accumulation of correctable errors at the likelihood of unplanned downtime.
- Failed DIMM isolation improves the service time thus improving the overall system availability.
- Address parity protection available on RDIMMs and LRDIMMs detects address bit errors to improve service time and overall system availability.

Mezzanine options and I/O

- Support for one (1) FlexibleLOM, providing two (2) (i.e. redundant) Ethernet ports
- Multiple mezzanine I/O expansion slots that support a wide variety of mezzanine cards supporting multiple data paths routed to redundant interconnect modules.
- Network Adapter Teaming (bonding) provides network fault tolerance, transmit load balancing, and switch-assisted load balancing.

Storage

- Two (2) Small Form Factor hot-plug SAS/SATA HDD or SSD or NVMe SSD drive bays
- Choice of the HPE Smart Array P244br Controller with 1GB FBWC, HPE Smart HBA 110i or the HP B140i (chipset SATA). RAID 0 and 1 support for all three storage controller options.
- Optional dual-port Fibre Channel mezzanine card(s) for redundant SAN connections.
NOTE: For NVMe support, please select the NVMe FIO setting (825555-B21) available on select models only.

Processor/Chipset

- Processor internal sensors & thermal control protection against over-temperature conditions
- Cache parity/ECC protects cache data from accidental data corruption.
- Machine Check Architecture (MCA) detects and captures hardware errors such as system memory ECC, parity, and cache, and improves service time.
- Intel® QPI Protocol Protection allows detection of data errors using a checksum of 8-tuple
- Core Disable for FRB (fault resilient boot) allows a system to power-on despite a failed boot. It uses BIST (built-in self-test) results to detect a failure and disables the target core-processor for the subsequent boot.

Server Blade Enclosure Infrastructure

- Pooled power for true N+N power redundancy through up to six (6) hot-plug, high-efficiency common slot enclosure-based power supplies (configuration dependent).
- Up to ten (10) enclosure-based hot-plug HPE Active Cool fans that scale to meet future demand to optimize airflow, reduce power draw, and improve acoustic performance.
- Dual grid power providing redundant rack enclosure power feeds to the server blade enclosure
- HPE Dynamic Power Saver Mode monitors the total enclosure power consumption in real-time and automatically adjusts with change in demand for improved efficiency and reliability. Dynamic Power Capping safely limits power usage without impacting performance by using peak usage instead of average power usage, removes risk to electrical infrastructure by using hardware-based capping algorithm, and reclaims more power by dynamically capping power limits based on workload demand.
- Up to eight interconnect modules per server blade enclosure providing four simultaneous redundant fabrics for FlexFabric, Virtual Connect Ethernet, Fibre Channel, InfiniBand, and iSCSI.

Standard Features

- Ethernet, etc.
- Enclosure crosslinks between adjacent enclosures to provide interconnect module-to-module connections or as Virtual Connect module stacking links.
- Optional enclosure redundant Onboard Administrator system management module.

Warranty

This product is covered by a global limited warranty and supported by HPE Services and a network of Hewlett Packard Enterprise Authorized Channel Partners. Hardware diagnostic 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 HPE 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 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 may result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are designed for easy replacement but may involve added complexity. Customers may choose to 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 HPE ProLiant BL460c Gen9.
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Compatible SAN	<p>HPE ProLiant BL460c Gen9 server blades are optimized for HPE MSA, EVA, 3PAR and XP.</p> <p>HPE ProLiant BL460c Gen9 server blades are compatible with select 3rd party SANs. Please see blade storage page for more details at https://www.hpe.com/us/en/integrated-systems/bladesystem.html.</p>
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HPE Virtual Connect	<p>HPE Virtual Connect is an interconnect option for c-Class BladeSystem that simplifies server connectivity to data and storage networks, and reduces costs. Unique HPE Flex-10 technology makes maximum use of network bandwidths, provide dynamic tuning and enable extreme flexibility to meet individual server and infrastructure requirements by allocating up to 4 network connections per server port. Virtual Connect FlexFabric modules extend those capabilities to allocate one function per port to storage connections (FCoE).</p> <p>HPE OneView's software-defined approach to infrastructure management enables central console to administer network connections and workloads for thousands of servers, see http://www.hp.com/go/oneview</p> <p>For more information on Virtual Connect Ethernet, Fibre Channel, Converged Network and management options, see http://www.hpe.com/info/virtualconnect.</p>
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Embedded Management	<p>iLO Advanced for BladeSystem</p> <p>HPE iLO Advanced for BladeSystem licenses offer smart remote functionality without compromise, for all HPE ProLiant servers. The license includes the full integrated remote console, virtual keyboard, video, and mouse (KVM), multi-user collaboration, console record and replay, and GUI-based and scripted virtual media and virtual folders. You can also activate the enhanced security and power management functionality. Learn more about HPE iLO Advanced at http://www.hpe.com/info/ilo.</p>
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Server Management	<p>HPE Insight Control</p> <p>HPE Insight Control, lets you deploy, migrate, monitor, remote control, and optimize your IT infrastructure through a single, simple management console. For more information, see http://www.hp.com/go/insightcontrol.</p>
	<p>HPE OneView</p> <p>Powerful converged management of servers, storage, and network for IT service automation and infrastructure simplicity, see http://www.hpe.com/info/oneview .</p>
	<p>HPE Matrix Operating Environment</p> <p>The HPE Matrix Operating Environment (Matrix OE) for ProLiant and Integrity servers is an integrated command center that helps you instantly adjust to dynamic business demands. This advanced infrastructure management software lets you reduce the cost of common data center tasks by up to 40 percent while keeping pace with your changing business. The HPE Matrix OE includes the automated provisioning, optimization, and recovery management capabilities for</p>

Optional Features

HPE CloudSystem Matrix, the ideal platform for private cloud and Infrastructure as a Service (IaaS).

For more information, visit: <http://www.hp.com/go/matrixoe>

HPE Insight Cluster Management Utility (CMU)

HPE Insight Cluster Management Utility is a Hyperscale management framework that includes software for the centralized provisioning, management and monitoring of nodes and infrastructure. Learn more at <http://www.hp.com/go/cmu>.

High Performance Clusters

HPE Cluster Platforms

HPE Cluster Platforms are specifically engineered, factory-integrated large-scale ProLiant clusters optimized for High Performance Computing, with a choice of servers, networks and software. Operating system options include specially priced offerings for Red Hat Enterprise Linux and SUSE Linux Enterprise Server, as well as Microsoft Windows HPC Server. A Cluster Platform Configurator simplifies ordering. <http://www.hp.com/go/clusters>

HPE HPC Interconnects

High Performance Computing (HPC) interconnect technologies are available for this server as part of the HPE Cluster Platform portfolio. These high-speed InfiniBand and Gigabit interconnects are fully supported by Hewlett Packard Enterprise when integrated within an HPE cluster. Flexible, validated solutions can be defined with the help of configuration tools.

<http://www8.hp.com/us/en/products/servers/scalable-systems/clusterplatform.html>

Storage Software Whether you need to solve a specific data protection, archiving, or storage command and control challenge, or deliver on strategic consolidation, compliance, or continuity initiatives, look no further than HPE storage software. Our storage software helps you reduce costs, simplify storage infrastructure, protect vital assets and respond faster to business opportunities.

Storage software that gets the job done:

- **Data Protection and Recovery Software**
Whether you're a large enterprise or a smaller business, HPE data protection and recovery software will cost-effectively protect you against disaster and ensure business continuity.
- **Data Archive and Migration Software**
The HPE storage software enables you to comply with data retention and retrieval requirements, improve application performance, and reduce costs by efficiently migrating infrequently accessed or less valuable data to lower cost storage.
- **Storage Resource Management Software (SRM)**
The HPE storage resource management software reduces operational costs and provides the command and control foundation you need to efficiently manage and visualize your physical and virtual environments.
- **Data Replication Software**
Hewlett Packard Enterprise offers array-based and host-based replication software

Optional Features

for use in disaster recovery, testing, application development and reporting.

- Storage Device Management Software
Maximize your investment in HPE storage and networking with software that enables hardware-specific configuration, performance tuning and connectivity management.

- HPE StoreVirtual VSA
HPE StoreVirtual VSA allows you to create fully featured shared storage on a VMware vSphere or Microsoft Hyper-V virtualized server. This server model starting November 2013, includes a limited license for HPE StoreVirtual VSA software with 1TB of capacity. To download the license key and StoreVirtual VSA software, visit: <http://www.hp.com/go/unlockVSA>.

NOTE: You will need your server serial number in order to complete the registration form. Fully functional, capacity-based licenses are available in 4TB, 10T and 50TB sizes. For more information and access to the 60-day free trial, visit:

<http://www.hp.com/go/tryVSA>

NOTE: For more information available Storage Software including QuickSpecs, please see: <http://www.hpe.com/storage>

HPE Insight Online

HPE Insight Online is part of the HPE Support Center for one stop, secure access to product and HPE support information personalized to your IT environment. Insight Online can automatically display devices remotely monitored by HPE Remote Support tools. With Insight Online's easy navigation you can efficiently track your IT support contracts and device status from anywhere and at anytime. <http://www.hp.com/go/insightonline>

Get connected to HPE

To get the most from your investment in Hewlett Packard Enterprise servers, get connected to Hewlett Packard Enterprise using our innovative remote support technology which provides system health monitoring, pre-failure alert notification and more. For details, visit <http://www.hp.com/services/getconnected>

Expansion Blade Support

Supports one (1) optional D2220sb storage or PCI expansion blade

NOTE: Expansion blade support requires the use of either the HPE Dynamic Smart Array B140i or the HPE Smart Array P246br controller.

NOTE: Expansion blade support requires server firmware versions from SPP 2015.04 or later.

Factory Express Portfolio for Servers and Storage

HPE Factory Express offers configuration, customization, integration and deployment services for Hewlett Packard Enterprise 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. Hewlett Packard Enterprise products supported through Factory Express include a wide array of servers and storage: HPE Integrity, HPE ProLiant, HPE ProLiant Server Blades, HPE BladeSystem, HPE 9000 servers as well as the MSAxxxx, VA7xxx, EVA, XP, rackable tape libraries and

Optional Features

configurable network switches.

For more information on Factory Express services on your specific server model please contact your sales representative or go to: <http://www8.hp.com/us/en/campaigns/factory-express/server-storage-networking.html>

HPE Simple Configurator

SCE is a guided self-service tool to help sales and non-technical people provide customers with initial configurations in 3 to 5 minutes. You may then send the configuration on for configuration help, or use in your existing ordering processes. If you require "custom" rack configuration or configuration for products not available in SCE, please contact the HPE Customer Business Center or an Authorized Partner for assistance.

<https://h22174.www2.hp.com/SimplifiedConfig/Index>

Recommended Support Services for BL460

Service and Support

Protect your business beyond warranty with HPE Support Services. HPE Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Connect to Hewlett Packard Enterprise to help prevent problems and solve issues faster. HPE Support Services enable you to choose the right service level, length of coverage and response time as you purchase your new server, giving you full entitlement for the support for need for your IT and business.

Connect your devices

Unlock all of the benefits of your technology investment by connecting your products to HP Enterprise. Achieve up to 77%¹ reduction in down time, near 100%² diagnostic accuracy and a single consolidated view of your environment. By connecting, you will receive 24x7 monitoring, pre-failure alerts, automatic call logging, and automatic parts dispatch. HPE Proactive Care Service and HPE Datacenter Care Service customers will also benefit from proactive activities to help prevent issues and increase optimization. All of these benefits are already available to you with your server storage and networking products, securely connected to Hewlett Packard Enterprise support.

1 – IDC

2 – HP CSC reports 2014 - 2015

Optimized Support recommendation

HPE Proactive Care Advanced - 24x7 coverage, three year Support Service. This service helps achieve a higher return on your product investment with personalized support from a local assigned Account Support Manager who will share best practice advice and personalized recommendations designed to help improve availability and performance to increase stability and reduce unplanned downtime. Leverage your system's ability to connect to Hewlett Packard Enterprise for pre-failure alerts, automatic call logging and parts dispatch. For business critical incidents, this service offers critical event management to reduce mean time to resolution. This recommendation provides 24x7 coverage with four-hour response for hardware and collaborative support that offers two-hour callback for supported software issues. Collaborative software management is included with independent software vendors unless you have your software support from Hewlett Packard Enterprise where we own all cases from start through to resolution.

<https://www.hpe.com/h20195/V2/GetDocument.aspx?docname=4AA5-3259ENW&cc=us&lc=en>

Standard Support recommendation

HPE Proactive Care - 24x7 coverage, three year Support Service. HPE Proactive Care gives customers an enhanced call experience plus helps preventing problems and maintains IT stability by utilizing personalized proactive reports with recommendations and advice when your products are connected to Hewlett Packard Enterprise. This Service combines three years' proactive reporting and advice with our 24x7 coverage, four hour hardware response time when there is a problem. In addition, this service includes collaborative software support for Independent Software Vendors (ISVs), (Red Hat, VMWare, Microsoft, etc) running on your HPE servers.

<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA3-8855ENW.pdf>

Parts and Materials

Hewlett Packard Enterprise will provide HPE-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

The defective media retention service feature option applies only to Disk or eligible

Recommended Support Services for BL460

SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction.

Related Services

HPE Server Hardware Installation

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

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

Data Center Care Services

HPE Datacenter Care helps improve IT stability and security, increase the value of IT, and enable agility and innovation. It is a structured framework of repeatable, tested, and globally available services “building blocks.” You can deploy, operate, and evolve your datacenter wherever you are on your IT journey. With HPE Datacenter Care, you benefit from a personalized relationship with Hewlett Packard Enterprise via a single point of accountability for HPE and others' products. For more information, visit

<http://www.hpe.com/services/datacentercare>

Data Privacy Services

Protect your data through better media management. HPE Data privacy services help manage and protect sensitive data to reduce the risk of unauthorized access to private information and help meet compliance requirements. Our retention services allow you to keep drives and other devices upon failure with Defective Media Retention and Comprehensive Defective Material Retention, our removal services provide convenient data sanitization and our recovery services allow you to safely retire IT assets and capture any remaining value from the hardware.

<http://www.hp.com/services/dataprivacy>

HPE Education Services

Keep your IT staff trained making sure they have the right skills to deliver on your business outcomes. Book on a class today and learn how to get the most from your technology investment. <http://www.hpe.com/ww/learn>

For more information: <http://www.hpe.com/services>

Models

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

NOTE: Pre-configured models ship with the configurations below. Options can be selected from the Core or Additional options section of this QuickSpecs.

NOTE: Hewlett Packard Enterprise does not allow factory integration of options into pre-configured models. Any additional options purchased will be shipped separately.

NOTE: If you desire a custom configuration please see "Configuration Information - Factory Integrated Models" section of this QuickSpecs.

NOTE: All Pre-configured Models come populated with some hard drive blanks installed.

NOTE: Not all models are available in all regions. Check with your local country Hewlett Packard Enterprise offices for availability.

E5-2600 v3 series Processors

HPE ProLiant BL460c Gen9 E5- 2609v4 1P 16GB- R Server 813192-B21	Processor(s) Cache Memory Memory Network Controller Storage Controller Hard Drive Internal Storage Optical Drive Bay Expansion Slots Management Form Factor Warranty	(1) Intel® Xeon® E5-2609 v4 (1.7GHz/8-core/20MB/6.4GT-s QPI/85W, DDR4-1866) 20MB (1x20MB) Level 3 cache 16GB (2x 8GB) 2400MT/s (DDR4-2400) Registered DIMMs at 1.2V) NOTE: Total of 16 DIMM slots. Only eight (8) usable with single processor. HPE FlexFabric 10Gb 2-port 536FLB FlexibleLOM HPE Smart HBA H244br Controller with RAID 0,1 None ship standard Supports up to two (2) HPE hot-plug SFF SAS/SATA/SDD drives NOTE: NVMe SSDs not available on this model. SAS: 2.0TB; SATA: 2.0TB; SAS SSD: 3.84TB; SATA SSD: 3.84TB None 2 standard - Slot 1 supports Type A mezzanine Cards. Slot 2 supports Type A and Type B mezzanine cards. HPE iLO Management (standard) Optional: HPE OneView or HPE Insight Control Up to eight (8) half-height blades supported in the HPE BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HPE BladeSystem c7000 Enclosure Server warranty includes 3-year Parts, 3-year Labor, 3-year on-site support.
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<u>HPE ProLiant</u> <u>BL460c Gen9 E5-</u> <u>2620v4 1P 16GB-</u> <u>R Server</u> 813193-B21	Processor(s) Cache Memory Memory Network Controller Storage Controller Hard Drive	(1) Intel® Xeon® E5-2620 v4 (2.1GHz/8-core/20MB/8GT-s QPI/85W, DDR4-2133) 20MB (1x20MB) Level 3 cache 16GB (2x 8GB) 2400MT/s (DDR4-2400) Registered DIMMs at 1.2V) NOTE: Total of 16 DIMM slots. Only eight (8) usable with single processor. HPE FlexFabric 10Gb 2-port 536FLB FlexibleLOM HPE Smart HBA H244br Controller with RAID 0,1 None ship standard Supports up to two (2) HPE hot-plug SFF SAS/SATA/SDD drives NOTE: NVMe SSDs not available on this model.
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Models

Internal Storage	SAS: 2.0TB; SATA: 2.0TB; SAS SSD: 3.84TB; SATA SSD: 3.84TB
Optical Drive Bay	None
Expansion Slots	2 standard - Slot 1 supports Type A mezzanine Cards. Slot 2 supports Type A and Type B mezzanine cards.
Management	HPE iLO Management (standard) Optional: HPE OneView or HPE Insight Control
Form Factor	Up to eight (8) half-height blades supported in the HPE BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HPE BladeSystem c7000 Enclosure
Warranty	Server warranty includes 3-year Parts, 3-year Labor, 3-year on-site support.

HPE ProLiant BL460c Gen9 E5-2640v4 1P 32GB-R Server 813194-B21	Processor(s)	(1) Intel® Xeon® E5-2640 v4 (2.4GHz/10-core/25MB/8GT-s QPI/90W, DDR4-2133)
	Cache Memory	25MB (1x25MB) Level 3 cache
	Memory	32GB (2x 16GB) 2400MT/s (DDR4-2400) Registered DIMMs at 1.2V) NOTE: Total of 16 DIMM slots.
	Network Controller	HPE FlexFabric 10Gb 2-port 536FLB FlexibleLOM
	Storage Controller	HPE Smart Array P244br Controller with RAID 0,1
	Hard Drive	None ship standard Supports up to two (2) HPE hot-plug SFF SAS/SATA/SDD drives NOTE: NVMe SSDs not available on this model.
	Internal Storage	SAS: 2.0TB; SATA: 2.0TB; SAS SSD: 3.84TB; SATA SSD: 3.84TB
	Optical Drive Bay	None
	Expansion Slots	2 standard - Slot 1 supports Type A mezzanine Cards. Slot 2 supports Type A and Type B mezzanine cards.
	Management	HPE iLO Management (standard) Optional: HPE OneView or HPE Insight Control
Form Factor	Up to eight (8) half-height blades supported in the HPE BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HPE BladeSystem c7000 Enclosure	
Warranty	Server warranty includes 3-year Parts, 3-year Labor, 3-year on-site support.	

HPE ProLiant BL460c Gen9 E5-2650v4 2P 64GB-R Server 813195-B21	Processor(s)	(2) Intel® Xeon® E5-2650 v4 (2.2GHz/12-core/30MB/9.6GT-s QPI/90W, DDR4-2400)
	Cache Memory	30MB (1x30MB) Level 3 cache
	Memory	64GB (4x 16GB) 2400MT/s (DDR4-2400) Registered DIMMs at 1.2V) NOTE: Total of 16 DIMM slots.
	Network Controller	HPE FlexFabric 10Gb 2-port 536FLB FlexibleLOM
	Storage Controller	HPE Smart Array P244br Controller with RAID 0,1
	Hard Drive	None ship standard Supports up to two (2) HPE hot-plug SFF SAS/SATA/SDD drives NOTE: NVMe SSDs not available on this model.
	Internal Storage	SAS: 2.0TB; SATA: 2.0TB; SAS SSD: 3.84TB; SATA SSD: 3.84TB
	Optical Drive Bay	None

Models

Expansion Slots	2 standard - Slot 1 supports Type A mezzanine Cards. Slot 2 supports Type A and Type B mezzanine cards.
Management	HPE iLO Management (standard) Optional: HPE OneView or HPE Insight Control
Form Factor	Up to eight (8) half-height blades supported in the HPE BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HPE BladeSystem c7000 Enclosure
Warranty	Server warranty includes 3-year Parts, 3-year Labor, 3-year on-site support.

HPE ProLiant BL460c Gen9 E5- 2660v4 2P 128GB-R Server 813196-B21	Processor(s)	(2) Intel® Xeon® E5-2660 v4 (2.0GHz/14-core/35MB/9.6GT-s QPI/105W, DDR4-2400)
	Cache Memory	35MB (1x35MB) Level 3 cache
	Memory	128GB (4x 32GB) 2400MT/s (DDR4-2400) Load Reduced DIMMs at 1.2V) NOTE: Total of 16 DIMM slots.
	Network Controller	HPE FlexFabric 20Gb 2-port 650FLB FlexibleLOM
	Storage Controller	HPE Smart Array P244br Controller with RAID 0,1
	Hard Drive	None ship standard Supports up to two (2) HPE hot-plug SFF SAS/SATA/SDD drives NOTE: NVMe SSDs not available on this model.
	Internal Storage	SAS: 2.0TB; SATA: 2.0TB; SAS SSD: 3.84TB; SATA SSD: 3.84TB
	Optical Drive Bay	None
	Expansion Slots	2 standard - Slot 1 supports Type A mezzanine Cards. Slot 2 supports Type A and Type B mezzanine cards.
	Management	HPE iLO Management (standard) Optional: HPE OneView or HPE Insight Control
	Form Factor	Up to eight (8) half-height blades supported in the HPE BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HPE BladeSystem c7000 Enclosure
	Warranty	Server warranty includes 3-year Parts, 3-year Labor, 3-year on-site support.

HPE ProLiant BL460c Gen9 E5- 2680v4 2P 256GB-L Server 813197-B21	Processor(s)	(2) Intel® Xeon® E5-2680 v4 (2.4GHz/14-core/35MB/9.6GT-s QPI/120W, DDR4-2400)
	Cache Memory	35MB (1x35MB) Level 3 cache
	Memory	256GB (8x 32GB) 2400MT/s (DDR4-2400) Load Reduced DIMMs at 1.2V) NOTE: Total of 16 DIMM slots.
	Network Controller	HPE FlexFabric 20Gb 2-port 650FLB FlexibleLOM
	Storage Controller	HPE Smart Array P244br Controller with RAID 0,1
	Hard Drive	None ship standard Supports up to two (2) HPE hot-plug SFF SAS/SATA/SDD drives NOTE: NVMe SSDs not available on this model.
	Internal Storage	SAS: 2.0TB; SATA: 2.0TB; SAS SSD: 3.84TB; SATA SSD: 3.84TB
	Optical Drive Bay	None

Models

Expansion Slots	2 standard - Slot 1 supports Type A mezzanine Cards. Slot 2 supports Type A and Type B mezzanine cards.
Management	HPE iLO Management (standard) Optional: HPE OneView or HPE Insight Control
Form Factor	Up to eight (8) half-height blades supported in the HPE BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HPE BladeSystem c7000 Enclosure
Warranty	Server warranty includes 3-year Parts, 3-year Labor, 3-year on-site support.

E5-2600 v3 series Processors

NOTE: Optional: HPE OneView or HPE Insight Control

HP ProLiant BL460c Gen9 E5-2609v3 1P 16GB-R H244br Entry Server 727026-B21	Processor(s)	(1) Intel® Xeon® E5-2609 v3 (1.9GHz/6-core/15MB/6.4GT-s QPI/85W, DDR4-1600)
	Cache Memory	15MB (1x15MB) Level 3 cache
	Memory	16GB (2x 8GB) PC4-2133P-R (DDR4-2133) Registered DIMMs at 1.2V NOTE: Total of 16 DIMM slots. Only eight (8) usable with single processor.
	Network Controller	HPE FlexFabric 10Gb 2-port 536FLB FlexibleLOM
	Storage Controller	HPE Smart HBA H244br Controller with RAID 0,1
	Hard Drive	None ship standard Supports up to two (2) HPE hot-plug SFF SAS/SATA/SDD drives NOTE: NVMe SSDs not available on this model.
	Internal Storage	SAS: 2.0TB; SATA: 2.0TB; SAS SSD: 3.84TB; SATA SSD: 3.84TB
	Optical Drive Bay	None
	Expansion Slots	2 standard - Slot 1 supports Type A mezzanine Cards. Slot 2 supports Type A and Type B mezzanine cards.
	Management	HPE iLO Management (standard) Optional: HPE OneView or HPE Insight Control
	Form Factor	Up to eight (8) half-height blades supported in the HPE BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HPE BladeSystem c7000 Enclosure
	Warranty	Server warranty includes 3-year Parts, 3-year Labor, 3-year on-site support.

HP ProLiant BL460c Gen9 E5-2620v3 1P 16GB-R H244br Entry Server 727027-B21	Processor(s)	(1) Intel® Xeon® E5-2620 v3 (2.40GHz/6-core/15MB/8.0GT-s QPI/85W, DDR4-1866, HT, Turbo2)
	Cache Memory	15MB (1x15MB) Level 3 cache
	Memory	16GB (2x 8GB) PC4-2133P-R (DDR4-2133) Registered DIMMS at 1.2V NOTE: Total of 16 DIMM slots. Only eight (8) usable with single processor.
	Network Controller	HPE FlexFabric 10Gb 2-port 536FLB FlexibleLOM
	Storage Controller	HPE Smart HBA H244br Controller with RAID 0,1
	Hard Drive	None ship standard Supports up to two (2) HPE hot-plug SFF SAS/SATA/SDD drives NOTE: NVMe SSDs not available on this model.

Models

Internal Storage	SAS: 2.0TB; SATA: 2.0TB; SAS SSD: 3.84TB; SATA SSD: 3.84TB
Optical Drive Bay	None
Expansion Slots	2 standard - Slot 1 supports Type A mezzanine Cards. Slot 2 supports Type A and Type B mezzanine cards.
Management	HPE iLO Management (standard) Optional: HPE OneView or HPE Insight Control
Form Factor	Up to eight (8) half-height blades supported in the HPE BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HPE BladeSystem c7000 Enclosure
Warranty	Server warranty includes 3-year Parts, 3-year Labor, 3-year on-site support.

HP ProLiant BL460c Gen9 E5-2640v3 1P 32GB-R P244br Base Server 727028-B21	Processor(s)	(1) Intel® Xeon® E5-2640 v3 (2.6GHz/8-core/20MB/8.0GT-s QPI/95W, DDR4-1866, HT, Turbo2)
	Cache Memory	20MB (1x20MB) Level 3 cache
	Memory	32GB (2x 16GB) PC4-2133P-R (DDR4-1866 Registered DIMMs at 1.2V) NOTE: Total of 16 DIMM slots. Only eight (8) usable with single processor.
	Network Controller	HPE FlexFabric 10Gb 2-port 536FLB FlexibleLOM
	Storage Controller	HPE Smart Array P244br Controller with 1GB FBWC RAID 0,1
	Hard Drive	None ship standard Supports up to two (2) HPE hot-plug SFF SAS/SATA/SDD drives NOTE: NVMe SSDs not available on this model.
	Internal Storage	SAS: 2.0TB; SATA: 2.0TB; SAS SSD: 3.84TB; SATA SSD: 3.84TB
	Optical Drive Bay	None
	Expansion Slots	2 standard - Slot 1 supports Type A mezzanine Cards. Slot 2 supports Type A and Type B mezzanine cards.
	Management	HPE iLO Management (standard) Optional: HPE OneView or HPE Insight Control
Form Factor	Up to eight (8) half-height blades supported in the HPE BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HPE BladeSystem c7000 Enclosure	
Warranty	Server warranty includes 3-year Parts, 3-year Labor, 3-year on-site support.	

HP ProLiant BL460c Gen9 E5-2650v3 1P 32GB-R P244br Base Server 727029-B21	Processor(s)	(1) Intel® Xeon® E5-2650 v3 (2.3GHz/10-core/25MB/9.6GT-s QPI/105W, DDR4-2133, HT, Turbo2)
	Cache Memory	25MB (1x25MB) Level 3 cache
	Memory	32GB (2x 16GB) PC4-2133P-R (DDR4-2133 Registered DIMMs at 1.2V) NOTE: Total of 16 DIMM slots. Only eight (8) usable with single processor.
	Network Controller	HPE FlexFabric 10Gb 2-port 536FLB FlexibleLOM
	Storage Controller	HPE Smart Array P244br Controller with 1GB FBWC RAID 0,1
	Hard Drive	None ship standard Supports up to two (2) HPE hot-plug SFF SAS/SATA/SDD drives NOTE: NVMe SSDs not available on this model.
	Internal Storage	SAS: 2.0TB; SATA: 2.0TB; SAS SSD: 3.84TB; SATA SSD: 3.84TB
	Optical Drive Bay	None
	Expansion Slots	2 standard - Slot 1 supports Type A mezzanine Cards. Slot 2 supports Type A and Type B mezzanine cards.
	Management	HPE iLO Management (standard) Optional: HPE OneView or HPE Insight Control
Form Factor	Up to eight (8) half-height blades supported in the HPE BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HPE BladeSystem c7000 Enclosure	
Warranty	Server warranty includes 3-year Parts, 3-year Labor, 3-year on-site support.	

Models

Internal Storage	SAS: 2.0TB; SATA: 2.0TB; SAS SSD: 3.84TB; SATA SSD: 3.84TB
Optical Drive Bay	None
Expansion Slots	2 standard - Slot 1 supports Type A mezzanine Cards. Slot 2 supports Type A and Type B mezzanine cards.
Management	HPE iLO Management (standard) Optional: HPE OneView or HPE Insight Control
Form Factor	Up to eight (8) half-height blades supported in the HPE BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HPE BladeSystem c7000 Enclosure
Warranty	Server warranty includes 3-year Parts, 3-year3-year Labor, 3-year on-site support.

HP ProLiant BL460c Gen9 E5-2660v3 2P 64GB-R P244br Performance Server 727030-B21	Processor(s)	(2) Intel® Xeon® E5-2660 v3 (2.6GHz/10-core/25MB/9.6GT-s QPI/105W, DDR4-2133, HT, Turbo2)
	Cache Memory	25MB (1x25MB) Level 3 cache
	Memory	64GB (4x 16GB) PC4-2133P-R (DDR4-2133 Registered DIMMs at 1.2V) NOTE: Total of 16 DIMM slots.
	Network Controller	HPE FlexFabric 20Gb 2-port 650FLB FlexibleLOM
	Storage Controller	HPE Smart Array P244br Controller with 1GB FBWC RAID 0,1
	Hard Drive	None ship standard Supports up to two (2) HPE hot-plug SFF SAS/SATA/SDD drives NOTE: NVMe SSDs not available on this model.
	Internal Storage	SAS: 2.0TB; SATA: 2.0TB; SAS SSD: 3.84TB; SATA SSD: 3.84TB
	Optical Drive Bay	None
	Expansion Slots	2 standard - Slot 1 supports Type A mezzanine Cards. Slot 2 supports Type A and Type B mezzanine cards.
	Management	HPE iLO Management (standard) Optional: HPE OneView or HPE Insight Control
Form Factor	Up to eight (8) half-height blades supported in the HPE BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HPE BladeSystem c7000 Enclosure	
Warranty	Server warranty includes 3-year Parts, 3-year3-year Labor, 3-year on-site support.	

HP ProLiant BL460c Gen9 E5-2670v3 2P 128GB-L P244br Performance Server 727031-B21	Processor(s)	(2) Intel® Xeon® E5-2670 v3 (2.3GHz/12-core/30MB/9.6GT-s QPI/120W, DDR4-2133, HT, Turbo2)
	Cache Memory	30MB (1x130MB) Level 3 cache
	Memory	128GB (4x 32GB) PC4-2133P-L (DDR4-2133) Load Reduced DIMMs at 1.2V) NOTE: Total of 16 DIMM slots.
	Network Controller	HPE FlexFabric 20Gb 2-port 650FLB FlexibleLOM
	Storage Controller	Smart Array P244br Controller with 1GB FBWC RAID 0,1

Models

Hard Drive	None ship standard Supports up to two (2) HPE hot-plug SFF SAS/SATA/SDD drives NOTE: NVMe SSDs not available on this model.
Internal Storage	SAS: 2.0TB; SATA: 2.0TB; SAS SSD: 3.84TB; SATA SSD: 3.84TB
Optical Drive Bay	None
Expansion Slots	2 standard - Slot 1 supports Type A mezzanine Cards. Slot 2 supports Type A and Type B mezzanine cards.
Management	HPE iLO Management (standard) Optional: HPE OneView or HPE Insight Control
Form Factor	Up to eight (8) half-height blades supported in the HPE BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HPE BladeSystem c7000 Enclosure
Warranty	Server warranty includes 3-year3-year Parts, 3-year Labor, 3-year on-site support.

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, Hewlett Packard Enterprise recommends the use of an Hewlett Packard Enterprise 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 Gen9 E5-v3 10Gb/20Gb FlexibleLOM Configure-to-order Blade Server	727021-B21
	HPE ProLiant BL460c Gen9 E5-v4 10Gb/20Gb FlexibleLOM Configure-to-order Blade Server	813198-B21

Configurable Models ship with:

- One (1) FlexibleLOM connector providing a choice for one (1) of the supported 10Gb/20Gb FlexibleLOMs (see Step 2)
- Two (2) HPE small form factor hot-plug SAS/SATA/ HDD or 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
- HPE iLO Management (standard)

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

HPE Processors	<p>NOTE: All configure-to-order processor kits (i.e. xxxxxx-L21) contain one (1) processor.</p> <p>NOTE: If two processors are desired, select one xxxxxx-L21 here in Step 2 and one xxxxxx-B21 in Step 4.</p> <p>E5-2600 v4 series Processors</p> <p>HPE BL460c Gen9 Intel® Xeon® E5-2690v4 (2.6GHz/14-core/35MB/135W) FIO Processor Kit</p> <p>HPE BL460c Gen9 Intel® Xeon® E5-2683v4 (2.1GHz/16-core/40MB/120W) FIO Processor Kit</p> <p>HPE BL460c Gen9 Intel® Xeon® E5-2680v4 (2.4GHz/14-core/35MB/120W) FIO Processor Kit</p> <p>HPE BL460c Gen9 Intel® Xeon® E5-2660v4 (2.0GHz/14-core/35MB/105W) FIO Processor Kit</p> <p>HPE BL460c Gen9 Intel® Xeon® E5-2650v4 (2.2GHz/12-core/30MB/105W) FIO Processor Kit</p> <p>HPE BL460c Gen9 Intel® Xeon® E5-2650Lv4 (1.7GHz/14-core/35MB/65W) FIO Processor Kit</p> <p>HPE BL460c Gen9 Intel® Xeon® E5-2640v4 (2.4GHz/10-core/25MB/90W) FIO Processor Kit</p>	<p>819852-L21</p> <p>819851-L21</p> <p>819842-L21</p> <p>819841-L21</p> <p>819840-L21</p> <p>819849-L21</p> <p>819839-L21</p>
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Configuration Information - Factory Integrated Models

HPE BL460c Gen9 Intel® Xeon® E5-2630v4 (2.2GHz/10-core/25MB/85W) FIO Processor Kit	819845-L21
HPE BL460c Gen9 Intel® Xeon® E5-2630Lv4 (1.8GHz/10-core/25MB/55W) FIO Processor Kit	819846-L21
HPE BL460c Gen9 Intel® Xeon® E5-2623v4 (2.6GHz/4-core/10MB/85W) FIO Processor Kit	819844-L21
HPE BL460c Gen9 Intel® Xeon® E5-2620v4 (2.1GHz/8-core/20MB/85W) FIO Processor Kit	819838-L21
HPE BL460c Gen9 Intel® Xeon® E5-2609v4 (1.7GHz/8-core/20MB/85W) FIO Processor Kit	819837-L21
HPE BL460c Gen9 Intel® Xeon® E5-2603v4 (1.7GHz/6-core/15MB/85W) FIO Processor Kit	819843-L21
HPE BL460c Gen9 Intel® Xeon® E5-2699v4 (2.2GHz/22-core/55MB/145W) FIO Processor Kit	819856-L21
HPE BL460c Gen9 Intel® Xeon® E5-2698v4 (2.2GHz/20-core/50MB/135W) FIO Processor Kit	819855-L21
HPE BL460c Gen9 Intel® Xeon® E5-2697v4 (2.3GHz/18-core/45MB/145W) FIO Processor Kit	819854-L21
HPE BL460c Gen9 Intel® Xeon® E5-2697Av4 (2.6GHz/16-core/40MB/145W) FIO Processor Kit	819857-L21
HPE BL460c Gen9 Intel® Xeon® E5-2695v4 (2.1GHz/18-core/45MB/120W) FIO Processor Kit	819853-L21
HPE BL460c Gen9 Intel® Xeon® E5-2667v4 (3.2GHz/8-core/25MB/135W) FIO Processor Kit	819850-L21
HPE BL460c Gen9 Intel® Xeon® E5-2643v4 (3.4GHz/6-core/20MB/135W) FIO Processor Kit	819848-L21
HPE BL460c Gen9 Intel® Xeon® E5-2637v4 (3.5GHz/4-core/15MB/135W) FIO Processor Kit	819847-L21
E5-2600 v3 series Processors	
HP BL460c Gen9 Intel® Xeon® E5-2690v3 (2.6GHz/12-core/30MB/135W) FIO Processor Kit	726987-L21
HP BL460c Gen9 Intel® Xeon® E5-2680v3 (2.5GHz/12-core/30MB/120W) FIO Processor Kit	726988-L21
HP BL460c Gen9 Intel® Xeon® E5-2670v3 (2.3GHz/12-core/30MB/120W) FIO Processor Kit	726989-L21
HP BL460c Gen9 Intel® Xeon® E5-2660v3 (2.6GHz/10-core/25MB/105W) FIO Processor Kit	726990-L21
HP BL460c Gen9 Intel® Xeon® E5-2650v3 (2.3GHz/10-core/25MB/105W) FIO Processor Kit	726991-L21
HP BL460c Gen9 Intel® Xeon® E5-2640v3 (2.6GHz/8-core/20MB/90W) FIO Processor Kit	726992-L21
HP BL460c Gen9 Intel® Xeon® E5-2683v3 (2GHz/14-core/35MB/120W) FIO Processor Kit	726993-L21
HP BL460c Gen9 Intel® Xeon® E5-2630v3 (2.4GHz/8-core/20MB/85W) FIO Processor Kit	726994-L21

Configuration Information - Factory Integrated Models

HP BL460c Gen9 Intel® Xeon® E5-2620v3 (2.4GHz/6-core/15MB/85W) FIO Processor Kit	726995-L21
HP BL460c Gen9 Intel® Xeon® E5-2623v3 (3GHz/4-core/10MB/105W) FIO Processor Kit	726996-L21
HP BL460c Gen9 Intel® Xeon® E5-2609v3 (1.9GHz/6-core/15MB/85W) FIO Processor Kit	726997-L21
HP BL460c Gen9 Intel® Xeon® E5-2603v3 (1.6GHz/6-core/15MB/85W) FIO Processor Kit	726999-L21
HP BL460c Gen9 Intel® Xeon® E5-2650Lv3 (1.8GHz/12-core/30MB/65W) FIO Processor Kit	727000-L21
HP BL460c Gen9 Intel® Xeon® E5-2698v3 (2.3GHz/16-core/40MB/135W) FIO Processor Kit	727001-L21
HP BL460c Gen9 Intel® Xeon® E5-2630Lv3 (1.8GHz/8-core/20MB/55W) FIO Processor Kit	727002-L21
HP BL460c Gen9 Intel® Xeon® E5-2695v3 (2.3GHz/14-core/35MB/120W) FIO Processor Kit	727003-L21
HP BL460c Gen9 Intel® Xeon® E5-2637v3 (3.5GHz/4-core/15MB/135W) FIO Processor Kit	765268-L21
HP BL460c Gen9 Intel® Xeon® E5-2697v3 (2.6GHz/14-core/35MB/145W) FIO Processor Kit	767049-L21
HP BL460c Gen9 Intel® Xeon® E5-2667v3 (3.2GHz/8-core/20MB/135W) FIO Processor Kit	773123-L21
HP BL460c Gen9 Intel® Xeon® E5-2643v3 (3.4GHz/6-core/20MB/135W) FIO Processor Kit	773124-L21
HP BL460c Gen9 Intel® Xeon® E5-2699v3 (2.3GHz/18-core/45MB/145W) FIO Processor Kit	779795-L21

NOTE: All processors within the server must be identical.

NOTE: DIMM slots 4 and 5 are not accessible when the E5-2699 v4, E5-2697 v4, E5-2697A v4, E5-2667 v4, E5-2643 v4, E5-2637 v4, E5-2699 v3, the E5-2697 v3, the E5-2643 v3, the E5-2637 v3, or the E5-2667 v3 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: All processors support Intel® Hyper-Threading and Intel® Turbo Boost Technologies except the E5-2609 v4, E5-2603 v4, E5-2603 v3 and E5-2609 v3.

NOTE: DDR4 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed.

NOTE: Supports 1 or 2 processors. Mixing different processor models is not supported.

NOTE: For the Intel® C610 Chipset E5-2600 v3 and v4 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 Gen9 includes two I/O mezzanine expansion slots. A processor must be installed in processor slot 1 for access to the first

Configuration Information - Factory Integrated Models

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

HPE Memory

NOTE: HPE memory from previous generation servers (DDR3) is not compatible with this server. HPE SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen9. For additional information, please see the HPE SmartMemory QuickSpecs at:

<https://www.hpe.com/h20195/v2/GetHTML.aspx?docname=c04111535>

NOTE: LRDIMM and RDIMM are distinct memory technologies and cannot be mixed within a server.

NOTE: Depending on the memory configuration and processor model, the memory speed may run at 2400MT/s, 2133MT/s, 1866MT/s, or 1600MT/s. Please see [Memory Population Table](#) or the [Online Memory Configuration Tool](#) at: <http://h22195.www2.hp.com/DDR4memoryconfig/Home/Legal>

HPE SmartMemory

Registered DIMMs (RDIMMs) - E5-2600 v4 series Processors

HP 8GB (1x8GB) Single Rank x8 DDR4-2400 CAS-17-17-17 Registered Memory Kit 805347-B21

HP 16GB (1x16GB) Single Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit 805349-B21

HPE 16GB (1x16GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit 836220-B21

HP 32GB (1x32GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit 805351-B21

Load Reduced DIMMs (LRDIMMs) - E5-2600 v4 series Processors

HP 32GB (1x32GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Load Registered Memory Kit 805353-B21

HP 64GB (1x64GB) Quad Rank x4 DDR4-2400 CAS-17-17-17 Load Registered Memory Kit 805358-B21

HPE 128GB (1x128GB) Octal Rank x4 DDR4-2400 CAS-20-18-18 Load Reduced Memory Kit 809208-B21

Registered DIMMs (RDIMMs) - E5-2600 v3 series Processors

HP 8GB (1x8GB) Dual Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit 759934-B21

HP 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit 726718-B21

HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit 726719-B21

HP 32GB (1x32GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit 728629-B21

Load Reduced DIMMs (LRDIMMs) - E5-2600 v3 series Processors

Configuration Information - Factory Integrated Models

HP 32GB (1x32GB) Quad Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726722-B21
HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726720-B21
HP 48GB (1x16GB +1x32GB) DDR4-2133 CAS-15-15-15 Load Reduced Memory FIO Kit	792278-B21
HP 64GB (1x64GB) Quad Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726724-B21

NOTE: For more information on ProLiant Energy Efficient Features, see: <http://www.hp.com/go/proliant-energy-efficient>

HPE 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.

20Gb FlexibleLOM Adapters

HP FlexFabric 20Gb 2-port 630FLB FIO Adapter	700066-B21
HP FlexFabric 20Gb 2-port 650FLB FIO Adapter	700764-B21

10Gb FlexibleLOM Adapters

HP FlexFabric 10Gb 2-port 536FLB FIO Adapter	766491-B21
HP Ethernet 10Gb 2-port 560FLB FIO Adapter	684214-B21

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

Step 3: Choose Additional Factory Integration Options

HPE Insight Software	HPE Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Single Server FIO LTU	C6N36A
Converged Infrastructure Management Software	HPE OneView with iLO Advanced - Server hardware required on same purchase order	
	HPE OneView including 3yr 24x7 Support Flexible Quantity E-LTU	E5Y35AAE
	HPE OneView for Blade Server including 3yr 24x7 Support FIO Bundle Physical 1-server LTU	F6Q89A
HPE Storage Controllers	HP Smart Array P244br/1GB FBWC 12Gb 2-ports Int FIO SAS Controller	761871-B21
	HP Smart Array P246br/1GB FBWC 12Gb 4-ports Int FIO SAS Controller	749975-B21
	HP Smart Array P741m/4GB FBWC 12Gb 4-ports Ext Mezzanine SAS Controller	726782-B21
	HP H244br 12Gb 2-ports Int FIO Smart Host Bus Adapter	761878-B21
	HP FIO Enable Smart Array B140i Setting	784308-B21
	HPE BL460c G9 Broadwell NVMe FIO Setting	825555-B21

NOTE: The HPE Gen9 Broadwell NVMe FIO Setting (825555-B21) is required to support SFF NVMe SSDs within the system. This option is not compatible with the HPE Smart Array P244br, HPE Smart Array P246br, or

Configuration Information - Factory Integrated Models

HPE Smart HBA H244br. Hewlett Packard Enterprise recommends the use of a dual M.2 solid state drive kit for boot when using this option.

NOTE: The HPE Smart Array B140i Controller (chipset SATA) comes standard with the HPE BL460c Gen9 10Gb/20Gb FLB CTO Blade (727021-B21). If neither the HPE Smart Array P244br nor the HPE H244br controllers are chosen, a SATA cable will be provided to support SATA devices for the two internal drives. If RAID is required when using the B140i, please choose 'HPE FIO B140i RAID Enable Kit - BIOS Setting' (784308-B21).

NOTE: The HPE Smart Array P246br controller is only required when using a PCI expansion blade or D2220sb storage blade with the BL460c Gen9.

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:

- HPE BladeSystem c3000 Enclosure QuickSpecs:

<http://www8.hp.com/h20195/v2/GetDocument.aspx?docname=c04123379>

NOTE: The c3000 HPE 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.

- HPE BladeSystem c7000 Enclosure QuickSpecs:

<http://www8.hp.com/h20195/v2/GetDocument.aspx?docname=c04229580>

NOTE: The c7000 HPE 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.

- HPE 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>

NOTE: For optimal cooling and system performance the BL460c Gen9 Server Blade requires the c7000 enclosure to be configured with 10 fans and the c3000 enclosure to be configured with 6 fans.

Core Options

HPE Networking

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 (HPE BladeSystem c7000 Enclosure) or bays 2-4 (HPE BladeSystem c3000 Enclosure).

20 Gigabit Ethernet Mezzanine Cards

HP FlexFabric 20Gb 2-port 630M Adapter 700076-B21

NOTE: Please see QuickSpecs for technical specifications and additional information at <https://www.hpe.com/h20195/v2/GetDocument.aspx?docname=c04312720>

HP FlexFabric 20Gb 2-port 650M Adapter 700767-B21

NOTE: Please see QuickSpecs for technical specifications and additional information at <https://www.hpe.com/h20195/v2/GetDocument.aspx?docname=c04347342>

10 Gigabit Ethernet Mezzanine Cards

HP FlexFabric 10Gb 2-port 534M Adapter 700748-B21

NOTE: Please see QuickSpecs for technical specifications and additional information at:

http://h18000.www1.hp.com/products/QuickSpecs/14619_div/14619_div.html

HP Ethernet 10Gb 2-port 560M Adapter 665246-B21

NOTE: Please see QuickSpecs for technical specifications and additional information at:

http://h18000.www1.hp.com/products/QuickSpecs/14478_div/14478_div.html

1 Gigabit Ethernet Mezzanine Cards

HP Ethernet 1Gb 4-port 366M Adapter 615729-B21

NOTE: Please see QuickSpecs for technical specifications and additional information at:

http://h18000.www1.hp.com/products/QuickSpecs/14335_div/14335_div.html

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.

20Gb FlexibleLOM Adapters

HP FlexFabric 20Gb 2-port 630FLB Adapter 700065-B21

NOTE: Please see QuickSpecs for technical specifications and additional information at <https://www.hpe.com/h20195/v2/GetDocument.aspx?docname=c04312719>

HP FlexFabric 20Gb 2-port 650FLB Adapter 700763-B21

Core Options

NOTE: Please see QuickSpecs for technical specifications and additional information at <https://www.hpe.com/h20195/v2/GetDocument.aspx?docname=c04347341>

10Gb FlexibleLOM Adapters

HP FlexFabric 10Gb 2-port 536FLB Adapter 766490-B21

NOTE: Please see QuickSpecs for technical specifications and additional information at <https://www.hpe.com/h20195/v2/GetDocument.aspx?docname=c04347246>

HP Ethernet 10Gb 2-port 560FLB Adapter 655639-B21

NOTE: Please see QuickSpecs for technical specifications and additional information at http://h18000.www1.hp.com/products/QuickSpecs/14331_div/14331_div.html

HPE Infiniband 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 mezzanine slot 2, both ports are active.

NOTE: InfiniBand QDR and FDR speeds are only supported on the HPE BladeSystem c7000 Enclosure. For additional information, please see the HPE 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 QDR/Ethernet 10Gb 2-port 544+M Adapter 764282-B21

NOTE: The QDR InfiniBand adapter may be installed in either mezzanine slot of the server.

HP InfiniBand FDR/Ethernet 10Gb/40Gb 2-port 544+M Adapter 764283-B21

NOTE: The FDR InfiniBand adapter must be installed in mezzanine slot 1 for FDR mode and may be installed in either mezzanine slot if operated in any other mode.

HP InfiniBand FDR 2-port 545M Adapter 702213-B21

HPE Fibre Channel

HP LPe1605 16Gb Fibre Channel HBA for BladeSystem c-Class 718203-B21

NOTE: Please see QuickSpecs for technical specifications and additional information at http://h18000.www1.hp.com/products/QuickSpecs/14742_div/14742_div.html

HP QMH2672 16Gb Fibre Channel Host Bus Adapter 710608-B21

NOTE: Please see QuickSpecs for technical specifications and additional information at <https://www.hpe.com/h20195/v2/GetDocument.aspx?docname=c04126962>

HP LPe1205A 8Gb Fibre Channel Host Bus Adapter for BladeSystem c-Class 659818-B21

NOTE: Please see QuickSpecs for technical specifications and additional information at <https://www.hpe.com/h20195/v2/GetDocument.aspx?docname=c04163733>

HP QMH2572 8Gb Fibre Channel Host Bus Adapter for BladeSystem c-Class 651281-B21

Core Options

NOTE: Please see QuickSpecs for technical specifications and additional information at <https://www.hpe.com/h20195/v2/GetDocument.aspx?docname=c04126040>

HPE Processors	E5-2600 v4 series Processors	
	HPE BL460c Gen9 Intel® Xeon® E5-2690v4 (2.6GHz/14-core/35MB/135W) Processor Kit	819852-B21
	HPE BL460c Gen9 Intel® Xeon® E5-2683v4 (2.1GHz/16-core/40MB/120W) Processor Kit	819851-B21
	HPE BL460c Gen9 Intel® Xeon® E5-2680v4 (2.4GHz/14-core/35MB/120W) Processor Kit	819842-B21
	HPE BL460c Gen9 Intel® Xeon® E5-2660v4 (2.0GHz/14-core/35MB/105W) Processor Kit	819841-B21
	HPE BL460c Gen9 Intel® Xeon® E5-2650v4 (2.2GHz/12-core/30MB/105W) Processor Kit	819840-B21
	HPE BL460c Gen9 Intel® Xeon® E5-2650Lv4 (1.7GHz/14-core/35MB/65W) Processor Kit	819849-B21
	HPE BL460c Gen9 Intel® Xeon® E5-2640v4 (2.4GHz/10-core/25MB/90W) Processor Kit	819839-B21
	HPE BL460c Gen9 Intel® Xeon® E5-2630v4 (2.2GHz/10-core/25MB/85W) Processor Kit	819845-B21
	HPE BL460c Gen9 Intel® Xeon® E5-2630Lv4 (1.8GHz/10-core/25MB/55W) Processor Kit	819846-B21
	HPE BL460c Gen9 Intel® Xeon® E5-2623v4 (2.6GHz/4-core/10MB/85W) Processor Kit	819844-B21
	HPE BL460c Gen9 Intel® Xeon® E5-2620v4 (2.1GHz/8-core/20MB/85W) Processor Kit	819838-B21
	HPE BL460c Gen9 Intel® Xeon® E5-2609v4 (1.7GHz/8-core/20MB/85W) Processor Kit	819837-B21
	HPE BL460c Gen9 Intel® Xeon® E5-2603v4 (1.7GHz/6-core/15MB/85W) Processor Kit	819843-B21
	HPE BL460c Gen9 Intel® Xeon® E5-2699v4 (2.2GHz/22-core/55MB/145W) Processor Kit	819856-B21
	HPE BL460c Gen9 Intel® Xeon® E5-2698v4 (2.2GHz/20-core/50MB/135W) Processor Kit	819855-B21
	HPE BL460c Gen9 Intel® Xeon® E5-2697v4 (2.3GHz/18-core/45MB/145W) Processor Kit	819854-B21
	HPE BL460c Gen9 Intel® Xeon® E5-2697Av4 (2.6GHz/16-core/40MB/145W) Processor Kit	819857-B21
	HPE BL460c Gen9 Intel® Xeon® E5-2695v4 (2.1GHz/18-core/45MB/120W) Processor Kit	819853-B21
	HPE BL460c Gen9 Intel® Xeon® E5-2667v4 (3.2GHz/8-core/25MB/135W) Processor Kit	819850-B21
HPE BL460c Gen9 Intel® Xeon® E5-2643v4 (3.4GHz/6-core/20MB/135W) Processor Kit	819848-B21	

Core Options

HPE BL460c Gen9 Intel® Xeon® E5-2637v4 (3.5GHz/4-core/15MB/135W) Processor Kit	819847-B21
E5-2600 v3 series Processors	
HP BL460c Gen9 Intel® Xeon® E5-2690v3 (2.6GHz/12-core/30MB/135W) Processor Kit	726987-B21
HP BL460c Gen9 Intel® Xeon® E5-2680v3 (2.5GHz/12-core/30MB/120W) Processor Kit	726988-B21
HP BL460c Gen9 Intel® Xeon® E5-2670v3 (2.3GHz/12-core/30MB/120W) Processor Kit	726989-B21
HP BL460c Gen9 Intel® Xeon® E5-2660v3 (2.6GHz/10-core/25MB/105W) Processor Kit	726990-B21
HP BL460c Gen9 Intel® Xeon® E5-2650v3 (2.3GHz/10-core/25MB/105W) Processor Kit	726991-B21
HP BL460c Gen9 Intel® Xeon® E5-2640v3 (2.6GHz/8-core/20MB/90W) Processor Kit	726992-B21
HP BL460c Gen9 Intel® Xeon® E5-2683v3 (2GHz/14-core/35MB/120W) Processor Kit	726993-B21
HP BL460c Gen9 Intel® Xeon® E5-2630v3 (2.4GHz/8-core/20MB/85W) Processor Kit	726994-B21
HP BL460c Gen9 Intel® Xeon® E5-2620v3 (2.4GHz/6-core/15MB/85W) Processor Kit	726995-B21
HP BL460c Gen9 Intel® Xeon® E5-2623v3 (3GHz/4-core/10MB/105W) Processor Kit	726996-B21
HP BL460c Gen9 Intel® Xeon® E5-2609v3 (1.9GHz/6-core/15MB/85W) Processor Kit	726997-B21
HP BL460c Gen9 Intel® Xeon® E5-2603v3 (1.6GHz/6-core/15MB/85W) Processor Kit	726999-B21
HP BL460c Gen9 Intel® Xeon® E5-2650Lv3 (1.8GHz/12-core/30MB/65W) Processor Kit	727000-B21
HP BL460c Gen9 Intel® Xeon® E5-2698v3 (2.3GHz/16-core/40MB/135W) Processor Kit	727001-B21
HP BL460c Gen9 Intel® Xeon® E5-2630Lv3 (1.8GHz/8-core/20MB/55W) Processor Kit	727002-B21
HP BL460c Gen9 Intel® Xeon® E5-2695v3 (2.3GHz/14-core/35MB/120W) Processor Kit	727003-B21
HP BL460c Gen9 Intel® Xeon® E5-2637v3 (3.5GHz/4-core/15MB/135W) Processor Kit	765268-B21
HP BL460c Gen9 Intel® Xeon® E5-2697v3 (2.6GHz/14-core/35MB/145W) Processor Kit	767049-B21
HP BL460c Gen9 Intel® Xeon® E5-2667v3 (3.2GHz/8-core/20MB/135W) Processor Kit	773123-B21
HP BL460c Gen9 Intel® Xeon® E5-2643v3 (3.4GHz/6-core/20MB/135W) Processor Kit	773124-B21
HP BL460c Gen9 Intel® Xeon® E5-2699v3 (2.3GHz/18-core/45MB/145W) Processor Kit	779795-B21

NOTE: All processors within the server must be identical.

Core Options

NOTE: DIMM slots 4 and 5 are not accessible when the E5-2699 v4, E5-2697 v4, E5-2697A v4, E5-2667 v4, E5-2643 v4, E5-2637 v4, E5-2699 v3, the E5-2697 v3, the E5-2643 v3, the E5-2637 v3, or the E5-2667 v3 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: All processors support Intel® Hyper-Threading and Intel® Turbo Boost Technologies except the E5-2609 v4, E5-2603 v4, E5-2603 v3 and E5-2609 v3.

NOTE: DDR4 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed.

NOTE: Supports 1 or 2 processors. Mixing different processor models is not supported.

NOTE: For the Intel® C610 Chipset E5-2600 v3 and v4 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 Gen9 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: The letter "L" following the model number indicates denotes lower wattage.

HPE Memory

NOTE: HPE memory from previous generation servers (DDR3) is not compatible with this server. HPE SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen9. For additional information, please see the HPE SmartMemory QuickSpecs at:

<https://www.hpe.com/h20195/v2/GetHTML.aspx?docname=c04111535>

NOTE: LRDIMM and RDIMM are distinct memory technologies and cannot be mixed within a server.

NOTE: Depending on the memory configuration and processor model, the memory speed may run at 2400MT/s, 2133MT/s, 1866MT/s, or 1600MT/s.

Please see [Memory Population Table](#) or the [Online Memory Configuration Tool](#) at: <http://h22195.www2.hp.com/DDR4memoryconfig/Home/Legal>

HPE SmartMemory

Registered DIMMs (RDIMMs) - E5-2600 v4 series Processors

HP 8GB (1x8GB) Single Rank x8 DDR4-2400 CAS-17-17-17 Registered Memory Kit	805347-B21
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HP 16GB (1x16GB) Single Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	805349-B21
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HPE 16GB (1x16GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	836220-B21
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HP 32GB (1x32GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	805351-B21
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Load Reduced DIMMs (LRDIMMs) - E5-2600 v4 series Processors

Core Options

HP 32GB (1x32GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Load Registered Memory Kit	805353-B21
HP 64GB (1x64GB) Quad Rank x4 DDR4-2400 CAS-17-17-17 Load Registered Memory Kit	805358-B21
HPE 128GB (1x128GB) Octal Rank x4 DDR4-2400 CAS-20-18-18 Load Reduced Memory Kit	809208-B21
Registered DIMMs (RDIMMs) - E5-2600 v3 series Processors	
HP 8GB (1x8GB) Dual Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit	759934-B21
HP 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726718-B21
HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726719-B21
HP 32GB (1x32GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	728629-B21
Load Reduced DIMMs (LRDIMMs) - E5-2600 v3 series Processors	
HP 32GB (1x32GB) Quad Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726722-B21
HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726720-B21
HP 48GB (1x16GB +1x32GB) DDR4-2133 CAS-15-15-15 Load Reduced Memory FIO Kit	792278-B21
HP 64GB (1x64GB) Quad Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726724-B21

HPE Solid State M.2 SATA Drives

NOTE: The solid state M.2 SATA drives plug directly into a connector on the system board and do not use a SFF drive cage slot.

NOTE: RAID 1, 0 are provided through the B140i in UEFI BIOS mode only.

HP 64GB Value Endurance Solid State M.2 Enablement Kit for ProLiant Blades	785233-B21
HP Dual 64GB Value Endurance Solid State M.2 Enablement Kit for ProLiant Blades	775588-B21
HPE 120GB Read Intensive-1 Solid State Drive M.2 Kit for ProLiant Blades	846495-B21
HPE Dual 120GB Read Intensive-1 Solid State Drive M.2 Kit for ProLiant Blades	846497-B21

HPE Hard Drives

NOTE: The ProLiant BL460c Gen9 server includes the HPE hot-plug small form factor (SFF) SmartDrive carrier for enhanced management and reduced maintenance errors. HPE drives from generation G7 servers and before are not compatible with the BL460c Gen9 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: HPE 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

Core Options

model.

HPE NVMe PCIe Read Intensive SFF (2.5-inch) Solid State Drives	
HP 2TB NVMe PCIe Read Intensive SFF 2.5-in SC2 3yr Wty Solid State Drive	764908-B21
HP 1.2TB NVMe PCIe Read Intensive SFF 2.5-in SC2 3yr Wty Solid State Drive	764906-B21
HP 400GB NVMe PCIe Read Intensive SFF 2.5-in SC2 3yr Wty Solid State Drive	764904-B21

HPE NVMe PCIe Mixed Use SFF (2.5-inch) Solid State Drives	
HP 2TB NVMe PCIe Mixed Use SFF 2.5-in SC2 3yr Wty Solid State Drive	765044-B21
HP 1.6TB NVMe PCIe Mixed Use SFF 2.5-in SC2 3yr Wty Solid State Drive	765038-B21
HP 800GB NVMe PCIe Mixed Use SFF 2.5-in SC2 3yr Wty Solid State Drive	765036-B21
HP 400GB NVMe PCIe Mixed Use SFF 2.5-in SC2 3yr Wty Solid State Drive	765034-B21

HPE NVMe PCIe Write Intensive SFF (2.5-inch) Solid State Drives	
HP 1.6TB NVMe PCIe Write Intensive SFF 2.5-in SC2 3yr Wty Solid State Drive	764892-B21
HP 800GB NVMe PCIe Write Intensive SFF 2.5-in SC2 3yr Wty Solid State Drive	736939-B21
HP 400GB NVMe PCIe Write Intensive SFF 2.5-in SC2 3yr Wty Solid State Drive	736936-B21

NOTE: The HPE Gen9 Broadwell NVMe FIO Setting (825555-B21) is required to support SFF NVMe SSDs within the system. This option is not compatible with the HPE Smart Array P244br, HPE Smart Array P246br, or HPE Smart HBA H244br. Hewlett Packard Enterprise recommends the use of a dual M.2 solid state drive kit for boot when using this option.

NOTE: Hewlett Packard Enterprise has qualified the NVMe drive portfolio using the Operating System inbox drivers, full detail on the Solid State Drive QuickSpecs:

<https://www.hpe.com/h20195/v2/GetDocument.aspx?docname=c04154378>

6G SATA Hot Plug with SmartDrive SFF (2.5-inch) Midline (MDL) Drives	
HP 1TB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	655710-B21
HP 500GB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	655708-B21

NOTE: Please see the QuickSpecs for technical specifications and additional information at

<http://www8.hp.com/h20195/v2/GetDocument.aspx?docname=c04111725>.

12G SAS (2.5-inch) 512e SC HDD	
HP 600GB 12G SAS 15K rpm SFF (2.5-inch) SC 512e Enterprise 3yr Warranty Hard Drive	748387-B21
HP 1TB 12G SAS 7.2K rpm SFF (2.5-inch) SC 512e 1yr Warranty Hard Drive	765464-B21
HP 1.8TB 12G SAS 10K rpm SFF (2.5-inch) SC Enterprise 512e 3yr Warranty Hard Drive	791034-B21

Core Options

HP 2TB 12G SAS 7.2K rpm SFF (2.5-inch) SC 512e 1yr Warranty Hard Drive	765466-B21
12G SAS (2.5-inch) SFF MDL SC HDD	
HPE 1TB 12G SAS 7.2K rpm SFF (2.5in) SC Midline 1yr Warranty Hard Drive	832514-B21
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
SAS Hot Plug SmartDrive SFF (2.5-inch) Midline Drives	
HP 1TB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	652749-B21
HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	652745-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 SATA (2.5-inch) 512e SC HDD	
HP 1TB 6G SATA 7.2K rpm SFF (2.5-inch) SC 512e 1yr Warranty Hard Drive	765453-B21
HP 2TB 6G SATA 7.2K rpm SFF (2.5-inch) SC 512e 1yr Warranty Hard Drive	765455-B21
12G SAS Write Intensive SFF (2.5-inch) SC Solid State Drive	
HP 200GB 12G SAS Write Intensive SFF 2.5-in SC 3yr Wty Solid State Drive	802578-B21
HP 400GB 12G SAS Write Intensive SFF 2.5-in SC 3yr Wty Solid State Drive	802582-B21
HP 800GB 12G SAS Write Intensive SFF 2.5-in SC 3yr Wty Solid State Drive	802586-B21
HP 1.92TB 12G SAS Read Intensive SFF 2.5-in SC 3yr Wty Solid State Drive	802891-B21
HPE 800GB 12G SAS Write Intensive-1 SFF (2.5in) SC 3yr Wty Solid State Drive	846430-B21
HPE 1.6TB 12G SAS Write Intensive-1 SFF (2.5in) SC 3yr Wty Solid State Drive	846432-B21
12G SAS Mixed Use SFF (2.5-inch) SC Solid State Drive	

Core Options

HPE 800GB 12G SAS Mixed Use-1 SFF (2.5in) SC 3yr Wty Solid State Drive	846434-B21
HPE 800GB 12G SAS Mixed Use-3 SFF 2.5-in SC 3yr Wty Solid State Drive	822559-B21
HPE 1.6TB 12G SAS Mixed Use-1 SFF (2.5in) SC 3yr Wty Solid State Drive	846436-B21
12G SAS SFF (2.5-inch) SC 3yr Wty H2 Drive	
HP 1.2TB 12G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	781518-B21
HP 900GB 12G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	785069-B21
HP 600GB 12G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	781516-B21
HP 300GB 12G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	785067-B21
6G SATA Value Endurance Hot Plug SFF (2.5-inch) Enterprise Boot Solid State Drives	
HP 120GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Boot 3yr Wty Solid State Drive	717965-B21
HP 80GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Boot 3yr Wty Solid State Drive	734360-B21
6G SATA Value Endurance Hot Plug SFF (2.5-inch) Enterprise Value Solid State Drives	
HP 1.6TB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	757339-B21
HP 800GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	717973-B21
HP 600GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	739898-B21
HP 480GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	717971-B21
HP 300GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	739888-B21
HP 240GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	717969-B21
6G SATA Value Endurance SFF (2.5-inch) SC Enterprise Value M1 Solid State Drives	
HP 120GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty M1 Solid State Drive	764923-B21
HP 240GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty M1 Solid State Drive	764925-B21
HP 480GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty M1 Solid State Drive	764927-B21
HP 800GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty M1 Solid State Drive	764929-B21

Core Options

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
HP 100GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691862-B21
6G SAS VE (2.5-inch) SC EV Solid State Drives	
HP 240GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty G1 Solid State Drive	756636-B21
6G SATA 2.5in WI-PLP SC SSD	
HP 1.2TB 6G SATA Write Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804677-B21
HP 800GB 6G SATA Write Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804671-B21
HP 400GB 6G SATA Write Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804665-B21
HP 200GB 6G SATA Write Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804639-B21
6G SATA 2.5in MU-PLP SC SSD	
HP 1.6TB 6G SATA Mixed Use-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804631-B21
HP 800GB 6G SATA Mixed Use-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804625-B21
HP 480GB 6G SATA Mixed Use-2 SFF 2.5-in SC 3yr Wty Solid State Drive	832414-B21
HP 200GB 6G SATA Mixed Use-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804613-B21
6G SATA 2.5in RI-PLP SC SSD	
HP 1.6TB 6G SATA Read Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804605-B21
HP 800GB 6G SATA Read Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804599-B21
HP 480GB 6G SATA Read Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804593-B21
HP 240GB 6G SATA Read Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804587-B21
HP 120GB 6G SATA Read Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804581-B21
HP 80GB 6G SATA Read Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804575-B21
12G SAS ME SFF (2.5-inch) SC Enterprise Mainstream H2 Solid State Drives	
HP 1.6TB 12G SAS Mainstream Endurance SFF 2.5-in ENT Mainstream SC 3yr Wty H2 Solid State Drive	779176-B21

Core Options

HP 200GB 12G SAS Mainstream Endurance SFF 2.5-in ENT Mainstream SC 3yr Wty H2 Solid State Drive	779164-B21
HP 400GB 12G SAS Mainstream Endurance SFF 2.5-in ENT Mainstream SC 3yr Wty H2 Solid State Drive	779168-B21
HP 800GB 12G SAS Mainstream Endurance SFF 2.5-in ENT Mainstream SC 3yr Wty H2 Solid State Drive	779172-B21
12G SAS VE SFF (2.5-inch) SC EV Solid State Drives	
HP 1.6TB 12G SAS Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	762263-B21
HP 800GB 12G SAS Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	762261-B21
6G SATA Hot Plug MU-3 SFF (2.5-inch) SC Solid State Drives	
HP 1.92TB 6G SATA Mixed Use-3 SFF 2.5-in SC 3yr Wty Solid State Drive	817011-B21
HP 960GB 6G SATA Mixed Use-3 SFF 2.5-in SC 3yr Wty Solid State Drive	816995-B21
HP 480GB 6G SATA Mixed Use-3 SFF 2.5-in SC 3yr Wty Solid State Drive	816985-B21
HP 240GB 6G SATA Mixed Use-3 SFF 2.5-in SC 3yr Wty Solid State Drive	816975-B21
HP 120GB 6G SATA Mixed Use-3 SFF 2.5-in SC 3yr Wty Solid State Drive	816965-B21
6G SATA Hot Plug RI SFF (2.5-inch) SC Solid State Drives	
HP 3.84TB 6G SATA Read Intensive-3 SFF 2.5-in SC 3yr Wty Solid State Drive	816929-B21
HP 1.92TB 6G SATA Read Intensive-3 SFF 2.5-in SC 3yr Wty Solid State Drive	816919-B21
HP 960GB 6G SATA Read Intensive-3 SFF 2.5-in SC 3yr Wty Solid State Drive	816909-B21
HP 480GB 6G SATA Read Intensive-3 SFF 2.5-in SC 3yr Wty Solid State Drive	816899-B21
HP 240GB 6G SATA Read Intensive-3 SFF 2.5-in SC 3yr Wty Solid State Drive	816889-B21
HP 120GB 6G SATA Read Intensive-3 SFF 2.5-in SC 3yr Wty Solid State Drive	816879-B21
HPE 120GB 6G SATA Read Intensive-1 SFF 2.5-in SC 3yr Wty Solid State Drive	838404-B21
HPE 240GB 6G SATA Read Intensive-1 SFF 2.5-in SC 3yr Wty Solid State Drive	838406-B21
HPE 480GB 6G SATA Read Intensive-1 SFF 2.5-in SC 3yr Wty Solid State Drive	838408-B21
HPE 960GB 6G SATA Read Intensive-1 SFF 2.5-in SC 3yr Wty Solid State Drive	838410-B21
HPE 1.92TB 6G SATA Read Intensive-1 SFF 2.5-in SC 3yr Wty Solid State Drive	838412-B21
6G SATA Read Intensive (2.5-inch) SC Solid State Drive	
HP 480GB 6G SATA Read Intensive SFF 2.5-in SC 3yr Wty Solid State Drive	789145-B21

Core Options

SAS Hot Plug with SmartDrive SFF (2.5-inch) Enterprise Drives	
HP 300GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	759208-B21
HP 450GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	759210-B21
HP 600GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	759212-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

HPE Insight software	HPE Insight Control	
	HPE Insight Control including 1yr 24x7 Technical Support and Updates 1-server LTU	C6N27A
	HPE Insight Control including 1yr 24x7 TSU E-LTU	C6N28ABE
	HPE Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle FIO E-LTU	C6N36ABE
	HP Insight Control Server Provisioning Media Kit	BD883A
	HPE Insight Management Media Kit	C6N31A

NOTE: HPE Insight Management Media Kit contains DVDs without licenses. Contains HPE Systems Insight Manager, HPE Insight Control, HPE 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 HPE Software Technical Support Service.

NOTE: Licenses ship without media. The HPE 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: <https://www.hpe.com/h20195/v2/GetHTML.aspx?docname=c04123391>

HPE iLO Advanced License	HPE Integrated Lights-Out (iLO) Advanced for ProLiant BladeSystem Remote Management	
	HPE iLO Advanced for BladeSystem including 3yr 24x7 Technical Support and Updates E-LTU	E6U63ABE
	HPE iLO Advanced for BladeSystem including 3yr 24x7 Tech Support and Updates 1-server LTU	BD502A
	HPE iLO Advanced for BladeSystem including 1yr 24x7 Technical Support and Updates E-LTU	E6U60ABE
	HPE iLO Advanced for BladeSystem including 1yr 24x7 Support 1-server LTU	512488-B21

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 HPE 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>

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 HPE 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

Additional Options

Converged Infrastructure Management Software	HPE OneView	
	HPE OneView with iLO Advanced	
	HPE OneView including 3yr 24x7 Support Physical 1-server LTU	E5Y34A
	HPE OneView including 3yr 24x7 Support Flexible Quantity E-LTU	E5Y35AAE
	HPE OneView Physical Media Kit LTU	E5Y37A
	HPE OneView w/o iLO including 3yr 24x7 Support 1-server LTU	P8B24A
	HPE OneView w/o iLO including 3yr 24x7 Support Flexible Quantity E-LTU	P8B26AAE
	HPE OneView w/o iLO including 3yr 24x7 Support 1-server FIO LTU	P8B31A
<p>NOTE: For additional license kits please see the QuickSpecs at http://h18004.www1.hp.com/products/QuickSpecs/14621_div/14621_div.html.</p>		

High Performance Clusters	HPE Cluster Management Utility	
	HPE Insight Cluster Management Utility 1yr 24x7 Flexible LTU	QL803B
	HPE Insight Cluster Management Utility 3yr 24x7 Flexible LTU	BD476A
	<p>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.</p>	
	HPE Insight Cluster Management Utility Media	BD477A
<p>NOTE: For additional license kits please see the QuickSpecs at http://h18004.www1.hp.com/products/QuickSpecs/12612_div/12612_div.html.</p>		

HPE I/O Accelerator Options	NOTE: HPE I/O Accelerator cards can be used in legacy BIOS mode only.	
	HP 1.2TB Read Intensive Mezzanine PCIe Workload Accelerator for BladeSystem c-Class	794603-B21
	HP 1.6TB Read Intensive Mezzanine PCIe Workload Accelerator for BladeSystem c-Class	794605-B21

HPE Security	HP Trusted Platform Module Option	488069-B21
	HP Trusted Platform Module 2.0 Kit	745823-B21
<p>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 R2 and 2012. 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 R2 and 2012 has not been tampered with while the system was offline.</p>		

Additional Options

NOTE: For more information about TPM, including a white paper, go to <http://h20195.www2.hp.com/v2/getpdf.aspx/4AA5-4782ENW.pdf>

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.

HPE Storage Controllers	HP Smart Array P244br/1GB FBWC 12Gb 2-ports Int SAS Controller	749680-B21
	HP H244br 12Gb 2-ports Int Smart Host Bus Adapter	726809-B21
	HP Smart Array P246br/1GB FBWC 12Gb 4-ports Int SAS Controller	726793-B21
	HPE BL460c G9 Broadwell NVMe FIO Setting	825555-B21

NOTE: The HPE Gen9 Broadwell NVMe FIO Setting (825555-B21) is required to support SFF NVMe SSDs within the system. This option is not compatible with the HPE Smart Array P244br, HPE Smart Array P246br, or HPE Smart HBA H244br. HPE recommends the use of a dual M.2 solid state drive kit for boot when using this option.

NOTE: The HPE Smart Array B140i Controller (chipset SATA) comes standard with the HPE BL460c Gen9 10Gb/20Gb FLB CTO Blade (727021-B21). If neither the HPE Smart Array P244br nor the HPE H244br controllers are chosen, a SATA cable will be provided to support SATA devices for the two internal drives. If RAID is required when using the B140i, please choose 'HPE FIO B140i RAID Enable Kit - BIOS Setting' (784308-B21).

NOTE: The HPE Smart Array P246br controller is only required when using a PCI expansion blade or D2220sb storage blade with the BL460c Gen9.

HPE Secure Encryption	HP Secure Encryption per Svr Entitlement	C9A82AAE
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NOTE: HPE Secure Encryption is supported on the HPE Smart Array P244br and H244br (running in RAID mode) as an option. HPE Secure Encryption licensing is based on the number of physical drives requiring encryption.

NOTE: For more information about HPE Secure Encryption, go to <http://www.hp.com/go/hpsecureencryption>.

HPE InfiniBand 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.	
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NOTE: InfiniBand QDR and FDR speeds are only supported on the HPE BladeSystem c7000 Enclosure. For additional information, please see the HPE 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 QDR/Ethernet 10Gb 2-port 544+M Adapter	764282-B21
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NOTE: The QDR InfiniBand adapter may be installed in any mezzanine slot of the server.

HP InfiniBand FDR/Ethernet 10Gb/40Gb 2-port 544+M Adapter	764283-B21
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Additional Options

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 InfiniBand FDR 2-port 545M Adapter 702213-B21

HPE Flash Media Kits for USB Drives

HPE Flash Media Kits for USB Drives	HPE Flash Media Kits for USB Drives	
	HPE 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
	HP Dual 8GB microSD Enterprise Midline USB Kit	741279-B21
	HPE Dual 32GB microSD Enterprise Midline USB Kit	854845-B21

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

http://h18000.www1.hp.com/products/QuickSpecs/13971_div/13971_div.html

HPE Care Pack Services

HPE Care Pack Services	Proactive Care Services	
	HPE 3 year Proactive Care 24x7 BL4xxc Gen9 Service	U7BN8E
	HPE 3 year Proactive Care 24x7 with DMR BL4xxc Gen9 Service	U7BN9E
	HPE 3 year Proactive Care Advanced 24x7 BL4xxc Gen9 Service	U7BT6E
	HPE 3 year Proactive Care Advanced 24x7 with DMR BL4xxc Gen9 Service	U7CF8E

Installation Services

HPE Install c-Class Server Blade Service	UE493E
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NOTE: Additional HPE Care Pack services can be found at:

<http://www.hp.com/go/cpc>

Memory

For detailed memory configuration rules and guidelines, please use the Online DDR4 Memory Configuration Tool:

<http://h22195.www2.hp.com/DDR4memoryconfig/Home/Legal>

Memory Subsystem Architecture

Each Intel® Xeon® E5-2600 v3 family or Intel® Xeon® E5-2600 v3 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 64GB capacity DIMMs are supported for 1TB of memory (16 DIMM slots x 64GB per DIMM).

NOTE: 64GB DIMM support available in earl 2015.

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.
- LRDIMM and RDIMMs are all distinct memory technologies and cannot be mixed within a server. The majority of ProLiant Gen9 servers support RDIMM and LRDIMM.
- 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.
- HPE memory from previous generation servers is not compatible with the BL460c Gen9 Server Blade.
- To realize the performance memory capabilities listed in this document, HPE SmartMemory is required. For additional information, please see the HPE SmartMemory QuickSpecs at: <https://www.hpe.com/h20195/v2/GetHTML.aspx?docname=c04111535>
- For memory population rules and additional memory guidelines, please see the BL460c Gen9 user guide at <http://www.hp.com/support>.

Supported Memory Bandwidth on Intel® Xeon® E5-2600 v3 series Processors

DIMM Rank	Register DIMM (RDIMM)				Load Reduced (LRDIMM)		
	Single Rank (1R)	Dual Rank (2R)		Dual Rank (2R)	Quad Rank (4R)		
DIMM Capacity	8GB	16GB	8GB	32GB	16GB	32GB	64GB
Voltage	Std Voltage 1.2V	Std Voltage 1.2V	Std Voltage 1.2V	Std Voltage 1.2V	Std Voltage 1.2V	Std Voltage 1.2V	Std Voltage 1.2V
SLOTS THAT CAN BE POPULATED							
12 slot servers	12	12	12	12	12	12	NA
16 slot servers	16	16	16	16	16	16	16
MAXIMUM CAPACITY (GB)*							
12 slot servers	96	192	96	384	192	384	NA

Memory

16 slot servers	128	256	128	512	256	512	1024
POPULATED DIMM SPEED (MT/s)							
1 DIMM Per Channel	2133	2133	2133	2133	2133	2133	2133
2 DIMM Per Channel	2133	2133	2133	2133	2133	2133	2133

*Maximum Capacity will vary based on individual server platform qualification schedule

Memory Speed by E5-2600 v3 Series Processor Model

Processor Models	Supported Memory Speeds
E5-2690 v3, E5-2695 v3, E5-2697 v3, E5-2698 v3, E5-2699 v3, E5-2687W v3, E5-2683 v3, E5-2680 v3, E5-2670 v3, E5-2667 v3, E5-2660 v3, E5-2650 v3, E5-2650L, E5-2643 v3, E5-2637 v3	2133MT/s
E5-2640 v3, E5-2630 v3, E5-2630L v3, E5-2623 v3, E5-2620 v3	1866MT/s
E5-2609 v3, E5-2603 v3	1600MT/s

Standard and Maximum Memory Capacity (Pre-configured Models) for E5-2600 v3 Series

Pre Configured Models	Standard Memory	Maximum Memory Plus Optional Memory	Standard Memory Replaced with Optional Memory
Intel Xeon E5-2670 v3	128GB (4x 32GB)	896GB (4x 32GB + 12x 64GB)	1TB (16x 64GB)
Intel Xeon E5-2660 v3	64GB (4x 16GB)	448GB (4x 16GB + 12x 32GB)	1TB (16x 64GB)
Intel Xeon E5-2650 v3, E5-2640 v3	32GB (2x 16GB)	480GB (2x 16GB + 14x 32GB)	1TB (16x 64GB)
Intel Xeon E5-2620 v3, E5-2609 v3	16GB (2x 8GB)	240GB (2x 8GB + 14x 16GB)	1TB (16x 64GB)

NOTE: Capacity references are rounded to the common gigabyte (GB) values.

- 2GB = 2,048MB
- 4GB = 4,096MB
- 8GB = 8,192MB
- 16GB = 16,384MB
- 32GB = 32,768MB

Supported Memory Bandwidth on Intel® Xeon® E5-2600 v4 series Processors

DIMM Rank	Register DIMM (RDIMM)				Load Reduced (LRDIMM)	
	Single Rank (1R)		Dual Rank (2R)		Dual Rank (2R)	Quad Rank (4R)
DIMM Capacity	8GB	16GB	16GB	32GB	32GB	64GB
Voltage	Std Voltage 1.2V	Std Voltage 1.2V	Std Voltage 1.2V	Std Voltage 1.2V	Std Voltage 1.2V	Std Voltage 1.2V

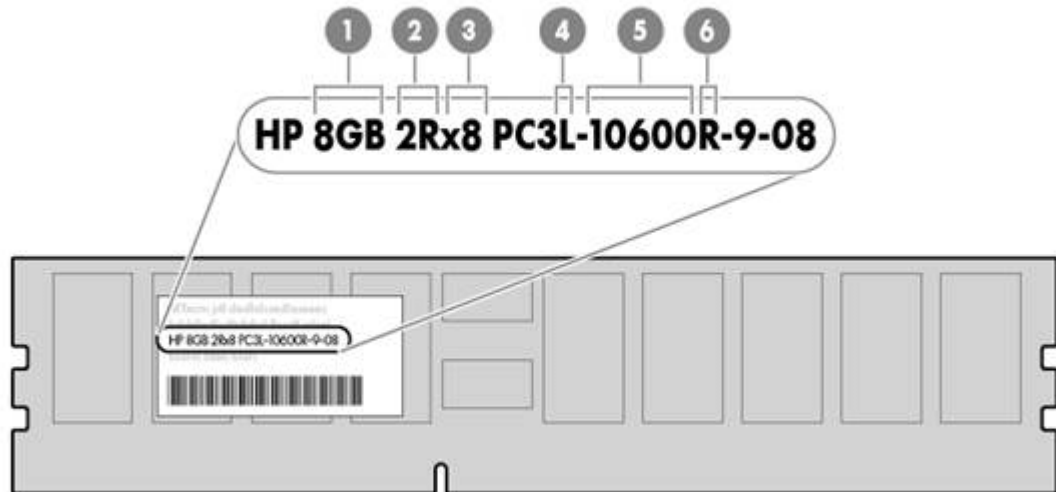
SLOTS THAT CAN BE POPULATED

Memory

12 slot servers	12	12	12	12	12	12
16 slot servers	16	16	16	16	16	16
MAXIMUM CAPACITY (GB)*						
12 slot servers	96	192	192	384	384	768
16 slot servers	128	256	256	512	512	1024
POPULATED DIMM SPEED (MT/s)						
1 DIMM Per Channel	2400	2400	2400	2400	2400	2400
2 DIMM Per Channel	2133	2133	2133	2133	2400	2400

*Maximum Capacity will vary based on individual server platform qualification schedule

Memory options part number decoder



Item	Description	Definition
1	Capacity	8 GByte 16 GByte 32 GByte
2	Rank	1R = Single-rank 2R = Dual-rank 4R = Quad-rank
3	Data width	x4 = 4-bit x8 = 8-bit

Memory

4	Memory generation	DDR4
5	Max. Memory speed	2133MT/s
6	CasLatency	P = 15
6	DIMM type	R = RDIMM (registered) L = LRDIMM (load reduced)

Following are memory options available from Hewlett Packard Enterprise:

HPE Memory

NOTE: HPE memory from previous generation servers (DDR3) is not compatible with this server. HPE SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen9. For additional information, please see the HPE SmartMemory QuickSpecs at:

<https://www.hpe.com/h20195/v2/GetHTML.aspx?docname=c04111535>

NOTE: LRDIMM and RDIMM are distinct memory technologies and cannot be mixed within a server.

NOTE: Depending on the memory configuration and processor model, the memory speed may run at 2400MT/s, 2133MT/s, 1866MT/s, or 1600MT/s.

Registered DIMMs (RDIMMs) - E5-2600 v4 series Processors

HP 8GB (1x8GB) Single Rank x8 DDR4-2400 CAS-17-17-17 Registered Memory Kit	805347-B21
HP 16GB (1x16GB) Single Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	805349-B21
HPE 16GB (1x16GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	836220-B21
HP 32GB (1x32GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	805351-B21

Load Reduced DIMMs (LRDIMMs) - E5-2600 v4 series Processors

HP 32GB (1x32GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Load Registered Memory Kit	805353-B21
HP 64GB (1x64GB) Quad Rank x4 DDR4-2400 CAS-17-17-17 Load Registered Memory Kit	805358-B21

Registered DIMMs (RDIMMs)

Registered DIMMs (RDIMMs) - E5-2600 v3 series Processors

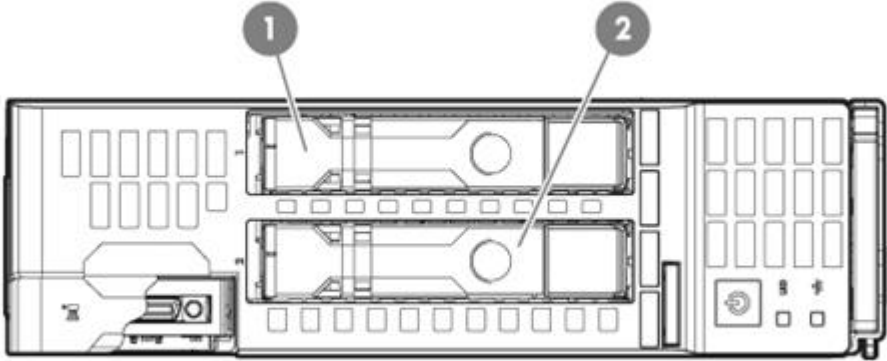
HP 8GB (1x8GB) Dual Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit	759934-B21
HP 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726718-B21
HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726719-B21
HP 32GB (1x32GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	728629-B21

Load Reduced DIMMs (LRDIMMs) - E5-2600 v3 series Processors

Memory

HP 48GB (1x16GB +1x32GB) DDR4-2133 CAS-15-15-15 Load Reduced Memory FIO Kit	792278-B21
HP 32GB (1x32GB) Quad Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726722-B21
HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726720-B21
HP 64GB (1x64GB) Quad Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726724-B21

Storage



1-2 2 x SFF hot-plug SAS, SATA, SAS SDD, and SATA SSD hard drives

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: <ul style="list-style-type: none"> • HPE BladeSystem c3000 Enclosure QuickSpecs at https://www.hpe.com/h20195/v2/GetDocument.aspx?docname=c04123379 • HPE BladeSystem c7000 Enclosure QuickSpecs at https://www.hpe.com/h20195/v2/GetHTML.aspx?docname=c04229580 		

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

NOTE: For optimal cooling and system performance the BL460c Gen9 Server Blade requires the c7000 enclosure to be configured with 10 fans and the c3000 enclosure to be configured with 6 fans.

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).
Extended Ambient Operating Support	For Approved hardware configurations, the supported system inlet range is extended to be: 5° to 10°C (41° to 50°F) and 35° to 40°C (95° to 104°F) at sea level with an altitude derating of 1.0°C per every 175 m (1.8°F per every 574 ft) above 900 m (2953 ft) to a maximum of 3050 m (10,000 ft)	
	NOTE: Qualifications for extended ambient configurations are detailed at: https://www.hp.com/servers/ASHRAE	
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

Technical Specifications

		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 HPE BladeSystem c-Class Enclosures QuickSpecs located at:	
	<ul style="list-style-type: none"> • HPE BladeSystem c3000 Enclosure QuickSpecs: http://h18000.www1.hp.com/products/QuickSpecs/12790_div/12790_div.html • HPE BladeSystem c7000 Enclosure QuickSpecs: http://h18000.www1.hp.com/products/QuickSpecs/12810_div/12810_div.html 	

HPE Smart Array P244br Controller	Disk Drive Interface	12Gb/s SAS (Serial Attached SCSI) 6Gb/s SATA (Serial ATA)
	Server Interface	x8 PCIe 3.0 provides 8GB/s maximum bandwidth
	Cache Memory	1GB flash backed write cache (FBWC) cache standard
	Logical Drives Supported	64 (with included 1GB cache)
	Host Memory Addressing	64-bit, supporting servers memory space greater than 4GB
	RAID Support	RAID 1 (mirroring), RAID 0 (striping), RAID 10
	Other	Upgradeable firmware with recovery ROM Online drive flash (with SAS drives)

HPE Smart HBA H244br Controller	Disk Drive Interface	12Gb/s SAS (Serial Attached SCSI) 6Gb/s SATA (Serial ATA)
	Server Interface	x8 PCIe 3.0 provides 8GB/s maximum bandwidth
	Cache Memory	None
	Logical Drives Supported	64
	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)

HPE Dynamic	Disk Drive Interface	6Gb/s SATA (Serial ATA)
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Technical Specifications

Smart Array B140i Controller	Server Interface	Embedded x4 PCIe 2.0
	SAS Connectors	2 internal SATA ports None
	Cache Memory	
	SAS Speed	6Gb/s SATA links
	Logical Drives Supported	Up to 10 logical volumes (2 physical drives)
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space
	Hot Plug Support	Yes
	RAID Support	RAID 1 (Mirroring) RAID 0 (Striping)
	Other	Upgradeable firmware with recovery ROM

HPE FlexFabric 10Gb 2-port 536FLB FlexibleLOM	Type	Integrated dual-port KR 10Gb FlexibleLOM with FlexFabric (Flex-10, FCoE, hardware-based iSCSI, iSCSI boot, TCP/IP offload engine, and autosensing 1Gb/10Gb Ethernet capability)
	Network Processor	QLogic 57840S with integrated MAC/PHY
	Data Transfer Method	x8 PCI Express 3.0
	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 HPE BladeSystem c-Class interconnect components. Both ports will operate at the same speed. NOTE: Each port on the 536FLB 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	Full hardware offload of iSCSI and FCoE storage protocol processing for highest performance converged Ethernet data and storage networks. Dual-port 10GbE Flex-10 FlexibleLOM network adapter that provides the flexibility to choose the type of LOM to meet growing infrastructure needs Industry-leading throughput and latency performance Supports the HPE Flex-10 blade interconnect technology User configurable bandwidth settings when combined with the 10Gb Flex-10 Virtual Connect module. From 100Mb/s to 10Gb/s on up to four "Physical Function" NICs per port, in increments of 100Mb/s for NIC. The combined bandwidth of NICs cannot exceed port bandwidth i.e. 10 Gb. Up to 40Gb/s bi-directional near line rate throughput Hardware acceleration and offloads for stateless TCP/IP, TCP Offload Engine

Technical Specifications

		(TOE) Improved small packet performance Support for Preboot eXecution Environment (PXE) Integrated PHY and MAC Supports for SR-IOV Support for Network Partitioning (NPAR)
HPE FlexFabric 20Gb 2-port 650FLB FlexibleLOM	Type	Integrated dual-port KR2 20Gb FlexibleLOM with FlexFabric (Flex-20, FCoE, RoCE, Tunnel Offload with VXLAN/NVGRE, hardware-based iSCSI, iSCSI boot, TCP/IP offload engine, and autosensing Ethernet speed capability)
	Network Processor	Emulex XE-104
	Data Transfer Method	x8 PCI Express 3.0
	Network Transfer Rate	Two ports, each at 40 Gbps bi-directional; 80 Gbps aggregate bi-directional theoretical bandwidth
	IEEE Compliance	802.3ae, 802.1Q, 802.3x, 802.1p, 802.3ad/LACP, 802.1AB(LLDP), 802.1Qbg, 802.1Qbb, 802.1Qaz, 802.3ap
	Standard Features	<p>Dual 20Gb ports provide up to 80Gb bi-directional per adapter</p> <p>Multi-speed adapter operates at either 20GbE or 10GbE</p> <p>Converges FCoE or RoCE with LAN traffic on a single Ethernet wire</p> <p>Tunnel Offload support for VXLAN and NVGRE</p> <p>RDMA over Converged Ethernet (RoCE) for greater server efficiency and lower latency (6125XLG only)</p> <p>Advanced storage offload processing freeing up valuable CPU cycles</p> <p>Supports UEFI and legacy boot options</p> <p>Mixed Storage – supports NIC + FCoE on one port, and NIC + iSCSI on the other</p> <p>Concurrent Storage – concurrently supports NIC, FCoE, and iSCSI storage functions on the same port (NIC + FCoE + iSCSI)</p> <p>Industry-leading throughput and latency performance</p> <p>Supports the HPE Flex-20 blade interconnect technology</p> <p>Over eight million small packets/s, ideal for web/mobile applications, mobile messaging, and social media</p> <p>User configurable bandwidth settings when combined with the 20Gb Flex-20 Virtual Connect module. From 100Mb/s to 10Gb/s on up to four "Physical Function" NICs per port, in increments of 100Mb/s for NIC. The combined bandwidth of NICs cannot exceed port bandwidth i.e. 20 Gb/s.</p> <p>Greater bandwidth with PCIe 3.0</p> <p>Jumbo Frames support</p> <p>Supports Wake On LAN (WOL)</p> <p>Support for Preboot eXecution Environment (PXE)</p> <p>Support for Microsoft Windows SMB Direct</p> <p>Optimized host virtualization density with SR-IOV support</p>

Environment-friendly Products and Approach	End-of-life Management and Recycling	<p>Hewlett Packard Enterprise offers end-of-life Hewlett Packard Enterprise product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to:</p> <p>https://promotions.ext.hpe.com/WMCF.Web/us/en/page/GlobalLandingPage/. To recycle your product, please go to:</p>
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Technical Specifications

<https://promotions.ext.hpe.com/WMCF.Web/us/en/page/GlobalLandingPage/> or contact your nearest Hewlett Packard Enterprise sales office. Products returned to Hewlett Packard Enterprise 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 Enterprise web site at:

<https://promotions.ext.hpe.com/WMCF.Web/us/en/page/GlobalLandingPage/>. These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.

Summary of Changes

Date	Version History	Action	Description of Change
06-Jun-2016	From Version 18 to 19	Changed	Models, Configuration Information - Factory Integrated Models, Core Options, Memory, and Technical Specifications sections were updated.
		Added	SKUs added in Related Options and Core Options sections: 854845-B21, 809208-B21, 822559-B21, 846436-B21
31-Mar-2016	From Version 17 to 18	Changed	Overview, Standard Features, Optional Features, Recommended Support Services for BL460, Models, Configuration Information - Factory Integrated, Core Options, Additional Options, and Memory sections were updated.
		Added	SKUs added to QuickSpecs: 813198-B21, 819852-L21, 819851-L21, 819842-L21, 819841-L21, 819840-L21, 819849-L21, 819839-L21, 819845-L21, 819846-L21, 819844-L21, 819838-L21, 819837-L21, 819856-L21, 819855-L21, 819854-L21, 819857-L21, 819853-L21, 819850-L21, 819848-L21, 819847-L21, 805347-B21, 805349-B21, 836220-B21, 805351-B21, 805353-B21, 805358-B21, 825555-B21, 819852-B21, 819851-B21, 819842-B21, 819841-B21, 819840-B21, 819849-B21, 819839-B21, 819845-B21, 819846-B21, 819844-B21, 819838-B21, 819837-B21, 819843-B21, 819856-B21, 819855-B21, 819854-B21, 819857-B21, 819853-B21, 819850-B21, 819848-B21, 819847-B21, 764908-B21, 764906-B21, 764904-B21, 765044-B21, 765038-B21, 765036-B21, 765034-B21, 764892-B21, 736939-B21, 736936-B21, 802891-B21, 846430-B21, 846432-B21, 846434-B21, 846436-B21, 816879-B21, 838404-B21, 838406-B21, 838408-B21, 838410-B21, 838412-B21.
		Removed	Obsolete SKUs were deleted: 756601-B21, 691864-B21
16-Feb-2016	From Version 16 to 17	Changed	Information updated in different sections.
		Added	SKUs Added in Core Options sections: 846495-B21, 846497-B21, 832514-B21.
		Removed	Obsolete SKUs were deleted: 789135-B21, E5Y38A, E5Y39AAE, QK763A, QK762A, QK761A, D8585AAE, D8584A.
09-Oct-2015	From Version 15 to 16	Changed	Core Options section was updated.
		Added	SKUs added: P8B24A, P8B26AAE, P8B31A
		Removed	Obsolete SKUs were deleted: 756621-B21, 756657-B21, 789155-B21
28-Sep-2015	From Version 14 to 15	Added	SKU added in Additional Options: 745823-B21
28-Aug-2015	From Version 13 to 14	Changed	Information in Core Options section was updated.
		Added	SKUs added in Core Options section: 659818-B21, 651281-B21

Summary of Changes

17-Aug-2015	From Version 12 to 13	Changed	Standard Features, Optional Features, Configuration Information - Factory Integrated Models, Core Options and Memory sections were updated.
		Added	SKUs added in Additional Options and Core Options sections: C9A82AAE, 804677-B21, 804671-B21, 804665-B21, 804639-B21, 804631-B21, 804625-B21, 832414-B21, 804613-B21, 804605-B21, 804599-B21, 804593-B21, 804587-B21, 804581-B21, 804575-B21.
		Removed	Obsolete SKU deleted: F6Q89AAE
19-Jun-2015	From Version 11 to 12	Changed	Information updated.
1-Jun-2015	From Version 10 to 11	Changed	Information in Optional Features, Configuration Information- Factory Integrated, and Models sections was updated.
		Added	SKUs added: 726724-B21, 748387-B21, 791034-B21, 726793-B21
		Removed	SKUs removed: 726793-B21, 741159-B21, 741151-B21
6-Apr-2015	From Version 9 to 10	Changed	Industry Standard Compliance and Additional Options sections were updated
30-Mar-2015	From Version 8 to 9	Added	SKUs Added: 741279-B21, 728629-B21, 726793-B21, 749975-B21, 726782-B21, 727261-B21, 802578-B21, 802582-B21, 802586-B21, 802891-B21, 781516-B21, 785067-B21, 765453-B21, 765455-B21, 765464-B21, 765466-B21, 789135-B21, 789145-B21, 789155-B21, 794603-B21, 794605-B21, 781518-B21, 785069-B21
		Removed	Obsolete SKUs Deleted: 741146-B21, 741138-B21
27-Feb-2015	From Version 7 to 8	Changed	Smart Buy 779805-S01 processor was updated in Product Bulleting US version.
9-Feb-2015	From Version 6 to 7	Changed	Core Options and Additional Options sections were updated
		Added	SKUs Added on Hard Drives section: 779164-B21, 779168-B21, 779172-B21, 779176-B21, 764923-B21, 764925-B21, 764927-B21, 764929-B21
		Removed	SKUs removed: 728935-B21, 718939-B21
12-Dec-2014	From Version 5 to 6	Changed	Descriptions were updated throughout the QuickSpecs.
		Added	SKU Added on HPE Smart Memory: 792278-B21
1-Dec-2014	From Version 4 to 5	Changed	Overview, Standard Features, Configuration Information - Factory Integrated Models and Core Options sections were updated
		Added	SKUs added: 759934-B21, 726720-B21, 775588-B21, 785233-B21, 757339-B21, 756657-B21, 756621-B21

Summary of Changes

		Removed	SKU E5Y35AAE deleted due to compatibility issues
10-Oct-2014	From Version 3 to 4	Changed	Smart Buy section added to the NA version only
8-Oct-2014	From Version 2 to 3	Changed	Network Controller, Enclosures and Compatible SAN sections were updated
		Added	HPE I/O Accelerator Options section has been added including following SKUs: QK763A, QK762A, QK761A
17-Sep-2014	From Version 1 to 2	Removed	Expansion Blade Support section was deleted
		Changed	Changes made throughout the Standard Features, Models, SmartMemory, Core Options and Carepacks sections.



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

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