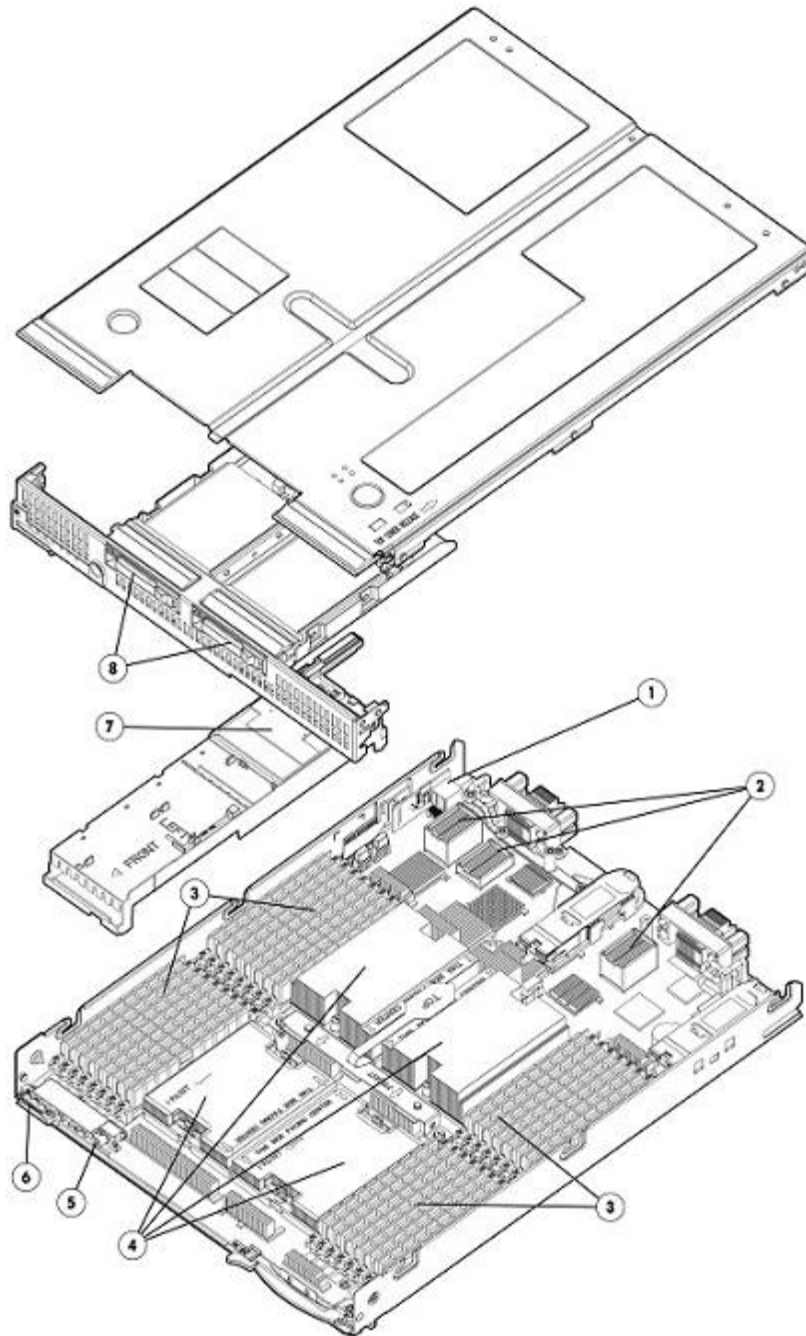


Overview

HP ProLiant BL685c Gen7 Server Blade



HP ProLiant BL685c G7 Server Blade

1. Internal USB connector/
Internal MicroSD card slot
2. Three (3) mezzanine I/O expansion slots
3. Thirty-two (32) DDR3 DIMM memory slots
4. Up to four (4) Multi-Core AMD Opteron™ 6300 Series
processors
5. System power button and LED
6. Local I/O Connector
7. Smart Array P410i storage controller (available as an option in
factory integrated models)
8. Two (2) small form factor (SFF) hot plug drive bays

Standard Features

This document covers the HP ProLiant BL685c G7 server blade only. For more information on HP BladeSystem c-Class Enclosures and HP BladeSystem c-Class Interconnect and Mezzanine Components, please see the following:

- HP BladeSystem c3000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12790_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 Platinum 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>
<http://h18004.www1.hp.com/products/blades/components/c-class-adapters.html>

NOTE: For optimal cooling and system performance the BL685c G7 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

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

12MB or 16MB Level 3 cache memory

Chipset

AMD SR5690 and SP5100

Upgradeability

Upgradeable to quad (4) processors

NOTE: The HP ProLiant BL685c G7 only supports two (2) and four (4) processor configurations.

Integrated Manageability

HP Integrated Lights-Out 3 (iLO 3)

Memory

Type	DDR3 Registered (RDIMM)
Standard (depending on model)	64GB (16 x 4GB)

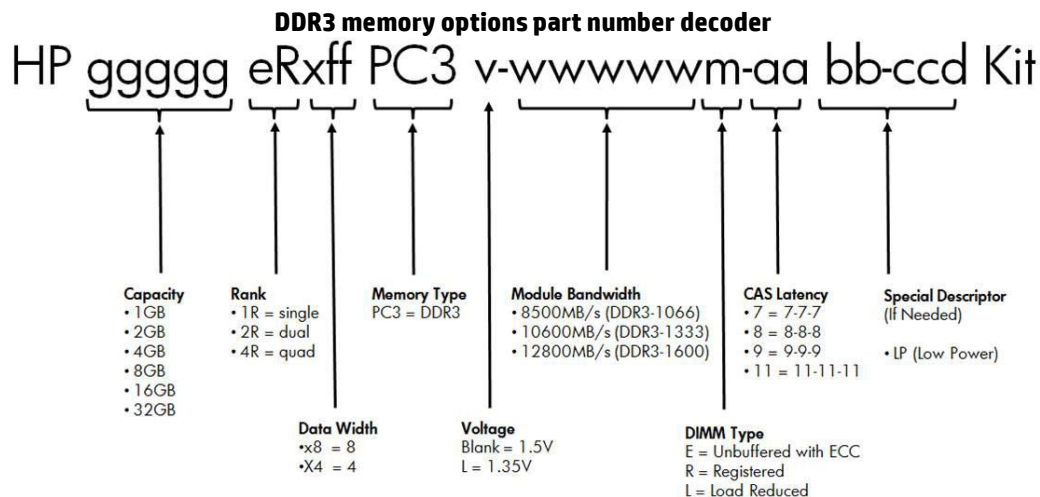
Standard Features

Maximum (RDIMM) 1TB (32 x 32GB) at 1066MHz or at 800MHz

Maximum (LRDIMM) 1TB (32 x 32GB) at 1333MHz

NOTE: Depending on the memory configuration, the memory speed may run at 1600MHz, 1333MHz, 1066MHz, or 800MHz. Please see Memory Population Table or the Online Memory Configuration Tool at: <http://www.hp.com/go/ddr3memory-configurator>

NOTE: Kits described as PC3L include Low Voltage DIMMs. For more information on ProLiant Energy Efficient Features, see: <http://www.hp.com/go/ddr3memory-configurator>



Network Controller Two (2) integrated NC551i Dual Port FlexFabric 10Gb Converged Network Adapters supporting stateless TCP/IP offload, TCP Offload Engine (TOE), Fibre Channel over Ethernet (FCoE) and iSCSI protocols
NOTE: Flex-10 capability requires the use of an HP Virtual Connect Flex-10 10Gb Ethernet module. Learn more at: <http://www.hp.com/go/virtualconnect>.
NOTE: Fibre Channel over Ethernet (FCoE) capability requires the use of an HP Virtual Connect FlexFabric 10GB/24-port Module or HP 10GbE Pass-Thru Module.
NOTE: Each port is autosensing 1 Gb / 10 Gb, and can interoperate with 1 Gb HP BladeSystem c-Class interconnect components. Both ports will operate at the same speed
 One (1) additional 10/100 network adapter dedicated to iLO 3 Management

I/O Expansion Slots Three (3) I/O expansion mezzanine slots (All x8 PCIe 2.0)

Storage Controller HP Smart Array P410i 1GB memory module with flash backed write cache (FBWC). Supports RAID 0,1.
 Controller
NOTE: The HP Smart Array P410i controller is required for all blades that support hot plug drives. See Factory Integrated Models section for more information.
NOTE: The HP Smart Array P410i supports 6G SAS and 3G SATA data transfer rates.

Maximum Internal Storage One of the following depending on Model

Hot Plug SAS	2.4TB SAS (2 x 1.2TB)
Hot Plug SATA	2.0TB SATA (2 x 1.0TB)
Hot Plug SATA SSD	3.2TB SATA SSD (2 x 1.6TB)
Hot Plug SAS SSD	3.2TB SAS SSD (2 x 1.6TB)

NOTE: SAS, SATA, and/or SSD drives cannot be mixed within the server.

Industry Standard Compliance

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

Standard Features

USB 2.0 Support

Operating Systems and Virtualization Software

[Microsoft Windows Server](#)
[Red Hat Enterprise Linux \(RHEL\)](#)
[SUSE Linux Enterprise Server \(SLES\)](#)
[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, including how to purchase from HP, please visit our OS Support Site at: <http://www.hp.com/go/ossupport> and our driver download page: <http://www.hp.com/support/BL685cG7>.

Enclosures

HP offers two (2) different c-Class server blade enclosures to meet your individual needs:

- The HP BladeSystem c7000 rack enclosure is 10U high and holds up to eight (8) ProLiant BL685c G7 servers plugged vertically.
- The HP BladeSystem c3000 rack enclosure is 6U high and holds up to four (4) HP ProLiant BL685c G7 servers plugged horizontally.

Server blades, storage blades, and interconnect modules are all designed to fit into the c7000 and c3000 enclosures.

For additional enclosure information, please see:

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

NOTE: For optimal cooling and system performance the BL685c G7 requires the c7000 enclosure to be configured with 10 fans and the c3000 enclosure to be configured with 6 fans.

Graphics

Integrated ATI RN-50 1280 x 1024 x 16M color

Resolution Color	Depths 1280 x 1024, 16.7M, 64k, 256, 16
Depths	1024 x 768, 16.7M, 64k, 256, 16
	800 x 600, 16.7M, 64k, 256, 16
	640 x 480, 16.7M, 64k, 256, 16

Form Factor

HP ProLiant BL685c G7 is a single-wide, full-height server blade that plugs into the HP BladeSystem c3000 and c7000 enclosures.

HP Insight management software

HP Service Pack for ProLiant

HP Service Pack for ProLiant is an enhanced, re-packaging of ProLiant systems software and firmware, but is still based on the rich legacy of ProLiant Support Packs (PSPs) and HP Smart Update Firmware DVD that are originally found in the Insight Foundation suite for ProLiant. It is a comprehensive systems software and firmware release offered as a tested solution on all ProLiant servers supported by Insight Foundation version 8.70. It evolves beyond separate installation of HP PSPs and the HP Smart Update Firmware DVD by providing a single image that combines both of these products. It offers combined firmware and systems software packaging and improved processes for drivers, utilities, agents, non agents, and other utilities that are required to keep pace in today's rapidly expanding technology infrastructure.

Main or base releases for HP Service Pack for ProLiant are planned approximately 3 times a year, but look for interim update releases that will capture hot fixes released between main releases. HP Service Pack for ProLiant is supported on all HP ProLiant SL/ML/DL 100, 300, 500, 700, and 900 servers and BladeSystems series servers that are supported with Insight Foundation version 8.70 and will supersede and replace Insight Foundation. It is downloadable from: http://www.hp.com/go/server/service_packs/updates as a web only release and is not available on media.

The first release of HP Service Pack for ProLiant is Version 2011.06.0. It contains the

Standard Features

first comprehensive collection of firmware and system software components, all tested together that include drivers, agents, non-agents, utilities, firmware packages for servers, controllers, storage, blades, enclosures, and all components and options supported by HP ProLiant Support Packs for Windows and Linux version 8.70. Additionally, VMware offline firmware updates will be included.

More information can be found at this link for HP Service Pack for ProLiant: http://www.hp.com/go/server/service_packs

HP Insight Foundation

Insight Foundation is being baselined at version v8.70 which means the following:

- Its Media Kit (contains 2 SmartStart CDs, the Firmware DVD, and the Management DVD) will continue to ship with all supported ProLiant G7 or earlier BTO servers until the last supported server is no longer shipping.
- The Media Kit will not be updated past version 8.70.
- ProLiant G7 or earlier CTO servers are able to order the Media Kit with the understanding that the media is not updated. Please check specific server QuickSpecs for availability of CTO Kit.
- PSP and Firmware DVD downloads will be updated through 2Q 2012 at the HP Insight Foundation Suite for ProLiant downloads tab: <http://www.hp.com/go/foundation>

Customers are urged to use the replacement product, HP Service Pack for ProLiant, instead of Insight Foundation Suite which is found at these location:

- <http://www.hp.com/go/spp>
- <http://www.hp.com/go/spp/download>

Security

- Power-on password
- Administrator's password
- Integrated Lights-Out 3 with:
 - 12 customizable user accounts
 - 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
 - Disable via a global setting
- Keyboard password
- External USB port enable/disable
- Network server mode
- Serial interface control
- TPM (Trusted Platform Module) 1.2 option

Availability

Dual-Port Fibre Channel Mezzanine Card for redundant SAN connection
Two (2) embedded dual-port 10Gb Converged Network Adapters for redundant LAN connections
Two (2) hot-plug SAS/SATA/SSD drive bays and integrated RAID (Smart Array P410i) controller with flash backed write cache
Redundant ROM on each server blade
Multiple mezzanine I/O expansion
Advanced ECC Memory
Online memory spare

Standard Features

Network adapter teaming (network fault tolerance, transmit load balancing, switch-assisted load balancing)

Warranty

This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Hard Drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

NOTE: Server Warranty includes 3 year 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

Three (3) optional dual-port Fibre Channel HBAs are supported by the HP ProLiant BL685c G7. Each mezzanine circuit board connects directly to the server blade system board. These Fibre Channel HBAs are available via option kits and must be ordered separately.

HBA mezzanine card option kits:

Emulex LPe1105 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem

Field-proven reliability and performance for a broad range of applications using drivers and management tools that are fully compatible with all Emulex HBAs

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

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

QLogic QMH2462 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem

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

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

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

HP BLc Brocade 804 8Gb Fibre Channel Host Bus Adapter

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

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

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

Compatible SAN

HP ProLiant BL685c G7 server blades are optimized for HP MSA, EVA, and XP

HP ProLiant BL685c G7 server blades are compatible with select third party SANs (please see blade storage page for more details:

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

HP Virtual Connect

HP Virtual Connect 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>

HP Insight management software

HP Insight Control

HP Insight Control, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, migrate, monitor, remote control, and optimize your IT infrastructure through a single, simple

Optional Features

management console. For more information, visit :

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

HP Insight Control includes one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit:

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

NOTE: HP Insight Control 7.2 introduces Insight Control server provisioning, a new capability ideal for multi-server OS and firmware provisioning to ProLiant and BladeSystem servers. Insight Control server provisioning is included and licensed as part of HP Insight Control. A media kit, "HP Insight Control server provisioning USB media kit" (# BD883A), including a USB, is available for customers who require a physical copy of the media loaded with Insight Control server provisioning software. Please note that this media kit is separate and in addition to the HP Insight Management DVD media kit (P/N C6N31A)

HP Matrix Operating Environment

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.

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>.

HP Integrated Lights-Out (iLO)

HP Integrated Lights-Out (iLO) simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration of ProLiant ML, DL, and BL servers. HP iLO functions without additional software and can be accessed from any location via a web browser. HP iLO works hand-in-hand with HP Systems Insight Manager, Insight Control suites, and Matrix Operating Environment for ProLiant, helping customers unleash the value of the ProLiant platform and deliver the highest possible quality of IT service. 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 environments 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

Optional Features

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:

- **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**
HP StoreVirtual VSA allows you to create fully featured shared storage on a VMware vSphere or Microsoft Hyper-V virtualized server. This server model starting November 2013, includes a limited license for HP StoreVirtual VSA software with 1TB of capacity. To download the license key and StoreVirtual VSA software, visit: <http://www.hp.com/go/unlockVSA>.
NOTE: You will need your server serial number in order to complete the registration form. Fully functional, capacity-based licenses are available in 4TB, 10T and 50TB sizes. For more information and access to the 60-day free trail, visit: <http://www.hp.com/go/tryVSA>

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

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 for your specific server model please contact your sales representative or go to: <http://www.hp.com/go/factory-express>.

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 Package

HP Proactive Care with 6 hour call-to-repair commitment, 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 highest level reactive coverage and enhanced escalation management, HP's 24x7, six hour call-to-repair hardware commitment. HP is the only leading manufacturer who makes this level of coverage available as a standard service offering for your most valuable servers. Service includes 24x7 collaborative software support for leading industry standard software running on your HP ProLiant server.

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

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

Data Center Platform Consulting Services

Choose HP Technology Services Consulting to modernize and migrate your key systems. These services help fine tune your data center to improve security, management and efficiency across IT infrastructure, operations, and facilities and prepare you for the new style of IT. HP understands the needs of the data center of the future and will serve as your guide for the journey.

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

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 protect

Service and Support

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. <http://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 ServiceOne Channel Partner. Or visit: <http://www.hp.com/services/bladestystem>

Pre-configured Models

Sixteen-Core Models

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

HP ProLiant BL685c G7 6380 4P 64GB-R P410i/1GB FBWC Server 699066-B21	Processor(s)	(4) AMD Opteron™ 6380 (2.5GHz/16-core/16MB/115W) Processor
	Cache Memory	16MB Level 3 cache memory
	Memory	64GB (16 x 4GB) PC3-10600, Registered DDR3-1333 NOTE: Total of 32 DIMM slots.
	Network Adapter	Two (2) embedded HP NC551i Dual Port FlexFabric 10Gb Converged Network Adapters
	Storage Controller	Smart Array P410i RAID controller with 1GB cache flash-backed write cache (FBWC)
	Hard Drives	None ships standard; (2) SFF SAS/SATA/SSD drive bays
	Internal Storage	Up to 2.4TB SAS Up to 2.0TB SATA Up to 3.2TB SATA SSD Up to 3.2TB SAS SSD
	Optical Drive	None ships standard
	Form Factor	Up to four (4) full-height blades supported in the HP BladeSystem c3000 Enclosure Up to eight (8) full-height blades supported in HP BladeSystem c7000 Enclosure

Twelve-Core Models

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

HP ProLiant BL685c G7 6344 4P 64GB-R P410i/1GB FBWC Server 708924-B21	Processor(s)	(4) AMD Opteron™ 6344 (2.6GHz/12-core/16MB/115W) Processor
	Cache Memory	16MB Level 3 cache memory
	Memory	64GB (16 x 4GB) PC3-10600, Registered DDR3-1333 NOTE: Total of 32 DIMM slots.
	Network Adapter	Two (2) embedded HP NC551i Dual Port FlexFabric 10Gb Converged Network Adapters
	Storage Controller	Smart Array P410i RAID controller with 1GB cache flash-backed write cache (FBWC)
	Hard Drives	None ships standard; (2) SFF SAS/SATA/SSD drive bays
	Internal Storage	Up to 2.4TB SAS Up to 2.0TB SATA Up to 3.2TB SATA SSD Up to 3.2TB SAS SSD
	Optical Drive	None ships standard
	Form Factor	Up to four (4) full-height blades supported in the HP BladeSystem c3000 Enclosure Up to eight (8) full-height blades supported in HP BladeSystem c7000 Enclosure

Eight-Core Models

HP ProLiant BL685c G7 6328 4P 64GB-R P410i/1GB FBWC Server 699068-B21	Processor(s)	(4) AMD Opteron™ 6328 (3.2GHz/8-core/16MB/115W) Processor
	Cache Memory	16MB Level 3 cache memory
	Memory	64GB (16 x 4GB) PC3-10600, Registered DDR3-1333 NOTE: Total of 32 DIMM slots.
	Network Adapter	Two (2) embedded HP NC551i Dual Port FlexFabric 10Gb Converged Network Adapters
	Storage Controller	Smart Array P410i RAID controller with 1GB cache flash backed write cache (FBWC)
	Hard Drives	None ships standard; (2) SFF SAS/SATA/SSD drive bays
	Internal Storage	Up to 2.4TB SAS Up to 2TB SATA Up to 3.2TB SATA SSD Up to 3.2TB SAS SSD

Pre-configured Models

Optical Drive

None ships standard

Form Factor

Up to four (4) full-height blades supported in the HP BladeSystem c3000 Enclosure

Up to eight (8) full-height blades supported in HP BladeSystem c7000 Enclosure

Configuration Information - Factory Integrated Models

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

NOTE: HP does not allow factory integration of options into standard models listed above.

NOTE: Configure-to-order servers must start with a CTO server.

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

Step 1: Base Server Blade Configuration

Models	HP ProLiant BL685c G7 Configure-to-order Server	518878-B21
	Two (2) integrated HP NC551i Dual Port FlexFabric 10Gb Converged Network Adapters and one (1) additional 10/100 server adapter dedicated to iLO 3 management	
	Two (2) small form factor (SFF) SAS/SATA/SSD hot plug drive bays	
	HP Integrated Lights-Out 3 (iLO 3)	

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

HP Processors	<p>For dual (2) processor configurations choose (one of the following):</p> <p>NOTE: If four (4) processors are desired, select one xxxxxx-L21 and one xxxxxx-B21.</p> <p>Sixteen-Core Processors</p> <p>HP BL685c G7 AMD Opteron™ 6380 (2.5GHz/16-core/16MB/115W) FIO 2-processor Kit 699069-L21</p> <p>HP BL685c G7 AMD Opteron™ 6378 (2.4GHz/16-core/16MB/115W) FIO 2-processor Kit 699070-L21</p> <p>HP BL685c G7 AMD Opteron™ 6376 (2.3GHz/16-core/16MB/115W) FIO 2-processor Kit 699071-L21</p> <p>HP BL685c G7 AMD Opteron™ 6366HE (1.8GHz/16-core/16MB/85W) FIO 2-processor Kit 699077-L21</p> <p>Twelve-Core Processors</p> <p>HP BL685c G7 AMD Opteron™ 6348 (2.8GHz/12-core/16MB/115W) FIO 2-processor Kit 699072-L21</p> <p>HP BL685c G7 AMD Opteron™ 6344 (2.6GHz/12-core/16MB/115W) FIO 2-processor Kit 699073-L21</p> <p>Eight-Core Processors</p> <p>HP BL685c G7 AMD Opteron™ 6328 (3.2GHz/8-core/16MB/115W) FIO 2-processor Kit 699074-L21</p> <p>HP BL685c G7 AMD Opteron™ 6320 (2.8GHz/8-core/16MB/115W) FIO 2-processor Kit 699075-L21</p> <p>Quad-Core Processors</p> <p>HP BL685c G7 AMD Opteron™ 6308 (3.5GHz/4-core/16MB/115W) FIO 2-processor Kit 699076-L21</p>
HP Memory	<p>Registered DIMMs (RDIMMs)</p> <p>HP 4GB (1x4GB) Single Rank x4 PC3-12800 (DDR3-1600) Registered CAS-11 Memory Kit 676331-B21</p> <p>HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 593911-B21</p> <p>HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit 604500-B21</p> <p>HP 8GB (1x8GB) Single Rank x4 PC3-12800 (DDR3-1600) Registered CAS-11 Memory Kit 676333-B21</p> <p>HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 593913-B21</p> <p>HP 16GB (1x16GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit 684066-B21</p> <p>Load Reduced DIMMs (LRDIMMs)</p> <p>HP 32GB (1x32GB) Quad Rank x4 PC3L-10600L (DDR3-1333) Load Reduced CAS-9 Low Voltage Memory Kit 647885-B21</p> <p>NOTE: LRDIMMs are supported on Opteron 6200 and 6300 Series processors only</p> <p>NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: http://www.hp.com/go/ddr3memory-configurator</p> <p>NOTE: A minimum of one (1) DIMM per processor is required.</p>

Configuration Information - Factory Integrated Models

NOTE: Kits described as PC3L include Low Voltage DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/ddr3memory-configurator.

NOTE: Depending on the memory configuration, the memory speed may run at 1600MHz, 1333MHz, 1066MHz, or 800MHz. Please see Memory Population Table or the Online Memory Configuration Tool at: <http://www.hp.com/go/ddr3memory-configurator>

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	<p>HP OneView with iLO Advanced - Server hardware required on same purchase order</p> <p>HP OneView for ProLiant DL Server incl 3yr 24x7 Supp FIO Bundle Physical 1 Svr Lic</p> <p>HP OneView for Blade Server incl 3yr 24x7 Supp FIO Bundle Physical 1 Svr Lic</p>	<p>E5Y43A</p> <p>F6Q89A</p>
HP Storage Controller	<p>HP Smart Array P410i/1G FBWC 2-ports Int PCIe x8 SAS Controller</p> <p>NOTE: Includes 1 GB cache with flash-backed write cache (FBWC).</p> <p>NOTE: The Smart Array P410i controller is required for all blades that support hot plug drives.</p>	588184-B22

Step 4: Choose Additional Options for Factory Integration

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

HP BladeSystem c3000 Enclosure QuickSpecs:

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:

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.

and HP BladeSystem c-Class Interconnect and Mezzanine Components:

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

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

NOTE: For optimal cooling and system performance the BL685c G7 requires the c7000 enclosure to be configured with 10 fans and the c3000 enclosure to be configured with 6 fans.

Core Options

NOTE: Some options may not be integrated at the factory. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

Ethernet Mezzanine Options	Gigabit Ethernet Mezzanines	
	HP NC360m Dual Port 1GbE BL-c Adapter	445978-B21
	HP NC364m Quad Port 1GbE BL-c Adapter	447883-B21

10 Gigabit Ethernet Mezzanines

NOTE: A 10 Gigabit Ethernet adapter is required for each server blade connecting to a 10Gb interconnect in bays 3-8 (HP BladeSystem c7000 Enclosure) or bays 2-4 (HP BladeSystem c3000 Enclosure).

NOTE: Each 10 Gigabit Ethernet adapter requires a minimum of 2GB of server memory.

NOTE: Only (2) 10 Gigabit Ethernet mezzanine cards can be installed in the BL685c G7 at the same time.

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

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

HP NC532m Dual Port 10GbE Multifunction BL-c Adapter	467799-B21
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HP NC552m 10Gb 2-port Flex-10 Ethernet Adapter	610609-B21
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HP NC553m 10Gb 2-port FlexFabric Adapter	613431-B21
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NOTE: Only (2) NC553m (PN613431-B21) mezzanine cards can be installed in the BL685c G7 at the same time.

HP Fibre Channel Mezzanine Options	8Gb Fibre Channel Mezzanines	
	Emulex LPe1205 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	456972-B21
	QLogic QMH2562 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	451871-B21

HP Processors	Sixteen-Core Processors	
	HP BL685c G7 AMD Opteron™ 6380 (2.5GHz/16-core/16MB/115W) 2-processor Kit	699069-B21
	HP BL685c G7 AMD Opteron™ 6378 (2.4GHz/16-core/16MB/115W) 2-processor Kit	699070-B21
	HP BL685c G7 AMD Opteron™ 6376 (2.3GHz/16-core/16MB/115W) 2-processor Kit	699071-B21
	HP BL685c G7 AMD Opteron™ 6366HE (1.8GHz/16-core/16MB/85W) 2-processor Kit	699077-B21

Twelve-Core Processors

HP BL685c G7 AMD Opteron™ 6348 (2.8GHz/12-core/16MB/115W) 2-processor Kit	699072-B21
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HP BL685c G7 AMD Opteron™ 6344 (2.6GHz/12-core/16MB/115W) 2-processor Kit	699073-B21
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Eight-Core Processors

HP BL685c G7 AMD Opteron™ 6328 (3.2GHz/8-core/16MB/115W) 2-processor Kit	699074-B21
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HP BL685c G7 AMD Opteron™ 6320 (2.8GHz/8-core/16MB/115W) 2-processor Kit	699075-B21
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Quad-Core Processors

HP BL685c G7 AMD Opteron™ 6308 (3.5GHz/4-core/16MB/115W) 2-processor Kit	699076-B21
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NOTE: HP ProLiant BL685c G7 processor option kits contain two (2) processors.

NOTE: The ProLiant BL685c G7 only supports two (2) and four (4) processor configurations.

Core Options

HP Memory

Registered DIMMs (RDIMMs)

HP 4GB (1x4GB) Single Rank x4 PC3-12800 (DDR3-1600) Registered CAS-11 Memory Kit	676331-B21
HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593911-B21
HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	604500-B21
HP 8GB (1x8GB) Single Rank x4 PC3-12800 (DDR3-1600) Registered CAS-11 Memory Kit	676333-B21
HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593913-B21
HP 16GB (1x16GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	684066-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: LRDIMMs are supported on Opteron 6200 and 6300 Series processors only

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

NOTE: A minimum of one (1) DIMM per processor is required.

NOTE: Kits described as PC3L include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: <http://www.hp.com/go/proliant-energy-efficient>

NOTE: Depending on the memory configuration, the memory speed may run at 1600MHz, 1333MHz, 1066MHz, or 800MHz. Please see Memory Population Table or the Online Memory Configuration Tool at: www.hp.com/go/ddr3memory-configurator

HP Hard Drives

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

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

NOTE: SAS, SATA, and/or SSD drives cannot be mixed within the server.

NOTE: The HP Smart Array P410i 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.

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

HP 1TB 3G SATA 7.2K rpm SFF (2.5-inch) Hot Plug Midline 1yr Warranty Hard Drive	625609-B21
HP 500GB 3G SATA 7.2K rpm SFF (2.5-inch) Midline 1yr Warranty Hard Drive	507750-B21

NOTE: Please see the for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13021_na/13021_na.html

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

HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	718160-B21
HP 900GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	619291-B21
HP 600GB 12G SAS 15K rpm SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive	785103-B21
HP 600GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581286-B21
HP 450GB 12G SAS 15K rpm SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive	785101-B21
HP 450GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581284-B21

HP 300GB 12G SAS 15K rpm SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive	785099-B21
HP 300GB 6G SAS 15K rpm SFF (2.5-inch) Hot Plug Enterprise 3yr Warranty Hard Drive	627117-B21
HP 300GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507127-B21

Core Options

HP 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512547-B21
NOTE: Please see the for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12244_na/12244_na.html	
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 Enterprise Boot 3yr Wty Solid State Drive	728726-B21
HP 80GB 6G SATA Value Endurance SFF 2.5-in Enterprise Boot 3yr Wty Solid State Drive	734366-B21
6G SATA Value Endurance Hot Plug SFF (2.5-inch) Enterprise Value Solid State Drives	
HP 1.6TB 6G SATA Value Endurance SFF 2.5-in Enterprise Value 3yr Wty Solid State Drive	757351-B21
HP 800GB 6G SATA Value Endurance SFF 2.5-in Enterprise Value 3yr Wty Solid State Drive	728743-B21
HP 600GB 6G SATA Value Endurance SFF 2.5-in Enterprise Value 3yr Wty Solid State Drive	739904-B21
HP 480GB 6G SATA Value Endurance SFF 2.5-in Enterprise Value 3yr Wty Solid State Drive	728739-B21
HP 300GB 6G SATA Value Endurance SFF 2.5-in Enterprise Value 3yr Wty Solid State Drive	739894-B21
NOTE: This drive supports G7 servers only.	
HP 240GB 6G SATA Value Endurance SFF 2.5-in Enterprise Value 3yr Wty Solid State Drive	728735-B21
6G SATA Value Endurance Hot Plug SFF (2.5-inch) Enterprise Value G1 Solid State Drives	
HP 480GB 6G SATA Value Endurance SFF 2.5-in Enterprise Value 3yr Wty G1 Solid State Drive	756666-B21
HP 240GB 6G SATA Value Endurance SFF 2.5-in Enterprise Value 3yr Wty G1 Solid State Drive	756651-B21
HP 120GB 6G SATA Value Endurance SFF 2.5-in Enterprise Value 3yr Wty G1 Solid State Drive	756630-B21
6G SATA LE Hot Plug SFF (2.5-inch) EL G1 Solid State Drives	
HP 960GB 6G SATA Light Endurance SFF 2.5-in Enterprise Light 3yr Wty G1 Solid State Drive	756611-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 Enterprise Mainstream 3yr Wty Solid State Drive	730065-B21
HP 400GB 6G SATA Mainstream Endurance SFF 2.5-in Enterprise Mainstream 3yr Wty Solid State Drive	730063-B21
HP 200GB 6G SATA Mainstream Endurance SFF 2.5-in Enterprise Mainstream 3yr Wty Solid State Drive	730061-B21
HP 100GB 6G SATA Mainstream Endurance SFF 2.5-in Enterprise Mainstream 3yr Wty Solid State Drive	730059-B21
SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives	
HP 1TB 6G SAS 7.2K rpm SFF (2.5-inch) Dual Port Midline 1yr Warranty Hard Drive	605835-B21
HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507610-B21
NOTE: Please see the for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14038_na/14038_na.html	

Additional Options

NOTE: Some options may not be integrated at the factory. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

HP Insight Software HP Insight Control

HP Insight Control including 1yr 24x7 Technical Support and Updates Single Server License	C6N27A
HP iLO Advanced for BladeSystem including 1yr 24x7 Support Eight Server License	512489-B21
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. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.

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

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

HP iLO Advanced License	HP iLO Advanced for BladeSystem including 1yr 24x7 Technical Support and Updates LTU	E-	E6U60ABE
	HP iLO Advanced for BladeSystem including 3yr 24x7 Technical Support and Updates LTU	E-	E6U63ABE

Converged Infrastructure Management Software

HP OneView

HP OneView with iLO Advanced

HP OneView incl 3yr 24x7 Supp Phys 1 Svr Lic	E5Y34A
HP OneView incl 3yr 24x7 Supp Flex Qty E-LTU	E5Y35AAE
HP OneView Media Kit Phys No Lic	E5Y37A
HP OneView w/o iLO including 3yr 24x7 Support 1 Server LTU	P8B24A
HP OneView w/o iLO including 3yr 24x7 Support Flex Quantity E-LTU	P8B26AAE
HP OneView w/o iLO including 3yr 24x7 Support FIO 1 Server LTU	P8B31A

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 Insight Cluster Management Utility 1yr 24x7 Flexible License	QL803B
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NOTE: This part number can be used to purchase one certificate for multiple licenses with a single activation key. Each license is for one node (server). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key.

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

Additional Options

http://h18004.www1.hp.com/products/quickspecs/12612_na/12612_na.html

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: Order a minimum of one license per cluster to purchase media including software and documentation, which will be delivered to the customer, and also licenses CMU management. No license key is delivered or required.

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

http://h18004.www1.hp.com/products/quickspecs/12612_na/12612_na.html

HP Security

HP Trusted Platform Module Option

488069-B21

NOTE: The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008. BitLocker leverages the enhanced security capabilities of a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2008 has not been tampered with while the system was offline.

NOTE: For more information about TPM, including a white paper, go to:

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

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

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

HP Storage Controller

HP Smart Array P712M Controller

HP Smart Array P712m/256 GB 2-ports Int/2-ports Ext Mezzanine SAS Controller

488348-B21

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

http://h18000.www1.hp.com/products/quickspecs/13296_na/13296_na.html

HP Smart Array P711m Controller

HP Smart Array P711m/1G 6Gb FBWC 4-ports Ext Mezzanine SAS Controller

513778-B21

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

http://h18000.www1.hp.com/products/quickspecs/14035_na/14035_na.html

Optional Upgrades

HP Smart Array Cache Battery Kit

383280-B21

NOTE: Supports the HP ProLiant BL2x220c and BL685c G7 server blades.

NOTE: HP Smart Array Cache Battery Kit supports HP P700m Controller.

HP Smart Array Advanced Pack including 1yr 24x7 Technical Support and Updates Single Server License

516471-B21

NOTE: A license key, a minimum of 256MB cache, and battery kit is required to enable Smart Array Advanced Pack features. For more information go to:

<http://www8.hp.com/h20195/v2/GetDocument.aspx?docname=c04154413>

HP Storage Blades

HP StoreEver LTO-5 Ultrium SB3000c Tape Blade

BS580B

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

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

Additional Options

HP D2200sb PCIe Storage Blade AP880A
NOTE: Please see the HP D2200sb PCIe Storage Blade QuickSpecs for technical specifications and additional information at:
<http://h18006.www1.hp.com/storage/bladesystem/index.html>.

HP Expansion Blade HP BLc PCI Expansion Blade 448018-B21
NOTE: Ships with one pre-installed PCI-X connect board. Also includes one PCIe connect board which requires installation.
NOTE: In a c3000 rack enclosure two half-height expansion blades may be installed above the full-height BL685c G7 in the two slots created by the mini divider in the top half of the c3000 enclosure. A mixture of half height and full height blades is not supported in the lower half of the c3000 enclosure. For more information, please see the HP BladeSystem c3000 Enclosure QuickSpecs at:
http://h18004.www1.hp.com/products/quickspecs/12790_na/12790_na.html
NOTE: Please see the QuickSpecs for Technical Specifications and additional configuration information at:
http://h18000.www1.hp.com/products/quickspecs/12753_na/12753_na.html

HP Rack Options **NOTE:** Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/11834_na/11834_na.html
HP Server Console Switch G2 with Virtual Media & CAC
 HP 0x2x16 KVM Server Console Switch G2 with Virtual Media CAC Software AF618A
NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13475_na/13475_na.html
HP IP Console Switch G2 with Virtual Media & CAC
 HP 2x1Ex16 KVM IP Console Switch G2 with Virtual Media CAC Software AF621A
 HP 4x1Ex32 KVM IP Console Switch G2 with Virtual Media CAC Software AF622A
NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13474_na/13474_na.html

HP USB and SD Options **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
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 4 hour 24x7 ProLiant BL6xxc Proactive Care Service U3B32E
 HP 3 year 4 hour 24x7 with Defective Media Retention ProLiant BL6xxc Proactive Care Service U3B35E
 HP 3 year 6 hour Call To Repair 24x7 ProLiant BL6xxc Proactive Care Service U3B38E
 HP 3 year 6hr Call To Repair 24x7 with Defective Media Retention ProLiant BL6xxc Proactive Care SVC U3B41E

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.

Additional Options

Installation Services - reduce the time required to get your system up and running and help minimize disruptions to your business.

HP Install c-Class Server Blade Service

UE493E

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

UG869E

Additional HP Care Pack services can be found at:

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

Memory

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

DDR3 Memory Population Guidelines

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

<http://www.hp.com/go/ddr3memory-configurator>

Some DIMM installation guidelines are summarized below:

- For the HP ProLiant BL685c G7 server blade with thirty-two (32) memory slots:
 - There are four (4) channels per processor; sixteen (16) channels per server.
 - There are two (2) DIMM slots for each memory channel; thirty-two (32) total slots.
 - Memory channel 1 consists of the two (2) DIMMs that are furthest from the processor.
 - Memory channel 4 consists of the two (2) DIMMs that are closest from the processor.
- A minimum of one (1) DIMM per processor is required.
- DIMM slots that are white should be populated first.
- Do not install DIMMs if the corresponding processor is not installed.
- If only two (2) processors are installed in a four (4) CPU system, only half of the DIMM slots are available.
- To maximize performance, balance the total memory capacity between all installed processors.
- To maximize performance, balance the total memory capacity on any given processor across the memory channels.
- You may only have up to eight (8) ranks installed per channel.
- You may install up to two (2) quad-rank DIMMs per channel.
- RDIMMs and LRDIMMs cannot be mixed.
- Mixing DIMMs with different voltage levels will result in the higher voltage level being used resulting in higher power consumption. When running virtualization software, a minimum of two (2) DIMMs per processor are required. Populate DIMM sockets 1A and 5B for each processor socket populated.

NOTE: DIMMs of different speeds may be mixed in any order; the server will select a common optimal speed.

DIMM slot/capacity/populated speed table								
DIMM Type	Registered DIMMS (RDIMMs)							Load Reduced (LRDIMMs)
DIMM Rank	Single Rank (1R)			Dual Rank (2R)			Quad Rank (4R)	Quad Rank (4R)
DIMM Capacity	4GB	4GB	8GB	8GB	16GB	16GB	32GB	32GB
DIMM Native Speed (MHz)	1333	1600	1600	1333	1333	1600	1066	1333
DIMM Voltage	LV/Std	Std	Std	LV/Std	LV/Std	Std	LV/Std	LV
SLOTS THAT CAN BE POPULATED								
32 slot servers	32	32	32	32	32	32	32	32
MAXIMUM CAPACITY (GB)								
32 slot servers	128	128	256	256	512	512	1TB	1TB
POPULATED DIMM SPEED (MHz)								
1 DIMM Per Channel	1333	1600	1600	1333	1333	1600	1066	1333
2 DIMM Per Channel	1333	1600	1600	1333	1333	1	1066/800	1333

NOTE: Mixing DIMMs with different voltage levels will result in the higher voltage level being used resulting in higher power consumption.

HP ProLiant BL685 G7 Server Blade DIMM slot and configuration diagrams

Basic memory slot and population diagram

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

Memory

32 DIMM SLOTS (8 per CPU node)					
	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A	1	A	Chnl 1
	2	E	2	E	
Chnl 2	3	C	3	C	Chnl 2
	4	G	4	G	
Chnl 3	5	B	5	B	Chnl 3
	6	F	6	F	
Chnl 4	7	D	7	D	Chnl 4
	8	H	8	H	
	CPU3		CPU4		
	slot #	population order	slot #	population order	
Chnl 1	1	A	1	A	Chnl 1
	2	E	2	E	
Chnl 2	3	C	3	C	Chnl 2
	4	G	4	G	
Chnl 3	5	B	5	B	Chnl 3
	6	F	6	F	
Chnl 4	7	D	7	D	Chnl 4
	8	H	8	H	

HP ProLiant BL685c G7 Server Blade (4P Model)

Standard memory configuration (4 CPU model)

- 32GB, consisting of eight (8) 4GB single-rank PC3-10600 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A: 4GB DIMM	1	A: 4GB DIMM	Chnl 1
	2	E: empty	2	E: empty	
Chnl 2	3	C: empty	3	C: empty	Chnl 2
	4	G: empty	4	G: empty	
Chnl 3	5	B: 4GB DIMM	5	B: 4GB DIMM	Chnl 3
	6	F: empty	6	F: empty	
Chnl 4	7	D: empty	7	D: empty	Chnl 4
	8	H: empty	8	H: empty	
	CPU3		CPU4		
	slot #	population order	slot #	population order	
Chnl 1	1	A: 4GB DIMM	1	A: 4GB DIMM	Chnl 1
	2	E: empty	2	E: empty	

Memory

Chnl 2	3	C: empty	3	C: empty	Chnl 2
	4	G: empty	4	G: empty	
Chnl 3	5	B: 4GB DIMM	5	B: 4GB DIMM	Chnl 3
	6	F: empty	6	F: empty	
Chnl 4	7	D: empty	7	D: empty	Chnl 4
	8	H: empty	8	H: empty	

Standard memory configuration (4 CPU model)

- 64GB, consisting of sixteen (16) 4GB single-rank PC3-10600 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A: 4GB DIMM	1	A: 4GB DIMM	Chnl 1
	2	E: empty	2	E: empty	
Chnl 2	3	C: 4GB DIMM	3	C: 4GB DIMM	Chnl 2
	4	G: empty	4	G: empty	
Chnl 3	5	B: 4GB DIMM	5	B: 4GB DIMM	Chnl 3
	6	F: empty	6	F: empty	
Chnl 4	7	D: 4GB DIMM	7	D: 4GB DIMM	Chnl 4
	8	H: empty	8	H: empty	
	CPU3		CPU4		
	slot #	population order	slot #	population order	
Chnl 1	1	A: 4GB DIMM	1	A: 4GB DIMM	Chnl 1
	2	E: empty	2	E: empty	
Chnl 2	3	C: 4GB DIMM	3	C: 4GB DIMM	Chnl 2
	4	G: empty	4	G: empty	
Chnl 3	5	B: 4GB DIMM	5	B: 4GB DIMM	Chnl 3
	6	F: empty	6	F: empty	
Chnl 4	7	D: 4GB DIMM	7	D: 4GB DIMM	Chnl 4
	8	H: empty	8	H: empty	

Standard Memory Plus Optional Memory (4 CPU model)

- 416GB, consisting of two (2) 4GB RDIMMs plus six (6) 16GB RDIMMs
 - 8 x 4GB single-rank PC3-10600 RDIMMs
 - 24 x 16GB quad-rank PC3-8500 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A: 4GB DIMM	1	A: 4GB DIMM	Chnl 1

Memory

	2	E: 16GB DIMM	2	E: 16GB DIMM	
Chnl 2	3	C: 16GB DIMM	3	C: 16GB DIMM	Chnl 2
	4	G: 16GB DIMM	4	G: 16GB DIMM	
Chnl 3	5	B: 4GB DIMM	5	B: 4GB DIMM	Chnl 3
	6	F: 16GB DIMM	6	F: 16GB DIMM	
Chnl 4	7	D: 16GB DIMM	7	D: 16GB DIMM	Chnl 4
	8	H: 16GB DIMM	8	H: 16GB DIMM	
	CPU3		CPU4		
	slot #	population order	slot #	population order	
Chnl 1	1	A: 4GB DIMM	1	A: 4GB DIMM	Chnl 1
	2	E: 16GB DIMM	2	E: 16GB DIMM	
Chnl 2	3	C: 16GB DIMM	3	C: 16GB DIMM	Chnl 2
	4	G: 16GB DIMM	4	G: 16GB DIMM	
Chnl 3	5	B: 4GB DIMM	5	B: 4GB DIMM	Chnl 3
	6	F: 16GB DIMM	6	F: 16GB DIMM	
Chnl 4	7	D: 16GB DIMM	7	D: 16GB DIMM	Chnl 4
	8	H: 16GB DIMM	8	H: 16GB DIMM	

Standard Memory Plus Optional Memory (4 CPU model)

- 320GB, consisting of two (2) 4GB RDIMMs plus six (6) 16GB RDIMMs
 - 16 x 4GB single-rank PC3-10600 RDIMMs
 - 16 x 16GB quad-rank PC3-8500 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A: 4GB DIMM	1	A: 4GB DIMM	Chnl 1
	2	E: 16GB DIMM	2	E: 16GB DIMM	
Chnl 2	3	C: 4GB DIMM	3	C: 4GB DIMM	Chnl 2
	4	G: 16GB DIMM	4	G: 16GB DIMM	
Chnl 3	5	B: 4GB DIMM	5	B: 4GB DIMM	Chnl 3
	6	F: 16GB DIMM	6	F: 16GB DIMM	
Chnl 4	7	D: 4GB DIMM	7	D: 4GB DIMM	Chnl 4
	8	H: 16GB DIMM	8	H: 16GB DIMM	
	CPU3		CPU4		
	slot #	population order	slot #	population order	
Chnl 1	1	A: 4GB DIMM	1	A: 4GB DIMM	Chnl 1
	2	E: 16GB DIMM	2	E: 16GB DIMM	
Chnl 2	3	C: 4GB DIMM	3	C: 4GB DIMM	Chnl 2
	4	G: 16GB DIMM	4	G: 16GB DIMM	

Memory

Chnl 3	5	B: 4GB DIMM	5	B: 4GB DIMM	Chnl 3
	6	F: 16GB DIMM	6	F: 16GB DIMM	
Chnl 4	7	D: 4GB DIMM	7	D: 4GB DIMM	Chnl 4
	8	H: 16GB DIMM	8	H: 16GB DIMM	

Standard Memory Replaced with Optional Memory (4 CPU Model)

RDIMM maximum configuration

- 1TB, consisting of thirty-two (32) 32GB quad-rank PC3L-8500
 - 32 x 32GB quad-rank PC3L-8500 RDIMMs

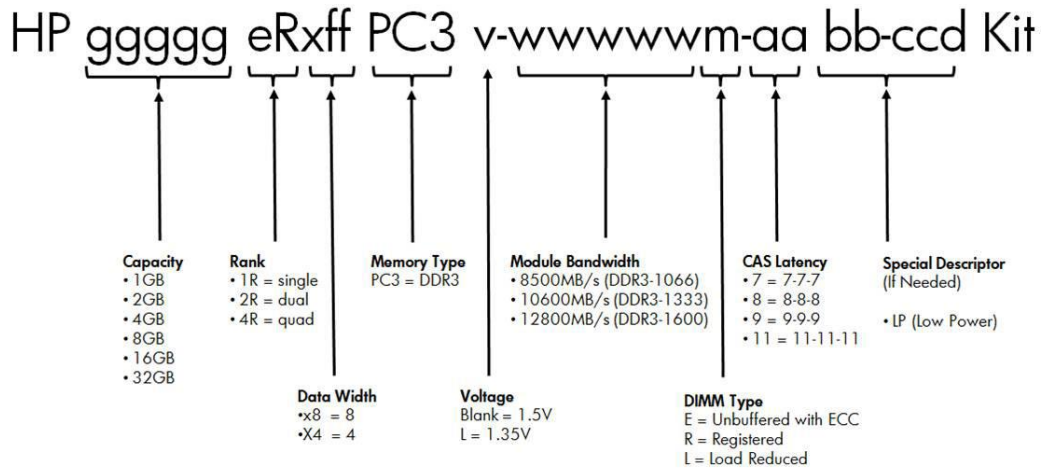
	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A: 32GB DIMM	1	A: 32GB DIMM	Chnl 1
	2	E: 32GB DIMM	2	E: 32GB DIMM	
Chnl 2	3	C: 32GB DIMM	3	C: 32GB DIMM	Chnl 2
	4	G: 32GB DIMM	4	G: 32GB DIMM	
Chnl 3	5	B: 32GB DIMM	5	B: 32GB DIMM	Chnl 3
	6	F: 32GB DIMM	6	F: 32GB DIMM	
Chnl 4	7	D: 32GB DIMM	7	D: 32GB DIMM	Chnl 4
	8	H: 32GB DIMM	8	H: 32GB DIMM	
	CPU3		CPU4		
	slot #	population order	slot #	population order	
Chnl 1	1	A: 32GB DIMM	1	A: 32GB DIMM	Chnl 1
	2	E: 32GB DIMM	2	E: 32GB DIMM	
Chnl 2	3	C: 32GB DIMM	3	C: 32GB DIMM	Chnl 2
	4	G: 32GB DIMM	4	G: 32GB DIMM	
Chnl 3	5	B: 32GB DIMM	5	B: 32GB DIMM	Chnl 3
	6	F: 32GB DIMM	6	F: 32GB DIMM	
Chnl 4	7	D: 32GB DIMM	7	D: 32GB DIMM	Chnl 4
	8	H: 32GB DIMM	8	H: 32GB DIMM	

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

- 2GB = 2048MB
- 4GB = 4096MB
- 8GB = 8192MB
- 16GB = 16384MB
- 32GB = 32768MB

Memory options part number decoder

Memory



HP Memory

Registered DIMMs (RDIMMs)

HP 4GB (1x4GB) Single Rank x4 PC3-12800 (DDR3-1600) Registered CAS-11 Memory Kit	676331-B21
HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593911-B21
HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	604500-B21
HP 8GB (1x8GB) Single Rank x4 PC3-12800 (DDR3-1600) Registered CAS-11 Memory Kit	676333-B21
HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593913-B21
HP 16GB (1x16GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	684066-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: LRDIMMs are supported on Opteron 6200 and 6300 Series processors only

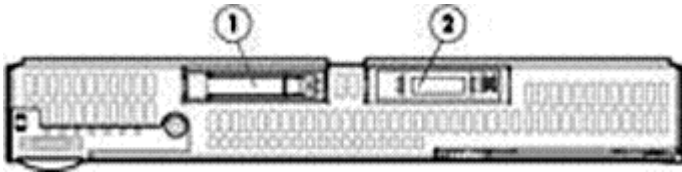
NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: <http://www.hp.com/go/ddr3memory-configurator>

NOTE: A minimum of one (1) DIMM per processor is required.

NOTE: Kits described as PC3L include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: <http://www.hp.com/go/proliant-energy-efficient>

NOTE: Depending on the memory configuration, the memory speed may run at 1600MHz, 1333MHz, 1066MHz, or 800MHz. Please see Memory Population Table or the Online Memory Configuration Tool at: <http://www.hp.com/go/ddr3memory-configurator>

Storage



1-2 2 x SFF SAS,SATA, SAS SSD, and SATA SSD Hot Plug Hard Drives

Technical Specifications

System Unit	Dimensions (H x W x D)	14.42 x 2.19 x 20.058 (36.63 x 5.56 x 50.95 cm)	
	Weight (approximate)	Maximum	27 lbs (12.25 kg)
		(all hard drives, DIMMs, and processors installed)	
	Power Specifications	Minimum	19.2 lbs (8.71 kg)
(no hard drives, two processors and four DIMMs)			
		<p>For power specifications including input requirements, BTU rating, and power supply output, 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</p> <p>HP BladeSystem c7000 Enclosure QuickSpecs: http://h18000.www1.hp.com/products/quickspecs/12810_na/12810_na.html</p> <p>To review typical system power ratings use the HP Power Advisor which is available via the online tool located at: http://www.hp.com/go/hppoweradvisor</p> <p>NOTE: For optimal cooling and system performance the BL685c G7 requires the c7000 enclosure to be configured with 10 fans and the c3000 enclosure to be configured with 6 fans.</p>	
System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).	
	Non-operating	-30° to 60°C (-22° to 140°F), maximum rate of change is 20°C/hr (36°F/hr).	
Relative Humidity (non-condensing)	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.	
	Non-operating	10 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.	
Altitude	Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).	
	Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).	
Acoustic Noise	<p>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</p> <p>HP BladeSystem c7000 Enclosure QuickSpecs: http://h18000.www1.hp.com/products/quickspecs/12810_na/12810_na.html</p>		

Technical Specifications

HP Smart Array P410i Controller	Disk Drive and Enclosure Interface	6G SAS (Serial Attached SCSI) 3.0 G SATA (Serial Advanced Technology Attachment)
	SAS Connectors	2 internal (SFF8484) x4 wide port connectors
	Cache Memory Speed	DDR2-533MHz with 40 or 72-bit wide bus provides up to 4.2 GB/s maximum bandwidth.
	Server Interface	x4 5G PCIe 2.0 provides 2 GB/s maximum bandwidth.
	SAS Speed	x2 6G SAS provides 1.2 GB/s maximum bandwidth.
	Cache Memory	72-bit 1GB cache; ECC protection, capacitor-backed
	Logical Drives Supported	Up to 32 logical drives
	Maximum Logical Drive Capacity	2.4 TB (2 x 1.2 TB)
	Host Memory Addressing	64-bit, supporting greater than 4 GB server memory space
	RAID Support	RAID 1 (Mirroring) RAID 0 (Striping)
	Upgradeable Firmware	Upgradeable Firmware with recovery ROM feature
Integrated HP NC551i Dual Port FlexFabric 10Gb Converged Network Adapter	Type	Integrated dual-port KR 10GbE with FlexFabric (FCoE or iSCSI) capability
	Network Processor	Blade Engines 2 (BE2)
	Data Transfer Method	x8 PCI Express 2.0
	Network Transfer Rate	Two ports, each at 20 Gbps full duplex; 40 Gbps aggregate full duplex theoretical bandwidth NOTE: Each port is autosensing 1 Gb / 10 Gb, and can interoperate with 1 Gb HP BladeSystem c-Class interconnect components. Both ports will operate at the same speed. NOTE: Each port on the NC551i adapter transmits from the server at 20 Gbps (theoretical) full duplex.
IEEE Compliance	802.1p QoS, 802.1Q VLAN tagging, 802.3ad link aggregation, 802.3ap 10GBase-KR, and 802.3x flow control	
Standard Features	<ul style="list-style-type: none"> 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) Accelerated FCoE or iSCSI 	
HP Integrated Lights-Out 3 (iLO 3) integrated on system board	Architecture	PCI Express based health and remote management ASIC
	Processor	PCI Express RISC processor core running at 250MHz
	Upgradeability	Option firmware upgradeable via Flash ROM
	Video Support	1600 x 1200 DVR max resolution
	Interfaces	One Ethernet network connection (10/100Mb/s)
	Memory	128-MB DDR with ECC
	Operating System Support	Microsoft Windows 2008 R2 Microsoft Windows 2008 (32 bit and 64 bit)

Technical Specifications

Microsoft Windows Server 2008 Standard Edition (32bit and 64bit)
 Microsoft Windows Server 2008 Enterprise Edition (32bit and 64bit)
 Microsoft Windows Server 2003 and Windows Server 2003 R2, and Windows Server 2003 for Extended Systems Standard Edition, Enterprise Edition
 Red Hat Enterprise Linux 5.4 (32 bit and 64 bit)
 SUSE LINUX Enterprise Server 11 (32bit and 64bit)
 SUSE LINUX Enterprise Server 10 (32bit and 64bit)
 VMware ESX 4.0
 VMware ESX 3.5.0

Client System Support

Microsoft Windows 7
 Microsoft Windows XP Professional Edition
 Microsoft Windows Vista Business and Ultimate Editions
 Red Hat Enterprise Desktop 5.00
 SUSE Linux Enterprise Desktop 11
 SUSE Linux Enterprise Desktop 10

Client Browser Support

Microsoft Internet Explorer 8
 Microsoft Internet Explorer 7
 Microsoft Internet Explorer 6
 Firefox 3.5 (on supported Windows and Linux systems)
 Firefox 3.0 (on supported Windows and Linux systems)

Command Line Support

Secure Shell and serial port access
 Secure Socket Layer
 Secure Shell version 2

Security

Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, CLP and XML scripting interface
 AES encryption of video
 RC4 encryption of video

Directory Support Services

Active Directory v1.0 (Windows 2003)

Driver Support

HP ProLiant iLO3 Management Controller Driver Package

Management protocols supported

SNMP, IPMI 2.0 (system and LAN interface), DMTF Systems Management Architecture for Server Hardware Command Line Protocol (SMASH CLP), HP RIBCL XML

Environment-friendly Products and Approach

End-of-life Management and Recycling

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

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at:

Technical Specifications

<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:
09-Oct-2015	From Version 42 to 43	Changed	Names for some skus were updated.
		Added	Skus Added: <ul style="list-style-type: none"> • P8B24A • P8B26AAE • P8B31A
		Remove	Obsolete skus deleted: <ul style="list-style-type: none"> • 604502-B21 • 627808-B21 • 627810-B21 • E5Y43AAE • F6Q89AAE • 416585-B21 • 453246-B21 • 539857-B21 • 581204-B21 • 741144-B21 • 741140-B21 • 741136-B21 • 741157-B21 • 741153-B21 • 741148-B21 • BK836A • 583210-B21 • AQ697B • AF616A • AF617A • DT528A#ABA • U6W98E
09-Feb-2015	From Version 41 to 42	Changed	Overview, Standard Features, Optional Features, Service and Support, Core Options sections were updated
		Removed	Obsolete skus deleted: <ul style="list-style-type: none"> • 593907-B21 • 686865-B21 • 654805-B21 • 654803-B21 • 654802-B21 • 654808-B21 • 654806-B21 • 654804-B21 • 654807-B21 • 654801-B21 • 672514-B21
01-Dec-2014	From Version 40 to 41	Changed	Core Options and Memory sections were updated
		Added	Sku Added on Hard Drives: <ul style="list-style-type: none"> • 757351-B21 • 756666-B21 • 756651-B21 • 756630-B21 • 756611-B21
		Removed	Obsolete skus deleted: <ul style="list-style-type: none"> • AJ878B
01-Nov-2014	From Version 39 to 40	Changed	Service and Support section was updated
18-Aug-2014	From Version 38 to 39	Added	SKUs added on Hard Drives: <ul style="list-style-type: none"> • 785103-B21 • 785101-B21 • 785099-B21 • 741144-B21 • 741140-B21 • 741136-B21 • 741157-B21 • 741153-B21 • 741148-B21
		Removed	Hard Drives section deleted on Storage
10-Jun-2014	From Version 37 to 38	Removed	Processors, Fibre Channel Support, Memory, Ethernet and Fibre Channel Mezzanine Options, Solid State Drives, Inside Software, USB and SD Options EOL items were removed.
18-Feb-2014	From Version 36 to 37	Changed	Memory, HP USB and SD Options, and HP Care Pack Services were revised.
13-Dec-2013	From Version 35 to 36	Changed	AMD Opteron 6172 processors was removed from Processors HP InfiniBand 4X DDR ConnectX-2 PCIe G2 Dual Port HCA was removed

Summary of Changes

			<p>from HP InfiniBand Mezzanine Options</p> <p>HP OneView was added to Optional Features</p> <p>Converged Infrastructure Management Software was added</p> <p>HP 1.2TB 6G SAS 10k rpm SFF SC Dual Port Enterprise 3yr Warranty Hard Drive, HP 300GB and 600GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Boot 3yr Wty Solid State Drives were added to Hard Drives</p>
13-Sep-2013	From Version 34 to 35	Changed	High Performance Clusters, Models, Processors, Hard Drives, Insight software, iLO Advanced License, and I/O Accelerator Options were revised.
10-Jun-2013	From Version 33 to 34	Changed	<p>Form Factor, Storage Controllers, and USB and SD Options product descriptions were revised</p> <p>Maximum SAS Internal Storage was increased to 2.4TB</p> <p>HP BL685c G7 AMD Opteron 6172 and 6164HE processors were added to Core Options</p> <p>HP I/O Expansion Options was removed from Additional Options</p>
13-May-2013	From Version 32 to 33	Changed	<p>Overview: Updated What's New section with Support for 32GB LRDIMMs.</p> <p>Standard Features: Updated Processors and Network Controller sections.</p> <p>Service and Support: Updated Entire Service and Support section.</p> <p>Core Options: Updated HP Processors, HP Memory and HP Hard Drives sections.</p> <p>Additional Options: Updated HP Expansion Blade, HP USB and SD Options and HP Care Pack Services sections.</p> <p>Memory: Updated DDR3 Memory Populations Guidelines, DIMM slot/capacity/ populated speed table and HP Memory sections.</p>
		Removed	<p>Overview: Removed At A Glance section.</p> <p>Standard Features: Removed Integrated Manageability</p> <p>Optional Features: Removed Operating Systems and Virtualization section.</p> <p>Additional Options: Removed HP Smart Array P700m Controller, HP I/O Expansion Options.</p>
		Added	<p>Standard Features: Added NOTES to the beginning of the section, Added Cache Memory, Chipset, Integrated Manageability, Industry Standard Compliance, Operating Systems and Virtualization Software, Enclosures, Form Factor, HP Insight management software, Security, Availability and Warranty sections.</p> <p>Added Optional Features section which includes: Fibre Channel Support, Compatible SAN, HP Virtual Connect, HP Insight Management, Storage Software, HP Proactive Insight experience, Factory Express Portfolio for Servers and Storage and HP Simple Configurator sections.</p> <p>Configuration Information-Factory Integrated Models: Added 647885-B21 to Step 2 HP Memory section.</p> <p>Additional Options: Added HP I/O Expansion Options section.</p>
25-Mar-2013	From Version 31 to 32	Removed	Removed Platinum reference throughout QS
		Added	<p>Overview: Added NOTE:s to the At A Glance section</p> <p>Configuration Information-Factory Integrated Models: Added NOTES to Step 4</p>
02-Mar-2013	From Version 30 to 31	Added	Added HP Proactive Insight experience to the Standard Features section.
01-Mar-2013	From Version 29 to 30	Removed	Removed SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives
		Changed	<p>Overview: Completely updated What's New with Support for HP 1.2TB 6G SAS 10K 2.5in DP ENT HDD and Added 6100 to Processors in At A Glance.</p> <p>Standard Features: 12 MB to Cache Memory, updated SAS size in Maximum Internal Storage and completely updated HP Insight Control in the HP Insight management software section.</p> <p>Models: Changed total SAS Internal Storage.</p> <p>Configuration Information: Updated note at beginning of Step 1 and Updated products in Step 3.</p>

Summary of Changes

			<p>Core Options: Added 7 new processor kits to HP Processor section, Updated notes in HP Memory and Completely updated HP Hard Drives.</p> <p>Additional Options: Complete updated HP Insight Control in the HP Insight Software, updated product description in HP Ultrium Tape Blades, updated product description in HP Storage Blades, updated product description in HP USB and SD Options and completely updated HP Care Pack Services.</p> <p>Memory: Update DIMM required per processor throughout section</p>
		Added	<p>Added Platinum to c3000 and c7000 Enclosures throughout entire QS</p> <p>Standard Feature: Added 7 new processors to Processor and Add Storage Software section</p> <p>Additional Options: Added HP I/O Expansion Options section, added HP Rack Options section</p>
18-Jan-2013	From Version 28 to 29	Changed	Changes made in the Standard Features, Step 2 of Configuration Information and in the Hard Drives section of Core Options.
04-Dec-2012	From Version 27 to 28	Changed	Changes made throughout the QuickSpec.
24-Sep-2012	From Version 26 to 27	Changed	Changes made in Standard Features section.
13-Aug-2012	From Version 25 to 26	Changed	Changes made throughout the QuickSpec.
06-Apr-2012	From Version 24 to 25	Changed	Memory chart was revised.
26-Mar-2012	From Version 23 to 24	Changed	<p>HP Virtual Connect was completely revised</p> <p>HP Insight Dynamics was changed to HP Matrix Operating Environment</p> <p>Part numbers were changed in High Performance Clusters</p> <p>New models were added to HP Insight Software</p> <p>Security - Trusted Platform Module was removed from Standard Features</p> <p>HP Smart Array P700m/256 4-ports Ext PCIe x8 SAS Controller was removed from HP Storage Controllers</p>
06-Mar-2012	From Version 22 to 23	Changed	Changed a link in the Hard Drives section of Core Options.
13-Feb-2012	From Version 21 to 22	Changed	<p>Optimized, Standard and Basic Care Packages were revised in Service and Support</p> <p>Hp Insight Software was updated</p> <p>Four-Core Processor was added</p> <p>HP 16GB Dual Rank x4 PC3-12800R Reg CAS-11 Memory Kit was added</p> <p>HP Smart Array P712m Controllers were added to HP Storage Controllers</p>
20-Dec-2011	From Version 20 to 21	Changed	<p>SAS, SATA, and/or SSD drives cannot be mixed within the server note was added to Internal Storage and Hard Drives</p> <p>HP 120GB and 60GB 3G SATA SFF (2.5-inch) Midline 1yr Warranty Solid State Drives were removed from Hard Drives</p>
14-Nov-2011	From Version 19 to 20	Changed	<p>DDR3 memory options part number decoder image was changed in Memory</p> <p>Hot Plug SATA SSD maximum internal storage was increased to 800GB</p> <p>HP Insight Foundation was revised in HP Insight management software</p> <p>HP Insight Cluster Management Utility and HP HPC Linux Value Pack were updated in High Performance Clusters</p> <p>Hard Drives were revised</p> <p>Additional Options was updated throughout</p> <p>Sixteen-Core and additional Eight- and Twelve-Core Processors were added</p> <p>Additional memory was added</p>
26-Sep-2011	From Version 18 to 19	Changed	<p>Maximum memory was increased to 1TB</p> <p>Hot Plug SATA SSD maximum internal storage was increased to 800GB</p> <p>Processors, Memory, Hard Drives and Ultrium Tape Blades were revised</p> <p>What's New was added to the Overview</p>
31-Aug-2011	From Version 17 to 18	Changed	Hard Drives were revised.
30-Aug-2011	From Version 16 to 17	Changed	Hot Plug SATA SSD maximum internal storage was increased to 800GB Service and Support and Hard Drives were completely revised

Summary of Changes

			Mentions of StorageWorks were removed from Additional Options
01-Aug-2011	From Version 15 to 16	Changed	Hard Drive descriptions were revised.
20-Jun-2011	From Version 14 to 15	Changed	Ethernet Mezzanine Options, High Performance Clusters, HP Security - TPM, HP I/O Expansion Options, HP InfiniBand Mezzanine Options, HP Storage Blades, HP Expansion Blade, HP USB and SD Options and HP Care Pack Services product descriptions were revised Hot Plug SAS SSD was added to Maximum Internal Storage 6G SAS Hot Plug Enterprise Performance and Mainstream Solid State Drives were added to Hard Drives
11-May-2011	From Version 13 to 14	Changed	Processor descriptions were revised HP 900GB 6G SAS 10K rpm SFF Enterprise Drive was added to Hard Drives HP 4X DDR IB Dual Port Mezzanine HCA for HP BladeSystem c-Class was removed from HP InfiniBand Mezzanine Options
22-Apr-2011	From Version 12 to 13	Removed	16GB Dual Rank memory was removed from the DIMM slot/capacity/populated speed table.
05-Apr-2011	From Version 11 to 12	Changed	Hot Plug SAS and SATA maximum internal storage was increased to 2TB Service and Support was completely revised Models product descriptions were revised Part numbers were changed for HP Cluster Management Utility Compute Node License and HP HPC Linux value Pack One Processor License in High Performance Clusters HP 1TB 6G SAS 7.2K rpm SFF Hot Plug Midline and HP 1TB 3G SATA 7.2K rpm SFF Hot Plug Midline were added to Hard Drives HP Smart Array P711m/1G 6Gb FBWC 4-ports Ext Mezzanine SAS Controller was added to HP Storage Controllers HP 640GB MLC IO Accelerator for BladeSystem c-Class was added to HP I/O Expansion Options HP 4GB Micro SDHC Flash Media Kit was added to HP USB and SD Options HP NC522m Dual Port Flex-10 10GbE Multifunction BL-c Adapter was removed from Ethernet Mezzanine Options HP StorageWorks SB920c Tape Blade was removed from HP Ultrium Tape Blade
18-Feb-2011	From Version 10 to 11	Added	Only (2) 10 Gigabit Ethernet mezzanine cards can be installed in the BL685c G7 at the same time note and Only (2) NC551m (PN 580151-B21) or NC553m (PN 613431-B21) mezzanine cards can be installed in the BL685c G7 at the same time note were added to Ethernet Mezzanine Options.
14-Feb-2011	From Version 9 to 10	Changed	AMD Opteron processor Models 6176 and 6140 and Low Power AMD Opteron processor Models 6166HE and 6132HE were added to Processors Oracle Solaris was added to Operating Systems and Virtualization Software Support for ProLiant Servers HP StorageWorks 80GB and 160GB IO Accelerator for BladeSystem c-Class was removed from HP I/O Expansion Options
10-Jan-2011	From Version 8 to 9	Changed	Security was modified in Standard Features HP Insight Software product descriptions were revised HP StorageWorks D2200sb PCIe Storage Blade was added and HP StorageWorks SB40c Storage Blade was removed from HP StorageWorks Storage Blades HP NC553m 10Gb 2-port FlexFabric Adapter was added to HP Ethernet Mezzanine Options Oracle Enterprise Linux (OEL) was removed from Operating Systems and Virtualization Software Support for ProLiant Servers
24-Nov-2010	From Version 7 to 8	Removed	HP 16GB Dual Rank x4 PC3L-10600 Registered CAS-9 Low Power Memory Kit was removed from Memory.
15-Nov-2010	From Version 6 to 7	Changed	Hot Plug SAS Maximum Internal Storage was increased to 1.2TB

Summary of Changes

			<p>Models, Processors, Storage Controllers and Fibre Channel Mezzanine Options product descriptions were revised</p> <p>HP Management DVD and HP ProLiant Smart Update Firmware DVD were added to HP Insight management software</p> <p>High Performance Clusters was added to Standard Features and Additional Options</p> <p>HP 16GB Dual Rank x4 PC3L-10600 Registered CAS-9 Low Power Memory Kit was added to Memory</p> <p>HP 450GB and 600GB 6G SAS 10K rpm SFF Dual Port Enterprise 3yr Warranty Hard Drives were added</p> <p>HP StorageWorks LTO-5 SB3000c Tape Blade was added to HP StorageWorks Storage Blades</p>
05-Oct-2010	From Version 4 to 6	Changed	<p>Network Controller and Operating Systems and Virtualization Software notes were revised</p> <p>Fibre Channel Support was completely revised</p> <p>Processor and Storage Controller product descriptions were revised</p> <p>Online memory spare was added to Availability</p> <p>HP 2GB Dual Rank x8 PC3-10600 Registered CAS-9 Memory Kit and A minimum of one (1) DIMM per processor is required note were added to Memory</p> <p>HP BLc NC552m Flex-10GbE Dual Port Adapter was added</p>
16-Aug-2010	From Version 3 to 4	Added	<p>What's New was added to the Overview</p> <p>Note was added to the beginning of Standard Features and Models</p> <p>HP NC551m Dual Port FlexFabric 10Gb Converged Network Adapter was added to Ethernet Mezzanine Options</p>
09-Jul-2010	From Version 2 to 3	Changed / Removed	<p>SmartStart was changed to version 8.5 in HP Insight management software</p> <p>Processor speed for AMD Opteron processor model 6136 was changed in Eight-Core Models</p> <p>iSCSI Ethernet mezzanine option for optimized iSCSI connectivity was removed from Mezzanine Support</p>
24-Jun-2010	From Version 1 to 2	Changed / Removed	<p>Changed the 6 to a 12 under the Cache Memory section for each Model.</p> <p>Removed part number 488074-B22 from the Ethernet Mezzanine Options section.</p>

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