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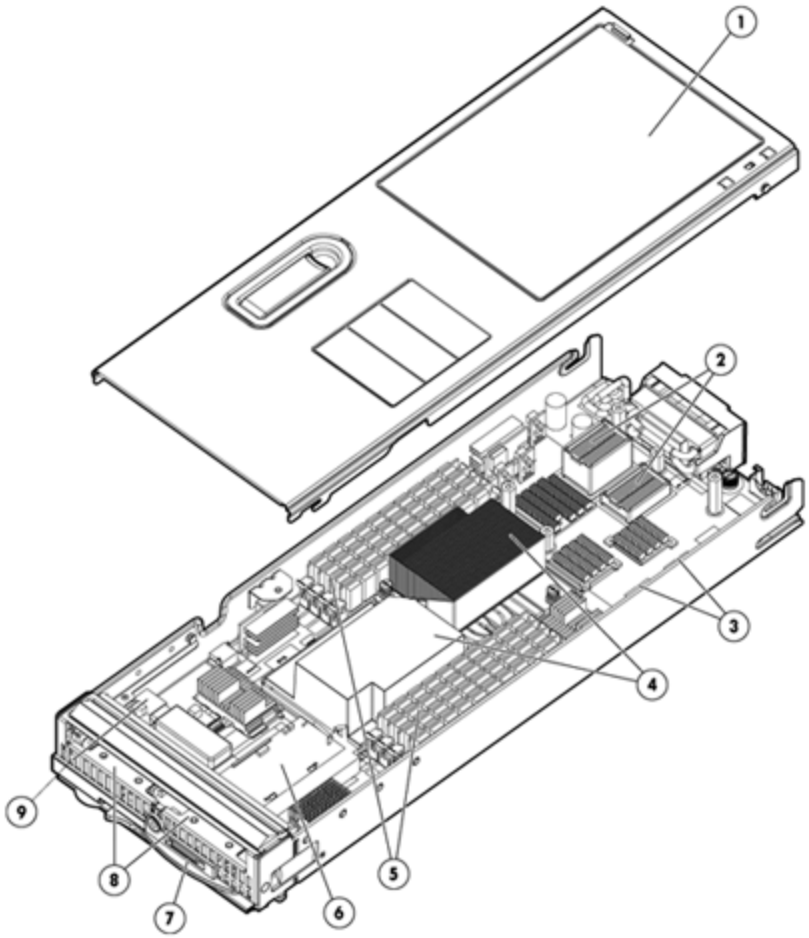
Overview

HP ProLiant BL465c Server Blade



HP ProLiant BL465c Server Blade

1. Access Panel
2. Two mezzanine I/O expansion slots
3. Two multifunction Gigabit Ethernet network adapter ports
4. Up to two AMD Opteron™ 2000 Series processors
5. Eight PC2-5300 Registered DIMM (DDR2-667) memory slots
6. Smart Array E200i storage controller (optional battery-backed write cache)
7. Local I/O connector
8. Two small form factor (SFF) hot-plug hard drive bays
9. Internal USB connector

What's New

- Support for HP NC532m Dual Port Flex-10 10GbE Multifunction BL-c Adapter

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At A Glance

This document covers the HP ProLiant BL465c server blade only. For more information on HP BladeSystem c-Class Enclosures and HP BladeSystem c-Class Interconnect Components, please see the following QuickSpecs:
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 Components QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12524_na/12524_na.html

The HP ProLiant BL465c delivers uncompromising performance and expandability, industry-leading management tools, and the latest technologies for dense compute environments.

HP ProLiant BL465c server blade includes:

- **Processor:**
  - Up to two Quad-Core AMD Opteron™ 2300 Series processors

        - Supports up to 2.3 GHz, 1 GHz HyperTransport™; 512 KB Level 2 cache memory per core; 2 MB Level 3 cache
    - Up to two AMD Opteron 2200 Series processors
        - Supports up to 3.0 GHz 1 GHz HyperTransport™; 1 MB Level 2 cache memory per core
    - ServerWorks HT-1000 and HT-2100 chipsets
- **Memory:**
    - Up to 32 GB of memory, supported by (8) 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 128 MB 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:**
    - Two (2) embedded NC370i Multifunction Gigabit Server Adapters
    - One (1) additional 10/100 server adapter 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:**
    - Two (2) I/O expansion mezzanine slots.
    - Supports up to (2) mezzanine cards
        - Dual-Port Fibre Channel Mezzanine (4-Gb) options for SAN connectivity (Choice of Emulex or QLogic)
        - 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)
- **Internal USB Support:**
    - One (1) internal USB 2.0 connector for security key devices and USB drive keys
- **VMware ESX Server 3i and Citrix XenServer virtualization technology**
    - Integrated Hypervisors (optional):
    - VMware ESX Server 3i virtualization technology
    - Citrix XenServer virtualization technology
- **Form Factor:**
    - HP ProLiant BL465c 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 cost, or optionally upgrade to iLO2 Select Pack offering features such as scriptable Virtual Media and historical power data.
    - HP Insight Control Environment for BladeSystem management suite delivers comprehensive system health, remote control, vulnerability scanning and patch management as well as flexible deployment and power management in one easy to install package.
- **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 16 ProLiant BL465c servers plugged vertically.
        - The HP BladeSystem c3000 rack enclosure is 6U high and holds up to 8 HP ProLiant BL465c servers plugged horizontally.
        - The HP BladeSystem c3000 tower enclosure is designed with casters for sites without racks and holds up to 8 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. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. SATA hard drives have a one year warranty. SAS drives have a 3 year warranty.
    - **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

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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/4AA0-7493ENW.pdf

Processor	AMD Opteron™ processor Model 2356 (2.3 GHz, 75W ACP)†
	AMD Opteron processor Model 2354 (2.2 GHz, 75W ACP)†

	AMD Opteron processor Model 2352 (2.1 GHz, 75W ACP)† AMD Opteron processor Model 2222 (3.0 GHz, 95W) AMD Opteron processor Model 2220 (2.8 GHz, 95W) AMD Opteron processor Model 2218 (2.6 GHz, 95W) AMD Opteron processor Model 2216 (2.4 GHz, 95W)* AMD Opteron processor Model 2210 (1.8 GHz, 95W)* Low Power AMD Opteron processor Model 2347 HE (1.9 GHz, 55W ACP)† Low Power AMD Opteron processor Model 2218 HE (2.6 GHz, 68W)* Low Power AMD Opteron processor Model 2216 HE (2.4 GHz, 68W) Low Power AMD Opteron processor Model 2214 HE (2.2 GHz, 68W) Low Power AMD Opteron processor Model 2212 HE (2.0 GHz, 68W)* Low Power AMD Opteron processor Model 2210 HE (1.8 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™ 2200 series processors are 64-bit, dual-core, and support AMD Virtualization™. AMD Opteron 2300 series processors are 64-bit, quad-core, and support AMD Virtualization™. **NOTE:** The BL465c only supports those processors listed above. Processor models greater than 2356 are not supported on the BL465c.
Upgradeability	Upgradeable to dual (2) processors
Cache Memory	1 MB Level 2 cache memory per core (2200 series) 512 KB Level 2 cache memory per core, 2MB Level 3 cache (2300 series)
Chipset	ServerWorks HT-1000 and HT-2100
Memory	Type: PC2-5300 DDR2 Registered DIMMs at 667 MHz Standard: 1 GB (2 x 512 MB) 2 GB (2 x 1 GB) Maximum: 32 GB (8 x 4 GB) **NOTE:** Memory must be installed in pairs.
Network Controller	Two (2) embedded NC370i Multifunction Gigabit Server Adapters One (1) additional 10/100 server adapter 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. 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.
Multifunction Networking	The embedded multifunction NC370i combines standard Gigabit Ethernet networking, TCP/IP offload engine (TOE) acceleration, iSCSI boot, and optional accelerated iSCSI 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 NC370i offers TOE for Microsoft® Windows environments. • The iSCSI network boot (iSCSI boot) allows the BL465c to boot from a remote operating system (OS) image located on a storage area network (SAN) within a Microsoft Windows

	and Linux environment. The BL465c uses an iSCSI firmware image (iSCSI boot option ROM) making the remote disk drive appear as a local, bootable C: drive. The BL465c 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. Additionally, the HP iSCSI boot solution includes scripts to significantly simplify the installation process.		
I/O Expansion Slots	Two I/O expansion mezzanine slots (One x8 and one x4 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 Attached SCSI
	Hot Plug Serial ATA (SATA)	240GB SATA	2 x 120GB Serial ATA
Graphics	Integrated ATI RN-50 1280 x 1024 x 16M color (32 MB DDR1 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	

Fibre Channel Support

Two optional Fibre Channel HBAs are supported by the HP ProLiant BL465c. Both mezzanine circuit boards connect directly to the server blade system board. These Fibre Channel HBAs are available via option kits and must be 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 BL465c server blades are optimized for HP StorageWorks MSA, EVA, and XP
HP ProLiant BL465c server blades are compatible with select 3rd party SANs (please see blade storage page for more details: http://h18000.www1.hp.com/products/servers/proliant-bl/c-Class/storage.html)

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Standard Features

Insight Control Environment for BladeSystem Management Suite

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
  NOTE: HP Server Migration Pack - Universal Edition is licensed separately from the Insight Control Environment Suite.
- 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 Enclosures QuickSpecs:
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
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/go/proliantessentials.

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.

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 will 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. From more information about this service, please visit: http://www.hp.com/services/insight.

Server Management 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.
	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: • Physical to physical - ProLiant • Physical to virtual • Virtual to virtual • Virtual to physical - ProLiant
	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. **NOTE:** Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to: http://www.hp.com/go/proliantessentials or the various ProLiant Essentials Value Pack product QuickSpecs for more information. **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 BL465c 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
	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. Insight Management Agents and The HP System Management Homepage are included on ProLiant Support Packs, and can also be

	installed using the server profiles provided with the ProLiant Essentials Rapid Deployment Pack. For additional information about the Management Agents and the HP System Management Homepage please visit the management Web site at: http://www.hp.com/servers/manage.
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 Datasheet, 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 BladeSystem to Superdome
  - HP ProLiant BladeSystem p-Class & c-Class
  - HP ProLiant DL
  - HP ProLiant ML
  - IBM System x
  - Dell PowerEdge
  - Sun x64
  - Fujitsu Siemens PRIMERGY
- Supported Virtual Machines
  - SG/LX in HP Integrity Virtual Machines guests
  - SG/LX in VMware ESX guests
  - SG/LX in Red Hat and SUSE Xen hosts (DOM0)
- Application Integration Toolkits
  - HP Serivceguard for Linux Oracle Database Toolkit
  - HP Serviceguard Extension for SAP on Linux (SGeSAP/LX)
  - Free Application Integration Toolkits:
    - Apache
    - MySQL
    - NFS
    - PostgreSQL
    - Samba
    - Tomcat
    - Sendmail
- Disaster Tolerant Solutions
  - HP 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: The above is not a complete list of all HP Serviceguard for Linux product numbers For a detailed list of supported configuration/certification options for HP Serviceguard for Linux please refer to the HP Serviceguard for Linux Configuration & Ordering Guide available at: http://www.hp.com/go/sglx/info.

OS Support

Microsoft Windows Server 2008
Microsoft Windows Server 2003
Microsoft Windows Compute Cluster Server 2003
Microsoft Windows Small Business Server 2003, R2
Red Hat Enterprise Linux
SUSE Linux Enterprise Server
Oracle Enterprise Linux (OEL)
Sun Solaris for x64/x86-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, please visit our Support Matrix at: http://www.hp.com/go/supportos.

Integrated Manageability

Integrated Lights-Out 2 (iLO2) 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 is included with the BL465c server blade.

Availability

Dual-Port Fibre Channel Mezzanine Card for redundant SAN connection
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)

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

Factory Express Portfolio for Servers and Storage

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

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

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

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.

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/bladesystemservices
http://www.hp.com/go/proliant/carepack

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Models

Dual-Core Models

HP ProLiant BL465c 2222 DC, 2GB (1P) 454894-B21	**Processor(s)** One of the following depending on model	(1) AMD Opteron processor Model 2222 (3.0 GHz) (1) AMD Opteron processor Model 2220 (2.8 GHz) (1) AMD Opteron processor Model 2218 (2.6 GHz) (1) Low Power AMD Opteron processor Model 2216 HE (2.4 GHz) (1) Low Power AMD Opteron processor Model 2214 HE (2.2 GHz) (1) Low Power AMD Opteron processor Model 2210 HE (1.8 GHz)
HP ProLiant BL465c 2220 DC, 2G (1P) 438220-B21	**Cache Memory**	1 MB Level 2 cache memory per core
HP ProLiant BL465c 2218 DC, 2GB (1P)	**Memory** One of the following	2 GB (2 x 1 GB) PC2-5300, Registered DDR2-667 1 GB (2 x 512 MB) PC2-5300, Registered DDR2-667

407235-B21	depending on model	
HP ProLiant BL465c 2216 HE DC, 2GB (1P) 407234-B21	**Network Adapter**	Two (2) embedded NC370i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 server adapter dedicated to iLO 2 management
	Storage Controller	Smart Array E200i Controller with 64MB (optional battery-backed write cache)
HP ProLiant BL465c 2214 HE DC, 2GB (1P) 403434-B21	**Hard Drives**	No drives included; (2) SFF SAS/SATA drive bays
	Internal Storage	292GB SAS 240GB SATA
HP ProLiant BL465c 2210 HE DC, 1GB (1P) 403433-B21	**Optical Drive**	None
	Form Factor	Up to 8 half-height blades supported in the HP BladeSystem c3000 Enclosure Up to 16 half-height blades supported in HP BladeSystem c7000 Enclosure

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Configuration Information - Factory Integrated Models

NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on CTO product offerings and requirements.
NOTE: HP does not allow factory integration of options into standard models listed above.
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

Models	HP ProLiant BL465c CTO Blade	403435-B21
	Configurable Model ships with:	

	Two (2) embedded NC370i Multifunction Gigabit Servers Adapters and one (1) additional 10/100 server adapter dedicated to iLO 2 management	
	Integrated Smart Array E200i RAID controller **NOTE:** Controller cache module selection is required. Select either the standard 64 MB module or the optional 128 MB module in step 2 below.	
	Two small form factor (SFF) SAS/SATA hot plug hard drive bays	
	Integrated Lights-Out 2 Standard Blade Edition	

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

Processors	**For single processor configuration choose:**	
	AMD Opteron™ processor Model 2222 (3.0 GHz, 95W) Processor Option Kit **NOTE:** If 2 processors are desired, select one 453809-L21 and one 453809-B21.	453809-L21
	AMD Opteron processor Model 2220 (2.8 GHz, 95W) Processor Option Kit, FIO Base **NOTE:** If 2 processors are desired, select one 438222-L21 and one 438222-B21.	438222-L21
	AMD Opteron processor Model 2218 (2.6 GHz, 95W) Processor Option Kit, FIO Base **NOTE:** If 2 processors are desired, select one 411948-L21 and one 411948-B21.	411948-L21
	AMD Opteron processor Model 2216 (2.4 GHz, 95W) Processor Option Kit, FIO Base **NOTE:** If 2 processors are desired, select one 411949-L21and one 411949-B21.	411949-L21
	AMD Opteron processor Model 2210 (1.8 GHz, 95W) Processor Option Kit, FIO Base **NOTE:** If 2 processors are desired, select one 414210-L21 and one 414210-B21.	414210-L21
	Low Power AMD Opteron processor Model 2218 HE (2.6 GHz, 68W) Processor Option Kit, FIO Base **NOTE:** If 2 processors are desired, select one 440763-L21 and one 440763-B21.	440763-L21
	Low Power AMD Opteron processor Model 2216 HE (2.4 GHz, 68W) Processor Option Kit, FIO Base **NOTE:** If 2 processors are desired, select one 414212-L21and one 414212-B21.	414212-L21
	Low Power AMD Opteron processor Model 2214 HE (2.2 GHz, 68W) Processor Option Kit, FIO Base **NOTE:** If 2 processors are desired, select one 411951-L21and one 411951-B21.	411951-L21
	Low Power AMD Opteron processor Model 2212 HE (2.0 GHz, 68W) Processor Option Kit, FIO Base **NOTE:** If 2 processors are desired, select one 414211-L21 and one 414211-B21.	414211-L21
	Low Power AMD Opteron processor Model 2210 HE (1.8 GHz, 68W) Processor Option Kit, FIO Base **NOTE:** If 2 processors are desired, select one 433148-L21 and one 433148-B21.	433148-L21
Memory	1 GB REG DDR2 PC2-5300 2 x 512 MB Single Rank Kit	408850-B21
	2 GB REG DDR2 PC2-5300 2 x 1 GB Single Rank Kit	408851-B21
	4 GB REG DDR2 PC2-5300 2 x 2 GB Dual Rank Kit	408853-B21
	8 GB REG DDR2 PC2-5300 2 x 4 GB Dual Rank Kit	408854-B21
	NOTE: Must be installed in pairs	
Storage Controller Cache	64 MB Cache - FIO Only	405102-B21
	128 MB Battery-Backed Cache Enabler **NOTE:** Supports the Smart Array E200i Controller, Smart Array 641 Controller,	351580-B21

and Smart Array 642 Controller.

Step 3: Choose Additional Factory Integratable Options

Integrated hypervisor	VMware ESX Server 3i 2P integrated hypervisor, FIO	464668-B21
	VMware ESX Server 3i VI3 Enterprise 2P integrated hypervisor, FIO	464669-B21
	NOTE: For additional information and option kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12307_na/12307_na.html	
	Citrix XenServer integrated hypervisor	
	Integrated XenServer HP Select Edition 2P/4P	464673-B21
	Integrated XenServer HP Enterprise Edition 2P/4P	464674-B21
	NOTE: For additional information and option kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/13018_na/13018_na.html	

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 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 Components QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12524_na/12524_na.html.

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Options

Ethernet Mezzanine Options	HP NC325m PCI Express Quad Port 1Gb Server Adapter for c-Class BladeSystem **NOTE:** If the NC325m is installed in mezzanine slot 1 of a half-height server, connectivity will be provided on only 2 of the 4 ports.	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 **NOTE:** If the NC364m is installed in mezzanine slot 1 of a half-height server, connectivity will be provided on only 2 of the 4 ports.	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
	HP NC382m Dual Port 1GbE Multifunction BL-c Adapter	453246-B21
	NOTE: 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.	
	HP NC512m Dual Port 10GbE Multifunction BL-c Adapter **NOTE:** An NC512m network adapter card is required for each server blade connecting to the HP 10Gb Ethernet BL-c Switch. **NOTE:** The NC512m is supported in type II x8 PCI Express mezzanine slots; maximum one adapter per server. For more information, see the Mezzanine Slot Compatibility matrix within the HP NC512m Dual Port 10GbE Multifunction BL-c Adapter QuickSpecs: http://h18004.www1.hp.com/products/servers/networking/nc512m/index.html **NOTE:** A minimum of 2 GB of server memory is required per NC512m and supports a maximum of 32 GB for Windows and 64 GB for Linux. **NOTE:** The NC512m adapter transmits from the server only at 20 Gbps, full duplex per port.	440910-B21
	HP NC532m Dual Port Flex-10 10GbE Multifunction BL-c Adapter **NOTE:** The NC532m network adapter card is required for each server blade connecting to a 10Gb interconnect in bays 3-8 (HP BladeSystem c7000 Enclosure) or bays 3-4 (HP BladeSystem c3000 Enclosure) **NOTE:** The NC532m requires a minimum of 2 GB of server memory. **NOTE:** The NC532m 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.	467799-B21
	QLogic QMH4062 1Gb E iSCSI Adapter for HP BladeSystem c-Class	488074-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
HP StorageWorks SB40c Storage Blade	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 PCI 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 c-Class Tape Blades	HP StorageWorks Ultrium 448c Tape Blade	440947-B21
	HP StorageWorks SB920c Tape Blade	AJ401A
	NOTE: Please see the QuickSpecs for Technical Specification 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://www.hp.com/go/blades.	
HP Insight Control Environment for	**NOTE:** Electronic licensing options are available for select ProLiant Essentials software products. Please see the appropriate ProLiant Essentials QuickSpecs	

BladeSystem Management Suite	for additional information.	
	Insight Control Environment for BladeSystem	
	HP Insight Control Environment for BladeSystem, No Media 1-Server License including 1 year of 24x7 Technical Support and Updates **NOTE:** Contains 1 license for each of RDP, PMP, VMM, VPM, IPM and iLO Select. Includes one year of 24 x 7 HP Software Technical Support and Update Service **NOTE:** 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.	453484-B21
	HP Insight Control Management Software Media Kit **NOTE:** Insight Control Management DVD media without licenses. Contains Insight Manager and Essentials software products and components licensed by Insight Control Management suites. Uses an integrated installer to perform quick and accurate software installation and updates. **NOTE:** For additional license kits please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12631_na/12631_na.html	436222-B21
	HP Insight Control Environment for Linux	
	HP Insight Control Environment for Linux v2.0, Media pack (CD) - No licenses included **NOTE:** This optional Media pack CD contains the ISO image for HP Insight Control Environment for Linux, HP System Insight Manager, and an integrated installer. Servers must be acquired separately. 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/ice-linux (click on Download button).	464422-B21
	HP Insight Control Environment for Linux v2.0, No Media, 1-Server license, including One year of 24x7 Technical Support and Updates **NOTE:** This part number can be used to purchase one (1) license with a single activation key. 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. 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_na/13019_na.html	464423-B21
	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 **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 license kits please see the QuickSpecs at: http://h18013.www1.hp.com/products/quickspecs/12632_na/12632_na.html	442937-B21
Server Management 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 **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 license kits please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11053_na/11053_na.html	452151-B21

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 **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 Service	460750-B21
HP Server Migration Pack - Universal Edition, No Media, Physical / Virtual to Virtual Single Migration License, including 1 year of 24x7 Technical Support **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 Service.	460753-B21
HP Server Migration Pack - Universal Edition, No Media, 1-Year Unlimited Migration License, including 1 year of 24x7 Technical Support **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 Service.	460756-B21

NOTE: For additional license kits please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/12855_na/12855_na.html

Monitor

Insight Dynamics- Virtual Server Environment

HP Insight Dynamics-VSE without Insight Control Environment, 1-server license including 1 year of 24x7 Technical Support and Updates **NOTE:** This license supports HP ProLiant ML/DL and c-Class Blade servers. Customer will receive via email a receipt and link to a license entitlement certificate.	483531-B21
HP Insight Dynamics-VSE with Insight Control Environment, 1-server license including 1 year of 24x7 Technical Support and Updates **NOTE:** This license supports HP ProLiant c-Class Blade servers. Customer will receive a printed license entitlement certificate via physical shipment.	483534-B21

NOTE: For additional license kits, please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/13050_na/13050_na.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 license kits please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/12362_na/12362_na.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 **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.	452677-B21

NOTE: For additional license kits please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/12623_na/12623_na.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 **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 license kits please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12328_na/12328_na.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/go/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/go/proliantessentials.	452153-B21
Processors	AMD Opteron™ processor Model 2356 (2.3 GHz, 75W ACP) Processor Option Kit	445106-B21
	AMD Opteron processor Model 2352 (2.1 GHz, 75W ACP) Processor Option Kit	445575-B21
	AMD Opteron processor Model 2354 (2.2 GHz, 75W ACP) Processor Option Kit	446587-B21
	AMD Opteron processor Model 2222 (3.0 GHz, 95W) Processor Option Kit	453809-B21
	AMD Opteron processor Model 2220 (2.8 GHz, 95W) Processor Option Kit	438222-B21
	AMD Opteron processor Model 2218 (2.6 GHz, 95W) Processor Option Kit	411948-B21
	AMD Opteron processor Model 2216 (2.4 GHz, 95W) Processor Option Kit	411949-B21
	AMD Opteron processor Model 2210 (1.8 GHz, 95W) Processor Option Kit	414210-B21
	Low Power AMD Opteron processor Model 2347 HE (1.9 GHz, 55W ACP) Processor Option Kit	456883-B21
	Low Power AMD Opteron processor Model 2218 HE (2.6 GHz, 68W) Processor Option Kit	440763-B21
	Low Power AMD Opteron processor Model 2216 HE (2.4 GHz, 68W) Processor Option Kit	414212-B21
	Low Power AMD Opteron processor Model 2214 HE (2.2 GHz, 68W) Processor Option Kit	411951-B21
	Low Power AMD Opteron processor Model 2212 HE (2.0 GHz, 68W) Processor Option Kit	414211-B21
	Low Power AMD Opteron processor Model 2210 HE (1.8 GHz, 68W) Processor Option Kit	433148-B21
Memory	1 GB REG PC2-5300 DDR2 2 x 512 MB Single Rank Kit	408850-B21
	2 GB REG PC2-5300 DDR2 2 x 1 GB Single Rank Kit	408851-B21
	4 GB REG PC2-5300 DDR2 2 x 2 GB Dual Rank Kit	408853-B21
	8 GB REG PC2-5300 DDR2 2 x 4 GB Dual Rank Kit	408854-B21
	NOTE: Must be installed in pairs.	
Hard Drives	**SAS Enterprise (ENT) Drives 2.5" Drives, Hot Plug**	
	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

	NOTE: SAS drives have a 3 year warranty. **NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12244_na/12244_na.html	
	SFF SATA Hot Plug Entry (ETY) Drives	
	HP 250GB 3G SATA 5.4K SFF ETY HDD	460355-B21
	HP 120GB 1.5G SATA 5.4K SFF ETY HDD	458924-B21
	NOTE: SATA drives have a 1 year warranty. Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13021_na/13021_na.html	
	SFF SATA Hot Plug	
	HP 120GB 1.5G SATA 5.4K SFF HDD	431786-B21
	NOTE: SATA drives have a 1 year warranty. Please see QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/11940_na/11940_na.html	
Storage Controller Cache	128MB Battery-Backed Cache Enabler **NOTE:** Supports the Smart Array E200i Controller.	351580-B21
High Availability Cluster Options	HP Serviceguard Linux for HP ProLiant/x86 Servers Licensed per physical server Includes media and One Year 24x7 Software Support & Updates	463831-B21
	HP Serviceguard Linux Oracle Database Toolkit for HP ProLiant/x86 Servers Licensed per cluster Includes media and One Year 24x7 Software Support & Updates	463833-B21
	HP Serviceguard Extension for SAP on Linux for HP ProLiant/x86 Servers Licensed per physical server Includes media and One Year 24x7 Software Support & Updates	463834-B21
	HP Serviceguard Linux Extended Distance Cluster (XDC) for HP ProLiant/x86 Servers Licensed per physical server Includes media and One Year 24x7 Software Support & Updates	463835-B21
	NOTE: The above is not a complete list of all HP Serviceguard for Linux product numbers For a detailed list of supported configuration/certification options for HP Serviceguard for Linux please refer to the HP Serviceguard for Linux Configuration & Ordering Guide available 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 including a complete list of Product Numbers for HP Serviceguard for Linux, please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11518_na/11518_na.html	
USB Options	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#ABA
	1.44MB External USB Floppy Drive	DC141B
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	UK065E
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UK066E
6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UK067E
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

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Options Memory Storage Technical Specifications

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. Both DIMMs in a memory bank must be identical.
4. Processor 1 memory bank A must always be populated.
5. DIMM banks are active only when the corresponding processor socket is populated.
6. If installing only one bank on a processor, populate the bank physically farthest from the processor.
7. If mixing DIMM sizes on the same processor, the largest capacity DIMMs must be populated in the bank physically farthest from the processor. The smallest capacity DIMMs must be populated in the bank physically nearest the processor.
8. For optimal performance in most applications, populate the first memory bank for every populated processor socket.

HP ProLiant BL465c Server Blade (1P Model)

Standard Memory

1024-MB (2 x 512 MB) or 2048-MB (2 x 1024 MB) (depending on model) of PC2-5300, Registered DDR2-667 ECC DIMMs.

Standard Memory Plus Optional Memory

Up to 25600-MB or 26624-MB (depending on model) 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 32768-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							
		1A	2A	3B	4B	5C	6C	7D	8D
Standard	**1024 MB**	**512 MB**	**512 MB**	**Empty**	**Empty**	**Empty**	**Empty**	**Empty**	**Empty**
Standard	**2048 MB**	**1024 MB**	**1024 MB**	Empty	Empty	**Empty**	**Empty**	**Empty**	**Empty**
Optional	**25600 MB**	**4096 MB**	**4096 MB**	**512 MB**	**512 MB**	**4096 MB**	**4096 MB**	**4096 MB**	**4096 MB**
Optional	**26624 MB**	**4096 MB**	**4096 MB**	**1024 MB**	**1024 MB**	**4096 MB**	**4096 MB**	**4096 MB**	**4096 MB**
Maximum	**32768 MB**	**4096 MB**	**4096 MB**	**4096 MB**	**4096 MB**	**4096 MB**	**4096 MB**	**4096 MB**	**4096 MB**

Following are memory options available from HP:

1 GB REG DDR2 PC2-5300 2 x 512 MB Single Rank Kit	408850-B21
2 GB REG DDR2 PC2-5300 2 x 1 GB Single Rank Kit	408851-B21
4 GB REG DDR2 PC2-5300 2 x 2 GB Dual Rank Kit	408853-B21
8 GB REG DDR2 PC2-5300 2 x 4 GB Dual Rank Kit	408854-B21

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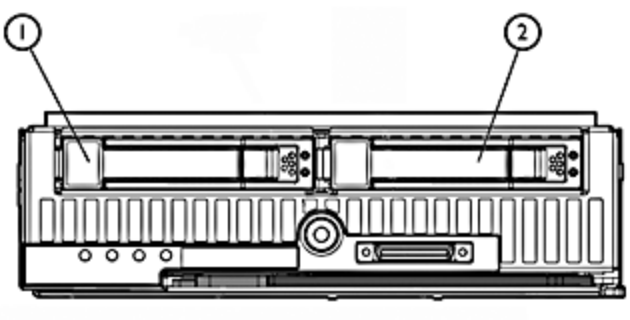
Storage



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

Hard Drives

Hot Plug SFF SAS 2.5" Drives

	Quantity Supported	Position Supported	Controller
36GB 15K SAS 72GB 10K SAS 72GB 15K SAS 146GB 15K SAS	2	1-2	Smart Array E200i Controller

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SFF SATA Hot Plug Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
250GB 3G 5.4K SATA 120GB 1.5G 5.4K SATA	2	1-2	Smart Array E200i Controller

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Technical Specifications

System Unit	**Dimensions** (H x W x D) (with bezel)	7.154 x 2.19 x 20.058 in (18.17 x 5.56 x 50.95 cm)	
	Weight (approximate)	Maximum (all hard drives and processors installed)	14.20 lb (6.44 kg)
		Minimum (one hard drive and processor installed)	10.75 lb (4.87 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 URL:	

			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 which is available via the online tool located at URL: http://www.hp.com/go/bladesystem/powercalculator
	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	5 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 URL: 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

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Smart Array E200i Controller	**Disk Drive and Enclosure Interface**	3G SAS (Serial Attached SCSI) 1.5G SATA (Serial Advanced Technology Attachment)
	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
Embedded NC370i Multifunction Gigabit Server Adapter	**Network Processor**	Broadcom 5706
	Data Transfer Method	100MHz PCI-X
	Network Transfer Rate	2000 Mb/s **NOTE:** 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	• TCP/IP offload engine (TOE) for Microsoft Windows • iSCSI Boot for Microsoft Windows and Linux • Optional accelerated iSCSI • 9K Jumbo frames • TCP/IP checksum offload (TCO) • Large send offload (LSO) • Interrupt coalescence • Dual address cycles (DAC) • Wake-on-LAN (WOL) • Pre-boot execution environment (PXE) • ProLiant Teaming including Network Fault Tolerance, Transmit Load Balancing, and Switch-Assisted Load Balancing • IPv6 packet transmit and receive (excluding all offload capabilities); IPv6 aware SNMPv1 agents for Microsoft Windows
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.