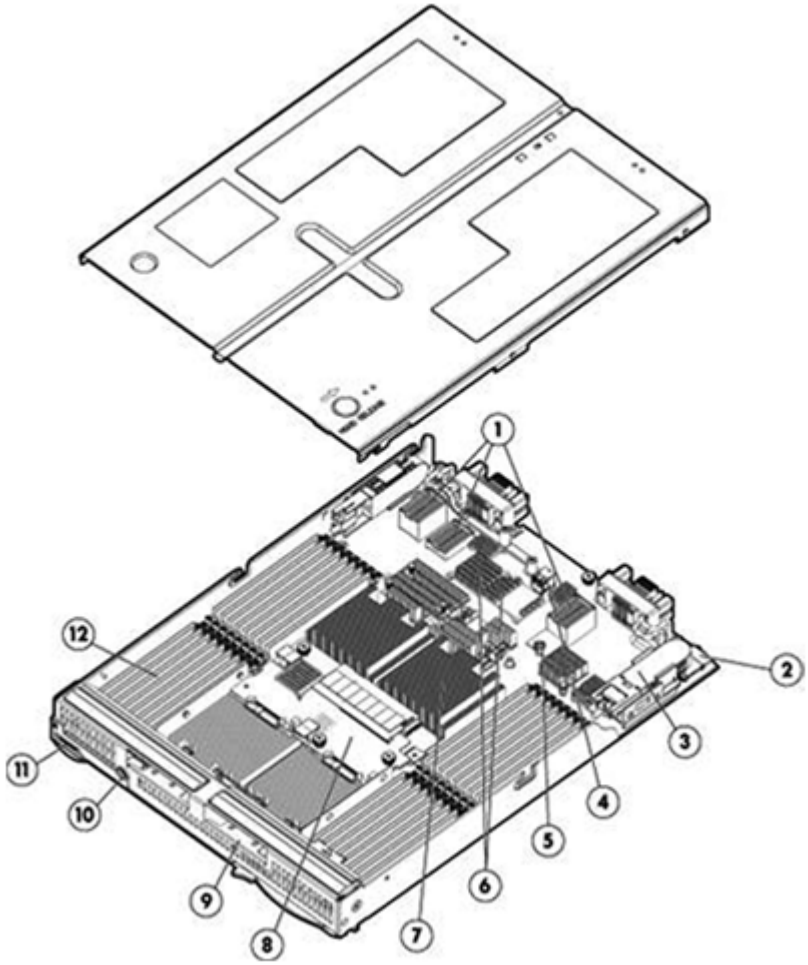
Overview



HP ProLiant BL685c G6 Server Blade

1. Three (3) mezzanine I/O expansion slots
2. Internal SD card slot
3. Optional Smart Array P400i battery
4. Internal USB connector
5. Optional Trusted Platform Module (TPM)
6. Two (2) embedded dual port Flex-10 10GbE multifunction server adapters
7. Up to four (4) AMD Opteron™ 8000 series processors
8. Smart Array P400i storage controller (available as an option in factory integrated models)
9. Two (2) small form factor (SFF) hot-plug hard drive bays
10. System power button and LED
11. Local I/O Connector
12. Thirty-two (32) PC2-5300 Registered DIMM (DDR2-667) or PC2-6400 Registered DIMM (DDR2-800) memory slots

What's New

- Support for HP NC553m 10Gb 2-port FlexFabric Adapter

Overview

At A Glance

This document covers the HP ProLiant BL685c G6 server blade only. For more information on HP BladeSystem c-Class Enclosures and HP BladeSystem c-Class Interconnects and Mezzanine Components, please see the following:

- 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 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

Engineered with a large memory footprint and more I/O than any other four socket server blade, the BL685c G6 eliminates the barriers to server consolidation and delivers outstanding performance for compute-intensive applications.

HP ProLiant BL685c G6 server blade includes:

- Processor:
  - Up to four (4) Six-Core AMD Opteron™ 8400 Series processors
    - Supports up to 2.6 GHz, 2.2 GHz HyperTransport™; 512 KB Level 2 cache memory per core; 6 MB Level 3 cache
  - Up to four (4) Quad-Core AMD Opteron 8300 Series processors
    - Supports up to 2.9 GHz, 2.2 GHz HyperTransport; 512 KB Level 2 cache memory per core; 6 MB Level 3 cache
  - AMD Dual Dynamic Power Management™ for optimum performance and reduced power consumption
  - ServerWorks HT-2100, HT-1000 chipsets
- Memory:
  - Up to 256 GB of memory, supported by thirty-two (32) slots of PC2-5300 Registered DIMMs or 128 GB of memory, supported by thirty-two (32) slots of PC2-6400 Registered DIMMs
  - Supporting memory interleaving (2:1)
    NOTE: The memory bus will operate at 800 MHz with four (4) or fewer DIMMs per processor, 667 MHz with six (6) DIMMs per processor, and 533 MHz with eight (8) DIMMs per processor.
- Storage Controller:
  - Smart Array P400i RAID controller with 512 MB cache (optional battery to enable battery-backed write cache (BBWC). Supports RAID 0,1.
    NOTE: The HP Smart Array P400i controller is required for all blades that support hot plug hard disk drives. For customers who choose to configure a driveless model via CTO or choose to use Solid State Drives, a Smart Array P400i controller is not required. See Factory Integrated Models section for more information.
  - HP Embedded SATA Controller
- Internal Drive Support:
  - Up to two (2) small form factor (SFF) SAS or SATA hot plug hard disk drives or SATA solid state drives, or
  - Up to two (2) non-hot plug SATA SSDs
    NOTE: Simultaneous operation of hot plug drives and non-hot plug solid state drives is not supported.
- Network Controller:
  - Two (2) embedded NC532i Dual Port Flex-10 10GbE Multifunction Server Adapters
    NOTE: Flex-10 capability requires the use of an HP Virtual Connect Flex-10 10Gb Ethernet module. Learn more at: www.hp.com/go/virtualconnect.
    NOTE: Each port is autosensing 1Gb/10Gb, and can interoperate with 1Gb HP BladeSystem c-Class interconnect components.
  - One (1) additional embedded 10/100 network adapter dedicated to iLO 2 management
- Mezzanine Support:
  - Three (3) I/O expansion mezzanine slots.

Overview

- Supports up to three (3) mezzanine cards
  - Dual-Port FlexFabric Adapter mezzanine option
  - Dual-Port Fibre Channel Mezzanine (4-Gb or 8-Gb) options for SAN connectivity
  - iSCSI Ethernet mezzanine option for optimized iSCSI connectivity
  - Ethernet server adapter mezzanine options for additional network ports
  - 4X DDR InfiniBand (IB) Mezzanine (20 Gb/s) options for low latency server interconnectivity (based on Mellanox technology)
  - I/O Accelerator mezzanine options for high transaction rate local storage
  - SAS mezzanine option for external direct attach and shared SAS storage

- Internal Media Support:
  - One (1) internal USB 2.0 connector for security key devices and USB drive key
  - One (1) internal SD-HC card slot
- Trusted Platform Module:
  - One (1) internal TPM 1.2 module connector
- Form Factor:
  - HP ProLiant BL685c G6 server blade plugs into the BladeSystem c3000 and c7000 enclosures
- Infrastructure Management:
  - This server blade requires the latest version of the Onboard Administrator firmware. This firmware release may also require other subsystem firmware upgrades. For information on the latest firmware versions, please see the Blades Firmware Maintenance website at: http://h18004.www1.hp.com/products/blades/components/c-class-compmatrix.html
  - HP Integrated Lights-Out 2 (iLO 2) management processor for simplified server setup, health monitoring and recovery, power and thermal control, and lights-out remote administration.
  - HP Insight Control, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, monitor, control and optimize your IT infrastructure through a single, simple management console. Insight Control supports both Windows and Linux-based central management servers.
  - HP Insight Dynamics for ProLiant, a product option, is an integrated command center that enables IT Staff personnel to continuously analyze and optimize a converged infrastructure, while automating and reducing the cost of common data center tasks by as much as 40 percent. This ultimately enables them to dynamically keep pace with the organization's changing business requirements.
- Operating Systems and Virtualization Software:
  - Supports Windows, RHEL, SLES, Solaris, VMware and Citrix XenServer
- Enclosures:
  - HP offers three (3) 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 G6 servers plugged vertically.
    - The HP BladeSystem c3000 rack enclosure is 6U high and holds up to four (4) HP ProLiant BL685c G6 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 G6 requires the c7000 enclosure to be configured with 10 fans and the c3000 enclosure to be configured with 6 fans.
- 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

Standard Features

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

Processor

Six-Core Processors

AMD Opteron™ processor Model 8435 (2.6 GHz, 6 MB L3 Cache, 75W ACP)

AMD Opteron processor Model 8431 (2.4 GHz, 6 MB L3 Cache, 75W ACP)

Low Power AMD Opteron processor Model 8425 HE (2.1 GHz, 6 MB L3 Cache, 55W ACP)
NOTE: Offered through Configure-To-Order process only. See Factory Integration Models section for more details.

Quad-Core Processors

AMD Opteron processor Model 8389 (2.9 GHz, 6 MB L3 Cache, 75W ACP)

AMD Opteron processor Model 8387 (2.8 GHz, 6 MB L3 Cache, 75W ACP)

AMD Opteron processor Model 8382 (2.6 GHz, 6 MB L3 Cache, 75W ACP)

Low Power AMD Opteron processor Model 8381 HE (2.5 GHz, 6 MB L3 Cache, 55W ACP)
NOTE: Offered through Configure-To-Order process only. See Factory Integration Models section for more details.

NOTE: AMD Opteron 8400 series processors are 64-bit, six-core, and support AMD Virtualization™.
NOTE: AMD Opteron 8300 series processors are 64-bit, quad-core, and support AMD Virtualization™.
NOTE: Processor wattage references reflect Average CPU Power (ACP). For more information on ACP visit: http://www.amd.com/powernow.

Upgradeability

Upgradeable to quad (4) processors
NOTE: The HP ProLiant BL685c G6 only supports two (2) and four (4) processor configurations.

Cache Memory

512 KB Level 2 cache memory per core

6 MB Level 3 cache memory

Chipset

ServerWorks HT-2100, HT-1000

Memory

Type	PC2-5300 DDR2 Registered DIMMs at 667 MHz PC2-6400 DDR2 Registered DIMMs at 800 MHz
Standard	8 GB (4 x 2 GB)
Maximum	256 GB (32 x 8 GB) at 533 MHz

NOTE: Memory must be installed in pairs.
NOTE: DIMMs must be installed in decreasing capacity with the largest DIMMs installed in the banks furthest away from each processor.
NOTE: The memory bus will operate at 800 MHz with four (4) or fewer DIMMs per processor, 667 MHz with six (6) DIMMs per processor, and 533 MHz with eight (8) DIMMs per processor.

Standard Features

Network Controller	Two (2) embedded NC532i Dual Port Flex-10 10GbE Multifunction Server Adapters NOTE: Flex-10 capability requires the use of an HP Virtual Connect Flex-10 10Gb Ethernet module. Learn more at: www.hp.com/go/virtualconnect. NOTE: The iSCSI offload feature of the embedded multifunction adapter requires the HP Accelerated iSCSI Pack. For more information, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12466_na/12466_na.html One (1) additional 10/100 network adapter dedicated to iLO 2 Management		
I/O Expansion Slots	Three (3) I/O expansion mezzanine slots (All x8 PCI Express)		
Integrated Manageability	HP Integrated Lights-Out 2 (iLO 2) management processor		
Storage Controller	HP Smart Array P400i Controller	512MB memory module supports RAID 0,1 Available upgrades: Battery-backed write cache option	
	NOTE: The HP Smart Array P400i controller is required for all blades that support hot plug hard disk drives. For customers who choose to configure a driveless model via CTO or choose to use Solid State Drives, a HP Smart Array P400i controller is not required. See Factory Integrated Models section for more information.		
	HP Embedded SATA Controller	Supports non-hot plug SATA SSD only	
Maximum Internal Storage	Hot Plug SAS	1.2TB SAS	2 x 600GB Serial SCSI
	Hot Plug SATA	1TB SATA	2 x 500GB Serial ATA
	Non-Hot Plug SSZD	128GB SATA	2 x 64GB Serial ATA
Graphics	Integrated ATI RN-50 1280 x 1024 x 16M color (32 MB DDR memory)		
Graphics Resolution Supported	Resolution Color Depths	Depths 1280 x 1024, 16.7M , 64k, 256,16 1024 x 768, 16.7M, 64k, 256, 16 800 x 600, 16.7M, 64k, 256, 16 640 x 480, 16.7M, 64k, 256, 16	

Standard Features

Fibre Channel Support

Three (3) optional dual-port Fibre Channel HBAs are supported by the HP ProLiant BL685c G6. 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 (PN 403621-B21)

- Based on the same field-proven ASIC, firmware, and driver technology as Emulex's renowned LPe1150 HBA, the Emulex LPe1105-HP is fully driver compatible with all Emulex HBAs

Emulex 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 (PN 403619-B21)

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

QLogic QMH2562 8Gb 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 (PN 590647-B21)

- 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 StorageWorks and supported by third party SAN vendors
- Support for Microsoft® Windows® and Linux operating system environments

Compatible SAN

HP ProLiant BL685c G6 server blades are optimized for HP StorageWorks MSA, EVA, and XP
HP ProLiant BL685c G6 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

Standard Features

HP Virtual Connect		HP Virtual Connect simplifies server connectivity to LANs and SANs, and reduces costs. Unique HP Flex-10 technology makes maximum use of 10-Gb Ethernet bandwidth by allowing multiple ports within a single Industry Standard connection that can be dynamically tuned to meet individual server requirements. HP Virtual Connect Enterprise Manager (VCEM) provides a central console to administer connections and workloads for thousands of servers. For more information on Virtual Connect Ethernet, Fibre Channel and management options see: www.hp.com/go/virtualconnect
HP Insight management software	HP Insight Foundation	Managing the growing number of servers can be complex and expensive for your organization. IT managers need to address changing business needs with tools that meet the challenges of managing today's complex Datacenters. HP provides management solutions that are designed to simplify a server's installation, configuration and maintenance throughout the entire server lifecycle. This provides the customer with higher levels of operational efficiency and highly reliable systems: www.hp.com/go/foundation. The foundation pack includes: • HP SmartStart • HP Management DVD • HP ProLiant Smart Update Firmware DVD • SmartStart version supported (minimum): SmartStart 8.15 http://www.hp.com/servers/smartstart NOTE: In an effort to support reducing our environmental impact, the HP Insight Foundation Suite for ProLiant media will be available as a selectable option for this server at time of order of a Factory Integrated Model. This will allow customers to order the number of media kits that best meet their needs and eliminate receiving unnecessary duplicate media.
	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 Insight Dynamics for ProLiant, helping customers unleash the value of the ProLiant platform and deliver the highest possible quality of IT service. For more information, visit: www.hp.com/go/iLO
	HP Insight Control	HP Insight Control, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, monitor, remote control, and optimize your IT infrastructure through a single, simple management console. Two versions of Insight Control are available, to serve environments requiring either a Linux-based or a Windows-based central management servers: HP Insight Control for Linux, and HP Insight Control. See 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.
	HP Insight Dynamics for ProLiant	HP Insight Dynamics for ProLiant, a product option, is an integrated command center that enables IT Staff personnel to continuously analyze and optimize a converged infrastructure, while automating and reducing the cost of common data center tasks by as much as 40 percent. As a powerfully integrated by design toolkit to accelerate complex technology projects and simplify daily operations that ultimately enable IT Staff personnel to dynamically keep pace with the organizations changing business requirements. It enables them to plan capacity and power continuously, balance across physical and virtual resources, and ensure cost-effective high availability. It also enables IT organizations to provision infrastructure consistently and automatically from pools of shared resources using a self-service portal. Resources provisioned can range from a single virtual machine to complex multi-tier environments and their associated physical and virtual resource requirements. In addition to the previous functional benefits, it also provides a cost-effective disaster recovery for physical and virtual environments that works with HP StorageWorks Continuous Access software for both the Enterprise Virtual Array and the XP storage array allowing application environments to be reactivated in minutes with the touch of a button to a remote location. NOTE: For more information, visit: http://www.hp.com/go/insightdynamics
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 Novell SLES, 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 Cluster Management Utility	HP Cluster Management Utility (CMU) is an HP-licensed and HP-supported suite of tools that are used to manage large-scale 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
	HP HPC Linux Value Pack	HP HPC Linux Value Pack (Value Pack) is an HP-licensed and HP-supported specially priced software bundle for the development and deployment of applications on HPC Cluster Platforms. Value Pack includes the Platform LSF workload scheduler, the HP-MPI parallelization library, the HP Unified Parallel C compiler and the HP Shmem library, as well as the execution environments for the libraries and compiler. HP HPC Linux Value Pack

Standard Features

Operating Systems and Virtualization Software	Microsoft Windows Server Microsoft Windows Server Hyper-V Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) Solaris 10 for x86/x64 based Systems 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/supportos and our driver download page http://www.hp.com/support/BL685cG6
Availability	Dual-Port Fibre Channel Mezzanine Card for redundant SAN connection Two (2) embedded dual-port 10Gb Ethernet adapters for redundant LAN connections Two (2) hot-plug SAS/SATA hard drive bays and integrated RAID (Smart Array P400i) controller (Battery-backed write cache is optional.) Redundant ROM on each server blade Multiple mezzanine I/O expansion ECC Memory Network adapter teaming (network fault tolerance, transmit load balancing, switch-assisted load balancing)
Industry Standard Compliance	ACPI 2.0 Compliant PCI 2.2 Compliant WOL Support Microsoft® Logo certifications USB 2.0 Support
Security	Power-on password Administrator's password Integrated Lights-Out 2 has 12 customizable user accounts and SSL encryption Integrated Lights-Out 2 can be disabled via a Global Setting
Security - Trusted Platform Module	The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008. BitLocker leverages the enhanced security capabilities of a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2008 has not been tampered with while the system was offline. NOTE: For more information about TPM, including a white paper, go to 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.

Standard Features

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 Enterprise Configurator

The HP eConfigure Enterprise Configurator now provides factory default racking for our HP hardware portfolio. This approach is aligned with our strategic direction to meet the needs and expectations of our valued customers. If you require "custom" rack configuration, please contact HP's Customer Business Center or an Authorized Partner for assistance. http://www.hp.com/products/configurator.

Service and Support

HP Care Pack Services: Packaged server and storage services for increased uptime, productivity and ROI

When you buy HP server and storage products and solutions, it's also a good time to think about what levels of support you may need. Our portfolio of service options reduce deployment and management worries while helping you get the most out of your server and storage investments. We take a holistic approach to your environment, bridging servers, blades, storage, software and network infrastructures with our packaged HP Care Pack Services for servers and storage.

Protect your business beyond warranty

When it comes to robustness and reliability, standard computing equipment warranties have matured along with technology. Good news that can also create problems stemming from depending on standard warranties designed to only protect against product defects and some downtime causes. Using a standard approach to warranty uplifts, such as HP Care Pack Services, helps reduce downtime risks and provides operational consistency for mission-critical and standard business computing.

HP Care Pack Services: Upgrading or extending standard server and storage warranties cost effectively

HP Care Pack Services offer a standard reactive hardware and software support services suite sold separately, or combined with our Support Plus and Support Plus 24 services. The portfolio also provides a combination of integrated proactive and reactive services, such as Proactive 24 Service and Critical Service. In addition with HP Proactive Select, you can acquire the specific proactive constancy and technical services. HP Proactive Select menu offers a broad set of service options that you can mix and match depending on your specific requirements. Proactive service options include offers for server, storage, network, SAN device, software, environment and education services.

HP server and storage lifecycle support services offers a full spectrum of customer care-from technology support to complex migrations to complete managed services. HP Factory Express provides customization, integration and deployment services for turnkey solutions. HP Education Services offer flexible, comprehensive training on to help your IT staff get the most out of your server and storage investments. HP Financial solutions extend innovative financing and cost-effective asset management programs-from purchase to equipment retirement.

Learn more: www.hp.com/services/servers and www.hp.com/services/storage

NOTE: Care Pack Services availability may vary by product and country.

HP Care Pack Services are sold by HP and HP Authorized Service Partners:

- Services for customers purchasing from HP or an enterprise reseller are quoted using HP order configuration tools.
- Customers purchasing from a commercial reseller can find HP Care Pack Services at http://www.hp.com/go/lookuptool

Recommended HP Care Pack Services for optimal satisfaction with your HP product

Recommended Services

3-Year HP Hardware Support Onsite Call-to-Repair (CTR) Service, 6- or 24-hour

Provides your IT manager with a team of support specialists who will quickly begin troubleshooting the system to help return the hardware to operating condition within 6 or 24 hours of the initial service request to the HP Global Solution Center.

HP is committed to repairing your hardware within a maximum of six or twenty four hours. The benefits include:

- Improved system uptime
- Predictable repair times
- More effective IT resource planning
- Consistent level of hardware support across your multi-technology systems

http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6636ENN

3-Year HP Hardware Support Onsite Service, 4-hour response, 24x7

Provides you with rapid remote support and if required an HP authorized representative who will arrive on site any time and day of the year to begin hardware maintenance service within 4 hours of the service request being logged.

This service provides a trained HP service specialist to perform an installation that meets HP quality standards, for:

- Help improve or maintain system uptime
- Convenient onsite support
- Committed response time

http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EEE

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.

- Expedited installation, with all service prerequisites met before the installation is performed
- Installation in accordance with manufacturer's specifications, enhancing the supportability of your HP-installed hardware and software
- Service delivery at a mutually scheduled time
- Allows your IT resources to stay focused on their core tasks and priorities
- Availability of an HP service specialist to answer questions during the onsite delivery of this service

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

Optional HP Care Pack Services that will enhance your HP product experience

Optional Services

HP Enhanced Network Installation & Startup for BladeSystem Switches
Provides for the configuration and testing of BladeSystem Ethernet interconnect switches to facilitate proper implementation of network protocols and access to advanced features.

http://h20195.www2.hp.com/V2/GetPDF.aspx/4aa0-5969ENW

3-Year HP Proactive 24
As an alternative to our recommended support level, for customers who want enhanced operational effectiveness and proactive problem identification:

Provides improved stability, availability and operational effectiveness with an integrated hardware and software support service that combines industry-leading reactive technical assistance with proactive account services, giving your IT manage support from a team of service specialists.

http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-1614ENUC

HP Proactive Select Service
Customer needs on demand access to consulting, technical proactive services and education courses

Provides a flexible way to purchase HP best-in-class consultancy and technical services. You can buy Proactive Select Service Credits when you purchase your hardware and then use the credits over the next 12 months.

http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-3842ENN

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eSupport

HP eSupport is a portfolio of technology-based services that assist you with managing your business environment - from the desktop to the data center.

Support Portal
The HP support portal provides one-stop access to the information, tools and services you need to manage the daily operations of your IT environment.

Features include:

- Access to self-solve tools (including search technical knowledge base)
- Efficient logging and tracking of support cases
- Collaboration with other business and IT professionals
- Download of patches and drivers
- Access to diagnostic tools
- Proactive notification of relevant information

Access to certain features of the support portal requires an HP service agreement. To access the support portal, visit: http://www.hp.com/support

HP Insight Remote Support software delivers secure remote support for your HP Servers and Storage, 24 X 7, so you can spend less time solving problems and more time focused on your business. You can have your systems remotely monitored for hardware failure using secure technology that's been proven at thousands of companies around the world. In many cases, you can avoid problems before they occur.

Customer Technical Training	In today's cost-conscious business environment, IT professionals, developers, consultants and users face an interesting challenge: how to keep up with the latest technologies and expand important skills while delivering profitable results on current projects. To help address this challenge, HP offers innovative training solutions that help keep you up-to-date on virtualization, server, storage, Insight Control, Citrix, Microsoft® and open source/Linux-related topics-while spending less time away from business-critical activities.
HP Services Awards	HP Technology Services continues to be recognized for service and support excellence by customers, partners, industry organizations and publications around the world. Recent honors and award reflect our services team's dedications, technical expertise, professionalism and uncompromising commitment to customer satisfaction.
Additional Services Information	To learn more on HP ProLiant servers, HP BladeSystem servers and HP StorageWorks storage products, please contact your HP sales representative or HP Authorized Channel Partner. Or visit: www.hp.com/services/proliant or www.hp.com/services/bladesystem or http://www.hp.com/hps/storage

Models

Six-Core Models

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

HP ProLiant BL685c G6 8435 6C, 8G (2P) 539815-B21 **HP ProLiant BL685c G6 8431 6C, 8G (2P)** 539818-B21	**Processor(s)** Two of the following depending on model	(2) AMD Opteron™ processor Model 8435 (2.6 GHz) (2) AMD Opteron processor Model 8431 (2.4 GHz)
	Cache Memory One of the following depending on model	512 KB Level 2 cache memory per core 6 MB Level 3 cache memory
	Memory	8 GB (4 x 2 GB) PC2-6400, Registered DDR2-800
	Network Adapter	Two (2) embedded NC532i Dual Port Flex-10 10GbE Multifunction Server Adapters and one (1) additional 10/100 server adapter dedicated to iLO 2 management
	Storage Controller	HP Smart Array P400i Controller with 512MB (optional battery-backed write cache)
	Hard Drives	No drives included; (2) SFF SAS/SATA drive bays
	Internal Storage	Up to 1.2TB SAS Up to 1TB SATA
	Optical Drive	None
	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

Quad-Core Models

HP ProLiant BL685c G6 8389 QC, 8G (2P) 491336-B21 **HP ProLiant BL685c G6 8387 QC, 8G (2P)** 491337-B21	**Processor(s)** Two of the following depending on model	(2) AMD Opteron processor Model 8389 (2.9 GHz) (2) AMD Opteron processor Model 8387 (2.8 GHz)
	Cache Memory One of the following depending on model	512 KB Level 2 cache memory per core 6 MB Level 3 cache memory
	Memory	8 GB (4 x 2 GB) PC2-6400, Registered DDR2-800
	Network Adapter	Two (2) embedded NC532i Dual Port Flex-10 10GbE Multifunction Server Adapters and one (1) additional 10/100 server adapter dedicated to iLO 2 management
	Storage Controller	HP Smart Array P400i Controller with 512MB (optional battery-backed write cache)
	Hard Drives	No drives included; (2) SFF SAS/SATA drive bays
	Internal Storage	Up to 1.2TB SAS Up to 1TB SATA
	Optical Drive	None

Models

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

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

Step 1: Base Server Blade Configuration

HP Models	HP ProLiant BL685c G6 Configure-to-order Server	491338-B21
	Two (2) embedded NC532i Dual Port Flex-10 10GbE Multifunction Server Adapters and one (1) additional 10/100 server adapter dedicated to iLO 2 management	
	Two (2) small form factor (SFF) SAS/SATA hot plug hard drive bays	
	Two (2) non-hot plug internal SATA SSD drive bays	
	HP Embedded SATA Controller	
	HP Integrated Lights-Out 2 (iLO 2) management processor	

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

HP Processors	For dual (2) processor configurations choose (one of the following): NOTE: If four (4) processors are desired, select one xxxxxx-L21 and one xxxxxx-B21.	
	AMD Opteron™ 8435 2.60GHz Six Core 75 Watts BL685c G6 Factory Integrated Processor Option Kit	539816-L21
	AMD Opteron™ 8431 2.40GHz Six Core 75 Watts BL685c G6 Factory Integrated Processor Option Kit	539819-L21
	AMD Opteron™ 8389 2.90GHz Quad Core 75 Watts BL685c G6 Factory Integrated Processor Option Kit	491341-L21
	AMD Opteron™ 8387 2.80GHz Quad Core 75 Watts BL685c G6 Factory Integrated Processor Option Kit	491343-L21
	AMD Opteron™ 8382 2.60GHz Quad Core 75 Watts BL685c G6 Factory Integrated Processor Option Kit	591872-L21
	AMD Opteron™ 8425HE 2.10GHz Six Core 55 Watts 2P BL685c G6 Factory Integrated Processor Option Kit	539821-L21
	AMD Opteron™ 8381HE 2.50GHz Quad Core 55 Watts BL685c G6 Factory Integrated Processor Option Kit	508864-L21
HP Memory	HP 2GB (2x1GB) Single Rank PC2-6400 (DDR2-800) Registered Memory Kit	497763-B21
	HP 4GB (2x2GB) Single Rank PC2-6400 (DDR2-800) Registered Memory Kit	497765-B21
	HP 8GB (2x4GB) Dual Rank PC2-6400 (DDR2-800) Registered Memory Kit	497767-B21
	HP 8GB (2x4GB) Dual Rank x4 PC2-6400 (DDR2-800) Registered Low Power Memory Kit	504351-B21
	HP 16GB (2x8GB) Dual Rank PC2-5300 (DDR2-667) Registered Memory Kit	408855-B21
	HP 64GB (8x8GB) Dual Rank PC2-5300 (DDR2-667) Registered Memory Kit	495605-B21
	NOTE: Must be installed in pairs.	
	NOTE: DIMMs must be installed in decreasing capacity with the largest DIMMs installed in the banks furthest away from each processor.	

NOTE: The memory bus will operate at 800 MHz with four (4) or fewer DIMMs per processor, 667 MHz with six (6) DIMMs per processor, and 533 MHz with eight (8) DIMMs per processor.

Step 3: Choose Additional Factory Integration Options

HP Storage Controller	HP Smart Array P400i/512 BL685c G6 Factory Integrated Controller NOTE: The Smart Array P400i controller is required for all blades that support hot plug hard disk drives. NOTE: For additional Storage Controller Options see Additional Options section of this QuickSpec.	512867-B21

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

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.

HP Ethernet Mezzanine Options	Gigabit Ethernet Mezzanines	
	HP NC325m PCI Express Quad Port 1Gb Server Adapter for c-Class BladeSystem	416585-B21
	HP NC326m PCI Express Dual Port 1Gb Server Adapter for c-Class BladeSystem	406771-B21
	HP NC360m Dual Port 1GbE BL-c Adapter	445978-B21
	HP NC364m Quad Port 1GbE BL-c Adapter	447883-B21
	HP NC382m Dual Port 1GbE Multifunction BL-c Adapter	453246-B21
	QLogic QMH4062 1GbE iSCSI Adapter for c-Class BladeSystem	488074-B22
	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: Each 10 Gigabit Either 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 NC522m Dual Port Flex-10 10GbE Multifunction BL-c Adapter	467801-B21
	HP NC532m Dual Port Flex-10 10GbE Multifunction BL-c Adapter	467799-B21
	HP NC542m Dual Port Flex-10 10GbE BLc Adapter	539857-B21
	HP NC550m 10GbE 2-port PCIe x8 Flex-10 Ethernet Adapter	581204-B21
	HP NC551m Dual Port FlexFabric 10Gb Converged Network Adapter	580151-B21
	HP BLc NC552m Flex-10GbE Dual Port Adapter	610609-B21
	HP NC553m 10Gb 2-port FlexFabric Adapter	613431-B21
HP Fibre Channel Mezzanine Options	4Gb Fibre Channel Mezzanines	
	Emulex LPe1105 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	403621-B21
	QLogic QMH2462 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	403619-B21
	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 BLc Brocade 804 8Gb Fibre Channel Host Bus Adapter	590647-B21

Core Options

HP Processors	HP BL685c G6 AMD Opteron™ 8435 (2.60GHz/6-core/6MB/75W) Processor Kit	539816-B21
	HP BL685c G6 AMD Opteron™ 8431 (2.40GHz/6-core/6MB/75W) Processor Kit	539819-B21
	HP BL685c G6 AMD Opteron™ 8389 (2.90GHz/4-core/6MB/75W) Processor Kit	491341-B21
	HP BL685c G6 AMD Opteron™ 8387 (2.80GHz/4-core/6MB/75W) Processor Kit	491343-B21
	HP BL685c G6 AMD Opteron™ 8382 (2.60GHz/4-core/6MB/75W) Processor Kit	591872-B21
	HP BL685c G6 AMD Opteron™ 8425HE (2.10GHz/6-core/6MB/55W) 2-Processor Kit	539821-B21
	HP BL685c G6 AMD Opteron™ 8381HE (2.50GHz/4-core/6MB/55W) Processor Kit	508864-B21
	NOTE: HP ProLiant BL685c G6 processor option kits contain two (2) processors.	
	NOTE: The ProLiant BL685c G6 only supports two (2) and four (4) processor configurations.	
HP Memory	HP 2GB (2x1GB) Single Rank PC2-6400 (DDR2-800) Registered Memory Kit	497763-B21
	HP 4GB (2x2GB) Single Rank PC2-6400 (DDR2-800) Registered Memory Kit	497765-B21
	HP 8GB (2x4GB) Dual Rank PC2-6400 (DDR2-800) Registered Memory Kit	497767-B21
	HP 8GB (2x4GB) Dual Rank x4 PC2-6400 (DDR2-800) Registered Low Power Memory Kit	504351-B21
	HP 16GB (2x8GB) Dual Rank PC2-5300 (DDR2-667) Registered Memory Kit	408855-B21
	HP 64GB (8x8GB) Dual Rank PC2-5300 (DDR2-667) Registered Memory Kit	495605-B21
	NOTE: Must be installed in pairs.	
	NOTE: DIMMs must be installed in decreasing capacity with the largest DIMMs installed in the banks furthest away from each processor.	
	NOTE: The memory bus will operate at 800 MHz with four (4) or fewer DIMMs per processor, 667 MHz with six (6) DIMMs per processor, and 533 MHz with eight (8) DIMMs per processor.	
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.	
	SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives	
	HP 600GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581286-B21
	HP 450GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581284-B21
	HP 300GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507127-B21
	HP 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512547-B21
	HP 146GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507125-B21

Core Options

HP 72GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512545-B21
NOTE: Please see the for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12244_na/12244_na.html	
SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives	
HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507610-B21
SATA Hot Plug SFF (2.5-inch) Midline (MDL) Drives	
HP 500GB 3G SATA 7.2K rpm SFF (2.5-inch) Midline 1yr Warranty Hard Drive	507750-B21
HP 160GB 3G SATA 7.2K rpm SFF (2.5-inch) Midline 1yr Warranty Hard Drive	530888-B21
SATA Hot Plug SFF (2.5-inch) Entry (ETY) Drives	
HP 250GB 3G SATA 5.4K rpm SFF (2.5-inch) Entry 1yr Warranty Hard Drive	460355-B21
HP 120GB 1.5G SATA 5.4K rpm SFF (2.5-inch) Entry 1yr Warranty Hard Drive	458924-B21
NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13021_na/13021_na.html	
Solid State Drives (SSD)	
HP 32GB 1.5G SATA SFF (2.5-inch) Non-hot Plug Entry 3yr Warranty Solid State Drive	461201-B21
HP 64GB 1.5G SATA SFF (2.5-inch) Non-hot Plug Entry 3yr Warranty Solid State Drive	461203-B21
NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13121_na/13121_na.html	

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 Electronic License	T9074BAE
	HP Insight Control including 1yr 24x7 Technical Support and Updates Single Server License	452148-B22
	HP Insight Software Media Kit NOTE: Insight Software DVD media without licenses. Contains Insight Control, Insight Dynamics and Virtual Connect Enterprise Manager. Uses an integrated installer to perform quick and accurate software installation and updates. NOTE: Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: http://www.hp.com/go/insightupdates. NOTE: Electronic licenses can be used to purchase multiple licenses with a single activation key. 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	436222-B21
	HP Insight Control for Linux	
	HP Insight Control for Linux including 1yr 24x7 Support Single Server License	TC209A
	HP Insight Control for Linux including 1yr 24x7 Support Electronic License NOTE: This part number can be purchased as a single license or as multiple licenses with a single activation key. Customer will receive a license entitlement certificate via e-mail. 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: Electronic LTUs are only available through limited points of sales; if not available, order a printed license entitlement certificate instead.	TC213AAE
	HP Insight Control for Linux Media Kit NOTE: Media pack DVD contains the ISO image for HP Insight Control for Linux, HP Systems Insight Manager, HP Insight Control power management, HP Insight Control virtual machine management, and an integrated installer. Servers must be acquired separately. NOTE: This Media pack is optional because the latest ISO image and latest updates may be downloaded at no cost from: http://www.hp.com/go/ic-linux (click on Download button). NOTE: Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: http://www.hp.com/go/ic-linux (click on Download button). NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single set of activation keys. NOTE: Tracking licenses may only be purchased by customers that have implemented an activation key agreement (AKA) with HP. For more information on Activation Key Agreements please visit: http://h18013.www1.hp.com/products/servers/proliantessentials/license/options.html	TC208A
	HP Integrated Lights-Out (iLO) Advanced for BladeSystem Remote Management	

Additional Options

	HP iLO Advanced for BladeSystem including 1yr 24x7 Support Single Server License NOTE: Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: http://www.hp.com/go/insightupdates. NOTE: Electronic 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: For additional license kits, including electronic delivery options, please see the HP Integrated Lights-Out 2 (iLO 2) QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12362_na/12362_na.html	512488-B21
	HP Insight Control server deployment	
	HP Insight Control Server Deployment including 1yr 24x7 Support Electronic License	T9082AAE
	HP Insight Control Server Deployment including 1yr 24x7 Support Single Server License NOTE: Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: http://www.hp.com/go/insightupdates. NOTE: Electronic 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: For additional license kits please see the Insight Control QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/12631_na/12631_na.html	452151-B21
High Performance Clusters	HP Cluster Management Utility Compute Node License 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: http://h18004.www1.hp.com/products/quickspecs/12612_na/12612_na.html	436284-B21
	HP Cluster Management Utility Media and Management License 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	433257-B21
	HP HPC Linux Value Pack One Processor License NOTE: This part number can be used to purchase one certificate for multiple licenses with a single activation key. Each license is for one socket (a.k.a. processor). 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: http://h18004.www1.hp.com/products/quickspecs/13485_na/13485_na.html	TC293A

Additional Options

	HP HPC Linux Value Pack Media NOTE: This part number can be used to purchase media including software and documentation, which will be delivered to the customer. NOTE: For additional license kits please see the QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/13485_na/13485_na.html	TC294A
HP Security - TPM	HP Trusted Platform Module (TPM) Kit 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.	488069-B21
HP Storage Controller	HP Smart Array P700m/512 4-ports Ext PCIe x8 SAS Controller	508226-B21
	HP Smart Array P700m/256 4-ports Ext PCIe x8 SAS Controller	507925-B21
	Optional Upgrade	
	HP Smart Array P-Series Low Profile Battery NOTE: The Smart Array battery option kit is required to enable battery-backed write cache (BBWC) on the P400i or P700m array controller. NOTE: Please see the QuickSpecs for Technical Specifications and additional configuration information at: http://h18000.www1.hp.com/products/quickspecs/13175_na/13175_na.html	452348-B21
HP I/O Expansion Options	HP StorageWorks 80GB IO Accelerator for BladeSystem c-Class	AJ876A
	HP StorageWorks 160GB IO Accelerator for BladeSystem c-Class	AJ877A
	HP StorageWorks 320GB IO Accelerator for BladeSystem c-Class NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13220_na/13220_na.html	AJ878A
HP c-Class Mezzanines Options	HP InfiniBand Mezzanine Options	
	HP 4X DDR IB Dual Port Mezzanine HCA for HP BladeSystem c-Class	448262-B21
HP Ultrium Tape Blades	HP StorageWorks SB1760c Tape Blade NOTE: LTO-4 Ultrium tape technology	AQ697A
	HP StorageWorks SB920c Tape Blade NOTE: LTO-3 Ultrium tape technology	AJ401A
	HP StorageWorks Ultrium 448c Tape Blade NOTE: LTO-2 Ultrium tape technology 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 NOTE: Please visit the BladeSystem c-Class enclosure QuickSpecs for a complete list of recommended data protection solutions for BladeSystem c-Class enclosures: http://h18004.www1.hp.com/products/blades/bladesystem/index.html	440947-B21

Additional Options

HP StorageWorks Storage Blades	HP StorageWorks LTO-5 SB3000c Tape Blade 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	BS580A
	HP StorageWorks SB40c Storage Blade with HP LeftHand VSA bundle NOTE: Please see the QuickSpecs for Technical Specifications and additional configuration information at: http://h18000.www1.hp.com/products/quickspecs/12587_na/12587_na.html	AT459A
	HP StorageWorks D2200sb PCIe Storage Blade NOTE: The HP PCI Express Mezzanine Pass-Thru Card (P/N 431643-B21) is required to support the HP StorageWorks D2200sb PCIe Storage Blade with the BL620c G7. Up to two storage blades are supported per server mix and match (Ultrium Tape, D2200sb PCIe Storage, and/or PCI Expansion Blades). NOTE: The HP PCI Express Mezzanine Pass-Thru Card can be placed in mezzanine slot 2 and/or 3. NOTE: Please see the HP StorageWorks D2200sb PCIe Storage Blade QuickSpecs for technical specifications and additional information at: http://h18006.www1.hp.com/storage/bladesystem/index.html.	AP880A
	HP StorageWorks SB40c Storage Blade NOTE: Please see the QuickSpecs for Technical Specifications and additional configuration information at: http://h18000.www1.hp.com/products/quickspecs/12587_na/12587_na.html	411243-B21
HP Expansion Blade	HP PCI Expansion Blade NOTE: Ships with one pre-installed PCI-X connect board. Also includes one PCIe connect board which requires installation. NOTE: Please see the QuickSpecs for Technical Specifications and additional configuration information at: http://h18000.www1.hp.com/products/quickspecs/12753_na/12753_na.html	448018-B21
HP USB and SD Options	**SD Options**	
	HP 4GB SD Flash Media Kit NOTE: Blank SD media device is supported for use with VMware and Citrix. USB media must be installed in the internal slot of the ProLiant server. Learn more at: http://www.hp.com/go/proliantvirtualization.	580387-B21
	USB Options	
	HP 2GB USB Flash Media Drive Key Kit NOTE: HP qualified blank USB key for use with HP ProLiant servers that support the VMware virtualization environment and other HP value-add software like SmartStart. HP recommends this industry standard USB flash device for use with VMware ESXi. USB device must be installed in the internal slot of the ProLiant server for use with VMware ESXi. Refer to HP VMware Getting Started Guide for installation instructions.	608447-B21
	HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver)	DC172B
	HP USB 04 Standard Keyboard	DT528A#ABA

Additional Options

HP Care Pack Services

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

Hardware Services On-site Service

4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	UK108E
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UK109E
6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UK110E

Memory

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

DIMM installation guidelines:

1. All DIMMs must be PC2-5300 Registered DDR2 DIMMs (667 MHz) or PC2-6400 Registered DDR2 DIMMs (800 MHz).
2. Both DIMM slots in a memory bank must be populated.
3. Banks must be populated in sequential alphabetic order, starting with bank A.
4. Both DIMMs in a memory bank must be identical. Install identical DIMMs as pairs only, starting with DIMM socket 1, bank A.
5. Multiple advanced memory protection (AMP) modes are supported, based on DIMM population and RBSU selection. The server blade defaults to Advanced ECC.
6. DIMMs must be installed in decreasing capacity with the largest DIMMs installed in the banks furthest away from each processor.
7. DIMM banks are active only when the corresponding processor socket is populated.
8. The memory bus will operate at 800 MHz with four (4) or fewer DIMMs per processor, 667 MHz with six (6) DIMMs per processor, and 533 MHz with eight (8) DIMMs per processor.

HP ProLiant BL685c G6 Server Blade

Standard Memory

8192 MB (4 x 2048 MB) of PC2-6400 Registered DDR2-800 ECC DIMMs.

Standard Memory Replaced with Optional Memory

Up to 262144 MB of PC2-5300, Registered DDR2 ECC DIMMs. Memory is available with the removal of standard memory and the installation of optional PC2-5300, Registered DDR2 DIMM memory expansion kits.

Memory		Slot							
Standard	8192 MB	Processor 1							
		1A	2A	3B	4B	5C	6C	7D	8D
		2048 MB	2048 MB	Empty	Empty	Empty	Empty	Empty	Empty
		Processor 2							
		9E	10E	11F	12F	13G	14G	15H	16H
		2048 MB	2048 MB	Empty	Empty	Empty	Empty	Empty	Empty
		Processor 3							
		17I	18I	19J	20J	21K	22K	23L	24L
		Empty	Empty	Empty	Empty	Empty	Empty	Empty	Empty
		Processor 4							
		25M	26M	27N	28N	29O	30O	31P	32P
		Empty	Empty	Empty	Empty	Empty	Empty	Empty	Empty
Maximum	262144 MB	Processor 1							
		1A	2A	3B	4B	5C	6C	7D	8D
		8192 MB	8192 MB	8192 MB	8192 MB	8192 MB	8192 MB	8192 MB	8192 MB
		Processor 2							
		9E	10E	11F	12F	13G	14G	15H	16H
		8192 MB	8192 MB	8192 MB	8192 MB	8192 MB	8192 MB	8192 MB	8192 MB
		Processor 3							
		17I	18I	19J	20J	21K	22K	23L	24L
		8192 MB	8192 MB	8192 MB	8192 MB	8192 MB	8192 MB	8192 MB	8192 MB
		Processor 4							

Memory

		25M	26M	27N	28N	29O	30O	31P	32P
		8192 MB	8192 MB	8192 MB	8192 MB	8192 MB	8192 MB	8192 MB	8192 MB

HP Memory

Following are memory options available from HP:

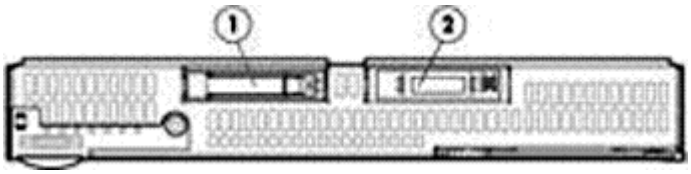
HP 2GB (2x1GB) Single Rank PC2-6400 (DDR2-800) Registered Memory Kit	497763-B21
HP 4GB (2x2GB) Single Rank PC2-6400 (DDR2-800) Registered Memory Kit	497765-B21
HP 8GB (2x4GB) Dual Rank PC2-6400 (DDR2-800) Registered Memory Kit	497767-B21
HP 8GB (2x4GB) Dual Rank x4 PC2-6400 (DDR2-800) Registered Low Power Memory Kit	504351-B21
HP 16GB (2x8GB) Dual Rank PC2-5300 (DDR2-667) Registered Memory Kit	408855-B21
HP 64GB (8x8GB) Dual Rank PC2-5300 (DDR2-667) Registered Memory Kit	495605-B21

NOTE: Must be installed in pairs.

NOTE: DIMMs must be installed in decreasing capacity with the largest DIMMs installed in the banks furthest away from each processor.

NOTE: The memory bus will operate at 800 MHz with four (4) or fewer DIMMs per processor, 667 MHz with six (6) DIMMs per processor, and 533 MHz with eight (8) DIMMs per processor.

Storage



1-2 2 x SFF SAS or SATA Hot Plug Hard Drives

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: Simultaneous operation of hot plug hard drives and solid state drives is not supported.

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

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

	Quantity Supported	Position Supported	Controller
600GB 6G SAS 10K DP 450GB 6G SAS 10K DP 300GB 6G SAS 10K DP 146GB 6G SAS 15K DP 146GB 6G SAS 10K DP 72GB 6G SAS 15K DP	2	1-2	Smart Array P400i Controller

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

	Quantity Supported	Position Supported	Controller
500GB 6G SAS 7.2K DP	2	1-2	Smart Array P400i Controller

SATA Hot Plug SFF Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
500GB 3G SATA 7.2K 160GB 3G SATA 5.4K	2	1-2	Smart Array P400i Controller

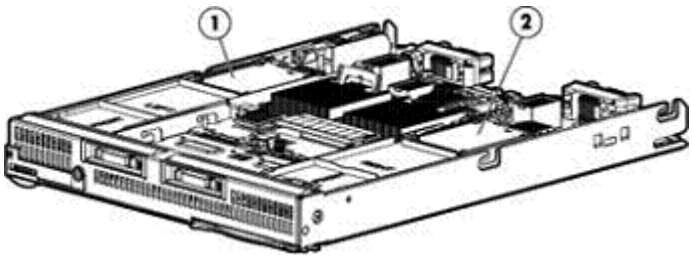
SATA Hot Plug SFF (2.5-inch) Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
250GB 3G SATA 5.4K 120GB 1.5G SATA 5.4K	2	1-2	Smart Array P400i Controller

Solid State Drives (SSD)

	Quantity Supported	Position Supported	Controller
32GB 1.5G SATA 64GB 1.5G SATA	2	1-2	Smart Array E200i Controller

Storage



1-2 2 x SATA Solid State Drives (SSD)

SATA Non-Hot Plug Solid State Drives

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

System Unit	Dimensions (H x W x D)	14.42 x 2.19 x 20.058 (36.63 x 2.19 x 50.95 cm)	
	Weight (approximate)	Maximum (all hard drives and processors installed)	22.8 lbs (10.3 kg)
		Minimum (two processors and four DIMMs)	20.82 lbs (9.44 kg)
	Power Specifications	For power specifications including input requirements, BTU rating, and power supply output, please see the HP BladeSystem c-Class Enclosures QuickSpecs located at: 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 To review typical system power ratings use the HP BladeSystem Power Sizer available at: http://www.hp.com/go/bladesystem/powercalculator NOTE: For optimal cooling and system performance the BL685c G6 requires the c7000 enclosure to be configured with 10 fans and the c3000 enclosure to be configured with 6 fans.	
	System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 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	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 P400i Controller	Disk Drive and Enclosure Interface	3G SAS (Serial Attached SCSI) 1.5G 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	x8 2.5G PCIe provides 2 GB/s maximum bandwidth.
	SAS Speed	x8 3G SAS provides 2.4 GB/s maximum bandwidth.
	Cache Memory	72-bit 512MB cache; ECC protection, battery-backed, and transportable
	Logical Drives Supported	Up to 32 logical drives
	Maximum Logical Drive Capacity	500 GB (2 x 250 GB)
	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

Embedded NC532i Dual Port Flex-10 10GbE Multifunction Server Adapter	Type	Integrated dual-port KR 10GbE
	Network Processor	Broadcom 57711
	Data Transfer Method	x8 PCI Express 1.0
	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. NOTE: Each port on the NC532i adapter transmits from the server at only 20 Gbps (theoretical) full duplex.
	IEEE Compliance	802.1p QoS, 802.1Q VLAN tagging, 802.3ad link aggregation, 802.3ap 10GBase-KR, and 802.3x flow control
	Standard Features	• ProLiant Teaming including Network Fault Tolerance, Transmit Load Balancing, and Switch-Assisted Load Balancing • 4K Jumbo frames • Microsoft Windows Receive Side Scaling (RSS) • Optional accelerated iSCSI

Technical Specifications

HP Integrated Lights-Out 2 (iLO 2) integrated on system board	Architecture	32-bit PCI-based health and remote management ASIC
	Processor	32-bit RISC processor core running at 66MHz
	Upgradeability	Option firmware upgradeable via Flash ROM
	Operating System Support	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 (32bit and 64bit)
		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
		Microsoft Windows XP Professional Edition
		Microsoft Windows Vista Business and Ultimate Editions
		Red Hat Enterprise Linux Desktop 5.00
		SUSE Linux Enterprise Desktop 11
		SUSE Linux Enterprise Desktop 10
	Client Browser Support	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	Telnet, Secure Shell and serial port access
		Secure Socket Layer
		Secure Shell version 2 (Password and certificate)
	Security	Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, CLP and XML scripting interface
		RC4 encryption of video
	Directory Support Services	Active Directory v1.0 (Windows 2003)
	Driver Support	Health Driver (HP ProLiant iLO 2 Management Controller Driver) iLO Management Channel Interface Driver
	Management protocols supported	SNMP 2, IPMI 2.0 (KCS interface), DMTF Server Management Command Line Protocol Specification
		(SM CLP), DMTF Web Services Management Specification (WS Management)

Environment-friendly Products and Approach	End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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