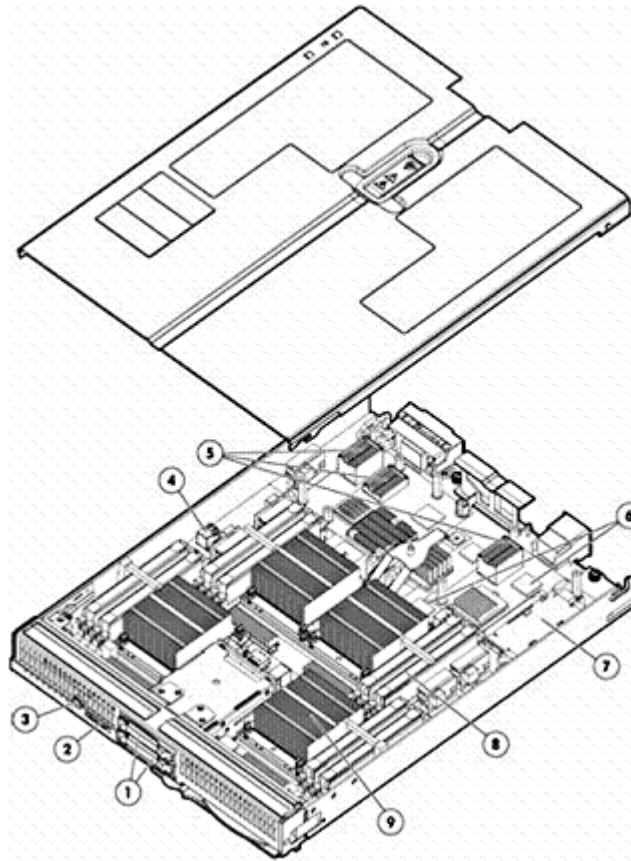


### Overview



### HP ProLiant BL685c Server Blade

1. Two small form factor (SFF) hot-plug drive bays
2. Local I/O connector
3. System power LED
4. Internal USB connector
5. Three mezzanine I/O expansion slots
6. Four Gigabit Ethernet network adapters ports, two are multifunction
7. Smart Array E200i storage controller (optional battery-backed write cache)
8. Sixteen PC2-5300 Registered DIMM (DDR2-667) memory slots
9. Up to four AMD Opteron™ 8000 series processors

### What's New

- Support for the Low Power Quad-Core AMD Opteron™ processor Model 8347 HE

### At A Glance

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

- HP BladeSystem c-Class Infrastructure QuickSpecs:  
[http://h18000.www1.hp.com/products/quickspecs/12517\\_ca/12517\\_ca.html](http://h18000.www1.hp.com/products/quickspecs/12517_ca/12517_ca.html)

### Overview

- HP BladeSystem c-Class Interconnect Components QuickSpecs:  
[http://h18000.www1.hp.com/products/quickspecs/12524\\_ca/12524\\_ca.html](http://h18000.www1.hp.com/products/quickspecs/12524_ca/12524_ca.html)

The HP ProLiant BL685c delivers no-compromise performance and expansion in the densest 4P server blade form-factor available to handle your most demanding applications.

HP ProLiant BL685c server blade includes:

- **Processor:**
  - Up to four Quad-Core AMD Opteron™ 8300 Series processors
    - Supports up to 2.3 GHz, 1 GHz HyperTransport™; 512KB Level 2 cache memory per core; 2MB Level 3 cache
  - Up to four AMD Opteron 8200 Series processors
    - Supports up to 3.0 GHz, 1 GHz HyperTransport™; 1MB Level 2 cache memory per core
- **Memory:**
  - Up to 64 GB of memory, supported by (16) slots of PC2-5300 Registered DIMMs at 667 MHz
  - Supporting memory interleaving (2:1)
- **Storage Controller:**
  - Integrated Smart Array E200i RAID controller with 64 MB cache (with optional battery-backed write-cache with an upgrade to 128MB cache (BBWC). Supports RAID 0,1.
- **Internal Drive Support:**
  - Up to 2 small form factor (SFF) SAS or SATA hot plug hard disk drives
- **Network Controller:**
  - Four (4) integrated network adapters
    - One (1) embedded NC326i Dual Port Gigabit Server Adapter
    - Two (2) embedded NC373i Multifunction Gigabit Server Adapters
    - One (1) additional 10/100 NIC dedicated to iLO 2 Management

**NOTE:** The Gigabit Ethernet adapters transmit from the server only at 2000 Mbps, full duplex per port. For more information, see the "Network Controller" item in Standards Features section.
- **Mezzanine Support:**
  - Three (3) additional I/O expansion slots via mezzanine card.
  - Supports up to (3) mezzanine cards
    - Dual-Port Fibre Channel Mezzanine (4-Gb) options for SAN connectivity (Choice of Emulex or QLogic).
    - Ethernet server adapter mezzanine options for additional network ports
      - HP NC512m Dual Port 10GbE Multifunction BL-c Adapter
      - HP NC373m PCI Express Dual Port Multifunction Gigabit Server Adapter for c-Class BladeSystem
      - HP NC364m Quad Port 1GbE BL-c Adapter
      - HP NC360m Dual Port 1GbE BL-c Adapter
      - HP NC326m PCI Express Dual Port 1Gb Server Adapter for c-Class BladeSystem
      - HP NC325m PCI Express Quad Port 1Gb server Adapter for c-Class BladeSystem
      - 4X DDR InfiniBand (IB) Mezzanine (20 Gb/s) options for low latency server interconnectivity (based on Mellanox technology)
- **Internal USB Support:**
  - One (1) internal USB 2.0 connector for security key devices and USB drive key
- **VMware ESX Server 3i and Citrix XenServer virtualization technology**
  - Integrated Hypervisors:
    - VMware ESX Server 3i virtualization technology
    - Citrix XenServer virtualization technology
- **Form Factor:**
  - HP ProLiant BL685c server blade plugs into the BladeSystem c3000 and c7000 enclosures
- **Management:**
  - Integrated Lights-Out 2 (iLO 2) Standard Blade Edition with virtual KVM and graphical remote console at no additional

### Overview

cost

- **Operating Systems:**
  - Supports Windows and Linux
- **Enclosures:**
  - HP offers three different c-Class server blade enclosures to meet your individual needs:
    - The HP BladeSystem c7000 rack enclosure is 10U high and holds up to 8 ProLiant BL685c servers plugged vertically.
    - The HP BladeSystem c3000 rack enclosure is 6U high and holds up to 4 HP ProLiant BL685c servers plugged horizontally.
    - The HP BladeSystem c3000 tower enclosure is designed with casters for sites without racks and holds up to 4 HP ProLiant BL685c servers plugged vertically.
  - 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>.
- **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. Additional support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. . Certain restrictions and exclusions apply. SATA hard drives have a one year warranty.
  - **NOTE:** Server Warranty includes 3 year Parts, 3 year Labour, 3-year on-site support. 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 a brief, printer friendly data sheet that describes this product and informs you of the essential capabilities and specifications, please visit: <http://h71028.www7.hp.com/ERC/downloads/4AA0-6122ENW.pdf>

**Processor** AMD Opteron™ processor Model 8356 (2.3 GHz, 75W ACP)†  
AMD Opteron processor Model 8354 (2.2 GHz, 75W ACP)†  
AMD Opteron processor Model 8222 (3.0 GHz, 95W)  
AMD Opteron processor Model 8220 (2.8 GHz, 95W)  
AMD Opteron processor Model 8218 (2.6 GHz, 95W)  
AMD Opteron processor Model 8216 (2.4 GHz, 95W)  
AMD Opteron processor Model 8214 (2.2 GHz, 95W)  
Low Power AMD Opteron processor Model 8347 HE (1.9 GHz, 55W ACP)†  
Low Power AMD Opteron processor Model 8218 HE (2.6 GHz, 68W)\*  
\* Offered through Configure-To-Order process only. See Factory Integration Models section for more details.  
† Processor wattage references reflect Average CPU Power (ACP). For more information on ACP visit: <http://www.amd.com/powernow>.  
**NOTE:** AMD Opteron 8200 series processors are 64-bit, dual-core, and support AMD Virtualization™. AMD Opteron 8300 series processors are 64-bit, quad-core, and support AMD Virtualization™.

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

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**Cache Memory** 1MB Level 2 cache memory per core (8200 series)  
512KB Level 2 cache memory per core, 2MB Level 3 cache (8300 series)

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**Chipset** nVidia CK8-04, IO-04

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**Memory**

Type	PC2-5300 DDR2 Registered DIMMs at 667 MHz
Standard	4 GB (4 x 1 GB)
Maximum	64 GB (16 x 4 GB)

**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.

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### Standard Features

#### Network Controller

Four (4) embedded NIC ports, plus one (1) additional management NIC port consisting of:

One (1) embedded NC326i Dual Port Gigabit Server Adapter

Two (2) embedded NC373i Multifunction Gigabit Server Adapters with TCP/IP Offload Engine for Microsoft Windows

One (1) additional 10/100 NIC dedicated to iLO 2 Management

**NOTE:** The Gigabit Ethernet adapters transmit from the server only at 2000 Mbps, full duplex per port. However, within a Linux environment, the speed can be reduced or "throttled" using a feature available within the Linux operating system; see the white paper at:

<http://h71028.www7.hp.com/ERC/downloads/4AA1-5513ENW.pdf> for more information.

The 10 Gigabit KX-4 NC512m adapter transmits from the server only at 20 Gbps (20,000 Mbps), full duplex.

Once the adapter signal reaches the interconnect within the blade enclosure and communicates outside the blade enclosure to the LAN, the blade interconnect uplink types and settings determine the cable media, speed, duplex mode, and auto negotiation mode. Interconnects are available with Ethernet uplinks supporting 10/100/1000T, 10/100/1000 SFP, 1000 SX fiber, and 10Gb KX-4.

#### Multifunction Networking

The embedded multifunction NC373i combines standard Gigabit Ethernet networking, TCP/IP offload engine (TOE) acceleration for Windows and Linux iSCSI boot capability into a single adapter.

- TOE moves the processing of data in the TCP protocol stack from the server CPU to the network card, freeing CPU cycles for other activities. With TOE, network communications are improved, and server efficiency is increased. The NC373i offers TOE for Microsoft® Windows 2000 and 2003 environments.
- The Linux iSCSI network boot (iSCSI boot) allows the BL685c to boot from a remote operating system (OS) image located on a storage area network (SAN) within a Red Hat or SUSE Linux environment. The BL685c uses an iSCSI firmware image (iSCSI boot option ROM) making the remote disk drive appear as a local, bootable C: drive. The BL685c is configured to connect to and boot from the iSCSI target disk on the network and download the OS image from the iSCSI target disk. The iSCSI boot option ROM is supplied by HP at no cost. The additional cost and mezzanine slot usage of an add-in iSCSI HBA card is not required. Additionally, the HP iSCSI boot solution includes scripts to significantly simplify the installation process.

#### I/O Expansion Slots

Three I/O expansion mezzanine slots (All x8 PCI Express)

#### Integrated Manageability

Integrated Lights-Out 2 (iLO 2) Standard Blade Edition (integrated on motherboard)

#### Storage Controller

Smart Array E200i Controller

64MB memory module supports RAID 0,1

Available upgrades: 128MB with Battery-backed write cache

#### Maximum Internal Storage

Hot Plug Serial Attach SCSI (SAS)

292GB SAS

2 x 146GB Serial SCSI

Hot Plug Serial ATA (SATA)

240GB SATA

2 x 120GB Serial ATA

### Standard Features

**Graphics** Integrated ATI RN-50 1280 x 1024 x 16M colour (32 MB DDR memory)

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**Graphics Resolution Supported** Resolution Colour 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

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### Fiber Channel on the HP ProLiant BL685c server blade

Two optional Fibre Channel HBAs are supported by the HP ProLiant BL685c. Both mezzanine circuit boards connect directly to the server blade system board. These Fibre Channel HBAs are available via option kits ordered separately.

Two option kits

Emulex LPe1105-HP 4Gb FC HBA for HP c-Class BladeSystem (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

QLogic QMH2462 4Gb FC HBA for HP c-Class BladeSystem (403619-B21)

- Uses common drivers which means that customers can standardize on one QLogic driver whether they are using the QMH2462 or other 4Gb and 2Gb HBAs powered by QLogic

Emulex and QLogic Fibre Channel HBAs feature

- Optimal performance utilizing PCI Express
  - 4/2/1Gb/s auto negotiating speeds
  - 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 systems environments
- 

### Compatible SAN

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

HP ProLiant BL685c server blades are compatible with select third party SANs (please see blade storage page for more details: <http://h18000.www1.hp.com/products/servers/proliant-bl/c-Class/storage.html>)

### Standard Features

#### Insight Control Management Suites for BladeSystem

Insight Control Environment for BladeSystem delivers foundation management for HP BladeSystem lifecycles, including hardware resource deployment, health monitoring, software version control, performance monitoring, vulnerability scanning and patch management.

Insight Control Environment for BladeSystem installs and licenses the following components by default using a wizard-based integrated installer:

- HP Systems Insight Manager
- HP iLO Select Pack
- HP Insight Power Manager
- HP ProLiant Essentials Rapid Deployment Pack
- HP ProLiant Essentials Performance Management Pack
- HP ProLiant Essentials Vulnerability and Patch Management Pack
- HP ProLiant Essentials Virtual Machine Management Pack

Additional ProLiant Essentials software and management tools included on the Insight Control Management kit can be installed manually.

- HP Server Migration Pack - Universal Edition
- HP Open Service Event Manager
- HP Instant Support Enterprise Edition

**NOTE:** HP Server Migration Pack - Universal Edition can be installed from the SMP-P2P CD included in the Insight Control Management media kit.

**NOTE:** Insight Control Environment for BladeSystem can be installed from the Insight Control Management DVD, which can be delivered with HP BladeSystem c-Class enclosures with a choice of licensing options. Licensing options include a free 30 day evaluation license for 8 servers (default option for every enclosure order), a full purchased license for 8 blade servers or a full purchased license for 16 blade servers). For additional information on HP c-Class Infrastructure please visit: HP BladeSystem c-Class Infrastructure QuickSpecs:

[http://h18000.www1.hp.com/products/quickspecs/12517\\_ca/12517\\_ca.html](http://h18000.www1.hp.com/products/quickspecs/12517_ca/12517_ca.html)

**NOTE:** For additional product and licensing information about Insight Control Environment for BladeSystem, HP Systems Insight Manager and Essentials software refer to <http://www.hp.com/servers/proliantessentials>.

HP Insight Control Environment for Linux (ICE-Linux) provides comprehensive discovery, imaging & deployment, monitoring, and management for Linux-based ProLiant server platforms. Built on the industry-leading HP Systems Insight Manager framework, this solution integrates open source technology with experience leveraged from HP's Linux products in HP ICLE and HP XC Clusters, while providing paths to the future with developing management technologies.

HP Insight Control management suites and most HP ProLiant Essentials include 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>.

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#### Stand Alone Software Product - ProLiant Essentials

HP Systems Insight Manager

HP Systems Insight Manager (HP SIM) provides a unified, secure and extensible standards-based environment to centrally manage servers, storage and other infrastructure devices, (both HP and non-HP) across multiple operating system platforms.

### Standard Features

ProLiant Essentials Rapid Deployment Pack	Rapid Deployment Pack (RDP) extends HP Systems Insight Manager with a complete deployment solution for HP ProLiant blade servers. RDP provides a central location to configure server hardware, deploy Windows, Linux and VMware ESX operating environments and install HP ProLiant Support Pack drivers using images and scripted profiles.
ProLiant Essentials Performance Management Pack	Performance Management Pack (offered exclusively through the Insight Control suites) - a performance management solution that identifies and explains hardware performance bottlenecks on ProLiant servers and attached options enabling users to better utilize their valuable resources.
Server Migration Pack - Universal Edition	Upgrading, replacing, or virtualizing your existing server? Effortlessly transition to new virtual or physical HP ProLiant servers or BladeSystem with automated, accurate and affordable migration of OS, application and data. SMP Universal automates the manual processes required for migrating servers between physical or virtual platforms, whether migrating to VMware or Microsoft virtual machines. SMP Universal allows all of the following: <ul style="list-style-type: none"><li>● Physical to ProLiant</li><li>● Physical to virtual</li><li>● Virtual to virtual</li><li>● Virtual to ProLiant</li></ul>
Virtual Machine Management Pack	Get the most out of server virtualization by unifying the management of physical and virtual servers in HP Systems Insight Manager. The Virtual Machine Management Pack plug-in provides central management and control of VMware and Microsoft virtual machines and provides physical host to virtual machine association.
Vulnerability and Patch Management Pack	Vulnerability and Patch Management Pack (offered exclusively through the Insight Control suites) - identifies and remediates software security vulnerabilities due to missing patches as well operating system configurations that can be exploited by viruses, worms, and other blended threats.
Integrated Lights-Out Select Pack	Upgrades the iLO 2 processor with enhanced console sharing and replay, virtual media (floppy, CD/DVD, USB key), virtual folders, historical power reporting, power capping and enterprise security (directory services and two-factor authentication) for servers managed using remote consoles available in iLO 2 Standard and iLO 2 Standard Blade Edition.
Insight Power Manager (IPM)	Upgrades the single-server remote management capabilities of iLO Select/Advanced to include centralized reporting and policy-based management of power consumption and thermal output provided by the Insight Power Manager. IPM unifies all of this functionality within a single user interface - HP Systems Insight Manager.
iLO Power Management Pack for BladeSystem	Is energy-efficient management software that delivers centralized control, reliable security, and energy savings for your BladeSystem infrastructure. iPMP combines the total control of iLO 2 Advanced in the area of remote management with the energy monitoring and control of the Insight Power Manager to deliver a robust solution capable of full remote control and power management of ProLiant servers through a unified interface within HP Systems Insight Manager.

**NOTE:** Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to: <http://www.hp.com/servers/proliantessentials> or the various ProLiant Essentials Value Pack product QuickSpecs for more information.

### Standard Features

**NOTE:** Selected software packages listed here include one year of 24 x 7 Software Technical Support and Update Service. If you have any questions about this service please visit the HP website at:  
<http://www.hp.com/services/insight>

#### Core Infrastructure Management

##### SmartStart

SmartStart is a tool that simplifies single server setup, providing a rapid way to deploy reliable and consistent server configurations. SmartStart 7.60 and later can now deploy the HP ProLiant BL685c using the I/O port with an attached USB CD-ROM device. To obtain a copy of SmartStart for your blade server order or download your copy from the SmartStart web site. For more information, please visit the SmartStart Web site at:

<http://www.hp.com/servers/smartstart>.

SmartStart version supported (minimum): SmartStart 7.60

##### Core Infrastructure Management SmartStart Insight Management Agents

The Insight Management Agents should be installed on all HP servers to present system instrumentation, health and configuration information into HP Systems Insight Manager and the HP System Management Homepage. The HP System Management Homepage aggregates systems data from Insight Management Agents and other HP management tools, providing a consolidated browser-based interface for managing individual servers.

##### Subscriber's Choice

Subscriber's Choice Driver and Support Alerts/Notifications is a web-based email subscription service that provides software and driver change notifications for ProLiant products. Sign up at:

<http://www.hp.com/go/subscriberschoice> and customize your profile to receive various new alerts as they become available, on a weekly or monthly basis.

##### ProLiant Support Packs and ROMPaq, software

The latest software, drivers, and firmware fully optimized and tested for your ProLiant server and options, available through ProLiant Support Packs the ProLiant Essentials Rapid Deployment Pack, SmartStart or downloaded from Software and Drivers download pages website at:

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

#### HP Serviceguard for Linux (SGLX)

HP Serviceguard for Linux is a high availability clustering solution designed to protect applications and services from a wide variety of software and hardware failures, monitoring the health of each server (node) and quickly responding to failures such as those that affect system processes, system memory, LAN media and adapters, and application processes.

The following is a quick summary of HP Serviceguard for Linux features and support. For the most recent list of Linux distributions & kernels, servers and storage supported with Serviceguard for Linux, see the Serviceguard for Linux Certification Matrix, available at: <http://www.hp.com/go/sglx/info>.

- Supported Linux Distributions:
  - Red Hat EL 4
  - Red Hat EL 5
  - SUSE SLES10
- Supported Server Platforms
  - HP Integrity
  - HP ProLiant
  - Selected 3rd party x86 class servers
- Physical and virtual server support

### Standard Features

- Application Integration Toolkits
  - Oracle Single Instance Database
  - Serviceguard Extension for SAP for Linux (SGeSAP/LX)
  - Other Application Integration Toolkits for sendmail, MySQL and more are free to download at <http://www.hp.com/go/softwaredepot/ha>
- Disaster Tolerant Solutions
  - Serviceguard for Linux Extended Distance Cluster (XDC) extends cluster distances up to 100 km, utilizes software RAID mirroring for data replication and is storage array independent
  - HP StorageWorks XP/EVA Cluster Extension Software for Linux (CLX) works seamlessly with HP Serviceguard for Linux, HP StorageWorks Continuous Access, and HP Disk Arrays to automate failover and failback between sites
- Software updates are distributed by HP Services to customers with support contracts

**NOTE:** For additional information on HP Serviceguard for Linux, visit <http://www.hp.com/go/sglx> or see the HP Serviceguard for Linux QuickSpecs.

**NOTE:** HP Serviceguard for Linux products for HP ProLiant and select 3rd party x86 class servers include 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/swsupport>.

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### OS Support

Microsoft Windows Server 2008  
Microsoft Windows Server 2003  
Microsoft Windows Compute Cluster Server 2003  
Red Hat Enterprise Linux  
SUSE Linux Enterprise Server  
Solaris 10 32/64-bit  
VMware ESX Server  
Integrated VMware ESX Server 3i  
Integrated Citrix XenServer

**NOTE:** For more complete and up-to-date information of all supported OSes for ProLiant, certification information and how to buy server operating systems from HP please visit the OS product site at: <http://h18004.www1.hp.com/products/servers/software/OEM.html>.

**NOTE:** For an up-to-date listing of the latest software and drivers available for your server, please select your server: <http://h20000.www2.hp.com/bizsupport/TechSupport/Product.jsp?lang=en&cc=us&taskId=135&prodTypeId=15351&prodCatId=241435>.

**NOTE:** Not all of the server options support the full list of server operating systems. For the list of operating systems supported on a specific server option, please consult the QuickSpecs for that specific option at: <http://h18004.www1.hp.com/products/blades/components/c-class-components.html>.

### Standard Features

**Integrated Manageability** Integrated Lights-Out 2 (iLO 2) Standard Blade Edition (integrated on motherboard)

- Virtual KVM based remote console
- Virtual media (single server, browser based access only)
- Remote Serial Console
- Virtual Power Button Control
- Virtual Unit ID control
- Integrated Remote Console (ActiveX Control client)
- Dedicated network connectivity
- OS independent hardware health status
- Present server power consumption
- Browser, command line and scripted access
- Automatic IP Configuration via DHCP/DNS/WINS
- Industry Standard 128-bit Secure Sockets Layer (SSL) and Secure Shell security (SSH)
- Advanced Encryption Standard (AES)/Triple Data Encryption Standard (3DES)
- IML and iLO Event Logging
- Support for 12 user accounts with customizable access privilege
- Single sign-on from HP BladeSystem Onboard Administrator

**NOTE:** Advanced features such as Graphical Remote Console and browser accessible Virtual Floppy/CD-ROM are included with the BL685c server blade.

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### Availability

Dual-Port Fibre Channel Mezzanine Card for redundant SAN connection  
Two embedded Gigabit Ethernet adapters for redundant LAN connections  
Two hot-plug SAS/SATA hard drive bays and integrated RAID (Smart Array E200i) controller on every server blade (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)

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### Industry Standard Compliance

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

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### 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

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### 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 MSAxxx, VA7xx, 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 eCo-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 Centre or an Authorized Partner for assistance.

#### Service and Support

HP Care Pack services provide total care and support expertise with committed response designed to meet your IT and business needs.

The HP Care Pack service for HP 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.

To fully capitalize on your HP BladeSystem servers' capabilities requires a service partner who thoroughly understands your server technology and systems environment. HP Services, an industry leader in provision of multi vender support solutions provides a range of support services designed to meet the varying needs of business. Whether an SMB or large global corporation HP has a HP BladeSystem server support offer to help you speedily deploy and maximize system uptime.

**Recommended Service** - Simplify ProLiant solution implementation, maintenance and management.

- **Support Service** - 4-Hour Response Coverage, 3-Year, 24 x 7, Same Business Day
- **Deployment Service** - Installation and Start Up for HP BladeSystem Infrastructure

**Enhanced Service** - Optimize service level to increase IT performance and availability

- **Support Service** - HP Proactive BladeSystem Service, 1-Year
- **Deployment Service** - Enhanced Network Installation and Start-up for HP BladeSystem Switches

Installation & Start-Up service for HP BladeSystem Infrastructure plus HP BladeSystem Enhanced Network Installation and Start-UP as per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excluding HP holidays.

For a complete listing of service offerings and information visit:

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

<http://www.hp.com/go/proliant/carepack>

### Models

#### Dual-Core Models

HP ProLiant BL685c 8222 Processor(s)  
DC 4 GB (2P) 454906-B21 [One of the following depending on model](#)

(2) AMD Opteron™ processor Model 8222 (3.0 GHz)  
(2) AMD Opteron processors Model 8220 (2.8 GHz)  
(2) AMD Opteron processors Model 8218 (2.6 GHz)  
(2) AMD Opteron processors Model 8216 (2.4 GHz)  
(2) AMD Opteron processors Model 8214 (2.2 GHz)

HP ProLiant BL685c 8220  
DC 4 GB (2P) 438818-B21 **Cache Memory**  
**Memory**

1MB Level 2 cache memory per core  
4 GB (4 x 1 GB) PC2-5300, Registered DDR2-667

HP ProLiant BL685c 8214 **Network Adapter**  
4 GB (2P)  
405659-B21

One (1) embedded NC326i Dual Port Gigabit Server Adapter, Two (2) embedded NC370i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 server adapter dedicated to iLO 2 management

HP ProLiant BL685c 8216 **Storage Controller**  
DC 4 GB (2P)  
405660-B21 **Hard Drives**  
**Internal Storage**

Smart Array E200i Controller with 64MB (optional battery-backed write cache)

No drives included; (2) SFF SAS/SATA drive bays

292GB SAS  
240GB SATA

HP ProLiant BL685c 8218 **Optical Drive**  
DC 4 GB (2P)  
405661-B21 **Form Factor**

None

Up to 4 full-height blades supported in the HP BladeSystem c3000 Enclosure  
Up to 8 full-height blades supported in HP BladeSystem c7000 Enclosure

### Configuration Information - Factory Integrated Models (North America only)

**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:** This product offering does not support HP Factory Express Server Configuration Level 1.

**NOTE:** FIO indicates that this option is available only as a Factory Installable Option.

### Step 1: Base Server Blade Configuration

<b>Models</b>	<p>HP ProLiant BL685c CTO Blade <span style="float: right;">405024-B21</span></p> <p>One (1) embedded NC326i Dual Port Gigabit Server Adapter, two (2) embedded NC373i Multifunction Gigabit Server Adapters, and one (1) additional 10/100 NIC dedicated to iLO 2 Management</p> <p>Integrated Smart Array E200i RAID controller</p> <p><b>NOTE:</b> Controller cache module selection is required. Select either the standard 64 MB module or the optional 128 MB module in step 2 below.</p> <p>Two small form factor (SFF) SAS/SATA hot plug hard drive bays</p> <p>Integrated Lights-Out 2 Standard Blade Edition</p>
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### Step 2: Choose Required Options (one of the following from each list unless otherwise noted):

<b>Processors</b>	<p><b>For dual (2) processor configurations choose (one of the following):</b></p> <p>AMD Opteron™ processor Model 8222 (3.0 GHz, 95W) Option Kit, FIO Base <span style="float: right;">454907-L21</span></p> <p>AMD Opteron processor Model 8220 (2.8 GHz, 95W) Option Kit, FIO Base <span style="float: right;">438820-L21</span></p> <p>AMD Opteron processor Model 8218 (2.6 GHz, 95W) Option Kit, FIO Base <span style="float: right;">409613-L21</span></p> <p>AMD Opteron processor Model 8216 (2.4 GHz, 95W) Option Kit, FIO Base <span style="float: right;">409612-L21</span></p> <p>AMD Opteron processor Model 8214 (2.2 GHz, 95W) Option Kit, FIO Base <span style="float: right;">409611-L21</span></p> <p>Low Power AMD Opteron processor Model 8218 HE (2.6 GHz, 68W), FIO Base <span style="float: right;">440936-L21</span></p> <p><b>OR</b></p> <p><b>For quad (4) processor configurations choose (one of the following):</b></p> <p>AMD Opteron processor Model 8222 (3.0 GHz, 95W) Option Kit, FIO Base <span style="float: right;">454907-L21</span></p> <p>AMD Opteron processor Model 8220 (2.8 GHz, 95W) Option Kit, FIO Base <span style="float: right;">438820-L21</span></p> <p>AMD Opteron processor Model 8218 (2.6 GHz, 95W) Option Kit, FIO Base <span style="float: right;">409613-L21</span></p> <p>AMD Opteron processor Model 8216 (2.4 GHz, 95W) Option Kit, FIO Base <span style="float: right;">409612-L21</span></p> <p>AMD Opteron processor Model 8214 (2.2 GHz, 95W) Option Kit, FIO Base <span style="float: right;">409611-L21</span></p> <p>Low Power AMD Opteron processor Model 8218 HE (2.6 GHz, 68W) Option Kit, FIO Base <span style="float: right;">440936-L21</span></p> <p><b>Plus (one of the following):</b></p> <p>AMD Opteron processor Model 8222 (3.0 GHz, 95W) Option Kit <span style="float: right;">454907-B21</span></p> <p>AMD Opteron processor Model 8220 (2.8 GHz, 95W) Option Kit <span style="float: right;">438820-B21</span></p> <p>AMD Opteron processor Model 8218 (2.6 GHz, 95W) Option Kit <span style="float: right;">409613-B21</span></p> <p>AMD Opteron processor Model 8216 (2.4 GHz, 95W) Option Kit <span style="float: right;">409612-B21</span></p> <p>AMD Opteron processor Model 8214 (2.2 GHz, 95W) Option Kit <span style="float: right;">409611-B21</span></p>
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### Configuration Information - Factory Integrated Models (North America only)

	Low Power AMD Opteron processor Model 8218 HE (2.6 GHz, 68W) Option Kit	440936-B21
	<b>NOTE:</b> All HP ProLiant BL685c processor option kits contain two processors.	
	<b>NOTE:</b> The HP ProLiant BL685c only supports 2 and 4 processor configurations.	
Memory	1 GB REG PC2-5300 2 x 512 MB Single Rank Kit	408850-B21
	2 GB REG PC2-5300 2 x 1 GB Single Rank Kit	408851-B21
	4 GB REG PC2-5300 2 x 2 GB Dual Rank Kit	408853-B21
	8 GB REG PC2-5300 2 x 4 GB Dual Rank Kit	408854-B21
	<b>NOTE:</b> Must be installed in pairs.	
	<b>NOTE:</b> DIMMs must be installed in decreasing capacity with the largest DIMMs installed in the banks furthest away from each processor.	
Storage Controller Cache	64 MB Cache - FIO Only	405102-B21
	128 MB Battery-Backed Cache Enabler	351580-B21
	<b>NOTE:</b> Supports the Smart Array E200i Controller, Smart Array 641 Controller, and Smart Array 642 Controller.	

### Step 3: Choose Additional Factory Integratable Options

Integrated Hypervisor	VMware ESX Server 3i integrated hypervisor	
	VMware ESX Server 3i 4P integrated hypervisor	480100-B21
	VMware ESX Server 3i VI3 Enterprise 4P integrated hypervisor	464670-B21
	<b>NOTE:</b> For additional information and option kits, please see the QuickSpecs at: <a href="http://h18000.www1.hp.com/products/quickspecs/12307_ca/12307_ca.html">http://h18000.www1.hp.com/products/quickspecs/12307_ca/12307_ca.html</a>	
	<b>Citrix XenServer integrated hypervisor</b>	
	Integrated XenServer HP Select Edition 2P/4P	464673-B21
	Integrated XenServer HP Enterprise Edition 2P/4P	464674-B21
	<b>NOTE:</b> For additional information and option kits, please see the QuickSpecs at: <a href="http://h18000.www1.hp.com/products/quickspecs/13018_ca/13018_ca.html">http://h18000.www1.hp.com/products/quickspecs/13018_ca/13018_ca.html</a>	

### Step 4: Choose Additional Options for Factory Integration

**NOTE:** For additional options, including server blade enclosures interconnect options and power subsystem options; please see the following QuickSpecs:

HP BladeSystem c-Class Infrastructure QuickSpecs:

[http://h18000.www1.hp.com/products/quickspecs/12517\\_ca/12517\\_ca.html](http://h18000.www1.hp.com/products/quickspecs/12517_ca/12517_ca.html)

and HP BladeSystem c-Class Interconnect Components QuickSpecs:

[http://h18000.www1.hp.com/products/quickspecs/12524\\_ca/12524\\_ca.html](http://h18000.www1.hp.com/products/quickspecs/12524_ca/12524_ca.html).

### Options

Ethernet Mezzanine Options	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 NC373m PCI Express Dual Port Multifunction Gigabit Server Adapter for c-Class BladeSystem	406770-B21
	<p><b>NOTE:</b> The Gigabit Ethernet adapters above transmit from the server only at 2000 Mbps, full duplex per port. For more information, see the "Network Controller" segment in the Standards Features section.</p> <p>HP NC512m Dual Port 10GbE Multifunction BL-c Adapter</p> <p><b>NOTE:</b> An NC512m network adapter card is required for each server blade connecting to the HP 10Gb Ethernet BL-c Switch.</p> <p><b>NOTE:</b> A maximum of one NC512m is supported per server in a type II mezzanine slot. For more information, see the Mezzanine Slot Compatibility matrix within the HP NC512m Dual Port 10GbE Multifunction BL-c Adapter QuickSpecs at: <a href="http://h18000.www1.hp.com/products/quickspecs/12752_ca/12752_ca.html">http://h18000.www1.hp.com/products/quickspecs/12752_ca/12752_ca.html</a></p> <p><b>NOTE:</b> The NC512m requires a minimum of 4 GB of server memory and supports a maximum of 64 GB for supported Linux operating systems and a 32 GB for all other supported operating systems. Therefore, when an NC512m is installed in a blade server, the server is limited to a maximum of 64 GB of memory when using a NC512m supported Linux OS and 32 GB when using any other NC512m supported OS.</p> <p><b>NOTE:</b> The NC512m adapter transmits from the server only at 20 Gbps, full duplex</p>	440910-B21
Fibre Channel Mezzanine Options	Emulex LPe1105 FC Dual Channel 4Gb, PCI-E-to-Fibre Channel Host Bus Adapter	403621-B21
	QLogic QMH2462 4Gb FC HBA for HP c-Class BladeSystem	403619-B21
HP InfiniBand Mezzanine Options	HP 4X DDR IB Dual Port Mezzanine HCA for HP BladeSystem c-Class	448262-B21
	HP 4X DDR IB Mezzanine HCA for HP BladeSystem c-Class	410533-B21
c-Class Mezzanines	<p>HP PCI Express Mezzanine Pass-Thru Card for HP BladeSystem c-Class</p> <p><b>NOTE:</b> Required to support the HP StorageWorks SB40c Storage Blade HP BladeSystem PCI Expansion Blade, HP StorageWorks Ultrium 448c Tape Blade, and HP StorageWorks SB920c Tape Blade with HP c-Class BladeSystem full-height server blades (e.g. BL480c, BL680c, BL685c)</p>	431643-B21
HP StorageWorks SB40c Storage Blade	<p>HP StorageWorks SB40c Storage Blade</p> <p><b>NOTE:</b> Please see the SB40c Storage Blade QuickSpecs for additional options and configuration information at: <a href="http://h18000.www1.hp.com/products/quickspecs/12587_ca/12587_ca.html">http://h18000.www1.hp.com/products/quickspecs/12587_ca/12587_ca.html</a></p>	411243-B21



### Options

physical shipment. 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. One certificate is shipped for each license.

**NOTE:** For additional License Kits, please see the QuickSpecs at:  
[http://h18000.www1.hp.com/products/quickspecs/13019\\_ca/13019\\_ca.html](http://h18000.www1.hp.com/products/quickspecs/13019_ca/13019_ca.html)

#### HP iLO Power Management Pack for BladeSystem

HP iLO Power Management Pack for BladeSystem, No Media, 1-Server License including 1 year of 24x7 Technical Support and Updates 442937-B21

**NOTE:** This option kit includes 1 license for iLO Select and Insight Power Manager. Customer will receive a printed license entitlement certificate via physical shipment. 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:** For additional HP iLO Power Management Pack for BladeSystem license kits please see the QuickSpecs at:  
[http://h18013.www1.hp.com/products/quickspecs/12632\\_ca/12632\\_ca.html](http://h18013.www1.hp.com/products/quickspecs/12632_ca/12632_ca.html)

### Stand Alone Software Product - ProLiant Essentials

**NOTE:** Electronic licensing options are available for select ProLiant Essentials software products. Please see the appropriate ProLiant Essentials QuickSpecs for additional information.

#### Deploy

##### ProLiant Essentials Rapid Deployment Pack

ProLiant Essentials Rapid Deployment Pack No Media 1-Server License including 1 year of 24x7 Technical Support and Updates 452151-B21

**NOTE:** This license allows 1 server to be deployed and managed via RDP. Customer will receive a printed license entitlement certificate via physical shipment. 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:** For additional ProLiant Essentials Rapid Deployment Pack license kits please see the QuickSpecs at:  
[http://h18000.www1.hp.com/products/quickspecs/11053\\_ca/11053\\_ca.html](http://h18000.www1.hp.com/products/quickspecs/11053_ca/11053_ca.html)

##### HP Server Migration Pack - Universal Edition

HP Server Migration Pack - Universal Edition, No Media, Physical / Virtual to ProLiant Single Migration License, including 1 year of 24x7 Technical Support 460750-B21

**NOTE:** This license allows 1 physical to ProLiant or virtual to ProLiant migration. Customer will receive a printed license entitlement certificate and documentation via physical shipment. 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

HP Server Migration Pack - Universal Edition, No Media, Physical / Virtual to Virtual Single Migration License, including 1 year of 24x7 Technical Support 460753-B21

**NOTE:** This license allows 1 physical to virtual or virtual to virtual migration. Customer will receive a printed license entitlement certificate and documentation via physical shipment. 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.

### Options

HP Server Migration Pack - Universal Edition, No Media, 1-Year Unlimited Migration License, including 1 year of 24x7 Technical Support and Updates NOTE: This license allows unlimited migrations (physical to ProLiant, physical to virtual, virtual to virtual, and virtual to ProLiant) for one year. Customer will receive a printed license entitlement certificate and documentation via physical shipment. 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. 460756-B21

**NOTE:** For additional HP Server Migration Pack - Universal Edition license kits please see the QuickSpecs at:

[http://h18000.www1.hp.com/products/quickspecs/12855\\_ca/12855\\_ca.html](http://h18000.www1.hp.com/products/quickspecs/12855_ca/12855_ca.html)

#### Control

##### Integrated Lights-Out Select Pack

ProLiant Essentials Integrated Lights-Out Select Pack, No Media, 1-Server License 452158-B21

**Featuring:** Sophisticated remote control and security features for HP BladeSystem servers and ProLiant BL servers in text console environments.

**NOTE:** For additional ProLiant Essentials Integrated Lights-Out Value Packs please see the QuickSpecs at:

[http://h18000.www1.hp.com/products/quickspecs/12362\\_ca/12362\\_ca.html](http://h18000.www1.hp.com/products/quickspecs/12362_ca/12362_ca.html)

#### Optimize

##### HP Insight Power Manager (IPM)

HP Insight Power Manager, No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates 452677-B21

**NOTE:** Customers purchasing this upgrade must already have an iLO Advanced or Select license on each managed server. Customer will receive a printed license entitlement certificate via physical shipment. 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:** For additional HP Insight Power Manager Pack license kits please see the QuickSpecs at:

[http://h18000.www1.hp.com/products/quickspecs/12623\\_ca/12623\\_ca.html](http://h18000.www1.hp.com/products/quickspecs/12623_ca/12623_ca.html)

##### ProLiant Essentials Virtual Machine Management Pack

ProLiant Essentials Virtual Machine Management Pack, No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates 452153-B21

**NOTE:** Customer will receive a printed license entitlement certificate via physical shipment. 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:** For additional ProLiant Virtual Machine Management Pack license kits please see the QuickSpecs at:

[http://h18000.www1.hp.com/products/quickspecs/12328\\_ca/12328\\_ca.html](http://h18000.www1.hp.com/products/quickspecs/12328_ca/12328_ca.html)

**NOTE:** Electronic licensing options are available for Insight Control suites and select ProLiant Essentials software products. Please see the appropriate Insight Control and ProLiant Essentials QuickSpecs for additional information.

**NOTE:** Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to <http://www.hp.com/servers/proliantessentials> or the various ProLiant Essentials Value Pack product QuickSpecs for more information.

**NOTE:** For more information regarding ProLiant Essentials Software, please see the following URL: <http://www.hp.com/servers/proliantessentials>.

### Options

<b>Processors</b>	AMD Opteron™ processor Model 8356 (2.3 GHz, 75W ACP) Processor Option Kit	447977-B21
	AMD Opteron processor Model 8354 (2.2 GHz, 75W ACP) Processor Option Kit	447978-B21
	AMD Opteron processor Model 8222 (3.0 GHz, 95W) Processor Option Kit	454907-B21
	AMD Opteron processor Model 8220 (2.8 GHz, 95W) Processor Option Kit	438820-B21
	AMD Opteron processor Model 8218 (2.6 GHz, 95W) Processor Option Kit	409613-B21
	AMD Opteron processor Model 8216 (2.4 GHz, 95W) Processor Option Kit	409612-B21
	AMD Opteron processor Model 8214 (2.2 GHz, 95W) Processor Option Kit	409611-B21
	Low Power AMD Opteron processor Model 8347 HE (1.9 GHz, 55W ACP) Processor Option Kit	456908-B21
	Low Power AMD Opteron processor Model 8218 HE (2.6 GHz, 68W) Processor Option Kit	440936-B21

**NOTE:** HP ProLiant BL685c processor option kits contain two processors.

**NOTE:** The ProLiant BL685c only supports 2 and 4 processor configurations.

<b>Memory</b>	1 GB REG PC2-5300 2 x 512 MB Single Rank Kit	408850-B21
	2 GB REG PC2-5300 2 x 1 GB Single Rank Kit	408851-B21
	4 GB REG PC2-5300 2 x 2 GB Dual Rank Kit	408853-B21
	8 GB REG PC2-5300 2 x 4 GB Dual Rank Kit	408854-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.

<b>Hard Drives</b>	<b>Serial Attached SCSI (SAS) SFF Hot Plug</b>	
	HP 72GB 3G SAS 15k SFF DP HDD	418371-B21
	HP 72GB 3G SAS 15K SFF SP HDD	431935-B21
	HP 36GB 3G SAS 15k SFF DP HDD	418369-B21
	HP 36GB 3G SAS 15K SFF SP HDD	431933-B21
	HP 146GB 3G SAS 10K SFF DP HDD	418367-B21
	HP 146GB 3G SAS 10K SFF HDD	431958-B21
	HP 72GB 3G SAS 10K SFF DP HDD	384842-B21
	HP 72GB 3G SAS 10K SFF SP HDD	375861-B21
	HP 36GB 3G SAS 10K SFF SP HDD	375859-B21

**NOTE:** SAS drives have a 3 year warranty.

**NOTE:** Please see the SAS Hard Drive QuickSpecs for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature:

[http://h18000.www1.hp.com/products/quickspecs/12244\\_ca/12244\\_ca.html](http://h18000.www1.hp.com/products/quickspecs/12244_ca/12244_ca.html)

<b>SFF SATA Hot Plug</b>		
	HP 120GB 1.5G SATA 5.4K SFF HDD	431786-B21

### Options

**NOTE:** SATA drives have a 1 year warranty. Please see the SATA Hard Drive QuickSpecs for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature:  
[http://h18000.www1.hp.com/products/quickspecs/11940\\_ca/11940\\_ca.html](http://h18000.www1.hp.com/products/quickspecs/11940_ca/11940_ca.html)

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<b>Storage Controller Cache</b>	128MB Battery-Backed Cache Enabler <b>NOTE:</b> Supports the Smart Array E200 Controller.	351580-B21
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<b>Cluster Options</b>	HP Serviceguard Linux x86 Server License & Media including One Year 24x7 Software Support & Updates	463831-B21
	HP Serviceguard Linux Oracle Single Instance Database Toolkit x86 Cluster License & Media including One Year 24x7 Software Support & Update	463833-B21
	HP Serviceguard Linux Extension for SAP (SGeSAP/LX) x86 Server License & Media including One Year 24x7 Software Support & Updates	463834-B21
	HP Serviceguard Linux Extended Distance Cluster (XDC) x86 Server License & Media including One Year 24x7 Software Support & Updates	463835-B21

**NOTE:** For a detailed list of supported configuration/certification options for HP Serviceguard for Linux please refer to the HP Serviceguard for Linux Certification Matrix at: <http://www.hp.com/go/sglx/info>

**NOTE:** HP Serviceguard for Linux products running on x86 platforms now include one year of 24 x 7 Software Technical Support and Updates. Please see the Support Information section of the HP Serviceguard for Linux QuickSpecs for details.

**NOTE:** For additional information regarding the HP Serviceguard for Linux License, please see the following QuickSpecs at:  
[http://h18000.www1.hp.com/products/quickspecs/11518\\_ca/11518\\_ca.html](http://h18000.www1.hp.com/products/quickspecs/11518_ca/11518_ca.html)

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<b>USB Options</b>	HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver)	DC172B
	HP 1GB USB 2.0 Floppy Drive Key	442085-B21
	HP 256MB USB 2.0 Floppy Drive Key	442084-B21
	External USB 2.0 Multi-Bay II Cradle	PA509A
	Multibay II 9.5mm DVD Drive	PA849A
	HP USB 04 Standard Keyboard	DT528A#xxx
	1.44MB External USB Floppy Drive	DC141B

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### Options

#### Service and Support Offerings (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

#### Support Plus 24

Onsite HW support 24x7, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time including HP holidays, Electronic UE473E

## Memory

### DIMM installation guidelines:

1. All DIMMs must be PC2-5300 Registered DDR2 DIMMs (667 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.

### HP ProLiant BL685c Server Blade

#### Standard Memory

4096-MB (4 x 1024 MB) of PC2-5300, Registered DDR2-667 ECC DIMMs.

#### Standard Memory Plus Optional Memory

Up to 53248-MB of PC2-5300, Registered DDR2-667 ECC DIMMs. Memory is available with the installation of optional PC2-5300, Registered DDR2-667 DIMM memory expansion kits.

#### Standard Memory Replaced with Optional Memory

Up to 65536-MB of PC2-5300, Registered DDR2-667 ECC DIMMs. Memory is available with the removal of standard memory and the installation of optional PC2-5300, Registered DDR2-667 DIMM memory expansion kits.

Memory		Slot							
Standard	4096 MB	1A	2A	3B	4B	5C	6C	7D	8D
		1024 MB	1024 MB	Empty	Empty	1024 MB	1024 MB	Empty	Empty
		9E	10E	11F	12F	13G	14G	15H	16H
		Empty	Empty	Empty	Empty	Empty	Empty	Empty	Empty
Optional	53248 MB	1A	2A	3B	4B	5C	6C	7D	8D
		4096 MB	4096 MB	1024 MB	1024 MB	4096 MB	4096 MB	1024 MB	1024 MB
		9E	10E	11F	12F	13G	14G	15H	16H
		4096 MB	4096 MB	4096 MB	4096 MB	4096 MB	4096 MB	4096 MB	4096 MB
Maximum	65536 MB	1A	2A	3B	4B	5C	6C	7D	8D
		4096 MB	4096 MB	4096 MB	4096 MB	4096 MB	4096 MB	4096 MB	4096 MB
		9E	10E	11F	12F	13G	14G	15H	16H
		4096 MB	4096 MB	4096 MB	4096 MB	4096 MB	4096 MB	4096 MB	4096 MB

## Memory

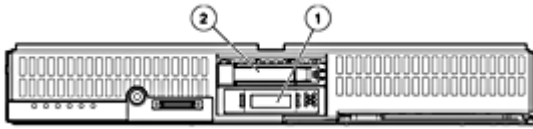
Following are memory options available from HP:

1 GB REG PC2-5300 2 x 512 MB Single Rank Kit	408850-B21
2 GB REG PC2-5300 2 x 1 GB Single Rank Kit	408851-B21
4 GB REG PC2-5300 2 x 2 GB Dual Rank Kit	408853-B21
8 GB REG PC2-5300 2 x 4 GB Dual Rank Kit	408854-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.

## Storage



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

### Hard Drives

#### SAS Hard Drive

	Quantity Supported	Position Supported	Controller
72GB 15,000 rpm SAS SFF	2	1-2	Smart Array E200i Controller
36GB 15,000 rpm SAS SFF			
146GB 10,000 rpm SAS SFF			
72GB 10,000 rpm SAS SFF			

#### Serial-ATA (SATA) Hard Drive

	Quantity Supported	Position Supported	Controller
120 GB 5,400 rpm SATA	2	1-2	Smart Array E200i Controller

### Technical Specifications

<b>System Unit</b>	<b>Dimensions</b> (H x W x D)	14.42 x 2.19 x 20.058 in (36.63 x 2.19 x 50.95 cm)
	<b>Shipping Dimensions</b> (H x W x D)	21.50 x 9.94 x 23.13 in (54.61 x 25.25 x 58.75 cm)
<b>Weight</b> (approximate)	Maximum (all hard drives and processors installed)	22.8 lbs (10.3 kg)
	Minimum (one hard drive and processor installed)	19.35 lbs (8.75 kg)
<b>Power Specifications</b>	<p>For power specifications including input requirements, BTU rating, and power supply output, please see the HP BladeSystem c-Class Infrastructure QuickSpecs located at:  <a href="http://h18000.www1.hp.com/products/quickspecs/12517_ca/12517_ca.html">http://h18000.www1.hp.com/products/quickspecs/12517_ca/12517_ca.html</a></p> <p>To review typical system power ratings use the HP BladeSystem Power Sizer available at: <a href="http://www.hp.com/go/ bladesystem/powercalculator">http://www.hp.com/go/ bladesystem/powercalculator</a>.</p>	
<b>System Inlet Temperature</b>	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).
<b>Relative Humidity</b> (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.
<b>Altitude</b>	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).
<b>Acoustic Noise</b>	<p>For acoustic noise specifications, please see the HP BladeSystem c-Class Infrastructure QuickSpecs located at:  <a href="http://h18000.www1.hp.com/products/quickspecs/12517_ca/12517_ca.html">http://h18000.www1.hp.com/products/quickspecs/12517_ca/12517_ca.html</a></p>	

### Technical Specifications

Smart Array E200i 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	DDR-1/266 MHz provides up to 4.2 GB/s maximum bandwidth.
	Server Interface	x4 2.5G PCIe provides 2GB/s maximum bandwidth.
	SAS Speed	x2 3G SAS provides 600MB/s maximum bandwidth.
	Cache Memory	40-bit 64MB or 128MB cache: ECC protection, battery-backed, and transportable
	Logical Drives Supported	Up to 32 logical volumes
	Maximum Logical Drive Capacity	292GB (2 x 146GB)
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space
	RAID Support	RAID 1 (Mirroring) RAID 0 (Striping)
	Upgradeable Firmware	Upgradeable Firmware
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Embedded NC326i Dual Port Gigabit Server Adapter	Network Processor	Broadcom 5715S
	Data Transfer Method	Four lane (x4) PCI Express
	Network Transfer Rate	Two ports, each at 1000 Mb/s <b>NOTE:</b> The Gigabit Ethernet adapters above transmit from the server only at 2000 Mbps, full duplex per port. For more information, see the "Network Controller" segment in the Standards Features section.
	IEEE Compliance	802.1p, 802.1Q, 802.3, 802.3ad, and 802.3x
Standard Features	<ul style="list-style-type: none"> <li>● 9K Jumbo frames</li> <li>● TCP/IP checksum offload (TCO)</li> <li>● Large send offload (LSO)</li> <li>● Interrupt coalescence</li> <li>● Dual address cycles (DAC)</li> <li>● Wake-on-LAN (WOL)</li> <li>● Pre-boot execution environment (PXE)</li> <li>● ProLiant Teaming including Network Fault Tolerance, Transmit Load Balancing, and Switch-Assisted Load Balancing</li> <li>● IPv6 packet transmit and receive (excluding all offload capabilities); IPv6 aware SNMPv1 agents for Windows</li> </ul>	
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### Technical Specifications

Embedded NC373i Multifunction Gigabit Server Adapter	Network Processor	Broadcom 5708S
	Data Transfer Method	Four lane (x4) PCI Express
	Network Transfer Rate	1000 Mb/s half duplex (theoretical maximum value) <b>NOTE:</b> The Gigabit Ethernet adapters above transmit from the server only at 2000 Mbps, full duplex per port. For more information, see the "Network Controller" segment in the Standards Features section.
	IEEE Compliance	802.1p, 802.1Q, 802.3, 802.3ad, and 802.3x
	Standard Features	<ul style="list-style-type: none"><li>• TCP/IP offload engine (TOE) for Microsoft Windows 2003</li><li>• iSCSI Boot for Linux</li><li>• 9K Jumbo frames</li><li>• TCP/IP checksum offload (TCO)</li><li>• Large send offload (LSO)</li><li>• Interrupt coalescence</li><li>• Dual address cycles (DAC)</li><li>• Wake-on-LAN (WOL)</li><li>• Pre-boot execution environment (PXE)</li><li>• ProLiant Teaming including Network Fault Tolerance, Transmit Load Balancing, and Switch-Assisted Load Balancing</li><li>• IPv6 packet transmit and receive (excluding all offload capabilities); IPv6 aware SNMPv1 agents for Microsoft Windows</li></ul>

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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: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a> . To recycle your product, please go to: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.
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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.