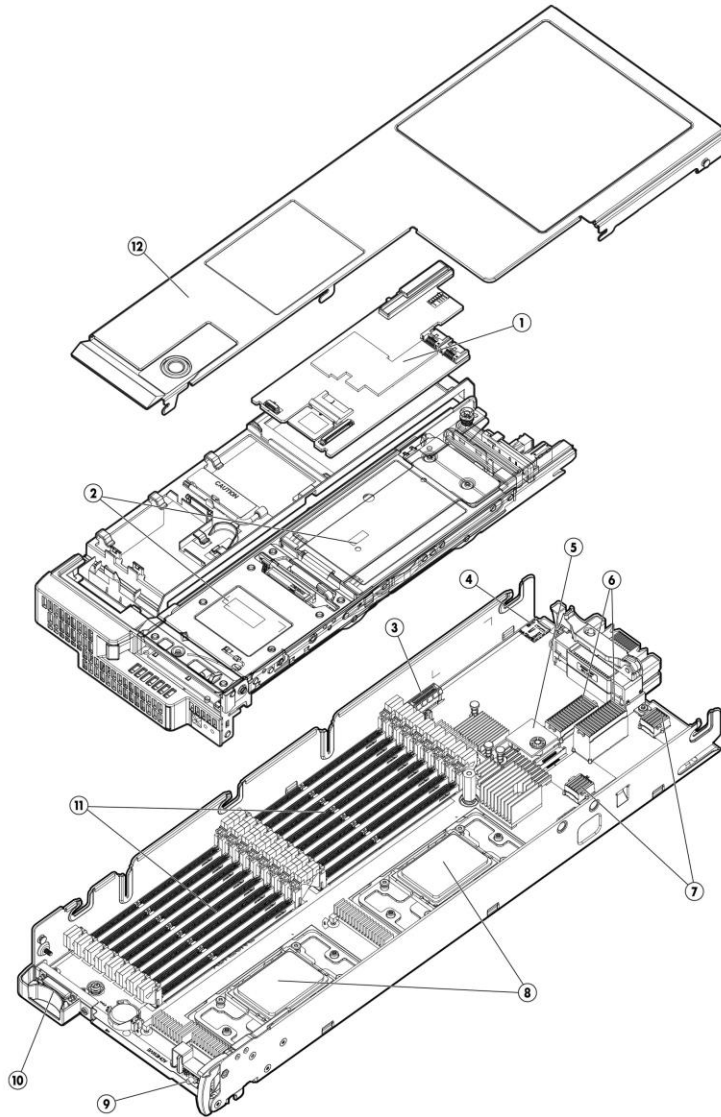


Overview

HP ProLiant BL465c Gen8 Server Blade



- | | |
|--|---|
| 1. HP Smart Array P220i Controller with 512MB FBWC | 7. FlexibleLOM connector |
| 2. Two (2) small form factor (SFF) hot plug drive bays | 8. Up to two (2) Multi-Core AMD Opteron™ 6300 Series processors |
| 3. Internal USB connector | 9. System power button and LED |
| 4. Internal MicroSD card slot | 10. Local I/O connector |
| 5. TPM connector | 11. Sixteen (16) DDR3 DIMM memory slots (8 per processor) |
| 6. Two (2) mezzanine I/O expansion slots | 12. Access panel |

Standard Features

NOTE: This document covers the HP ProLiant BL465c Gen8 server blade only. For information on HP BladeSystems c-Class Enclosures and HP BladeSystem c-Class Interconnect and Mezzanine Components, please see the following:

HP BladeSystem c-Class Enclosures QuickSpecs:

- HP BladeSystem c3000 Enclosure QuickSpecs at http://h18000.www1.hp.com/products/quickspecs/12790_na/12790_na.html
NOTE: The c3000 HP c-Class enclosures have full backwards and forwards compatibility, existing server blades are supported in the new enclosures and any future server blades will be supported in the existing enclosures.
- HP BladeSystem c7000 Enclosure QuickSpecs at http://h18000.www1.hp.com/products/quickspecs/12810_na/12810_na.html
NOTE: The c7000 HP c-Class enclosures have full backwards and forwards compatibility, existing server blades are supported in the new enclosures and any future server blades will be supported in the existing enclosures.
- HP BladeSystem c-Class Interconnect and Mezzanine Components 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 proper BladeSystem operation, the minimum required versions of HP Onboard Administrator and HP Virtual Connect are required and available via the HP Service Pack for ProLiant, please see: <http://www.hp.com/go/spp/download>.

NOTE: For optimal cooling and system performance the BL465c Gen8 requires the c7000 enclosure to be configured with 10 fans and the c3000 enclosure to be configured with 6 fans.

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

Processor

One of the following depending on Model

Sixteen-Core Processors

AMD Opteron™ 6380 (2.5GHz/ 16-core/16MB/115W) Processor
AMD Opteron™ 6378 (2.4GHz 16-core/16MB/115W) Processor
AMD Opteron™ 6376 (2.3GHz 16-core/16MB/115W) Processor
Low Power AMD Opteron™ 6366HE (1.8GHz/16-core/16MB/85W) Processor

Twelve-Core Processors

AMD Opteron™ 6348 (2.8GHz/12-core/16MB/115W) Processor
AMD Opteron™ 6344 (2.6GHz/ 12-core/ 16MB/115W) Processor
AMD Opteron™ 6238 (2.6GHz/12-core/16MB/115W) Processor
AMD Opteron™ 6234 (2.4GHz/12-core/16MB/115W) Processor

Eight-Core Processors

AMD Opteron™ 6328 (3.2GHz/8-core/16MB/115W) Processor
AMD Opteron™ 6320 (2.8GHz/8-core/16MB/115W) Processor

Quad-Core Processors

AMD Opteron™ 6308 (3.5GHz/4-core/16MB/115W) Processor

NOTE: Processor wattage references reflect Thermal Design Power (TDP). For more information on TDP and Average CPU Power (ACP) visit: <http://www.amd.com/acp>.

Cache Memory

16MB Level 3 cache memory

Chipset

AMD SR5690 and SP5100

NOTE: For more information regarding AMD chipsets, please see the following: <http://www.amd.com/us/products/Pages/chipsets.aspx>.

Standard Features

Upgradeability Upgradeable to two (2) processors

On System Management Chipset HP iLO (Firmware: HP iLO 4)
NOTE: For more information, visit: <http://www.hp.com/go/ilo>

Memory Protection Advanced ECC
 Online spare mode

Memory

Type	HP SmartMemory DDR3 Load Reduced (LRDIMM) or Registered (RDIMM)
Standard (Pre-configured Models)	16GB (2 x 8 GB) DDR3 1333MHz RDIMMs at 1.35v
Maximum (LRDIMM)	512GB (16 x 32GB) at 1333MHz
Maximum (RDIMM)	256GB (16 x 16GB) up to 1600MHz

NOTE: HP memory from previous generation servers are not qualified or warranted with this server. HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen8. For additional information, please see the HP SmartMemory QuickSpecs at:

http://h18000.www1.hp.com/products/quickspecs/14225_na/14225_na.html.

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

NOTE: Depending on the memory configuration and processor model, the memory speed may run at 1600MHz, 1333MHz, or 1066MHz. Please see Memory Population Table or the Online Memory Configuration Tool at: www.hp.com/go/ddr3memory-configurator.

Network Controller One (1) FlexibleLOM connector for one dual-port FlexibleLOM
NOTE: FlexibleLOM options include 10Gb FlexFabric, 20Gb FlexFabric, 10Gb Flex-10, and 10Gb Ethernet.
NOTE: FlexFabric capabilities require the use of an HP Virtual Connect FlexFabric module. Learn more at: <http://www.hp.com/go/bladeSystem/interconnects>
NOTE: The server supports one FlexibleLOMs.
NOTE: For Pre-configured Model configurations, FlexibleLOM is already included.
NOTE: All FlexibleLOMs are dual port: one port is routed to interconnect module bay 1 and the other to bay 2.
NOTE: FlexibleLOMs are not compatible with prior generation c-Class server blades
 Standard iLO Network Controller:
 One (1) 10/100 Mbps port for the HP iLO 4 On System Management Chipset
 One (1) 10/100 Mbps port for the HP iLO 4 to Onboard Administrator link. The Onboard Administrator (with 10/100/1000 Mbps) to BladeSystem link is 1Gbps.

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

- x8 PCIe 2.0 Type A (supports Type A mezzanine cards) (expansion slot 1).
NOTE: This expansion slot supports dual-port mezzanine cards: one port is routed to interconnect module bay 3 and the other to bay 4.
- x16 PCIe 2.0 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.

Standard Features

Mezzanine card options include:

- Dual-port 10Gb FlexFabric, 20Gb FlexFabric, 10Gb Flex-10, 10Gb Ethernet options, and quad-port 1Gb Ethernet server adapter mezzanine options for additional network ports
- Dual-port 8Gb and 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
- Smart Array SAS RAID controller mezzanine options for external direct attach and shared SAS storage

HP Server ROM

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

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

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

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

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

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

Storage Controller

All Models One (1) HP Smart Array P220i Controller with 512MB FBWC, (RAID 0 and 1)
NOTE: Upgradeable firmware with recovery ROM.
NOTE: The HP Smart Array P220i supports two (2) small form factor (SFF) hot plug drive bays.
NOTE: The HP Smart Array P220i supports 6G SAS and 3G SATA data transfer rates.
 Available Options: Smart Array Advanced Pack Software for enhanced performance, reliability, availability, and security of system data

Maximum Internal Storage

Hot Plug SFF SAS	2.4TB	2 x 1.2TB
Hot Plug SFF SATA	2.0TB	2 x 1.0TB
Hot Plug SFF SAS SSD	3.2TB	2 x 1.6GB
Hot Plug SFF SATA SSD	3.2TB	2 x 1.6GB

NOTE: The ProLiant BL465c Gen8 server includes the new HP small form factor (SFF) hot plug SmartDrive carrier for enhanced management and reduced maintenance errors. HP drives from previous generation servers are not compatible with the ProLiant BL465c Gen8 drive bays.

Standard Features

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

Interfaces

Micro SDHC Slot One (1) internal Micro Secure Digital High Capacity (Micro SDHC) card slot

USB 2.0 Port One (1) internal USB 2.0 connector for USB flash media drive keys

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

Industry Standard Compliance

ACPI 2.0

Microsoft® Logo certifications

USB 2.0 Support

IPMI 2.0

Secure Digital 2.0

TPM 1.2 Support

IEEE (specific IEEE standards dependant on Ethernet adapter card(s) installed)

Advanced Encryption Standard (AES)

Triple Data Encryption Standard (3DES)

SNMP

PCIe 2.0

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](#)

[Citrix XenServer](#)

NOTE: For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: <http://www.hp.com/go/ossupport> and our driver download page <http://www.hp.com/support/BL465cGen8>

Enclosures

HP offers two different c-Class server blade enclosures to meet your individual needs:

- The HP BladeSystem c7000 rack enclosure is 10U high and holds up to sixteen (16) ProLiant BL465c Gen8 servers plugged vertically.
- The HP BladeSystem c3000 rack enclosure is 6U high and holds up to eight (8) HP ProLiant BL465c Gen8 servers plugged horizontally.
- Server blades, storage blades, interconnect modules, power supplies, fans, and redundant Onboard Administrator modules are all designed to fit into the c3000 and c7000 enclosures.

NOTE: For additional enclosure information, please see:

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

Graphics

Integrated Matrox G200 video standard

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

HP iLO 4 On System Management Memory

- 16 MB Flash

Standard Features

- 256 MB DDR 3 with ECC (112 MB after ECC and video)

Form Factor	HP ProLiant BL465c Gen8 is a half-height server blade that plugs into the HP BladeSystem c3000 and c7000 enclosures.
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On System Management	HP iLO Management Engine	HP iLO Management Engine is a comprehensive set of embedded management features supporting the complete lifecycle of the server, from initial deployment, through ongoing management, to service alerting and remote support. HP iLO Management Engine comes standard on all HP ProLiant Gen8 servers. The HP iLO Management Engine portfolio includes:
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- **HP iLO:** Provides remote embedded server management without OS-based management software
- **HP Agentless Management:** Provides remote embedded server management without OS-based management software
- **HP Active Health System:** Builds diagnostic support into the server.
- **HP Intelligent Provisioning:** Lets customers provision and configure a single server without any separate media. No more SmartStart CDs or Smart Update Firmware DVD are needed.
 - To start Intelligent Provisioning:
 - Press the F10 key during the ProLiant Gen8 server boot process (also known as power on self test or POST).
 - Please go to the Intelligent Provisioning website at www.hp.com/go/intelligentprovisioning for additional information and to view usage videos.
 - Use the Service Pack for ProLiant (SPP) at www.hp.com/go/spp to get firmware and software updates.
 - HP iLO Mobile App: Enables the ability to access, deploy, and manage your server anytime from anywhere from select smartphones and mobile devices. For additional information please visit: www.hp.com/go/ilo/mobileapp

NOTE: For more information, visit: <http://www.hp.com/go/ilo> or [HP iLO Management Engine technologies whitepaper](#)

HP Insight management software	HP Service Pack for ProLiant	HP Service Pack for ProLiant (SPP) and HP Smart Update Manager (HP SUM) provide a comprehensive approach to firmware and system software maintenance. Together they provide better operating stability and ensure maximum uptime. The SPP will be updated at a predictable cadence, typically coinciding with new HP server hardware launches. By enabling firmware to be updated online and integrating firmware and system software updates in one operation, HP SUM and the SPP offer faster updates of individual servers and dramatically faster updates of entire BladeSystem enclosures. Further improving system uptime and stability is the fact that HP provides 12 months of support for each Service Pack for ProLiant release.
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The user experience around HP SUM and the SPP has been improved in several ways, starting with the web download. A single web page provides

Standard Features

access to a single download containing both the latest version of HP SUM and the latest SPP. Optional smaller subsets with only specific types of servers or specific operating systems are offered to save on download time. The HP SUM application provides a straightforward, intuitive user interface that guides the user through the steps of discovery, analyses and update, providing comprehensive information on available updates, criticality and interdependencies. This information is also available in reports. By providing the option of multiple local or shared repositories which can be easily updated from hp.com, HP SUM provides the tools to optimize stability and consistency throughout the company. While HP SUM and the SPP recommend the combinations of firmware and system software that HP has found to be the best practice, the application gives customers the flexibility to set their own specific baseline.

The Service Pack for ProLiant has been rigorously tested with specific attention for interaction between firmware, drivers and agents both within the server as well as in interaction with the BladeSystem enclosure components (Onboard Administrator and Virtual Connect). This testing ensures the highest quality as well as providing the input for HP SUM to deploy updates taking into account all interdependencies, when determining the correct updates and order of update deployment.

NOTE: The Service Pack for ProLiant (which includes HP SUM) can be downloaded from www.hp.com/go/spp/download. More information can be found: <http://www.hp.com/go/SmartUpdate>, www.hp.com/go/spp and <http://www.hp.com/go/hpsum>

Security

- Power-on password
- Administrator's password
- Keyboard password (QuickLock)
- HP iLO 4 On System Management Chipset with:
 - SSL encryption
 - Secure Shell version 2
 - Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, CLP and XML scripting interface
 - AES and RC4 encryption of video
- External USB port enable/disable
- Network server mode
- Serial interface control
- TPM (Trusted Platform Module) 1.2 option
- Advanced Encryption Standard (AES)

Availability

Memory

- Advanced ECC uses single device data correction (SDDC) to detect and correct single and all multi-bit error that occurs within a single DRAM chip. Both x4 and x8 SDDC are supported
- Memory online spare mode (also known as rank spare mode) detects a rank that is degrading and switches operation to the spare rank.
- Memory demand and patrol scrubbing to prevent accumulation of correctable errors and reducing 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

Standard Features

improving service time and overall system availability.

Mezzanine options and I/O

- FlexibleLOM connector supporting two (i.e. redundant) Ethernet ports.
- Multiple mezzanine I/O expansion slots that support a wide variety of mezzanine cards each 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/SSD drive bays.
- Integrated HP Smart Array P220i Controller with 512MB FBWC, RAID 0 and 1 support, and upgradeable firmware with recovery ROM capability.
- Optional HP D2200sb or D2220sb Storage Blade for direct attached and shared storage within the c-Class enclosure.
- Optional dual-port Fibre Channel mezzanine cards for redundant SAN connections.

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 bus, memory ECC, parity, and cache, and improves service time.

Server Blade Enclosure Infrastructure

- Pooled power for true N+N power redundancy through up to six (6) hot-plug, high-efficiency, enclosure-based power supplies (configuration dependant).
- Up to ten (10) redundant enclosure-based hot-plug HP Active Cool fans that scale to meet future demands and optimize airflow, reduce power draw, and improve acoustic performance.
- Dual grid power providing redundant rack enclosure power feeds to the server blade enclosure.
- HP Dynamic Power Saver Mode the total enclosure power consumption is monitored in real time and automatically adjusted with changes in demand for improved efficiency and reliability.
- HP Dynamic Power Capping safely limits power usage without impacting performance by capping peak instead of average power usage, removes risk to electrical infrastructure with fast-acting, hardware-based capping algorithm, and reclaims more power by dynamically controlling 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, iSCSI, etc.
- Enclosure crosslinks between adjacent 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 HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from

Standard Features

date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Certain restrictions and exclusions apply. Hard drives have either a one year or three year warranty; refer to specific hard drive QuickSpecs for details.

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

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

Optional Features

Fibre Channel Support	Up to two (2) optional Fibre Channel mezzanine HBAs are supported on the HP ProLiant BL465c Gen8.	
Compatible SAN	<p>HP ProLiant BL465c Gen8 server blades are optimized for HP MSA, EVA and XP.</p> <p>HP ProLiant BL465c Gen8 server blades are compatible with select 3rd party SANs. Please see blade storage page for more details at http://h18004.www1.hp.com/products/blades/components/c-class-sans.html.</p>	
HP Virtual Connect	<p>HP Virtual Connect is an interconnect option for BladeSystem c-Class that simplifies server connectivity to data and storage networks, and reduces costs. Unique HP 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. HP Virtual Connect Enterprise Manager (VCEM) provides server management software with a central console to administer network connections and workloads for thousands of servers. For more information on Virtual Connect Enterprise Manager, see http://www.hp.com/go/vcem. For more information on Virtual Connect Ethernet, Fibre Channel, Converged Network and management options, see http://www.hp.com/go/virtualconnect.</p>	
HP Insight management software	HP Insight Control	<p>HP Insight Control, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, migrate, monitor, remote control, and optimize your IT infrastructure through a single, simple management console. For more information, see http://www.hp.com/go/insightcontrol.</p>
		<p>HP Insight Control includes one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, see: http://www.hp.com/services/insight.</p>
	HP Matrix Operating Environment	<p>The HP 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.</p>
		<p>The HP Matrix OE includes the automated provisioning, optimization, and recovery management capabilities for HP CloudSystem Matrix, the ideal platform for private cloud and Infrastructure as a Service (IaaS). For more information, see http://www.hp.com/go/matrixoe.</p>
	HP iLO Scale-Out	<p>The HP iLO Scale-Out license ideal for web/hosting/cloud service providers and High Performance Computing environments. This license is a specific subset of iLO Advanced functionality, provides fast remote access through Text Console via SSH, lower operational cost with Dynamic power capping, and faster time to resolution through Email-based Alerting and proactive notifications. With this newly designed HP iLO Scale-Out license HPC customers now have a server management package solely design and priced for their massive data environments. HP iLO Scale-Out is available on all HP ProLiant Gen8 BL and SL platforms. For more information, see: www.hp.com/go/iLO/scale-out</p>
	HP iLO Advanced	<p>HP Integrated Lights-Out Advanced License a product option, providing smart remote server management without compromise. iLO Advanced unlocks the full set of remote administration functionality for all HP ProLiant servers by activating the full Virtual Keyboard Video and Mouse</p>

Optional Features

remote console, multi-user collaboration, console record and replay, GUI-based and scripted virtual media and virtual folders, and enhanced security and power management functionality. For more information, see: <http://www.hp.com/go/iLOADvance>.

HP iLO Advanced License for ProLiant Servers

HP iLO management processors for HP ProLiant Gen8 servers virtualizes system controls to help simplify server setup, engage health monitoring and power and thermal control, and promote remote administration. HP iLO functions out-of-the-box without additional software installation and functions regardless of the servers' state of operation. The HP iLO can be accessed from any location via a web browser and works hand-in-hand with HP Systems Insight Manager, Insight Control, and Matrix Operating Environment, helping customers unleash the value of the ProLiant platform and deliver the highest possible quality of IT service to the business.

Advanced functionality, such as graphical remote console, multi-user collaboration, and video record/playback can be activated with the optional HP iLO Advanced or HP iLO Advanced for BladeSystem licenses. The Advanced licensed features offer sophisticated remote administration of servers in dynamic data center and remote locations and can help significantly reduce cost associated with IT-related travel and unplanned downtime.

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

HP OneView

The HP OneView architecture combines server, storage, and networking with control of datacenter environmentals into a single, integrated management platform. Architected to deliver lifecycle management for the complete Converged Infrastructure, it facilitates collaboration, removes friction, collapses cycle times, eliminates error-prone work, and accelerates time to value. HP OneView v1.0 combines management of servers and virtual connect with open integration to automate and customize existing tools and processes. With OneView, you'll work smarter—with greater visibility and control—and fully capitalize on the benefits of a Converged Infrastructure.

For more information on HP OneView management, see: <http://www.hp.com/go/oneview>.

High Performance Clusters

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

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

<http://www.hp.com/techservers/clusters/ucp/index.html>

HP Insight Cluster Management Utility HP Insight Cluster Management Utility (CMU) is an HP-licensed and HP-supported suite of tools that are used for lifecycle management of hyperscale clusters of Linux ProLiant systems. CMU includes software for the centralized provisioning, management and monitoring of nodes. CMU makes the administration of clusters user friendly, efficient, and effective.

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

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 HP 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:

Optional Features

- **Data Protection and Recovery Software**
Whether you're a large enterprise or a smaller business, HP data protection and recovery software will cost-effectively protect you against disaster and ensure business continuity.
- **Data Archive and Migration Software**
HP's 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)**
HP's 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**
HP offers array-based and host-based replication software for use in disaster recovery, testing, application development and reporting.
- **Storage Device Management Software**
Maximize your investment in HP storage and networking with software that enables hardware-specific configuration, performance tuning and connectivity management.
- **HP StoreVirtual VSA**
With HP StoreVirtual VSA you can use the power of virtualization to turn a set of heterogeneous and disconnected physical disk drives in your servers and storage devices into a single pool of logical storage capacity.

NOTE: For more information available Storage Software including QuickSpecs, please see: www.hp.com/go/storage/software.

HP Insight Online

HP Insight Online is a new addition to the HP Support Center for one stop, secure access to product and HP support information personalized to your IT environment. Insight Online can automatically display devices remotely monitored by HP Insight Remote Support. 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>

Expansion Blade Support

Supports one (1) optional storage, tape, or PCI expansion blade.

Factory Express Portfolio for Servers and Storage

HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.

Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSAxxxx, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches.

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

HP 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 HP's Customer Business Center or an Authorized Partner for assistance. <http://www.hp.com/products/configurator>

Service and Support

Service and Support **HP Technology Services for Industry Standard Servers**

HP Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Connect to HP to help prevent problems and solve issues faster. Our support technology lets you to tap into the knowledge of millions of devices and thousands of experts to stay informed and in control, anywhere, any time.

Protect your business beyond warranty with HP Care Pack Services

HP Care Pack Services enable you to order the right service level, length of coverage and response time as you purchase your new server, giving you full entitlement for the term you select.

Recommended HP Care Pack Services for your HP product

Optimized Care

HP Proactive Care Advanced - 24x7 coverage, three year Care Pack Service

Achieve a higher return on your product investment with the personal attention from a locally assigned Account Support Manager who delivers recommendations designed to improve availability and performance. Leverage your system's ability to connect to HP for automated problem detection and rapid critical event management to increase stability and reduce unplanned downtime. This recommendation provides 24x7 coverage with four-hour response for hardware and two-hour callback for supported software. Collaborative call management comes with Proactive Care Advanced or you may choose full support from HP where we own all cases through to resolution. HP is a leading provider of support services for most operating systems used on HP BladeSystem with long, successful partnerships with vendors such as Microsoft, Red Hat, VMware, SUSE and others. Purchasing software support from HP simplifies troubleshooting and shortens time to resolution with one call for hardware or software questions.

<http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA5-3259ENW&cc=us&lc=en>

Standard Care

HP Proactive Care with 24x7 coverage, three year Care Pack Service

HP Proactive Care helps prevent problems and stabilize IT by utilizing secure, real-time, predictive analytics and proactive consultations when your products are connected to HP. This Care Pack Service combines three years' proactive reporting and advice with our 24x7 coverage and enhanced escalation management, four hour hardware response time and two hour call back for software questions on leading industry standard software running on your HP ProLiant server.

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

Related Services

HP ProLiant Server Hardware Installation

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

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

Factory Express for Servers and storage

HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed. For more information on Factory Express services for your specific server model please contact your sales representative or go to: <http://www.hp.com/go/factory-express>.

Data Privacy Services

Protect your data through better media management. HP Data privacy services help manage and

Service and Support

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, 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.

www.hp.com/services/dataprivacy

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

Get connected to HP to improve your support experience

Connecting products to HP will help prevent problems with 24x7 monitoring, prefailure alerts, automatic call logging, and parts dispatch, plus current data will be available for the proactive reports that are part of Proactive Care Services. With Connected products, you can have a dashboard to manage your IT anywhere, anytime, from any device.

HP Support Center

Personalized online support portal with access to information, tools and experts to support HP business products. Submit support cases online, chat with HP experts, access support resources or collaborate with peers. Learn more <http://www.hp.com/go/hpsc>

HP's Support Center Mobile App allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalized IT support anywhere, anytime. HP Insight Remote Support and HP Support Center are available at no additional cost with a HP warranty, HP Care Pack or HP contractual support agreement.

NOTE: HP Support Center Mobile App is subject to local availability.

Parts and Materials

HP will provide HP-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 SSD/Flash Drives replaced by HP due to malfunction.

For more information

To learn more on HP ProLiant servers and HP BladeSystem servers, please contact your HP sales representative or HP Authorized Channel Partner. Or visit: www.hp.com/services/bladestem

Models

<p>HP ProLiant BL465c Gen8 6380 1P 16GB-R P220i Server 699045-B21</p>	<p>Processor(s) Cache Memory Memory Network Controller Storage Controller Hard Drive Internal Storage Optical Drive Bay Expansion Slots Management Form Factor Warranty</p>	<p>(1) AMD Opteron™ 6380 (2.5GHz/16-core/16MB/115W) Processor 16MB Level 3 cache memory 16GB (2 x 8 GB) DDR3 1333MHz RDIMMs at 1.35v NOTE: Total of 16 DIMM slots. One (1) HP FlexFabric 10Gb 2-port 554FLB FlexibleLOM HP Smart Array P220i Controller with 512MB FBWC RAID 0,1 None ship standard Supports up to two (2) HP SFF hot-plug SAS/SATA/SDD drives SAS: 2.4TB; SATA: 2.0TB; SAS SSD: 3.2TB; SATA SSD: 3.2TB None 2 standard - Slot 1 supports Type A mezzanine Cards. Slot 2 supports Type A and Type B mezzanine cards. HP iLO Management Engine (standard) Optional: HP iLO Scale-Out or HP Insight Control Up to eight (8) half-height blades supported in the HP BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HP BladeSystem c7000 Enclosure Server warranty includes 3 year Parts, 3 year Labor, 3-year on-site support.</p>
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<p>HP ProLiant BL465c Gen8 6344 1P 16GB-R P220i Server 708931-B21</p>	<p>Processor(s) Cache Memory Memory Network Controller Storage Controller Hard Drive Internal Storage Optical Drive Bay Expansion Slots Management Form Factor Warranty</p>	<p>(1) AMD Opteron™ 6344 (2.6GHz/12-core/16MB/115W) Processor 16MB Level 3 cache memory 16GB (2 x 8 GB) DDR3 1333MHz RDIMMs at 1.35v NOTE: Total of 16 DIMM slots. One (1) HP FlexFabric 10Gb 2-port 554FLB FlexibleLOM HP Smart Array P220i Controller with 512MB FBWC RAID 0,1 None ship standard Supports up to two (2) HP SFF hot-plug SAS/SATA/SDD drives SAS: 2.4TB; SATA: 2.0TB; SAS SSD: 3.2TB; SATA SSD: 3.2TB None 2 standard - Slot1 supports Type A mezzanine Cards. Slot 2 supports Type A and Type B mezzanine cards. HP iLO Management Engine (standard) Optional: HP iLO Scale-Out or HP Insight Control Up to eight (8) half-height blades supported in the HP BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HP BladeSystem c7000 Enclosure Server warranty includes 3 year Parts, 3 year Labor, 3-year on-site support.</p>
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Smart Buys

<p>HP ProLiant BL465c Gen8 6220 2P 64GB-R P220i Server/S-Buy 696173-S01</p>	<p>Processor(s) (2) AMD Opteron™ 6220 (3.0GHz/8-core/16MB/115W) Processor</p> <p>Cache Memory 16MB Level 3 cache memory</p> <p>Memory 64GB (8 x 8 GB) DDR3 1600MHz RDIMMs at 1.5v NOTE: Total of 16 DIMM slots.</p> <p>Network Controller One (1) HP FlexFabric 10Gb 2-port 554FLB FlexibleLOM</p> <p>Storage Controller HP Smart Array P220i Controller with 512MB FBWC RAID 0,1</p> <p>Hard Drive None ship standard Supports up to two (2) HP SFF hot-plug SAS/SATA/SDD drives</p> <p>Internal Storage SAS: 2.0TB; SATA: 2.0TB; SAS SSD: 1.6TB; SATA SSD: 800GB</p> <p>Optical Drive Bay None</p> <p>Expansion Slots 2 standard - Slot1 supports Type A mezzanine Cards. Slot 2 supports Type A and Type B mezzanine cards.</p> <p>Management HP iLO Management Engine (standard) Optional: HP Insight Control</p> <p>Form Factor Up to eight (8) half-height blades supported in the HP BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HP BladeSystem c7000 Enclosure</p> <p>Warranty Server warranty includes 3 year Parts, 3 year Labor, 3-year on-site support.</p>
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<p>HP ProLiant BL465c Gen8 6278 2P 64GB-R P220i Server/S-Buy 696172-S01</p>	<p>Processor(s) (2) AMD Opteron™ 6278 (2.4GHz/16-core/16MB/115W) Processor</p> <p>Cache Memory 16MB Level 3 cache memory</p> <p>Memory 64GB (8 x 8 GB) DDR3 1600MHz RDIMMs at 1.5v NOTE: Total of 16 DIMM slots.</p> <p>Network Controller One (1) HP FlexFabric 10Gb 2-port 554FLB FlexibleLOM</p> <p>Storage Controller HP Smart Array P220i Controller with 512MB FBWC RAID 0,1</p> <p>Hard Drive None ship standard Supports up to two (2) HP SFF hot-plug SAS/SATA/SDD drives</p> <p>Internal Storage SAS: 2.0TB; SATA: 2.0TB; SAS SSD: 1.6TB; SATA SSD: 800GB</p> <p>Optical Drive Bay None</p> <p>Expansion Slots 2 standard - Slot1 supports Type A mezzanine Cards. Slot 2 supports Type A and Type B mezzanine cards.</p> <p>Management HP iLO Management Engine (standard) Optional: HP Insight Control</p> <p>Form Factor Up to eight (8) half-height blades supported in the HP BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HP BladeSystem c7000 Enclosure</p> <p>Warranty Server warranty includes 3 year Parts, 3 year Labor, 3-year on-site support.</p>
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<p>HP ProLiant BL465c Gen8 6320 2P 64GB-R P220i Server/S-Buy 709114-S01</p>	<p>Processor(s) (2) AMD Opteron™ 6320 (2.8GHz/8-core/16MB/115W) Processor</p> <p>Cache Memory 16MB Level 3 cache memory</p> <p>Memory 64GB (8 x 8 GB) DDR3 1600MHz RDIMMs at 1.5v NOTE: Total of 16 DIMM slots.</p> <p>Network Controller One (1) HP FlexFabric 10Gb 2-port 554FLB FlexibleLOM</p>
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Smart Buys

Storage Controller	HP Smart Array P220i Controller with 512MB FBWC RAID 0,1
Hard Drive	None ship standard Supports up to two (2) HP SFF hot-plug SAS/SATA/SDD drives
Internal Storage	SAS: 2.0TB; SATA: 2.0TB; SAS SSD: 1.6TB; SATA SSD: 800GB
Optical Drive Bay	None
Expansion Slots	2 standard - Slot1 supports Type A mezzanine Cards. Slot 2 supports Type A and Type B mezzanine cards.
Management	HP iLO Management Engine (standard) Optional: HP Insight Control
Form Factor	Up to eight (8) half-height blades supported in the HP BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HP BladeSystem c7000 Enclosure
Warranty	Server warranty includes 3 year Parts, 3 year Labor, 3-year on-site support.

**HP ProLiant BL465c
Gen8 6378 2P 64GB-R
P220i Server/S-Buy**
709113-S01

Processor(s)	(2) AMD Opteron™ 6378 (2.4GHz 16-core/16MB/115W) Processor
Cache Memory	16MB Level 3 cache memory
Memory	64GB (8 x 8 GB) DDR3 1600MHz RDIMMs at 1.5v NOTE: Total of 16 DIMM slots.
Network Controller	One (1) HP FlexFabric 10Gb 2-port 554FLB FlexibleLOM
Storage Controller	HP Smart Array P220i Controller with 512MB FBWC RAID 0,1
Hard Drive	None ship standard Supports up to two (2) HP SFF hot-plug SAS/SATA/SDD drives
Internal Storage	SAS: 2.0TB; SATA: 2.0TB; SAS SSD: 1.6TB; SATA SSD: 800GB
Optical Drive Bay	None
Expansion Slots	2 standard - Slot1 supports Type A mezzanine Cards. Slot 2 supports Type A and Type B mezzanine cards.
Management	HP iLO Management Engine (standard) Optional: HP Insight Control
Form Factor	Up to eight (8) half-height blades supported in the HP BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HP BladeSystem c7000 Enclosure
Warranty	Server warranty includes 3 year Parts, 3 year Labor, 3-year on-site support.

Configuration Information - Factory Integrated Models

HP ProLiant BL465c Gen8 6328 1P 16GB-R P220i Server 699047-B21	Processor(s)	(1) AMD Opteron™ 6328 (3.2GHz/8-core/16MB/115W) Processor
	Cache Memory	16MB Level 3 cache memory
	Memory	16GB (2 x 8 GB) DDR3 1333MHz RDIMMs at 1.35v NOTE: Total of 16 DIMM slots.
	Network Controller	One (1) HP FlexFabric 10Gb 2-port 554FLB FlexibleLOM
	Storage Controller	HP Smart Array P220i Controller with 512MB FBWC RAID 0,1
	Hard Drive	None ship standard Supports up to two (2) HP SFF hot-plug SAS/SATA/SDD drives
	Internal Storage	SAS: 2.4TB; SATA: 2.0TB; SAS SSD: 3.2TB; SATA SSD: 3.7TB
	Optical Drive Bay	None
	Expansion Slots	2 standard - Slot1 supports Type A mezzanine Cards. Slot 2 supports Type A and Type B mezzanine cards.
	Management	HP iLO Management Engine (standard) Optional: HP iLO Scale-Out or HP Insight Control
	Form Factor	Up to eight (8) half-height blades supported in the HP BladeSystem c3000 Enclosure Up to sixteen (16) half-height blades supported in HP BladeSystem c7000 Enclosure
	Warranty	Server warranty includes 3 year Parts, 3 year Labor, 3-year on-site support.

NOTE: This section lists some of the steps required to configure a Factory Integrated Model (configure-to-order or CTO server). To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on CTO product offerings and requirements.

NOTE: Configure-to-order server blades must start with a CTO Blade Server.

NOTE: FIO indicates that this option is only available as a factory installable option.

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

HP Models	HP ProLiant BL465c Gen8 10Gb FlexibleLOM Configure-to-order Blade Server	634975-B21
	Configurable Model ships with:	
	One (1) FlexibleLOM connector providing a choice of supported FlexibleLOMs (see Step 2)	
	One (1) HP Smart Array P220i Controller with 512MB FBWC and RAID 0 and 1 support	
	Two (2) HP small form factor hot-plug SAS/SATA/SSD hard drive bays	
	One (1) x8 PCIe I/O expansion slot (Type A)	
	One (1) x16 PCIe I/O expansion slot (Type A or Type B)	
	One (1) integrated USB connector and one (1) Micro SDHC connector	
	One (1) TPM connector	
	HP iLO Management Engine (standard)	

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

HP Processors	For single processor configuration choose:
	Core Processor Option Kits
	NOTE: The BL465c Gen8 supports one or two processors.
	NOTE: All configure-to-order processor kits (i.e. xxxxxx-L21) contain one (1) processor.
	NOTE: If two processors are desired, select one xxxxxx-L21 here in Step 2 and one xxxxxx-B21 in Step 3.
	NOTE: All processors within the server must be identical.

Configuration Information - Factory Integrated Models

NOTE: The letters "HE" following the model number denotes lower wattage.

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

Sixteen-Core Processors

HP BL465c Gen8 AMD Opteron™ 6380 (2.5GHz/16-core/16MB/115W) FIO Processor Kit	699048-L21
HP BL465c Gen8 AMD Opteron™ 6378 (2.4GHz/16-core/16MB/115W) FIO Processor Kit	699049-L21
HP BL465c Gen8 AMD Opteron™ 6376 (2.3GHz/16-core/16MB/115W) FIO Processor Kit	699050-L21
HP BL465c Gen8 AMD Opteron™ 6366HE (1.8GHz/16-core/16MB/85W) FIO Processor Kit	699056-L21

Twelve-Core Processors

HP BL465c Gen8 AMD Opteron™ 6348 (2.8GHz/12-core/16MB/115W) FIO Processor Kit	699051-L21
HP BL465c Gen8 AMD Opteron™ 6344 (2.6GHz/12-core/16MB/115W) FIO Processor Kit	699052-L21

Eight-Core Processors

HP BL465c Gen8 AMD Opteron™ 6328 (3.2GHz/8-core/16MB/115W) FIO Processor Kit	699053-L21
HP BL465c Gen8 AMD Opteron™ 6320 (2.8GHz/8-core/16MB/115W) FIO Processor Kit	699054-L21

Quad-Core Processors

HP BL465c Gen8 AMD Opteron™ 6308 (3.5GHz/4-core/16MB/115W) FIO Processor Kit	699055-L21
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HP Memory

NOTE: To realize the performance memory capabilities listed in this document, HP SmartMemory is required. For additional information, please see the HP SmartMemory QuickSpecs at:

http://h18000.www1.hp.com/products/quickspecs/14225_na/14225_na.html (Worldwide)

NOTE: HP memory from previous generation servers are not fully compatible with Smart Memory features in Gen8 Servers.

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

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

HP SmartMemory

Registered DIMMs (RDIMMs)

HP 4GB (1x4GB) Single Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647871-B21
HP 4GB (1x4GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	647873-B21
HP 8GB (1x8GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	695793-B21
HP 8GB (1x8GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647877-B21
HP 8GB (1x8GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	647879-B21
HP 16GB (1x16GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low	647883-B21

Configuration Information - Factory Integrated Models

Voltage Memory Kit	
HP 16GB (1x16GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	672633-B21

Load Reduced DIMMs (LRDIMMs)

HP 32GB (1x32GB) Quad Rank x4 PC3L-10600L (DDR3-1333) Load Reduced CAS-9 Low Voltage Memory Kit	647885-B21
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NOTE: Depending on the memory configuration and processor model, 1600MHz and 1333MHz memory may operate at a lower speed. Please see the "Memory" section later in this document and the Online Memory Configuration Tool for details at www.hp.com/go/ddr3memory-configurator.

HP Networking

FlexibleLOM Adapters

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

10/20Gb FlexibleLOM Adapters

HP FlexFabric 20Gb 2-port 630FLB FIO Adapter	700066-B21
HP FlexFabric 10Gb 2-port 554FLB FIO Adapter	684212-B21
HP Ethernet 10Gb 2-port 560FLB FIO Adapter	684214-B21
HP Flex-10 10Gb 2-port 530FLB FIO Adapter	684211-B21
HP FlexFabric 10Gb 2-port 534FLB FIO Adapter	700742-B21

NOTE: HP ProLiant BL465c Gen8 10Gb FlexibleLOM Configure-to-order Blade Server (634975-B21) must be selected in order to select one of the 10/20Gb FlexibleLOM adapters.

NOTE: HP FlexFabric 10Gb 2-port 534FLB FlexibleLOM and HP FlexFabric 20Gb 2-port 630FLB FlexibleLOM do not support iSCSI or FCoE boot from SAN on the BL465c Gen8

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

Step 3: Choose Additional Factory Integration Options

HP Insight Software	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Single Server FIO License	C6N36A
Converged Infrastructure Management Software	HP OneView with iLO Advanced - Server hardware required on same purchase order	
	HP OneView incl 3yr 24x7 Supp Bundle 1 Svr E-LTU	E5Y43AAE
	HP OneView for Blade Server incl 3yr 24x7 Supp FIO Bundle Physical 1 Svr Lic	F6Q89A
	HP OneView for Blade Server incl 3yr 24x7 Supp FIO Bundle 1 Svr E-LTU	F6Q89AAE
HP Storage Blades	HP D2220sb Configure-to-order Storage Blade	QW918A

Step 4: Choose Additional Options for Factory Integration

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

- HP BladeSystem c3000 Enclosure QuickSpecs: http://h18000.www1.hp.com/products/quickspecs/12790_na/12790_na.html

Configuration Information - Factory Integrated Models

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

- HP BladeSystem c7000 Enclosure QuickSpecs:

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

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

- HP BladeSystem c-Class Interconnect and Mezzanine Components:

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

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

NOTE: For optimal cooling and system performance the BL465c Gen8 requires the c7000 enclosure to be configured with 10 fans and the c3000 enclosure to be configured with 6 fans.

Core Options

HP Networking

10/20Gb Ethernet Mezzanine

NOTE: Each adapter requires a minimum of 2GB of server memory.

NOTE: A 10 Gigabit Ethernet adapter supports linking at 1Gbps or 10Gbps when connected to an interconnect module with 10Gb Ethernet downlinks.

NOTE: A 10 Gigabit Ethernet adapter supports linking at only 1Gbps when connected to an interconnect module with 1Gb Ethernet downlinks.

NOTE: The mezzanine adapters on each server blade connects to an interconnect in bays 3-8 (HP BladeSystem c7000 Enclosure) or bays 2-4 (HP BladeSystem c3000 Enclosure).

HP FlexFabric 20Gb 2-port 630M Adapter

700076-B21

NOTE: Please see QuickSpecs for technical specifications and additional information at: <http://www8.hp.com/h20195/v2/GetDocument.aspx?docname=c04312720>

HP Flex-10 10Gb 2-port 530M Adapter

631884-B21

NOTE: Please see QuickSpecs for technical specifications and additional information at: http://h18000.www1.hp.com/products/quickspecs/14217_na/14217_na.html.

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_na/14619_na.html

HP Flex-10 10Gb 2-port 552M Adapter

674764-B21

NOTE: Please see QuickSpecs for technical specifications and additional information at: http://h18000.www1.hp.com/products/quickspecs/14218_na/14218_na.html.

HP FlexFabric 10Gb 2-port 554M Adapter

647590-B21

NOTE: Please see QuickSpecs for technical specifications and additional information at: http://h18000.www1.hp.com/products/quickspecs/14221_na/14221_na.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_na/14478_na.html.

1Gb Ethernet Mezzanine

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_na/14335_na.html

FlexibleLOM Adapters

NOTE: The server supports one FlexibleLOM that is installed in the FlexibleLOM connector and is already included in Pre-configured Models and added per Step 2 for Factory Integrated Models. The FlexibleLOM options below are used to change these original FlexibleLOMs.

10/20Gb FlexibleLOM

HP FlexFabric 20Gb 2-port 630FLB Adapter

700065-B21

NOTE: HP FlexFabric 20Gb 2-port 630FLB FlexibleLOM does not support iSCSI or FCoE boot from SAN on the BL465c Gen8

NOTE: Please see QuickSpecs for technical specifications and additional information at: <http://www8.hp.com/h20195/v2/GetDocument.aspx?docname=c04312719>

HP Flex-10 10Gb 2-port 530FLB Adapter

656590-B21

NOTE: Please see QuickSpecs for technical specifications and additional information at: http://h18000.www1.hp.com/products/quickspecs/14216_na/14216_na.html.

HP FlexFabric 10Gb 2-port 534FLB FIO Adapter

700742-B21

NOTE: HP FlexFabric 10Gb 2-port 534FLB FlexibleLOM does not support iSCSI or FCoE boot from SAN on the BL465c Gen8

NOTE: Please see QuickSpecs for technical specifications and additional information at: <http://www8.hp.com/h20195/v2/GetDocument.aspx?docname=c04111370>

HP FlexFabric 10Gb 2-port 554FLB Adapter

647586-B21

Core Options

NOTE: Please see QuickSpecs for technical specifications and additional information at: http://h18000.www1.hp.com/products/quickspecs/14219_na/14219_na.html.

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_na/14331_na.html

HP Fibre Channel

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: http://h18000.www1.hp.com/products/quickspecs/14338_na/14338_na.html

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

NOTE: Please see QuickSpecs for technical specifications and additional information at: http://h18000.www1.hp.com/products/quickspecs/14230_na/14230_na.html

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

NOTE: Please see QuickSpecs for technical specifications and additional information at: http://h18000.www1.hp.com/products/quickspecs/14622_na/14622_na.html

HP Processors

NOTE: The BL465c Gen8 supports one or two processors.

NOTE: All processors within the server must be identical.

NOTE: The letters "HE" following the model number denotes lower wattage.

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

Sixteen-Core Processors

HP BL465c Gen8 AMD Opteron™ 6380 (2.5GHz/16-core/16MB/115W) Processor Kit 699048-B21

HP BL465c Gen8 AMD Opteron™ 6378 (2.4GHz/16-core/16MB/115W) Processor Kit 699049-B21

HP BL465c Gen8 AMD Opteron™ 6376 (2.3GHz/16-core/16MB/115W) Processor Kit 699050-B21

HP BL465c Gen8 AMD Opteron™ 6366HE (1.8GHz/16-core/16MB/85W) Processor Kit 699056-B21

Twelve-Core Processors

HP BL465c Gen8 AMD Opteron™ 6348 (2.8GHz/12-core/16MB/115W) Processor Kit 699051-B21

HP BL465c Gen8 AMD Opteron™ 6344 (2.6GHz/12-core/16MB/115W) Processor Kit 699052-B21

Eight-Core Processors

HP BL465c Gen8 AMD Opteron™ 6328 (3.2GHz/8-core/16MB/115W) Processor Kit 699053-B21

HP BL465c Gen8 AMD Opteron™ 6320 (2.8GHz/8-core/16MB/115W) Processor Kit 699054-B21

Quad-Core Processors

HP BL465c Gen8 AMD Opteron™ 6308 (3.5GHz/4-core/16MB/115W) Processor Kit 699055-B21

HP Memory

NOTE: To realize the performance memory capabilities listed in this document, HP SmartMemory is required. For additional information, please see the HP SmartMemory QuickSpecs at:

http://h18000.www1.hp.com/products/quickspecs/14225_na/14225_na.html (Worldwide)

NOTE: HP memory from previous generation servers are not fully compatible with Smart Memory features in Gen8 Servers.

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

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

HP SmartMemory

Registered DIMMs (RDIMMs)

HP 4GB (1x4GB) Single Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit 647871-B21

Core Options

HP 4GB (1x4GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	647873-B21
HP 8GB (1x8GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	695793-B21
HP 8GB (1x8GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647877-B21
HP 8GB (1x8GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	647879-B21
HP 16GB (1x16GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647883-B21
HP 16GB (1x16GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	672633-B21

Load Reduced DIMMs (LRDIMMs)

HP 32GB (1x32GB) Quad Rank x4 PC3L-10600L (DDR3-1333) Load Reduced CAS-9 Low Voltage Memory Kit	647885-B21
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NOTE: Depending on the memory configuration, 1600MHz and 1333MHz memory may operate at a lower speed. Please see the "Memory" section later in this document and the Online Memory Configuration Tool for details at:

www.hp.com/go/ddr3memory-configurator.

HP Hard Drives

NOTE: The ProLiant BL465c Gen8 server includes the new HP hot-plug small form factor (SFF) SmartDrive carrier for enhanced management and reduced maintenance errors. HP drives from previous generation servers are not compatible with the BL465c Gen8 drive bays.

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

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

NOTE: The hard drive options are not required when configuring a drive-less model.

NOTE: The HP Smart Array P220i supports 6G SAS and 3G SATA data transfer rates. 12G SAS and 6G SATA drives will negotiate to the maximum data transfer rate supported by the controller.

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
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NOTE: This drive supports Gen8 servers only.

HP 80GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Boot 3yr Wty Solid State Drive	734360-B21
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6G SATA Value Endurance Hot Plug SFF (2.5-inch) Enterprise Value Solid State Drives

HP 800GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	717973-B21
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HP 600GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	739898-B21
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HP 480GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	717971-B21
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Core Options

HP 480GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty M1 Solid State Drive	764927-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

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

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://h18000.www1.hp.com/products/quickspecs/13021_na/13021_na.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

6G SAS (2.5-inch) 512e SC HDD

HP 1TB 12G SAS 7.2K rpm SFF (2.5-inch) SC 512e 1yr Warranty Hard Drive	765464-B21
HP 2TB 12G SAS 7.2K rpm SFF (2.5-inch) SC 512e 1yr Warranty Hard Drive	765466-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

6G SATA VE Hot Plug SFF (2.5-inch) SC EV G1 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 480GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty G1 Solid State Drive	756657-B21
HP 240GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty G1 Solid State Drive	756636-B21
HP 120GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty G1 Solid State Drive	756621-B21

6G SATA LE Hot Plug SFF (2.5-inch) SC EL G1 Solid State Drives

HP 960GB 6G SATA Light Endurance SFF 2.5-in SC Enterprise Light 3yr Wty G1 Solid State Drive	756601-B21
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Core Options

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
HP 600GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	759212-B21
HP 450GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	759210-B21
HP 300GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	759208-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_na/12244_na.html.

12G SAS Write Intensive SFF (2.5-inch) SC 3yr Wty H2 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

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 200GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691864-B21
HP 100GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691862-B21

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

6G SATA Read Intensive (2.5-inch) SC G2 Solid State Drive

HP 240GB 6G SATA Read Intensive SFF 2.5-in SC 3yr Wty Solid State Drive	789135-B21
HP 480GB 6G SATA Read Intensive SFF 2.5-in SC 3yr Wty Solid State Drive	789145-B21
HP 960GB 6G SATA Read Intensive SFF 2.5-in SC 3yr Wty Solid State Drive	789155-B21

12G SAS SFF (2.5-inch) SC ENT HDD

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

Core Options

12G SAS ME SFF (2.5-inch) SC Enterprise Mainstream H2 Solid State Drives

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 HE SFF (2.5-in) SC Enterprise Performance Solid State Drive

HP 800GB 12G SAS High Endurance SFF 2.5-in SC Enterprise Performance 3yr Wty Solid State Drive	741159-B21
HP 400GB 12G SAS High Endurance SFF 2.5-in SC Enterprise Performance 3yr Wty Solid State Drive	741155-B21
HP 200GB 12G SAS High Endurance SFF 2.5-in SC Enterprise Performance 3yr Wty Solid State Drive	741151-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

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

Additional Options

HP Insight software

HP Insight Control

HP Insight Control including 1yr 24x7 Technical Support and Updates Single Server License C6N27A

HP Insight Control Server Provisioning Media Kit BD883A

HP Insight Management Media Kit C6N31A

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

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

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

NOTE: Licenses ship without media. The HP Insight Management Media Kit can be ordered separately, or can be downloaded at:

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

NOTE: For additional license kits, please see the QuickSpecs at:

http://h18004.www1.hp.com/products/quickspecs/12631_na/12631_na.html

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

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

HP iLO Advanced for BladeSystem including 1yr 24x7 Support Eight Server License 512489-B21

HP Integrated Lights-Out (iLO)

HP iLO Scale Out

HP Integrated Lights-Out Scale-Out 3yr 24x7 Tech Support and Updates Flex Quantity License BD776A

HP Integrated Lights-Out Scale-Out 1yr 24x7 Tech Support and Updates Flex Quantity License BD778A

HP Integrated Lights-Out Scale-Out including 3yr 24x7 Tech Support and Updates Flex Qty E-LTU BD776AAE

HP Integrated Lights-Out Scale-Out including 1yr 24x7 Tech Support and Updates Flex Qty E-LTU BD778AAE

HP Integrated Lights-Out Scale-Out including 3yr 24x7 Tech Support and Updates Tracking License BD777A

HP Integrated Lights-Out Scale-Out including 1yr 24x7 Tech Support and Updates Tracking License BD779A

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

NOTE: For additional license kits, including electronic delivery options, please see the iLO QuickSpecs at <http://www.hp.com/go/iLO>

Converged Infrastructure Management Software

HP OneView

HP OneView with iLO Advanced

HP OneView incl 3yr 24x7 Supp Phys 1 Svr Lic E5Y34A

HP OneView incl 3yr 24x7 Supp Flex Qty E-LTU E5Y35AAE

Additional Options

HP OneView Media Kit Phys No Lic E5Y37A

HP OneView without iLO Advanced

HP OneView w/o iLO Adv incl 3yr 24x7 Supp Phys 1 Svr Lic E5Y38A

HP OneView w/o iLO Adv inc 3yr 24x7 Supp Flex Qty E-LTU E5Y39AAE

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

High Performance Clusters

HP Cluster Management Utility

HP Insight Cluster Management Utility 1yr 24x7 Flexible License QL803B

HP Insight Cluster Management Utility 3yr 24x7 Flexible License BD476A

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

HP Insight Cluster Management Utility Media BD477A

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

HP I/O Accelerator Options

HP 1.2TB Multi Level Cell IO Accelerator for BladeSystem c-Class QK763A

HP 785GB Multi Level Cell IO Accelerator for BladeSystem c-Class QK762A

HP 365GB Multi Level Cell IO Accelerator for BladeSystem c-Class QK761A

HP 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

HP Security

HP Trusted Platform Module Option 488069-B21

NOTE: The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008 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 and 2012 has not been tampered with while the system was offline.

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

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

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

HP Storage Controllers

HP Smart Array P731m Controller

HP Smart Array P731m/2GB FBWC 6Gb 4-ports Ext Mezzanine SAS Controller 698535-B21

HP Smart Array P731m/512 FBWC 6Gb 4-ports Ext Mezzanine SAS Controller 698536-B21

NOTE: This option is a Type B mezzanine and is only supported on mezzanine slot 2.

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

Additional Options

http://h18000.www1.hp.com/products/quickspecs/14626_na/14626_na.html.
(Smart Array P731m Controller)

HP Smart Array P721m Controller

HP Smart Array P721m/2GB FBWC 6Gb 4-ports Ext Mezzanine SAS Controller 650072-B21

HP Smart Array P721m/512 FBWC 6Gb 4-ports Ext Mezzanine SAS Controller 655636-B21

NOTE: This option is a Type B mezzanine and is only supported on mezzanine slot 2.

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

http://h18000.www1.hp.com/products/quickspecs/14404_na/14404_na.html.
(Smart Array P721m Controller)

HP InfiniBand Mezzanines

NOTE: When an InfiniBand adapter is installed in mezzanine slot 1, only one port is active (regardless of operating mode). When installed in any other mezzanine slot, both ports are active.

NOTE: On PCIe 2.0 based servers like BL465 Gen8, InfiniBand FDR speeds are not feasible.

NOTE: InfiniBand QDR and FDR speeds are only supported on the HP BladeSystem c7000 Enclosure. For additional information, please see the HP BladeSystem c7000 Enclosure and InfiniBand QuickSpecs at:

http://h18004.www1.hp.com/products/quickspecs/12586_na/12586_na.html

http://h18000.www1.hp.com/products/quickspecs/13078_na/13078_na.html

HP Infiniband QDR/Ethernet 10Gb 2-port 544M Adapter 644160-B21

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

HP Infiniband FDR/Ethernet 10Gb/40Gb 2-port 544M Adapter 644161-B22

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

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

HP Ultrium Tape Blades

HP StoreEver LTO-4 Ultrium SB1760c Tape Blade AQ697B

NOTE: LTO-4 Ultrium tape technology.

HP StoreEver LTO-5 Ultrium SB3000c Tape Blade BS580B

NOTE: LTO-5 Ultrium tape technology.

NOTE: For the above Ultrium tape drives, please see the QuickSpecs for technical specifications and additional information at:

http://h18000.www1.hp.com/products/quickspecs/12729_na/12729_na.html

HP Storage Blades

HP D2200sb PCIe Storage Blade AP880A

NOTE: Please see the QuickSpecs for technical specifications and additional information at: <http://h18006.www1.hp.com/storage/bladefsystem/index.html>.

HP D2220sb PCIe and StoreVirtual VSA Bundle QW914A

HP D2220sb PCIe w/(12) 900 GB 6G SAS HDD Bundle QW915A

HP D2220sb Build-to-order Storage Blade QW917A

NOTE: For additional information, please see the QuickSpecs for technical specifications and additional information at:

http://h18000.www1.hp.com/products/quickspecs/14507_na/14507_na.html

HP Expansion Blade

HP BLc PCI Expansion Blade 448018-B21

NOTE: The PCI Expansion Blade provides PCI card slots for an adjacent c-Class Server Blade. Order one PCI expansion Blade for each server blade needing standard PCI-X or PCIe expansion slots.

NOTE: Ships with one pre-installed PCI-X connect board. Also includes one PCIe

Additional Options

connect board which requires installation.

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

http://h18000.www1.hp.com/products/quickspecs/12753_na/12753_na.html

HP Flash Media Kits for USB Drives

HP Enterprise Mainstream Flash Media Kits for Memory Cards

HP 8GB USB Enterprise Mainstream Flash Media Drive Key Kit	737953-B21
HP 8GB microSD Enterprise Mainstream Flash Media Kit	726116-B21
HP 32GB microSD Enterprise Mainstream Flash Media Kit	700139-B21

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

http://h18000.www1.hp.com/products/quickspecs/13971_na/13971_na.html

HP Care Pack Services

Proactive Care - Collaborative Support plus Proactive services delivered by the on shore/near shore Advanced Solution Center (ASC) and backed by the global delivery organization, end-to-end case ownership from a Technical Solution Specialists and Technical Account Manager who remotely delivers firmware/software revision management, proactive scans and incident trend reports. Recommended for customers running a virtualized infrastructure and/or customers who desire an enhanced call support experience.

HP 3 year 6hr Call To Repair 24x7 with Defective Media Retention ProLiant BL4xxc Proactive Care SVC	U3B23E
HP 3 year 4 hour 24x7 ProLiant BL4xxc Proactive Care Service	U3B14E
HP 3 year 4 hour 24x7 with Defective Media Retention ProLiant BL4xxc Proactive Care Service	U3B17E
HP 3 year 6 hour Call To Repair 24x7 ProLiant BL4xxc Proactive Care Service	U3B20E

Proactive Care Personalized Support Environmental Option - to add an onsite Account Support Manager (ASM) to Proactive Care. ASM is an assigned resource who delivers support planning and brings technical expertise and best practices advice for the customer's environment.

HP 3 year ISS ProactiveCare Personalized Support	U6W98E
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Installation Services - reduce the time required to get your system up and running and help minimize disruptions to your business.

HP Install c-Class Server Blade Service	UE493E
HP Hardware Installation during Non Standard Hours c-Class Server Blade Service	UG869E

NOTE: Additional HP 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 DDR3 Memory Configuration Tool:
www.hp.com/go/ddr3memory-configurator

Memory Subsystem Architecture

The memory subsystem in this server blade is divided into four memory channels that support two DIMMs each for a total of eight (8) DIMM per installed processor or a grand total of sixteen (16) DIMMs for the server. Up to 32GB capacity DIMMs are supported for 512GB of memory (16 DIMM slots x 32GB per DIMM).

Memory Population Rules and Guidelines:

- A minimum of one DIMM per processor is required.
- 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.
- To maximize performance, it is recommended to balance the total memory capacity between all installed processors and to load the channels similarly whenever possible.
- RDIMMs operating at either 1.35V or 1.5V may be mixed in any order, but the system will power them at the higher voltage.
- RDIMMs and LRDIMMs cannot be mixed.
- DIMMs of different speeds may be mixed in any order; the server will select a common optimal speed.
- The maximum memory speed is a function of the memory type, memory configuration, and processor model.
- The maximum memory capacity is a function of the memory type and number of installed processors.
- HP memory from previous generation servers is not compatible with the BL465c Gen8 Server Blade.
- To realize the performance memory capabilities listed in this document, HP SmartMemory is required. For additional information, please see the HP SmartMemory QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/14225_na/14225_na.html.
- For memory population rules and additional memory guidelines, please see the BL465c Gen8 user guide at
<http://www.hp.com/support>.

NOTE: Mixing 1.25V and 1.5V DIMMs is not allowed. Mixing DIMMs with different voltage levels will result in the higher voltage level being used resulting in higher power consumption.

BL465c Gen8 Supported Memory Bandwidth								
DIMM Type	Registered DIMMS (RDIMMs)							Load Reduced (LRDIMMs)
DIMM Rank	Single Rank (1R)		Dual Rank (2R)	Single Rank (1R)	Dual Rank (2R)	Dual Rank (2R)	Dual Rank (2R)	Quad Rank (4R)
DIMM Capacity	4GB	4GB	8GB	8GB	8GB	16GB	16GB	32GB
DIMM Native Speed (MHz)	1333	1600	1333	1600	1600	1333	1600	1066
Voltage ¹	LV	Std	LV	Std	Std	LV	Std	LV
¹ ULV= low voltage at 1.25V; LV= low voltage at 1.35V; Std = standard voltage at 1.5V.								
SLOTS THAT CAN BE POPULATED								
16 slot servers	16	16	16	16	16	16	16	16
MAXIMUM CAPACITY (GB) ¹								
16 slot servers	64	64	128	128	128	256	256	512
POPULATED DIMM SPEED (MHz)								

Memory

1 DIMM Per Channel	1333	1600	1333	1600	1600	1333	1600	1333
2 DIMM Per Channel	1333	1600	1333/ 1066	1600	1600	1333/ 1066	1600	1333

¹ Maximum capacity will vary based on individual server platform.

NOTE: Maximum memory speed is a function of the processor bus speed; see the table below "Memory Speed by Processor Model".

Memory Speed by Processor Model

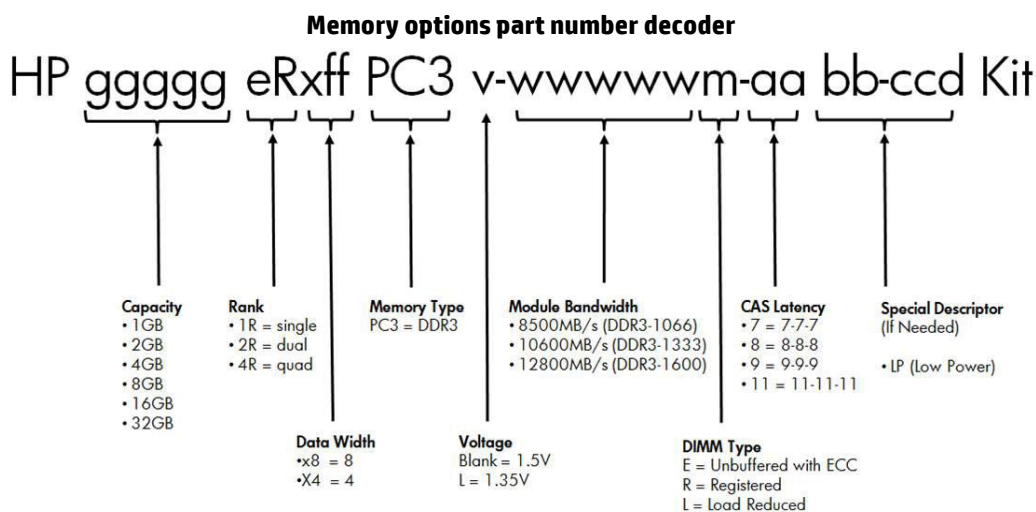
Processor Models	Supported Memory Speeds
AMD Opteron™ 6300 Series processors	1600/1333/1066MHz

Standard and Maximum Memory Capacity (Pre-configured Models)

Pre Configured Models	Standard Memory	Maximum Memory Plus Optional Memory	Standard Memory Replaced with Optional Memory
AMD Opteron 6328, 6344, 6380	16GB (2x 8GB)	192GB (8x 8GB + 8x 16GB)	512GB (16x 32GB)

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



Following are memory options available from HP:

HP Memory

HP SmartMemory

Registered DIMMs (RDIMMs)

HP 16GB (1x16GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit 647883-B21

HP 16GB (1x16GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 672633-B21

Memory

Memory Kit

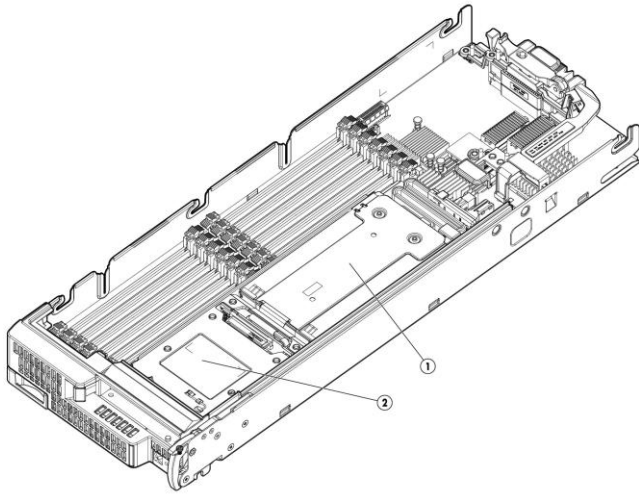
HP 8GB (1x8GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	695793-B21
HP 8GB (1x8GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	647879-B21
HP 8GB (1x8GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647877-B21
HP 4GB (1x4GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	647873-B21
HP 4GB (1x4GB) Single Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647871-B21

Load Reduced DIMMs (LRDIMMs)

HP 32GB (1x32GB) Quad Rank x4 PC3L-10600L (DDR3-1333) Load Reduced CAS-9 Low Voltage Memory Kit	647885-B21
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NOTE: Depending on the memory configuration, 1600MHz and 1333MHz memory may operate at a lower speed. Please see the [Online Memory Configuration Tool](http://www.hp.com/go/ddr3memory-configurator) for details at www.hp.com/go/ddr3memory-configurator

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)	<p>Maximum: all processors, 16 DIMMs, hard drives, mezzanine cards, and two flash cache batteries installed 14.00 lb (6.33 kg)</p> <p>Minimum: one processor and 2 DIMMs installed 10.50 lb (4.75 kg)</p>
	Power Specifications	<p>For power specifications including input requirements, BTU rating, and power supply output, please see the:</p> <ul style="list-style-type: none"> HP BladeSystem c3000 Enclosure QuickSpecs at http://h18000.www1.hp.com/products/quickspecs/12790_na/12790_na.html. HP BladeSystem c7000 Enclosure QuickSpecs at http://h18000.www1.hp.com/products/quickspecs/12810_na/12810_na.html. <p>NOTE: For optimal cooling and system performance the BL465c Gen8 requires the c7000 enclosure to be configured with 10 fans and the c3000 enclosure to be configured with 6 fans.</p> <p>To review typical system power ratings use the HP Power Advisor which is available via the online tool located at: www.hp.com/go/hppoweradvisor.</p>
System Inlet Temperature	Operating	<p>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.</p> <p>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.</p>
	Non-operating	<p>System performance may be reduced if operating with a fan fault or above 30°C (86°F).</p> <p>-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).</p>
Relative Humidity (non-condensing)	Operating	<p>10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.</p>
	Non-operating	<p>5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.</p>
Altitude	Operating	<p>3,050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1,500 ft/min).</p>
	Non-operating	<p>9,144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1,500 ft/min).</p>

Technical Specifications

Acoustic Noise

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

HP BladeSystem c3000 Enclosure QuickSpecs:

http://h18000.www1.hp.com/products/quickspecs/12790_na/12790_na.html

HP BladeSystem c7000 Enclosure QuickSpecs:

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

HP Smart Array P220i Controller

Disk Drive Interface

6Gb/s SAS (Serial Attached SCSI)

Server Interface

x4 PCI Express host interface

Cache Memory

512MB flash backed write cache (FBWC) cache standard

Logical Drives Supported

64 (with included 512MB cache)

Host Memory Addressing

64-bit, supporting servers memory space greater than 4GB

RAID Support

RAID 1 (mirroring) and RAID 0 (striping)

Other

Upgradeable firmware with recovery ROM
Online drive flash (with SAS drives)

HP FlexFabric 10Gb 2-port 554FLB FlexibleLOM

Type

Integrated dual-port KR 10Gb FlexibleLOM with FlexFabric (Flex-10, FCoE, hardware-based iSCSI, iSCSI boot, TCP/IP offload engine, and autosensing 1Gb/10Gb Ethernet capability)

Network Processor

Emulex BE3

Data Transfer Method

x8 PCI Express 2.0

Network Transfer Rate

Two ports, each at 20Gbps full duplex; 40Gbps aggregate full duplex theoretical bandwidth

NOTE: Each port is autosensing 1Gb/10Gb, and can interoperate with 1Gb HP BladeSystem c-Class interconnect components. Both ports will operate at the same speed.

NOTE: Each port on the 554FLB adapter transmits from the server at 20Gbps (theoretical) full duplex.

IEEE Compliance

802.1p, 802.1q, 802.1qau, 802.3ad, 802.3ae, 802.3ap (10GBase-KX4) and 802.3x

Standard Features

ProLiant Teaming including Network Fault Tolerance, Transmit Load Balancing, and Switch-Assisted Load Balancing
9K Jumbo frames (4K Jumbo frames when in FCoE mode)
Microsoft Windows Receive Side Scaling (RSS)
Hardware-based accelerated iSCSI
iSCSI boot
Flex-10 capability
Fibre Channel over Ethernet (FCoE)
TCP/IP offload engine (stateless TCP/IP)
Autosensing 1Gb/10Gb Ethernet

Environment-friendly Products and Approach

End-of-life Management and Recycling

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

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment

Technical Specifications

facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/green>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

Summary of Changes

Date	Version History	Action	Description of Change:
30-Mar-2015	From Version 25 to 26	Added	Skus Added: <ul style="list-style-type: none"> • 802578-B21 • 802582-B21 • 802586-B21 • 802891-B21 • 765453-B21 • 765455-B21 • 765464-B21 • 781518-B21 • 785069-B21 • 765466-B21 • 789135-B21 • 789145-B21 • 789155-B21 • 794603-B21 • 794605-B21 • 781516-B21 • 785067-B21
		Removed	Obsolete skus deleted: <ul style="list-style-type: none"> • 741146-B21 • 741138-B21 • 741142-B21
09-Feb-2015	From Version 24 to 25	Changed	Overview, Standard Features, Optional Features and Core Options sections were updated
		Added	HDD SSD 6G and 12G: <ul style="list-style-type: none"> • 779164-B21 • 779168-B21 • 779172-B21 • 779176-B21 • 764923-B21 • 764925-B21 • 764927-B21 • 764929-B21
		Removed	Obsolete skus deleted: <ul style="list-style-type: none"> • 686868-B21 • 634970-B21 • 660080-B21 • 634973-B21 • 686870-B21 • 634978-B21 • 660081-B21 • 634983-B21 • 660079-B21 • 686869-B21 • 697574-B21
01-Dec-2014	From Version 23 to 24	Changed	Standard Features and Memory sections were updated
		Added	SKU Added on Hard Drives: 757339-B21
		Removed	Obsolete skus deleted: 647869-B21
01-Nov-2014	From Version 22 to 23	Changed	Service and Support section was updated
29-Sep-2014	From Version 21 to 22	Added	Skus added on Core Options: <ul style="list-style-type: none"> • 764923-B21 • 764925-B21 • 764927-B21 • 764929-B21 • 756657-B21 • 756636-B21 • 756621-B21 • 756601-B21
		Removed	Obsolete skus were deleted: <ul style="list-style-type: none"> • 608447-B21
18-Aug-2014	From Version 20 to 21	Changed	Maximum Internal Storage, Configuration Information - Factory Integrated Models sections updated
		Added	SKUs added on Hard Drives: <ul style="list-style-type: none"> • 759212-B21 • 759210-B21 • 759208-B21
		Removed	Maximum Internal Storage section deleted from Storage Obsolete SKUs removed:

Summary of Changes

			<ul style="list-style-type: none"> • 647875-B21 • 647881-B21
03-Jul-2014	From Version 19 to 20	Added	FlexFabric Adapters were added: <ul style="list-style-type: none"> • 700065-B21 • 700066-B21 • 700076-B21
10-Jun-2014	From Version 18 to 19	Changed	Overview, Standard Features, Models, Configuration Information, Core Options, Additional Information and Storage sections were updated
31-Mar-2014	From Version 17 to 18	Changed	Processors in Configuration Information and HP Insight Control were revised.
18-Feb-2014	From Version 16 to 17	Changed	Processors, Storage Controllers, InfiniBand Mezzanines, and Care Pack Services were revised.
13-Dec-2013	From Version 15 to 16	Changed	HP OneView and Converged Infrastructure Management Software were added Models, Processors, Hard Drives, Storage Blades, and HP Flash Media Kits for USB Drives were revised
13-Sep-2013	From Version 14 to 15	Changed	HP Insight management software, High Performance Clusters, HP Networking, HP Fibre Channel, Hard Drives, Storage Controllers, and Storage Blades were revised.
13-May-2013	From Version 13 to 14	Changed	Changes were made in the following sections: Configuration Information - Step 3 Additional Options - HP Insight Control, HP InfiniBand Mezzanines, HP Storage Blades, HP Care Pack Services
25-Mar-2013	From Version 12 to 13	Added	Standard Features: Added notes to the At A Glance section. Configuration Information - Factory Integrated Models: Added notes to Step 4
		Removed	Removed Platinum reference throughout QS
01-Mar-2013	From Version 10 to 11	Added	Core Options: Added Part number 665246-B21 to HP Networking section.
25-Feb-2013	From Version 9 to 10	Changed	Changes were made in the following sections: Standard Features Core Options - HP Networking, HP Hard Drives Additional Options - HP Insight Control, HP InfiniBand Mezzanines Memory Chart Storage
18-Jan-2012	From Version 8 to 9	Changed	Changes were made in the following sections: Overview- Processor Core Options - HP Fibre Channel, HP Memory Additional Options - HP Storage Controllers, HP InfiniBand Mezzanines
12-Dec-2012	From Version 7 to 8	Changed	Changes were made to the North America and Canada versions only.
04-Dec-2012	From Version 6 to 7	Changed	Changes were made throughout the QuickSpecs.
28-Sep-2012	From Version 5 to 6	Changed	Changes were made in Options and Memory sections.
24-Sep-2012	From Version 4 to 5	Changed	Changes were made in Standard Features, Optional Features, Additional Options and Technical Specifications sections.
31-Aug-2012	From Version 3 to 4	Changed	Changes made in Overview, Configuration Information, Core Options, Additional Options and Memory.
13-Aug-2012	From Version 2 to 3	Changed	Changes made in Overview, Configuration Information, Core Options, Additional Options and Memory.
03-Aug-2012	From Version 1 to 2	Changed	Changes made to the North America and Canada versions only.

Summary of Changes

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