HP ProLiant BL460c Server Blade

Overview

1. Access Panel
2. Up to two Quad-Core or Dual-Core Intel® Xeon® 5000 Sequence processors
3. Small form factor (SFF) hot-plug drive bays (standard BTO models)
4. Local I/O connector
5. Eight (8) PC2-5300, Fully Buffered DIMMs (DDR2-667) Memory Slots
6. HP Smart Array E200i Controller with optional battery-backed write cache (standard BTO models)
7. Two Mezzanine slots
8. Internal USB Connector (standard BTO models)

What's New
- Support for Intel® Xeon® Quad-Core X5470 Processors
- Support for HP Hot Plug SATA 5.4K SFF Ety HDD
- Support for HP NC382m Dual Port 1GbE Multifunction BL-c Adapter
- Support for up to 64 GB of Memory with 16 GB REG PC2-5300 2x8 GB Dual Rank memory option kit
- Support for QLogic QMH4062 1GbE iSCSI Adapter for HP BladeSystem c-Class

At A Glance
This document covers the HP ProLiant BL460c server blade only. For more information on HP BladeSystems c-Class Infrastructure and HP BladeSystem c-Class Interconnect Components, please see the following QuickSpecs:

HP BladeSystem c-Class Enclosures QuickSpecs:
HP BladeSystem c3000 Enclosure QuickSpecs:
Overview

HP BladeSystem c7000 Enclosure QuickSpecs:

HP BladeSystem c-Class Interconnect Components QuickSpecs:

The HP ProLiant BL460c provides greater 2P x86 server blade density without compromise and maximum power-efficiency with flexibility and choice.

HP ProLiant BL460c server blade includes:

- **Processor:**
  - Up to two Quad-Core Intel® Xeon® 5400 Series processors
  - Up to two Quad-Core Intel® Xeon® 5300 Series processors
  - Up to two Dual-Core Intel® Xeon® 5200 Series processors
  - Supports up to 2 Dual-Core 3.33GHz, 1333 MHz FSB-1X6 MB Level 2 cache memory, and up to 2 Quad-3.33 GHz 1333MHz-2x6 MB Level 2 cache memory
  - Intel 5000P chipset supporting up to a 1333 MHz Front Side Bus

- **Memory:**
  - Up to 64 GB of memory, supported by (8) slots of PC2-5300 Fully Buffered DIMMs at 667 MHz
    - **NOTE:** 64 GB of memory is supported with 80W processors and below. Not supported with 120W processors.
  - Supporting low-power memory
  - Advanced ECC memory support
  - Supporting memory interleaving (2x1); memory mirroring and online spare capacity.

- **Storage Controller:**
  - Integrated HP Smart Array E200i RAID controller with 64 MB cache (with optional battery-backed write-cache with an upgrade to 128 MB cache in standard BTO models. Supports RAID 0,1 in standard BTO models
    - **NOTE:** Drive-less model available through CTO for customers not utilizing internal disk drives and attaching directly to SAN. Please note that this model does not replace any prior model offerings. The feature listed above is not included in the standard Drive-less configure to order model. However, all configure to order models offer optional support for small form factor (SFF) hot-plug drive bays, HP Smart Array E200i Controller (with optional battery-backed write cache), and Internal USB Connector. See Factory Integrated Model section for more information.

- **Internal Drive Support:**
  - Up to 2 small form factor (SFF) SAS or SATA hot plug hard disk drives in standard BTO models
    - **NOTE:** Drive-less model now available through CTO for customers not utilizing internal disk drives and attaching directly to SAN. Please note that this model does not replace any prior model offerings. The feature listed above is not included in the standard Drive-less configure to order model. However, all configure to order models offer optional support for small form factor (SFF) hot-plug drive bays, HP Smart Array E200i Controller (with optional battery-backed write cache), and Internal USB Connector. See Factory Integrated Model section for more information.

- **Network Controller:**
  - Two (2) embedded NC373i Multifunction Gigabit Server Adapters with iSCSI boot, TCP/IP offload engine, and optional accelerated iSCSI
  - One (1) additional embedded 10/100 network adapter dedicated to iLO 2 management
    - **NOTE:** The Gigabit Ethernet adapters transmit from the server at 2000 Mbps only, full duplex per port. For more information, see the "Network Controller" item in Standards Features section.

- **Mezzanine Support:**
  - Two (2) additional I/O expansion slots via mezzanine card.
  - Supports up to two (2) mezzanine cards
    - Dual-Port Fibre Channel Mezzanine (4-Gb) options for SAN connectivity (Choice of Emulex or QLogic).
    - Wide variety of 10GbE and 1GbE network adapter options for additional network ports
Overview

- QLogic QMH4062 Gigabit Ethernet iSCSI initiator
- 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 in standard BTO models
  - **NOTE:** Drive-less model now available through CTO for customers not utilizing internal disk drives and attaching directly to SAN. Please note that this model does not replace any prior model offerings. The feature listed above is not included in the standard Drive-less configure to order model. However, all configure to order models offer optional support for small form factor (SFF) hot-plug drive bays, HP Smart Array E200i Controller (with optional battery-backed write cache), and Internal USB Connector. See Factory Integrated Model section for more information.

- **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 BL460c server blade plugs vertically into the BladeSystem c3000 and c7000 enclosures

- **Management:**
  - HP Integrated Lights-Out 2 (iLO 2) Standard Blade Edition with virtual KVM graphical remote console, with the option to upgrade to the iLO Select Pack. iLO Select Pack is a no installation upgrade offering automatic video footage of the events leading up to the server event (like bluescreens), automatic video footage of the server blade’s last boot sequence, on-demand video record and playback for training videos, team collaboration features for up to four users on a single iLO session, and much more. Learn more at: www.hp.com/go/iLO.

- **Operating Systems:**
  - Supports Windows, Linux, Netware, and Solaris Operating Systems

- **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 BL460c servers plugged vertically.
    - The HP BladeSystem c3000 rack enclosure is 6U high and holds up to 8 HP ProLiant BL460c servers plugged horizontally.
    - The HP BladeSystem c3000 tower enclosure is designed with casters for sites without racks and holds up to 8 HP ProLiant BL460c servers plugged vertically.
  - Server blades, storage blades, interconnect modules, power supplies, fans, and redundant Onboard Administrator modules are all designed to fit into the c3000 and c7000 enclosures.
  - 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. Certain restrictions and exclusions apply. 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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### Processor

<table>
<thead>
<tr>
<th>Kit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quad-Core Processor Option Kits</strong></td>
<td></td>
</tr>
<tr>
<td>Quad-Core Intel® Xeon® Processor X5460</td>
<td>(3.160 GHz, 1333 FSB, 120W)</td>
</tr>
<tr>
<td>Quad-Core Intel® Xeon® Processor X5450</td>
<td>(3.00 GHz, 1333 FSB, 120W)</td>
</tr>
<tr>
<td>Quad-Core Intel® Xeon® Processor E5450</td>
<td>(3.0 GHz, 1333 FSB, 80W)</td>
</tr>
<tr>
<td>Quad-Core Intel® Xeon® Processor E5440</td>
<td>(2.83 GHz, 1333 FSB, 80W)</td>
</tr>
<tr>
<td>Quad-Core Intel® Xeon® Processor E5430</td>
<td>(2.66 GHz, 1333 FSB, 80W)</td>
</tr>
<tr>
<td>Quad-Core Intel® Xeon® Processor E5420</td>
<td>(2.50 GHz, 1333 FSB, 80W)</td>
</tr>
<tr>
<td>Quad-Core Intel® Xeon® Processor L5420</td>
<td>(2.50 GHz, 1333 FSB, 50W, LV)</td>
</tr>
<tr>
<td>Quad-Core Intel® Xeon® Processor E5410</td>
<td>(2.33 GHz, 1333 FSB, 80W)</td>
</tr>
<tr>
<td>Quad-Core Intel® Xeon® Processor L5410</td>
<td>(2.33 GHz, 1333 FSB, 50W, LV)</td>
</tr>
<tr>
<td>Quad-Core Intel® Xeon® Processor E5405</td>
<td>(2.00 GHz, 1333 FSB, 80W)</td>
</tr>
<tr>
<td>Quad-Core Intel® Xeon® Processor X5365</td>
<td>(3.00 GHz, 1333 FSB, 120W)</td>
</tr>
<tr>
<td>Quad-Core Intel® Xeon® Processor X5355</td>
<td>(2.66 GHz, 1333 FSB, 120W)</td>
</tr>
<tr>
<td>Quad-Core Intel® Xeon® Processor E5345</td>
<td>(2.33 GHz, 1333 FSB, 80W)</td>
</tr>
<tr>
<td>Quad-Core Intel® Xeon® Processor E5335</td>
<td>(2.00 GHz, 1333 FSB, 80W)</td>
</tr>
<tr>
<td>Quad-Core Intel® Xeon® Processor L5335</td>
<td>(2.00 GHz, 1333 FSB, 50W)</td>
</tr>
<tr>
<td>Quad-Core Intel® Xeon® Processor E5320</td>
<td>(1.86 GHz, 1066 FSB, 80W)</td>
</tr>
<tr>
<td>Quad-Core Intel® Xeon® Processor L5320</td>
<td>(1.86 GHz, 1066 FSB, 50W)</td>
</tr>
<tr>
<td>Quad-Core Intel® Xeon® Processor E5310</td>
<td>(1.60 GHz, 1066 FSB, 80W)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Dual-Core Processor Option Kits</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual-Core Intel® Xeon® processor X5260</td>
<td>(3.33 GHz, 1333 FSB, 80W)</td>
</tr>
<tr>
<td>Dual-Core Intel® Xeon® processor L5240</td>
<td>(3.00 GHz, 1333 FSB, 40 W, LV)</td>
</tr>
<tr>
<td>Dual-Core Intel® Xeon® processor E5205</td>
<td>(1.86 GHz, 1333 FSB, 65W)</td>
</tr>
</tbody>
</table>

*Offered through Configure-To-Order only. See Factory Integrated Models section for more details.

**NOTES:** Intel 5400, 5300, and 5200 Series processors are 64-bit and support Intel VT. Intel 5200 Series processors are dual-core; Intel 5400 and 5300 Series processors are quad-core.

**NOTES:** For the Intel 5200, 5300 and 5400 Series, the letter preceding the model number indicates the performance/wattage of the processor. "X" denotes High Performance/Wattage; "E" denotes Enterprise Performance/Wattage (Mainstream); and "L" denotes Lower Wattage.

### Upgradeability

- Upgradeable to 2 processors

### Cache Memory

- 2 x 6 MB shared L2 cache (5400 Series)
- 1 x 6 MB L2 cache (5200 Series)
- 2 x 4 MB Level 2 cache memory (5300 Series)

### Chipset

- Intel® 5000P Chipset
### Standard Features

#### Memory
<table>
<thead>
<tr>
<th>Type</th>
<th>1 GB (2 x 512 MB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>2 GB (2 x 1 GB)</td>
</tr>
<tr>
<td>Maximum</td>
<td>64 GB (8 x 8 GB)</td>
</tr>
</tbody>
</table>

- **NOTE:** Memory must be installed in pairs.
- **NOTE:** 64GB of memory is supported with 80W processors and below. Not supported with 120W processors.

#### Network Controller
- Two (2) embedded NC373i Multifunction Gigabit Server Adapters with iSCSI boot, TCP/IP offload engine, and optional accelerated iSCSI
- One (1) additional 10/100 NIC dedicated to iLO 2 Management

**NOTE:** The Gigabit Ethernet adapters transmit from the server at 2000 Mbps, full duplex per port only. 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. 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 adapters combine standard Gigabit Ethernet networking, TCP/IP offload engine (TOE), 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 NC373i offers TOE for Microsoft® Windows 2000 and 2003 environments.
  - The iSCSI network boot (iSCSI boot) allows the BL460c to boot from a remote operating system (OS) image located on a storage area network (SAN). The BL460c uses an iSCSI firmware image (iSCSI boot option ROM) making the remote disk drive appear as a local, bootable C: drive. The BL460c 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
- Two I/O expansion mezzanine slots (one x8 and one x4)

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

<table>
<thead>
<tr>
<th>Storage Controller</th>
<th>HP Smart Array E200i Controller</th>
<th>64 MB memory module supports RAID 0,1</th>
<th>Available upgrades: 128 MB with Battery-backed write cache</th>
</tr>
</thead>
</table>

*NOTE:* For customers who choose to configure a driveless model via CTO, a storage controller is not required. See Factory Integrated Models section for more information.

<table>
<thead>
<tr>
<th>Maximum Internal Storage</th>
<th>Hot Plug Serial Attach SCSI (SAS)</th>
<th>292GB SAS</th>
<th>2 x 146GB Serial SCSI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hot Plug Serial ATA (SATA)</td>
<td>500GB SATA</td>
<td>2 x 250GB Serial ATA</td>
</tr>
</tbody>
</table>

*NOTE:* For customers who choose to configure a driveless model via CTO, internal storage is not required. See Factory Integrated Models section for more information.

<table>
<thead>
<tr>
<th>Graphics</th>
<th>Integrated ATI RN-50 1600x1280x64K 16M color (32 MB DDR1 memory)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Graphics Resolution Supported</th>
<th>Resolution Color Depths</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1600 x 1280, 64K, 256, 16</td>
</tr>
<tr>
<td></td>
<td>1280 x 1024, 16.7M, 64k, 256, 16</td>
</tr>
<tr>
<td></td>
<td>1024 x 768, 16.7M, 64k, 256, 16</td>
</tr>
<tr>
<td></td>
<td>800 x 600, 16.7M, 64k, 256, 16</td>
</tr>
<tr>
<td></td>
<td>640 x 480, 16.7M, 64k, 256, 16</td>
</tr>
</tbody>
</table>

### Fibre Channel Support

Two optional Fibre Channel HBAs are supported by the HP ProLiant BL460c. 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.
### HP ProLiant BL460c Server Blade

#### Standard Features

| Compatible SAN | HP ProLiant BL460c server blades are optimized for HP StorageWorks MSA, EVA and XP |

HP ProLiant 460c 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](http://h18000.www1.hp.com/products/servers/proliant-bl/c-class/storage.html))
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 and power management.

HP Control Insight 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-Universal 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:
- HP BladeSystem c7000 Enclosure QuickSpecs:

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.

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

<table>
<thead>
<tr>
<th>Server Management Stand Alone Software Product – ProLiant Essentials</th>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>HP Systems Insight Manager</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Integrated Lights-Out Advanced Pack</strong></td>
<td>Upgrades the iLO 2 processor with comprehensive remote control including Virtual KVM remote graphical console, enhanced console sharing and replay, virtual media (floppy, CD/DVD, USB key), virtual folders, and enterprise security (directory services and two-factor authentication).</td>
</tr>
<tr>
<td><strong>Integrated Lights-Out Select Pack</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>ProLiant Essentials Rapid Deployment Pack</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Insight Power Manager (IPM)</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>ProLiant Essentials Server Migration Pack – Universal Edition</strong></td>
<td>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 migrations:</td>
</tr>
<tr>
<td></td>
<td>• physical to ProLiant</td>
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<tr>
<td></td>
<td>• physical to virtual</td>
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<tr>
<td></td>
<td>• virtual to virtual</td>
</tr>
<tr>
<td></td>
<td>• virtual to ProLiant</td>
</tr>
<tr>
<td><strong>ProLiant Essentials Performance Management Pack</strong></td>
<td>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</td>
</tr>
</tbody>
</table>

**NOTE:** For more information, visit: http://www.hp.com/go/migrate.
The 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.

Virtual Machine Management Pack – provides central management and control of virtual machines from Microsoft and VMware. Integrated approach provides the ability to manage both physical and virtual resources from a single management console.

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

SmartStart is a tool that simplifies server setup, providing a rapid way to deploy reliable and consistent server configurations. For more information, please visit the SmartStart Web site at: http://www.hp.com/servers/smartstart.

SmartStart version supported (minimum): SmartStart 7.60

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 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.

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) 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](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) - supported Summer 2008

- **Application Integration Toolkits**
  - HP Serviceguard 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:** For additional information on HP Serviceguard for Linux, visit: [http://www.hp.com/go/sglx](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](http://www.hp.com/services/swsupport).
OS Support

Microsoft Windows 2000 Server
Microsoft Windows Server 2003 R2
Microsoft Windows Server 2008
Microsoft Windows Small Business Server 2003 R2
Red Hat Enterprise Linux
SUSE Linux Enterprise Server
Sun Solaris for x64/x86-based Systems
VMware

**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](http://www.hp.com/go/supportos).

Integrated Manageability

Integrated Lights-Out 2 Standard Blade Edition (iLO 2)

- 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

Availability

- Dual-Port Fibre Channel Mezzanine Card for redundant SAN connection
- Two (2) embedded Gigabit Ethernet adapters for redundant LAN connections Two (2) hot-plug SAS/SATA hard drive bays and integrated RAID (HP Smart Array E200i) controller on every BTO model server blade (Battery-backed write cache is optional.)*
- Redundant ROM on each server blade
- Advanced ECC Memory – can correct a multi-bit error (up to 4 bits) that occurs within one memory chip
- Memory Mirroring
- Memory Online Spare Capacity
- Network adapter teaming (network fault tolerance, transmit load balancing, switch-assisted load balancing)

* For customers who choose to configure a driveless model via CTO, these features are not required. See Factory Integrated Models section for more information.
Standard Features

**Industry Standard Compliance**
- ACPI 2.0 Compliant
- PCI 2.2 Compliant
- WOL Support
- Microsoft® Logo certifications
- USB 2.0 Support

**Security**
- One (1) internal USB 2.0 connector for security key devices and USB drive keys on every BTO model server blade* 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

* For customers who choose to configure a driveless model via CTO, internal USB connectors are not available unless 447711-B21 is selected. See Factory Integrated Models section for more information.

**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](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.

**NOTE:** This feature is not supported in the NEW Drive-less model which is available through CTO for those who do not utilize internal hard disk drives and attach to SAN.
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 vendor 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
Quad-Core Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Processor(s)</th>
<th>Cache Memory</th>
<th>Memory</th>
<th>Network Adapter</th>
<th>Storage Controller</th>
<th>Hard Drives</th>
<th>Internal Storage</th>
<th>Optical Drive</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP ProLiant BL460c</td>
<td>(1) Quad-Core Intel® Xeon® Processor E5450 (3.00 GHz, 1333 FSB, 80W)</td>
<td>2 x 6 MB Level 2 cache (5400 Series)</td>
<td>2 GB (2 x 1 GB) PC2-5300, FBD DDR2-667</td>
<td>Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 network adapter dedicated to iLO 2 Management</td>
<td>HP Smart Array E200i Controller with 64MB (optional battery-backed write cache)</td>
<td>No drives included; (2) SFF SAS/SATA drive bays</td>
<td>292GB SAS</td>
<td>None</td>
</tr>
<tr>
<td>E5450 2G (1P)</td>
<td>(1) Quad-Core Intel® Xeon® Processor E5440 (2.83 GHz, 1333 FSB, 80W)</td>
<td>2 x 4 MB Level 2 cache (5300 Series)</td>
<td>1 GB (2 x 512 MB) PC2-5300, FBD DDR2-667</td>
<td>eson (1) additional 10/100 network adapter dedicated to iLO 2 Management</td>
<td>HP Smart Array E200i Controller with 64MB (optional battery-backed write cache)</td>
<td>None</td>
<td>500GB SATA</td>
<td></td>
</tr>
<tr>
<td>E5440 2G (1P)</td>
<td>(1) Quad-Core Intel® Xeon® Processor E5430 (2.66 GHz, 1333 FSB, 80W)</td>
<td></td>
<td>2 GB (2 x 1 GB) PC2-5300, FBD DDR2-667</td>
<td>Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 network adapter dedicated to iLO 2 Management</td>
<td>HP Smart Array E200i Controller with 64MB (optional battery-backed write cache)</td>
<td>No drives included; (2) SFF SAS/SATA drive bays</td>
<td>292GB SAS</td>
<td>None</td>
</tr>
<tr>
<td>E5430 2G (1P)</td>
<td>(1) Quad-Core Intel® Xeon® Processor E5420 (2.50 GHz, 1333 FSB, 80W)</td>
<td></td>
<td>1 GB (2 x 512 MB) PC2-5300, FBD DDR2-667</td>
<td>Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 network adapter dedicated to iLO 2 Management</td>
<td>HP Smart Array E200i Controller with 64MB (optional battery-backed write cache)</td>
<td>No drives included; (2) SFF SAS/SATA drive bays</td>
<td>292GB SAS</td>
<td>None</td>
</tr>
<tr>
<td>E5420 2G (1P)</td>
<td>(1) Quad-Core Intel® Xeon® Processor L5420 (2.50 GHz, 1333 FSB, 50W)</td>
<td></td>
<td>2 GB (2 x 1 GB) PC2-5300, FBD DDR2-667</td>
<td>Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 network adapter dedicated to iLO 2 Management</td>
<td>HP Smart Array E200i Controller with 64MB (optional battery-backed write cache)</td>
<td>No drives included; (2) SFF SAS/SATA drive bays</td>
<td>292GB SAS</td>
<td>None</td>
</tr>
<tr>
<td>L5420 2G (1P)</td>
<td>(1) Quad-Core Intel® Xeon® Processor L5410 (2.33 GHz, 1333 FSB, 50W)</td>
<td></td>
<td>1 GB (2 x 512 MB) PC2-5300, FBD DDR2-667</td>
<td>Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 network adapter dedicated to iLO 2 Management</td>
<td>HP Smart Array E200i Controller with 64MB (optional battery-backed write cache)</td>
<td>No drives included; (2) SFF SAS/SATA drive bays</td>
<td>292GB SAS</td>
<td>None</td>
</tr>
<tr>
<td>L5410 2G (1P)</td>
<td>(1) Quad-Core Intel® Xeon® Processor E5410 (2.00 GHz, 1333 FSB, 80W)</td>
<td></td>
<td>2 GB (2 x 1 GB) PC2-5300, FBD DDR2-667</td>
<td>Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 network adapter dedicated to iLO 2 Management</td>
<td>HP Smart Array E200i Controller with 64MB (optional battery-backed write cache)</td>
<td>No drives included; (2) SFF SAS/SATA drive bays</td>
<td>292GB SAS</td>
<td>None</td>
</tr>
<tr>
<td>E5405 2G (1P)</td>
<td>(1) Quad-Core Intel® Xeon® Processor X5365 (3.00 GHz, 1333 FSB, 120W)</td>
<td></td>
<td>2 GB (2 x 1 GB) PC2-5300, FBD DDR2-667</td>
<td>Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 network adapter dedicated to iLO 2 Management</td>
<td>HP Smart Array E200i Controller with 64MB (optional battery-backed write cache)</td>
<td>No drives included; (2) SFF SAS/SATA drive bays</td>
<td>292GB SAS</td>
<td>None</td>
</tr>
<tr>
<td>E5345 2G (1P)</td>
<td>(1) Quad-Core Intel® Xeon® Processor X5355 (2.66 GHz, 1333 FSB, 120W)</td>
<td></td>
<td>1 GB (2 x 512 MB) PC2-5300, FBD DDR2-667</td>
<td>Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 network adapter dedicated to iLO 2 Management</td>
<td>HP Smart Array E200i Controller with 64MB (optional battery-backed write cache)</td>
<td>No drives included; (2) SFF SAS/SATA drive bays</td>
<td>292GB SAS</td>
<td>None</td>
</tr>
<tr>
<td>X5365 2G (1P)</td>
<td>(1) Quad-Core Intel® Xeon® Processor L5320 (2.00 GHz, 1333 FSB, 50W)</td>
<td></td>
<td>2 GB (2 x 1 GB) PC2-5300, FBD DDR2-667</td>
<td>Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 network adapter dedicated to iLO 2 Management</td>
<td>HP Smart Array E200i Controller with 64MB (optional battery-backed write cache)</td>
<td>No drives included; (2) SFF SAS/SATA drive bays</td>
<td>292GB SAS</td>
<td>None</td>
</tr>
<tr>
<td>X5355 2G (1P)</td>
<td>(1) Quad-Core Intel® Xeon® Processor L5335 (2.00 GHz, 1333 FSB, 50W)</td>
<td></td>
<td>1 GB (2 x 512 MB) PC2-5300, FBD DDR2-667</td>
<td>Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 network adapter dedicated to iLO 2 Management</td>
<td>HP Smart Array E200i Controller with 64MB (optional battery-backed write cache)</td>
<td>No drives included; (2) SFF SAS/SATA drive bays</td>
<td>292GB SAS</td>
<td>None</td>
</tr>
<tr>
<td>E5345 2G (1P)</td>
<td>(1) Quad-Core Intel® Xeon® Processor X5320 (1.60 GHz, 1333 FSB, 80W)</td>
<td></td>
<td>2 GB (2 x 1 GB) PC2-5300, FBD DDR2-667</td>
<td>Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 network adapter dedicated to iLO 2 Management</td>
<td>HP Smart Array E200i Controller with 64MB (optional battery-backed write cache)</td>
<td>No drives included; (2) SFF SAS/SATA drive bays</td>
<td>292GB SAS</td>
<td>None</td>
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<tr>
<td>L5335 2G (1P)</td>
<td>(1) Quad-Core Intel® Xeon® Processor E5320 (1.86GHz, 1066 FSB, 80W)</td>
<td></td>
<td>2 GB (2 x 1 GB) PC2-5300, FBD DDR2-667</td>
<td>Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 network adapter dedicated to iLO 2 Management</td>
<td>HP Smart Array E200i Controller with 64MB (optional battery-backed write cache)</td>
<td>No drives included; (2) SFF SAS/SATA drive bays</td>
<td>292GB SAS</td>
<td>None</td>
</tr>
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</table>
## HP ProLiant BL460c Server Blade

### Models

<table>
<thead>
<tr>
<th>Model Details</th>
<th>Form Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP ProLiant BL460c E5310 1G (1P) 435456-B21</td>
<td>Up to 8 half-height blades supported in HP BladeSystem c3000 Enclosure Up to 16 half-height blades supported in HP BladeSystem c7000 Enclosure</td>
</tr>
</tbody>
</table>

### Dual-Core Models

<table>
<thead>
<tr>
<th>Model Details</th>
<th>Processor(s)</th>
<th>Cache Memory</th>
<th>Memory</th>
<th>Network Adapter</th>
<th>Storage Controller</th>
<th>Hard Drives</th>
<th>Internal Storage</th>
<th>Optical Drive</th>
<th>Form Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP ProLiant BL460c X5260 2G, (1P) 461603-B21</td>
<td>(1) Dual-Core Intel® Xeon® processor X5260 (3.3 GHz, 1333 FSB, 80 W)</td>
<td>1 x 6 MB Level 2 cache memory (5200 Series)</td>
<td>2 GB (2 x 1 GB) PC2-5300, FBD DDR2-667</td>
<td>Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 network adapter dedicated to iLO 2 Management</td>
<td>HP Smart Array E200i Controller with 64MB (optional 128 MB battery-backed write cache)</td>
<td>No drives included; (2) SFF SAS/SATA drive bays</td>
<td>292GB SAS 500GB SATA</td>
<td>None</td>
<td>Up to 8 half-height blades supported in HP BladeSystem c3000 Enclosure Up to 16 half-height blades supported in HP BladeSystem c7000 Enclosure</td>
</tr>
<tr>
<td>HP ProLiant BL460c L5240 2G, (1P) 461604-B21</td>
<td>(1) Dual-Core Intel® Xeon® processor L5240 (3.00 GHz, 1333 FSB, 40 W, LV)</td>
<td></td>
<td>1 GB (2 x 512 MB) PC2-5300, FBD DDR2-667</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HP ProLiant BL460c E5205 1G, (1P) 461605-B21</td>
<td>(1) Dual-Core Intel® Xeon® processor E5205 (1.86 GHz, 1333 FSB, 65 W)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>292GB SAS 500GB SATA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The ProLiant Smart Buy program offers a collection of promotional server and option products that are configured with SMB in mind, offered at discounted prices, and positioned for quick delivery. Smart Buy server offers are available for a limited time only.

For a full listing of ProLiant Smart Buys available for all server families, visit [http://www.hp.com/go/smartbuy/server/specs](http://www.hp.com/go/smartbuy/server/specs)

### S-Buy BL460c E5345 461273-001

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>(1) Quad Core Intel Xeon Processor E5345 (2.33GHz, 1333 FSB)</td>
</tr>
<tr>
<td>Cache Memory</td>
<td>2x4 MB Level 2 cache</td>
</tr>
<tr>
<td>Memory</td>
<td>4 GB (2 x 2 GB) PC2-5300, FBD (DDR2-667)</td>
</tr>
<tr>
<td>Network Adapter</td>
<td>Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 NIC dedicated to iLO 2 Management</td>
</tr>
<tr>
<td>Storage controller</td>
<td>HP Smart Array E200i Controller with 64MB (optional 128MB battery-backed write cache)</td>
</tr>
<tr>
<td>Hard Drives</td>
<td>No drives included; (2) SFF SAS/SATA drive bays</td>
</tr>
<tr>
<td>Internal Storage</td>
<td>292GB SAS</td>
</tr>
<tr>
<td></td>
<td>240GB SATA</td>
</tr>
<tr>
<td>Optical Drive</td>
<td>None</td>
</tr>
<tr>
<td>Form Factor</td>
<td>Up to 8 half-height blades supported in HP BladeSystem c3000 Enclosure</td>
</tr>
<tr>
<td></td>
<td>Up to 16 half-height blades supported in HP BladeSystem c7000 Enclosure</td>
</tr>
</tbody>
</table>

### S-Buy BL460c E5430 485475-001

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>(1) Quad-Core Intel® Xeon® processor E5430 (2.66 GHz, 1333 FSB)</td>
</tr>
<tr>
<td>Cache Memory</td>
<td>2 x 6 MB Level 2 cache</td>
</tr>
<tr>
<td>Memory</td>
<td>4 GB (2 x 2 GB) PC2-5300, FBD (DDR2-667)</td>
</tr>
<tr>
<td>Network Adapter</td>
<td>Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 NIC dedicated to iLO 2 Management</td>
</tr>
<tr>
<td>Storage controller</td>
<td>HP Smart Array E200i Controller with 64MB (optional 128MB battery-backed write cache)</td>
</tr>
<tr>
<td>Hard Drives</td>
<td>No drives included; (2) SFF SAS/SATA drive bays</td>
</tr>
<tr>
<td>Internal Storage</td>
<td>292GB SAS</td>
</tr>
<tr>
<td></td>
<td>240GB SATA</td>
</tr>
<tr>
<td>Optical Drive</td>
<td>None</td>
</tr>
<tr>
<td>Form Factor</td>
<td>Up to 8 half-height blades supported in HP BladeSystem c3000 Enclosure</td>
</tr>
<tr>
<td></td>
<td>Up to 16 half-height blades supported in HP BladeSystem c7000 Enclosure</td>
</tr>
</tbody>
</table>
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 server blades must start with a CTO Blade.

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

NOTE: FIO indicates that this option is a Factory Installable Option.

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

Models
HP ProLiant BL460c Driveless CTO Blade 447707-B21

Configurable Model ships with:
Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 NIC dedicated to iLO 2 Management
Integrated Lights-Out 2 Standard Blade Edition

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

Processors
Quad-Core Processor Option Kits
Quad-Core Intel® Xeon® Processor X5470 (3.33 GHz, 1333 FSB, 120W) Option Kit, FIO 492308-L21
Quad-Core Intel® Xeon® processor X5460 (3.16 GHz, 1333 FSB, 120 W) Option Kit, FIO Base 459973-L21
Quad-Core Intel® Xeon® processor X5450 (3.00 GHz, 1333 FSB, 120 W) Option Kit, FIO Base 463056-L21
Quad-Core Intel® Xeon® processor E5450 (3.00 GHz, 1333 FSB, 80 W) Option Kit, FIO Base 459489-L21
Quad-Core Intel® Xeon® processor E5440 (2.83 GHz, 1333 FSB, 80 W) Option Kit, FIO Base 459490-L21
Quad-Core Intel® Xeon® processor E5430 (2.66 GHz, 1333 FSB, 80 W) Option Kit, FIO Base 459491-L21
Quad-Core Intel® Xeon® Processor E5420 (2.50 GHz, 1333 FSB, 80 W) Option Kit, FIO Base 459492-L21
Quad-Core Intel® Xeon® Processor E5410 (2.33 GHz, 1333 FSB) Option Kit, FIO Base 459493-L21
Quad-Core Intel® Xeon® processor E5405 (2.00 GHz, 1333 FSB, 80 W) Option Kit, FIO Base 459494-L21
Quad-Core Intel® Xeon® processor X5365 (3.00 GHz, 1333 FSB, 120 W) Option Kit, FIO Base 453190-L21
Quad-Core Intel® Xeon® processor X5355 (2.66 GHz, 1333 FSB, 120 W) Option Kit, FIO Base 453190-L21

QuickSpecs
HP ProLiant BL460c Server Blade
Configuration Information - Factory Integrated Models

Quad-Core Intel® Xeon® processor E5345 (2.33 GHz, 1333 FSB, 80 W) Option Kit, FIO Base

Quad-Core Intel® Xeon® processor E5335 (2.00 GHz, 1333 FSB, 80 W) Option Kit, FIO Base

Quad-Core Intel® Xeon® processor L5335 (2.00 GHz, 1333 FSB, 50 W) Option Kit, FIO Base

Quad-Core Intel® Xeon® Processor E5320 (1.86GHz, 1066 FSB, 80 W) Option Kit, FIO Base

Quad-Core Intel® Xeon® Processor L5320 (1.86 GHz, 1066 FSB, 80 W) Option Kit, FIO Base

Quad-Core Intel® Xeon® Processor E5310 (1.60GHz, 1066 FSB, 80 W) Option Kit, FIO Base

Dual-Core Intel® Xeon® processor X5260 (3.33 GHz, 1333 FSB, 80 W) Option Kit, FIO Base

Dual-Core Intel® Xeon® processor L5240 (3.00 GHz, 1333 FSB, 40 W, LV) Option Kit, FIO Base

Dual-Core Intel® Xeon® processor E5205 (1.86 GHz, 1333 FSB, 65 W) Option Kit, FIO Base

1 GB FBD PC2-5300 (2 x 512 MB) Kit
2 GB FBD PC2-5300 (2 x 1 GB LP) Kit
2 GB FBD PC2-5300 (2 x 1 GB) Kit
4 GB FBD PC2-5300 (2 x 2 GB LP) Kit
4 GB FBD PC2-5300 (2 x 2 GB) Kit
8 GB FBD PC2-5300 (2 x 4 GB) Kit
8 GB FBD PC2-5300 (2 x 4 GB LP) Kit
16 GB FBD PC2-5300 (2 x 8 GB) Kit
64 GB FBD PC2-5300 (8 x 8 GB) Kit

NOTE: Memory Option Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: http://h18004.www1.hp.com/products/servers/platforms/energyefficient/

NOTE: Must be installed in pairs

Step 3: Choose Additional Factory Integratable Options (one of the following from each list unless otherwise noted):

VMware ESX Server 3i integrated hypervisor
VMware ESX Server 3i 2P integrated hypervisor
VMware ESX Server 3i VI3 Enterprise 2P integrated hypervisor

NOTE: For additional information and option kits, please see the QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/12307_na/12307_na.html

Citrix XenServer integrated hypervisor
Integrated XenServer HP Select Edition 2P/4P
Integrated XenServer HP Enterprise Edition 2P/4P

NOTE: For additional information and option kits, please see the QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/13019_na/13019_na.html
HP ProLiant BL460c Hard Disk Drive Backplane, FIO

NOTE: Includes USB connector.
NOTE: The Hard Drive Backplane is required for all blades that support hard disk drives or require the internal USB 2.0 connector for security key devices, licensing or VMware ESX Server 3i.

Controller Cache

64 MB Cache - FIO Only
NOTE: Integrated HP Smart Array E200i RAID controller supporting RAID 0/1
Controller cache module selection is required for all blades that support hard disk drives. Select either the standard 64 MB module above or the optional 128 MB module below.

NOTE: This option is not required when configuring a Drive-less Model.

128 MB Battery-Backed Cache Enabler
NOTE: Supports the HP Smart Array E200i Controller.
NOTE: This option is not required when configuring a Drive-less Model.

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 options section below; or the following QuickSpecs:
HP BladeSystem c3000 Enclosure QuickSpecs:
HP BladeSystem c7000 Enclosure QuickSpecs:
and HP BladeSystem c-Class Interconnect Components QuickSpecs:
### 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 2 of the 4 ports.

- **Part Number:** 416585-B21

**HP NC326m PCI Express Dual Port 1Gb Server Adapter for c-Class BladeSystem**

- **Part Number:** 406771-B21

**HP NC360m Dual Port 1GbE BL-c Adapter**

- **Part Number:** 445978-B21

**HP NC364m Quad 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.

- **Part Number:** 447883-B21

**HP NC373m PCI Express Dual Port Multifunction Gigabit Server Adapter for c-Class BladeSystem**

**Note:** The Gigabit Ethernet adapters above transmit from the server at 2000 Mbps, full duplex per port only. For more information, see the “Network Controller” segment in the Standards Features section.

- **Part Number:** 406770-B21

**HP NC382m Dual Port 1GbE Multifunction BL-c Adapter**

**Note:** The HP BladeSystem TCP/IP offload engine is supported in a Microsoft Windows 2003 environment only.

- **Part Number:** 453246-B21

**HP NC512m Dual Port 10GbE Multifunction BL-c Adapter**

**Note:** The NC512m is supported in type II x8 PCI Express mezzanine slots; maximum two adapters per server. For more information, see the Mezzanine Slot Compatibility matrix within the HP NC512m Dual Port 10GbE Multifunction BL-c Adapter QuickSpecs:


**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.

- **Part Number:** 440910-B21

**QLogic QMH4062 1GbE iSCSI Adapter for HP BladeSystem c-Class**

- **Part Number:** 488074-B21

### Fiber Channel Mezzanine Options

- **Emulex LPe1105 FC Dual Channel 4Gb, PCI-E-to-Fibre Channel Host Bus Adapter**
  - **Part Number:** 403621-B21

- **QLogic QMH2462 4Gb FC HBA for HP c-Class BladeSystem**
  - **Part Number:** 403619-B21

### HP InfiniBand Mezzanine Options

**HP 4X DDR IB Dual Port Mezzanine HCA for HP BladeSystem c-Class**

- **Part Number:** 448262-B21

**HP 4X DDR IB Mezzanine HCA for HP BladeSystem c-Class**

- **Part Number:** 410533-B21

### HP StorageWorks SB40c Storage Blade

**HP StorageWorks SB40c Storage Blade**

**Note:** Please see the QuickSpecs for Technical Specifications and additional information:


- **Part Number:** 411243-B21
### 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 information:


![Price](448018-B21)

### HP c-Class Tape Blades

- **HP StorageWorks SB920c Tape Blade**
  - **NOTE:** LTO-3 Ultrium technology
  - **NOTE:** The HP PCI Express Mezzanine Pass-Thru Card for HP BladeSystem (431643-B21) is required when installing a tape blade adjacent to a full-height server blade.
  - **NOTE:** Please see the QuickSpecs for Technical Specifications and additional information:
  

- **HP StorageWorks Ultrium 448c Tape Blade**
  - **NOTE:** LTO-2 Ultrium technology

![Price](440947-B21)

### HP Insight Control Environment for BladeSystem Management Suite

**NOTE:** Electronic licensing options are available for Insight Control suites software products. Please see the appropriate Insight Control QuickSpecs 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:** 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 24x7 HP Software Technical Support and Update Service.

- 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:


![Price](453484-B21)

**Insight Control Environment for Linux**

- HP Insight Control Linux Edition, No Media, 1-Server License including 1 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 24x7 HP Software Technical Support and Update Service. One certificate is shipped for each license.

- HP Insight Control Linux Edition Media Only Kit
  - **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 included in the latest Insight Control releases.

![Price](464423-B21)
downloaded at no cost from: http://www.hp.com/go/ice-linux (click on Download button).

**NOTE:** For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/13019_na/13019_na.html

**HP iLO Power Management Pack for BladeSystems**

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://h18000.www1.hp.com/products/quickspecs/12632_na/12632_na.html

**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.**

**Deploy**

**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

**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.

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.

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.

**NOTE:** For additional License Kits please see the QuickSpecs at:

### Control

#### Integrated Lights-Out Select Pack

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

**NOTE:** For additional License Kits, please see the QuickSpecs at:

ProLiant Essentials Integrated Lights-Out Select Pack, No Media, 8-Blade License, including 1 year of 24x7 Technical Support and Updates 452161-B21

**Featuring:** Sophisticated remote control and security features for HP BladeSystem servers and ProLiant ML/DL servers.

**NOTE:** For additional License Kits please see the QuickSpecs at:

### 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 License Kits please see the QuickSpecs at:

#### 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 License Kits please see the QuickSpecs at:

**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.
Options

Processors

Quad-Core Process Option Kits
Quad-Core Intel® Xeon® Processor X5470 (3.33 GHz, 1333 FSB, 120W) 492308-B21
Quad-Core Intel® Xeon® Processor X5460 (3.16 GHz, 1333 FSB, 120 W) 459973-B21
Quad-Core Intel® Xeon® processor X5450 (3.00GHz 1333 FSB, 120 W) 463056-B21
Quad-Core Intel® Xeon® processor E5450 (3.00GHz 1333 FSB, 80 W) 459489-B21
Quad-Core Intel® Xeon® processor E5440 (2.83 GHz, 1333 FSB, 80 W) 459490-B21
Quad-Core Intel® Xeon® processor E5430 (2.66 GHz, 1333 FSB, 80 W) 459491-B21
Quad-Core Intel® Xeon® processor E5420 (2.50 GHz, 1333 FSB, 80 W) 459492-B21
Quad-Core Intel® Xeon® Processor L5420 (2.50 GHz, 1333 FSB, 50 W, LV) 462876-B21
Quad-Core Intel® Xeon® processor E5410 (2.33 GHz, 1333 FSB, 80 W) 459493-B21
Quad-Core Intel® Xeon® Processor L5410 (2.33 GHz, 1333 FSB, 50 W) 462877-B21
Quad-Core Intel® Xeon® processor E5405 (2.00 GHz, 1333 FSB, 80 W) 459494-B21
Quad-Core Intel® Xeon® processor X5365 (3.00 GHz, 1333 FSB, 120 W) 453190-B21
Quad-Core Intel® Xeon® processor X5355 (2.66 GHz, 1333 FSB, 120 W) 435565-B21
Quad-Core Intel® Xeon® processor E5345 (2.33 GHz, 1333 FSB, 80 W) 435564-B21
Quad-Core Intel® Xeon® processor E5335 (2.00 GHz, 1333 FSB, 80 W) 443753-B21
Quad-Core Intel® Xeon® processor L5335 (2.00 GHz, 1333 FSB, 50 W) 453609-B21
Quad-Core Intel® Xeon® processor E5320 (1.86GHz, 1066 FSB, 80 W) 435563-B21
Quad-Core Intel® Xeon® processor L5320 (1.86 GHz, 1066 FSB, 50 W) 443752-B21
Quad-Core Intel® Xeon® processor E5310 (1.60GHz, 1066 FSB, 80 W) 435562-B21

Dual-Core Process Option Kits
Dual-Core Intel® Xeon® processor X5260 (3.33 GHz, 1333 FSB, 80 W) Option Kit 461623-B21
Dual-Core Intel® Xeon® processor L5240 (3.00 GHz, 1333 FSB, 40 W, LV) Option Kit 461624-B21
Dual-Core Intel® Xeon® processor E5205 (1.86 GHz, 1333 FSB, 65 W) Option Kit 461625-B21

Memory

1 GB FBD PC2-5300 2 x 512 MB Kit 397409-B21
2 GB FBD PC2-5300 2 x 1 GB Low Power Kit 461826-B21
2 GB FBD PC2-5300 2 x 1 GB Kit 397411-B21
4 GB FBD PC2-5300 2 x 2 GB Low Power Kit 461828-B21
4 GB FBD PC2-5300 2 x 2 GB Kit 397413-B21
8 GB FBD PC2-5300 2 x 4 GB Kit 397415-B21
8 GB FBD PC2-5300 2 x 4 GB Low Power Kit 466440-B21
16 GB FBD PC2-5300 2 x 8 GB Kit 413015-B21
64 GB FBD PC2-5300 8 x 8 GB Kit 495604-B21

NOTE: Memory Option Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: http://h18004.www1.hp.com/products/servers/platforms/energyefficient/

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 SP 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.

Please see QuickSpecs for Technical Specifications and additional information:

SATA SFF 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:

Controller Cache

128MB Battery-Backed Cache Enabler 351580-B21

NOTE: Supports the HP Smart Array E200i Controller.

High Availability Cluster Options

HP Serviceguard for Linux

HP Serviceguard Linux for HP ProLiant/x86 Servers
Licensed per physical server
Includes media and One Year 24x7 Software Support & Updates

HP Serviceguard Linux Oracle Database Toolkit for HP ProLiant/x86 Servers
Licensed per cluster
Includes media and One Year 24x7 Software Support & Updates

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

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

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:
## Options


<table>
<thead>
<tr>
<th>USB Options</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver)</td>
<td>DC172B</td>
</tr>
<tr>
<td>HP 1GB USB 2.0 Floppy Drive Key</td>
<td>442085-B21</td>
</tr>
<tr>
<td>HP 256MB USB 2.0 Floppy Drive Key</td>
<td>442084-B21</td>
</tr>
<tr>
<td>External USB 2.0 Multi-Bay II Cradle</td>
<td>PA509A</td>
</tr>
<tr>
<td>Multibay II 9.5mm DVD Drive</td>
<td>PA849A</td>
</tr>
<tr>
<td>USB 2.0 4-port Hub</td>
<td>DG954A</td>
</tr>
<tr>
<td>2004 Standard Keyboard USB</td>
<td>DT528A#ABA</td>
</tr>
<tr>
<td>1.44MB External USB Floppy Drive</td>
<td>DC141B</td>
</tr>
</tbody>
</table>

### Service and Support Offerings

**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 incl. HP holidays, Electronic  UE473E
NOTE: Memory configurations listed do not apply to "Factory Integrated Models".

DIMM installation guidelines:

1. All DIMMs must be PC2-5300 Fully Buffered DIMMs at 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 FBDIMM population and RBSU selection. The server blade defaults to Advanced ECC.

**HP ProLiant BL460c 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, FBD DDR2-667 ECC DIMMs

**Standard Memory Plus Optional Memory**

Up to 50176 MB or 51200 MB (depending on model) of PC2-5300, FBD DDR2-667 ECC DIMMs. Memory is available with the installation of optional PC2-5300, FBD DDR2-667 DIMM memory expansion kits.

**Standard Memory Replaced with Optional Memory**

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

<table>
<thead>
<tr>
<th>Memory</th>
<th>Slot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard 1024 MB</td>
<td>1A</td>
</tr>
<tr>
<td>Standard 2048 MB</td>
<td>1A</td>
</tr>
<tr>
<td>Optional 50176 MB</td>
<td>1A</td>
</tr>
<tr>
<td>Optional 51200 MB</td>
<td>1A</td>
</tr>
<tr>
<td>Maximum 65536 MB</td>
<td>1A</td>
</tr>
</tbody>
</table>

Following are memory options available from HP:

1 GB FBD PC2-5300 (2 x 512 MB) Kit 397409-B21

2 GB FBD PC2-5300 (2 x 1 GB) Kit 461826-B21

2 GB FBD PC2-5300 (2 x 1 GB LP) Kit 397411-B21

4 GB FBD PC2-5300 (2 x 2 GB) Kit 461828-B21

4 GB FBD PC2-5300 (2 x 2 GB LP) Kit 397413-B21

8 GB FBD PC2-5300 (2 x 4 GB) Kit 397415-B21

8 GB FBD PC2-5300 (2 x 4 GB LP) Kit 466440-B21

16 GB FBD PC2-5300 (2 x 8 GB) Kit 413015-B21

64 GB FBD PC2-5300 (8 x 8 GB) Kit 495604-B21
### Storage

#### Hard Drives

**SAS Enterprise (ENT) Drives 2.5” Drives, Hot Plug**

<table>
<thead>
<tr>
<th>Quantity Supported</th>
<th>Position Supported</th>
<th>Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>72GB 3G 15K SAS</td>
<td>2</td>
<td>HP Smart Array E200i Controller</td>
</tr>
<tr>
<td>36GB 3G 15K SAS</td>
<td>1-2</td>
<td></td>
</tr>
<tr>
<td>146GB 3G 10K SAS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>72GB 3G 10K SAS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SATA SFF Hot Plug Entry (ETY) Drives**

<table>
<thead>
<tr>
<th>Quantity Supported</th>
<th>Position Supported</th>
<th>Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>250GB 3G SATA 5.4K</td>
<td>2</td>
<td>HP Smart Array E200i Controller</td>
</tr>
<tr>
<td>120GB 1.5 G SATA 5.4K</td>
<td>1-2</td>
<td></td>
</tr>
</tbody>
</table>

#### External Storage

**XP Disk Array Systems**

- Please see the XP Disk Array Systems QuickSpecs below to determine configuration requirements

**Enterprise Virtual Array Systems**

- Please see the XP Disk Array Systems QuickSpecs below to determine configuration requirements

---

HP StorageWorks XP10000 Disk Array:  
QuickSpecs

HP StorageWorks Enterprise Virtual Array Family
## Technical Specifications

<table>
<thead>
<tr>
<th>System Unit</th>
<th>Dimensions (H x W x D) (with bezel)</th>
<th>7.154 x 2.19 x 20.058 in (18.17 x 5.56 x 50.95 cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>Maximum (all hard drives and processors installed)</td>
<td>14.20 lb (6.44 kg)</td>
</tr>
<tr>
<td></td>
<td>Minimum (one hard drive and processor installed)</td>
<td>10.75 lb (4.87 kg)</td>
</tr>
</tbody>
</table>

### 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:


To review typical system power ratings use the HP BladeSystem Power Sizer which is available via the online tool located at URL:


### 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:
## HP Smart Array E200i Controller

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disk Drive and Enclosure Interface</td>
<td>3G SAS (Serial Attached SCSI)</td>
</tr>
<tr>
<td></td>
<td>1.5G SATA (Serial Advanced Technology Attachment)</td>
</tr>
<tr>
<td>Cache Memory Speed</td>
<td>DDR-1/266 MHz provides up to 4.2 GB/s maximum bandwidth.</td>
</tr>
<tr>
<td>Server Interface</td>
<td>x4 2.5G PCIe provides 2GB/s maximum bandwidth.</td>
</tr>
<tr>
<td>SAS Speed</td>
<td>x2 3G SAS provides 600MB/s maximum bandwidth.</td>
</tr>
<tr>
<td>Cache Memory</td>
<td>40-bit 64 MB or 128 MB cache: ECC protection, battery-backed, and transportable</td>
</tr>
<tr>
<td>Logical Drives Supported</td>
<td>Up to 32 logical volumes</td>
</tr>
<tr>
<td>Maximum Logical Drive Capacity</td>
<td>144GB (2 x 72GB)</td>
</tr>
<tr>
<td>Host Memory Addressing</td>
<td>64-bit, supporting greater than 4GB server memory space</td>
</tr>
<tr>
<td>RAID Support</td>
<td>RAID 5 (Distributed Data Guarding) requires 128MB BBWC option</td>
</tr>
<tr>
<td></td>
<td>RAID1, 1 + 0 (Striping &amp; Mirroring)</td>
</tr>
<tr>
<td></td>
<td>RAID 0 (Striping)</td>
</tr>
<tr>
<td>Upgradeable Firmware</td>
<td>Upgradeable Firmware</td>
</tr>
</tbody>
</table>

## Embedded NC373i Multifunction Gigabit Server Adapter

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Processor</td>
<td>Broadcom 5708S</td>
</tr>
<tr>
<td>Data Transfer Method</td>
<td>Four lane (x4) PCI Express</td>
</tr>
<tr>
<td>Network Transfer Rate</td>
<td>1000 Mb/s half duplex (theoretical maximum value)</td>
</tr>
<tr>
<td>IEEE Compliance</td>
<td>802.1p, 802.1Q, 802.3, 802.3ad, and 802.3x</td>
</tr>
<tr>
<td>Standard Features</td>
<td>• TCP/IP offload engine (TOE) for Microsoft Windows 2003</td>
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<td></td>
<td>• iSCSI Boot for Linux</td>
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<td></td>
<td>• Optional accelerated iSCSI</td>
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<td></td>
<td>• 9K jumbo frames</td>
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<td></td>
<td>• TCP/IP checksum offload (TCO)</td>
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<td></td>
<td>• Large send offload (LSO)</td>
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<td></td>
<td>• Interrupt coalescence</td>
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<td></td>
<td>• Dual address cycles (DAC)</td>
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<td></td>
<td>• Wake-on-LAN (WOL)</td>
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<td></td>
<td>• Pre-boot execution environment (PXE)</td>
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<td></td>
<td>• ProLiant Teaming including Network Fault Tolerance, Transmit Load Balancing, and Switch-Assisted Load Balancing</td>
</tr>
<tr>
<td></td>
<td>• IPv6 packet transmit and receive (excluding all offload capabilities); IPv6 aware SNMPv1 agents for Microsoft Windows</td>
</tr>
</tbody>
</table>
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.

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