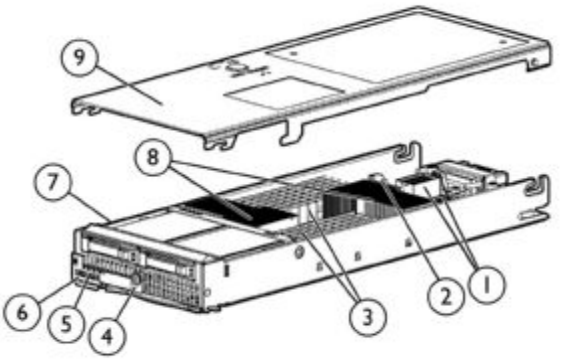
Overview




HP ProLiant WS460c G6 Workstation Blade

1. Two (2) mezzanine I/O expansion slots
2. Internal USB connector
3. Twelve (12) DDR3 Registered or Unbuffered DIMM Memory Slots
4. HP Smart Array P410i Controller
5. Two (2) small form factor (SFF) hot-plug drive bays
6. Local I/O Connector
7. Internal SD card slot
8. Up to two (2) Intel® Xeon® 5500 series processors
9. Access Panel

## At A Glance

This document covers the HP ProLiant WS460c G6 workstation blade only. For more information on HP BladeSystem 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:
http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html

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

HP BladeSystem c-Class Interconnect Components QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12524_div/12524_div.html

The HP ProLiant WS460c G6 provides greater 2P x86 server blade density without compromise and maximum power-efficiency with flexibility and choice.

HP ProLiant WS460c G6 workstation blade includes:

- Processor:
  - Up to two (2) Intel® Xeon® 5500 Series processors
  - Intel® 5500 Chipset
- Memory:
  - Twelve (12) DIMM slots
  - Up to 96GB, using PC3-10600 DDR3 Registered (RDIMM) memory

## Overview

- Up to 24GB, using PC3-10600 DDR3 Unbuffered (UDIMM) memory, operating at 1066MHz when fully populated at 2 DIMMs per Channel in 12 slot

- Storage Controller:
  - HP Smart Array P410i Controller (RAID 0/1) with optional 256MB or 512MB Battery-Backed Write Cache (BBWC)
- Internal Drive Support:
  - Up to two (2) small form factor (SFF) SAS hot plug hard disk drives
- Network Controller:
  - Embedded NC532i Dual Port Flex-10 10GbE Multifunction Server Adapter
    NOTE: Initially at time of product launch, device driver will only support 1Gbps speed and Flex-10 will not be supported. Requires 1Gbps only interconnect switches in enclosure.
    One (1) additional 10/100 server adapter dedicated to iLO 2 Management
- Mezzanine Support:
  - Two (2) I/O expansion or graphics adapter mezzanine slots
  - Supports up to (2) mezzanine cards
    - Graphics adapter mezzanine (NVIDIA Quadro FX 770M or FX 3600M)
    - Dual-Port Fibre Channel Mezzanine options for SAN connectivity (Choice of Emulex or QLogic)
- Graphics Adapter:
  - Professional 2D & 3D graphics with hardware acceleration via graphics subsystem
  - NVIDIA Quadro FX 770M with 256MB (Single or dual cards configuration capable)
    - For professional 2D graphics & entry 3D graphics application
    - 256 MB (GDDR3) memory
    - Supports up to four displays with dual card configuration
    - Mezzanine card which occupies one or two of the mezzanine slots
  - NVIDIA Quadro FX 770M with 512MB (Single card configuration only)
    - For mid-range 3D graphics application
    - 512 MB (GDDR3) memory
    - Supports up to two displays
    - Mezzanine card which occupies one of the mezzanine slots
  - NVIDIA Quadro FX 3600M (Single card configuration only)
    - For professional high-end 3D graphics application
    - 512 MB (GDDR3) memory
    - Supports up to two displays
    - Mezzanine card which occupies mezzanine slot 2
  - Workstation Blade Graphics Software Environment (when combined with HP gt7725 Thin Client and HP Remote Graphics Software as access client system)
    - Quad-display capable on remote access client system
    - Displays may be oriented in landscape or portrait mode. May also be tiled in matrices
    - Resolution: Max width 7680 pixels (@7680x1200), max height 7680 pixels (@1200x7680)
    - Unified graphics driver for FX 770M, FX 3600M
- Ports:
  - One (1) internal USB 2.0 connector for security key devices and USB drive keys
  - One (1) internal SD-HC Card slot
- Form Factor:
  - HP ProLiant WS460c G6 is a half-height server blade that plugs into the HP BladeSystem c3000 and c7000 enclosures
- Infrastructure Management:
  - Convenient slide-out Systems Insight Display for quick and easy front view server diagnostics, along with status LEDs, Automatic Server Recovery (ASR), ROM Based Setup Utility (RBSU)
  - HP ProLiant Onboard Administrator (powered by the Integrated Light-Out 2 management processor) for simplified server setup, health monitoring and recovery, power and thermal control, and lights-out remote administration
  - HP Insight Control (ICE) suites, as product options, deliver essential infrastructure management that can help save time and money by making it easy to deploy, monitor, control and optimize your IT infrastructure through a single, simple

Overview

management console.
NOTE: ICE-Linux is not supported in the WS460c G6.

- Operating Systems:
  - Supports following: (Not preinstalled or preloaded)
    - Genuine Microsoft® Windows Vista® Business (32-bit and 64-bit)
    - Genuine Microsoft® Windows® XP Professional 32-bit SP3
    - Genuine Microsoft® Windows® XP Professional x64 Edition with SP2
    - RedHat Enterprise Linux version 4.8 or 5.3 (64-bit)
- Enclosures:
  - HP offers three different c-Class workstation blade enclosures to meet your individual needs:
    - The HP BladeSystem c7000 rack enclosure is 10U high and holds up to sixteen (16) ProLiant WS460c G6 workstations plugged vertically.
    - The HP BladeSystem c3000 rack enclosure is 6U high and holds up to eight (8) HP ProLiant WS460c G6 workstations plugged horizontally.
    - The HP BladeSystem c3000 tower enclosure is designed with casters for sites without racks and holds up to eight (8) HP ProLiant WS460c G6 workstations plugged vertically.
  - Workstation blades, 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.
- HP Workstation Blade Solution:
  - HP ProLiant WS460c G6 Workstation Blade is one component of the several key components for the HP Workstation Blade Solution. For additional information, please see:
    http://h71028.www7.hp.com/enterprise/437520-0-0-225-121.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. Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.
    NOTE: Server/Workstation warranty includes 3 year Parts, 3 year Labor, 3-year on-site support. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at:
    http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html

## Standard Features

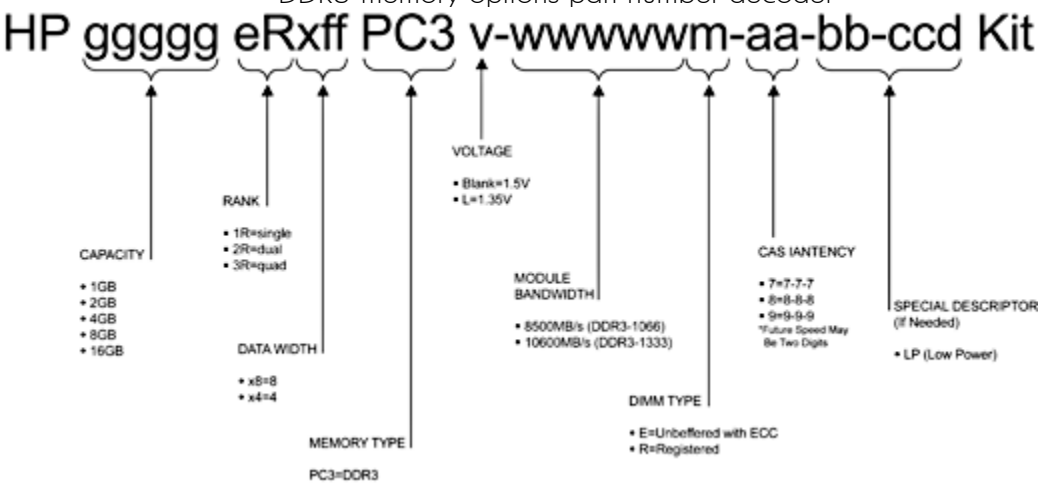
| | |
|---|---|
| Processor | Quad-Core Processors<br>Intel® Xeon® Processor X5570 (2.93 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3)<br>Intel® Xeon® Processor X5560 (2.80 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3)<br>Intel® Xeon® Processor X5550 (2.66 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3)<br>Intel® Xeon® Processor E5540 (2.53 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)<br>Intel® Xeon® Processor E5530 (2.40 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)<br>Intel® Xeon® Processor E5520 (2.26 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)<br>Intel® Xeon® Processor E5506 (2.13 GHz, 4MB L3 Cache, 80W, DDR3-800)<br>Intel® Xeon® Processor E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800)<br>Intel® Xeon® Processor L5530 (2.40 GHz, 8MB L3 Cache, 60W, DDR3-1066, HT, Turbo 1/1/2/2)<br>Intel® Xeon® Processor L5520 (2.26 GHz, 8MB L3 Cache, 60W, DDR3-1066, HT, Turbo 1/1/2/2)<br>Intel® Xeon® Processor L5506 (2.13 GHz, 4MB L3 Cache, 60W, DDR3-800)<br>Dual-Core Processors<br>Intel® Xeon® Processor E5502 (1.86 GHz, 4MB L3 Cache, 80W, DDR3-800)<br>NOTE: HT indicates that the processor model supports Intel® Hyper-Threading Technology.<br>NOTE: Turbo indicates the maximum potential frequency increment when using Intel® Turbo Boost Technology, with 4, 3, 2, and 1 cores active.<br>NOTE: DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed.<br>NOTE: For the Intel 5500 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 two (2) processors |
| Cache Memory | 4MB shared L3 cache<br>8MB shared L3 cache |
| Chipset | Intel® 5500 Chipset |

## Standard Features

| | | |
|---|---|---|
| Memory | Type | DDR3 Registered (RDIMM) |
| | Standard | 2GB (2 x 1GB) UDIMM |
| | | 4GB (4 x 1GB) UDIMM |
| | Maximum (RDIMM) | 96GB (12 x 8 GB) for Registered Memory configurations |
| | Maximum (UDIMM) | 24 GB (12 x 2 GB) for Unbuffered Memory configurations |

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

DDR3 memory options part number decoder




| | |
|---|---|
| Network Controller | Embedded NC532i Dual Port Flex-10 10GbE Multifunction Server Adapter<br>NOTE: Initially at time of product launch, device driver will only support 1Gbps speed and Flex-10 will not be supported. Requires 1Gbps capable interconnect switches in enclosure.<br>One (1) additional 10/100 NIC dedicated to iLO 2 Management |
| I/O Expansion Slots | Two (2) I/O expansion mezzanine slots (x8 PCI Express) |

Graphics Adapter (mezzanine card)

NVIDIA Quadro FX 770M graphics (via graphics mezzanine card)

NOTE: Workstation class performance for professional 2D graphics, entry/mid 3D graphics. Supported on HP WS460c G6 only. Not compatible and supported with HP ProLiant BL server blades.

| | |
|---|---|
| Memory size / type | 256 MB / DDR3 or 512MB / DDR3 |
| Memory interface | 128-bit |
| Precision | 128-bit color |
| Number of displays | Up to two displays per FX 770M 256MB. May be configured with two cards. |
| Graphics driver | Single, unified driver compatible with FX 770M and FX 3600M |

NVIDIA Quadro FX 3600M graphics (via graphics mezzanine card)

NOTE: Workstation class performance for professional 3D graphics. Supported on HP ProLiant WS460c G6 only. Not compatible and supported with HP ProLiant BL server blades.

| | |
|---|---|
| Memory size / type | 512MB / DDR3 |
| Memory interface | 256-bit |
| Precision | 128-bit color |

## Standard Features

| | | |
|---|---|---|
| | Number of displays | Up to two displays |
| | Graphics driver | Single, unified driver compatible with FX 770M and FX 3600M |
| Integrated Manageability | ProLiant Onboard Administrator (powered by the Integrated Lights-Out 2 management processor) | |
| Storage Controller | Type | HP Smart Array P410i Controller (RAID 0/1) |
| | Available Options: 256MB cache, Battery-Backed Write Cache (BBWC) module for 256MB cache, 512MB cache with Battery Backed Write Cache (BBWC).<br>NOTE: 3Gb (6Gb Capable) SAS / 1.5Gb (3Gb Capable) SATA.<br>NOTE: Supports two (2) Small Form Factor (SFF) Hot Plug drive bays.<br>NOTE: HP Smart Array Advanced Pack not supported on WS460c G6. | |
| Maximum Internal Storage | Hot Plug SAS | 1TB 2 x 500GB Serial SCSI |
| Graphics | Integrated ATI RN-50, 32 MB video memory (On-board) | |
| Graphics Resolution Supported | Resolution Color Depths | 1600 x 1200, 64K, 256, 16<br>1280 x 1024, 16.7M, 64k, 256, 16<br>1024 x 768, 16.7M, 64k, 256,16<br>800 x 600, 16.7M, 64k, 256, 16<br>640 x 480, 16.7M, 64k, 256, 16<br>NOTE: Maximum resolution available via ProLiant Onboard Administrator remote console is 1280 x 1024.<br>NOTE: On-board graphics. |

Fibre Channel Support

Two (2) optional Fibre Channel HBAs are supported by the HP ProLiant WS460c G6. 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.

HBA mezzanine card option kits:

Emulex LPe1105-HP 4Gb FC HBA (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 (403619-B21)

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

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

- Optimal performance utilizing PCI Express
- 4/2/1Gb/s auto negotiating speeds (4Gb HBAs)
- Dual-ports for redundant path connections
- Optimized for HP StorageWorks and supported by third party SAN vendors
- Support for Microsoft® Windows® 32-bit and Linux 64-bit operating system environments

## Standard Features

| | | |
|---|---|---|
| Compatible SAN | HP ProLiant WS460c G6 workstation blades are optimized for HP StorageWorks MSA, EVA and XP.<br><br>HP ProLiant 460c G6 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<br>NOTE: HP ProLiant WS460c G6 does not support boot from SAN. | |
| Core Infrastructure Management | ProLiant Onboard Administrator | HP ProLiant Onboard Administrator (powered by the HP Integrated Lights-Out 2 management processor) simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration. HP ProLiant Onboard Administrator functions without additional software, and can be accessed from any location via a web browser. See www.hp.com/go/ProLiantOA |
| Operating Systems Support for HP ProLiant Workstations | Microsoft Windows Vista Business SP2 (32-bit & 64-bit)<br>Microsoft Windows XP Professional SP3 (32-bit)<br>Microsoft Windows XP Professional x64 edition with SP2<br>Red Hat Enterprise Linux (RHEL) 4.8 and 5.3 (64-bit only) | |
| Availability | • Dual-Port Fibre Channel Mezzanine Card options for redundant SAN connection<br>• Two (2) hot-plug SAS hard drive bays and integrated RAID (HP Smart Array P410i Controller)<br>• Optional Battery-backed write cache module for integrated RAID controller<br>• Redundant ROM<br>• Advanced ECC Memory | |
| Industry Standard Compliance | • PCI 2.2 Compliant<br>• WOL Support<br>• SB 2.0 Support | |
| Security | • Power-on password<br>• Administrator's password<br>• Integrated Lights-Out 2 has 12 customizable user accounts and SSL encryption<br>• Integrated Lights-Out 2 can be disabled via a Global Setting | |

## Standard Features

**Factory Express Portfolio for Servers and Storage**

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

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

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

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**HP Enterprise Configurator**

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

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**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 workstation blades, cover the workstation blade and all HP branded hardware options qualified for the workstation, purchased at the same time or afterwards, internal to the workstation.

To fully capitalize on your HP BladeSystem workstations' capabilities requires a service partner who thoroughly understands your workstation 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

Models

## FX 770M graphics preconfigured models

| | | |
|---|---|---|
| HP WS460c G6 E5540 4GB (1P) Dual FX770M (quad display) 580641-B21 | Processor(s) | (1) Intel® Xeon® Processor E5540 (2.53 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) |
| | One of the following depending on model | (1) Intel® Xeon® Processor E5530 (2.40 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) |
| | Cache Memory | 8MB shared L3 cache |
| HP WS460c G6 E5530 2GB (1P) Single FX770M (dual display) 580640-B21 | Memory | 4 GB (4 x 1 GB) PC3-10600 (DDR3-1333) Unbuffered DIMMs |
| | One of the following depending on model | 2GB (2 x 1 GB) PC3-10600 (DDR3-1333) Unbuffered DIMMs |
| | Graphics Adapter | (1 or 2) NVIDIA Quadro FX 770M with 256MB memory |
| | Network Adapter | Embedded NC532i Dual Port Flex-10 10GbE Multifunction Server Adapter and one (1) additional 10/100 server adapter dedicated to iLO 2 management<br>NOTE: Initially at time of product launch, device driver will only support 1Gbps speed and Flex-10 will not be supported. Requires 1Gbps only interconnect switches in enclosure. |
| | Storage Controller | HP Smart Array P410i Controller with 512MB Battery-Backed Write Cache |
| | Hard Drives | None ship standard<br>NOTE: Client operating systems require local hard disk drives. Order desired capacity/performance drives separately. |
| | Internal Storage | SAS: 1TB (2 x 500GB SAS) - Maximum |
| | Optical Drive | None |
| | Operating System | None<br>NOTE: Client OS license and software not included. |
| | Form Factor | Up to eight (8) half-height blades supported in the HP BladeSystem c3000 Enclosure<br>Up to sixteen (16) half-height blades supported in HP BladeSystem c7000 Enclosure |

## Configuration Information - Factory Integrated Models

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

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

| | | |
|---|---|---|
| Models | HP ProLiant WS460c G6 CTO Blade | 580139-B21 |
| | Configurable Model ships with: | |
| | Embedded NC532i Dual Port Flex-10 10GbE Multifunction Server Adapter and one (1) additional 10/100 server adapter dedicated to iLO 2 management<br>NOTE: Initially at time of product launch, device driver will only support 1Gbps speed and Flex-10 will not be supported. Requires 1Gbps only interconnect switches in enclosure. | |
| | Integrated Lights-Out 2 Standard Blade Edition | |

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

| | | |
|---|---|---|
| HP Processors | For single processor configuration choose:<br>NOTE: HP ProLiant WS460c G6 shares same processor modules with BL460c G6 server. | |
| | Quad-Core Processor Option Kits | |
| | Intel® Xeon® Processor X5570 (2.93 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3) BL460c G6 Kit, FIO<br>NOTE: If two processors are desired, select one 507791-L21 and one 507791-B21. | 507791-L21 |
| | Intel® Xeon® Processor X5560 (2.80 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3) BL460c G6 Kit, FIO<br>NOTE: If two processors are desired, select one 507792-L21 and one 507792-B21. | 507792-L21 |
| | Intel® Xeon® Processor X5550 (2.66 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3) BL460c G6 Kit, FIO<br>NOTE: If two processors are desired, select one 507793-L21 and one 507793-B21. | 507793-L21 |
| | Intel® Xeon® Processor E5540 (2.53 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) BL460c G6 Kit, FIO<br>NOTE: If two processors are desired, select one 507794-L21 and one 507794-B21. | 507794-L21 |
| | Intel® Xeon® Processor L5530 (2.40 GHz, 8MB L3 Cache, 60W, DDR3-1066, HT, Turbo 1/1/2/2) BL460c G6 Kit, FIO<br>NOTE: If two processors are desired, select one 507795-L21 and one 507795-B21. | 507795-L21 |
| | Intel® Xeon® Processor E5530 (2.40 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) BL460c G6 Kit, FIO<br>NOTE: If two processors are desired, select one 507797-L21 and one 507797-B21. | 507797-L21 |
| | Intel® Xeon® Processor L5520 (2.26 GHz, 8MB L3 Cache, 60W, DDR3-1066, HT, Turbo 1/1/2/2) BL460c G6 Kit, FIO<br>NOTE: If two processors are desired, select one 507798-L21 and one 507798-B21. | 507798-L21 |
| | Intel® Xeon® Processor E5520 (2.26 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) BL460c G6 Kit, FIO<br>NOTE: If two processors are desired, select one 507799-L21 and one 507799-B21. | 507799-L21 |

Configuration Information - Factory Integrated Models

| | | |
|---|---|---|
| | Intel® Xeon® processor HP L5506 (2.13 GHz, 4MB L3 Cache, 60W, DDR3-800) BL460c G6 Kit, FIO<br>NOTE: If two processors are desired, select one 513859-L21 and one 513859-B21. | 513859-L21 |
| | Intel® Xeon® processor HP E5506 (2.13 GHz, 4MB L3 Cache, 80W, DDR3-800) BL460c G6 Kit, FIO<br>NOTE: If two processors are desired, select one 507800-L21 and one 507800-B21. | 507800-L21 |
| | Intel® Xeon® processor HP E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800) BL460c G6 Kit, FIO<br>NOTE: If two processors are desired, select one 507801-L21 and one 507801-B21. | 507801-L21 |
| | Dual-Core Processor Option Kits | |
| | Intel® Xeon® processor HP E5502 (1.86 GHz, 4MB L3 Cache, 80W, DDR3-800) BL460c G6 Kit, FIO<br>NOTE: If two processors are desired, select one 507802-L21 and one 507802-B21. | 507802-L21 |
| HP Memory | Registered DIMMS (RDIMMs) | |
| | HP 2GB 2Rx8 PC3-10600R -9 Kit | 500656-B21 |
| | HP 4GB 2Rx4 PC3-10600R-9 Kit | 500658-B21 |
| | HP 4GB 4Rx8 PC3-8500R-7 LP Kit | 500660-B21 |
| | HP 8GB 2Rx4 PC3-10600R-9 Kit | 500662-B21 |
| | HP 8GB 2Rx4 PC3-8500R-7 Kit | 516423-B21 |
| | Unbuffered with ECC DIMMs (UDIMMs) | |
| | HP 1GB 1Rx8 PC3-10600E-9 Kit | 500668-B21 |
| | HP 2GB 2Rx8 PC3-10600E-9 Kit | 500670-B21 |
| | NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator.<br>NOTE: Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient. | |

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

| | | |
|---|---|---|
| HP Storage Controllers | 256 MB Cache Module | 462968-B21 |
| | Battery Kit Upgrade (for BBWC)<br>NOTE: Requires 256 MB Cache Module. | 462969-B21 |
| | 512 MB BBWC Cache Module | 462967-B21 |

| | | |
|---|---|---|
| HP Graphics Options | NVIDIA Quadro FX 770M(256MB) graphics single card kit, FIO only | 580135-B21 |
| | NVIDIA Quadro FX 770M(256MB) graphics dual-card kit, FIO only | 580136-B21 |
| | NVIDIA Quadro FX 770M(512MB) graphics single card kit, FIO only | 580137-B21 |
| | NVIDIA Quadro FX 3600M(512MB) graphics single card kit, FIO only | 580138-B21 |
| | NOTE: Single card kit can support up to two displays as dual-display configuration on the access client using HP Remote Graphics Software.<br>NOTE: Dual card kit can support up to four displays as quad-display configuration on the access client using HP Remote Graphics Software. | |

## Step 4: Choose Additional Options for Factory Integration

NOTE: For additional options, please refer to the "Core Options" and "Additional Options" section below. For additional options, including server blade enclosures interconnect options and power subsystem options; please see the Core Options and Additional sections below; or the following QuickSpecs:
HP BladeSystem c-Class Enclosures QuickSpecs:
HP BladeSystem c3000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html
HP BladeSystem c7000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html
and HP BladeSystem c-Class Interconnect Components QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12524_div/12524_div.html.

## Core Options

| | | |
|---|---|---|
| HP Processors | Quad-Core Process Option Kits | |
| | Intel® Xeon® Processor X5570 (2.93 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3) BL460c G6 Kit | 507791-B21 |
| | Intel® Xeon® Processor X5560 (2.80 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3) BL460c G6 Kit | 507792-B21 |
| | Intel® Xeon® Processor X5550 (2.66 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3) BL460c G6 Kit | 507793-B21 |
| | Intel® Xeon® Processor E5540 (2.53 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) BL460c G6 Kit | 507794-B21 |
| | Intel® Xeon® Processor L5530 (2.40 GHz, 8MB L3 Cache, 60W, DDR3-1066, HT, Turbo 1/1/2/2) BL460c G6 Kit | 507795-B21 |
| | Intel® Xeon® Processor E5530 (2.40 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) BL460c G6 Kit | 507797-B21 |
| | Intel® Xeon® Processor L5520 (2.26 GHz, 8MB L3 Cache, 60W, DDR3-1066, HT, Turbo 1/1/2/2) BL460c G6 Kit | 507798-B21 |
| | Intel® Xeon® Processor E5520 (2.26 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) BL460c G6 Kit | 507799-B21 |
| | Intel® Xeon® processor HP L5506 (2.13 GHz, 4MB L3 Cache, 60W, DDR3-800) BL460c G6 Kit | 513859-B21 |
| | Intel® Xeon® processor HP E5506 (2.13 GHz, 4MB L3 Cache, 80W, DDR3-800) BL460c G6 Kit | 507800-B21 |
| | Intel® Xeon® processor HP E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800) BL460c G6 Kit | 507801-B21 |
| | Dual-Core Process Option Kits | |
| | Intel® Xeon® processor HP E5502 (1.86 GHz, 4MB L3 Cache, 80W, DDR3-800) BL460c G6 Kit | 507802-B21 |

| | | |
|---|---|---|
| HP Memory | Registered DIMMS (RDIMMs) | |
| | HP 2GB 2Rx8 PC3-10600R-9 Kit | 500656-B21 |
| | HP 4GB 2Rx4 PC3-10600R-9 Kit | 500658-B21 |
| | HP 4GB 4Rx8 PC3-8500R-7 LP Kit | 500660-B21 |
| | HP 8GB 2Rx4 PC3-10600R-9 Kit | 500662-B21 |
| | HP 8GB 2Rx4 PC3-8500R-7 Kit | 516423-B21 |
| | Unbuffered with ECC DIMMs (UDIMMs) | |
| | HP 1GB 1Rx8 PC3-10600E-9 Kit | 500668-B21 |
| | HP 2GB 2Rx8 PC3-10600E-9 Kit | 500670-B21 |
| | NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator. | |
| | NOTE: 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/. | |

## Core Options

| | | |
|---|---|---|
| HP Hard Drives | SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives | |
| | HP 300GB 3G SAS 10K SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive | 492620-B21 |
| | HP 146GB 3G SAS 15K SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive | 504062-B21 |
| | HP 146GB 3G SAS 10K SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive | 418367-B21 |
| | HP 72GB 3G SAS 15K SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive | 418371-B21 |
| | NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details. Please see QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html (Worldwide) | |
| | NOTE: The hard drive options are not required when configuring a Drive-less Model. | |
| HP Fiber 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 |
| | NOTE: Boot from SAN functionality not supported. | |

## Additional Options

| | | |
|---|---|---|
| HP Remote Access | HP Remote Graphics Software (RGS) v5.3.0 | |
| | NOTE: HP RGS is a licensed software sold separately. Not bundled with HP WS460c G6. | |
| | NOTE: For remote access to Windows Vista OS on blade, HP RGS version 5.3 or later is required. | |
| | NOTE: For more information on HP Remote Graphics Software, please find HP Remote Graphics in: http://www.hp.com/go/rgs | |
| | HP RGS Desktop E-LTU/E-Media; North America & EMEA only | AW684AAE |
| | HP RGS Desktop License Entitlement Certificate and CD-ROM Media; Latin America & Asia-Pacific/Japan | AW684AA |
| | HP RGS Desktop LTU and CD-ROM Media; Japan Only | AW686AA |
| | HP RGS Desktop 1 Year Software Assurance | AW685AA |
| | RGS Desktop 1 Yr Software Assurance; Japan Only | AW692AA |
| | HP 1- year 9x5 3-Incident Remote Graphics SW phone Technical Support; NA only | UE345E |
| HP Resource Brokering | HP PC Session Allocation Manager (SAM) | |
| | NOTE: HP SAM is a licensed software sold separately. Not bundled with HP ProLiant WS460c G6. | |
| | NOTE: Evaluation provision is included for trial use up to 30 managed blades. Any regular deployment with managed blades exceeding 30 blades will require matching number of license to the total number of blades being managed by SAM. | |
| | NOTE: For more information on HP SAM, refer to HP SAM White Paper: http://h71028.www7.hp.com/enterprise/downloads/SAM_21_WP_Oct07.pdf | |
| | HP PC Session Allocation Manager (SAM) license | AW189AA |
| | HP 1-year 9x5 3 Incident SAM SW Technical Support | UE392E |
| | HP 1-year 9x5 10 Incident SAM SW Technical Support | UE393E |
| | HP 1-year 9x5 25 Incident SAM SW Technical Support | UE394E |
| | HP 1-year 9x5 Unlimited SAM SW Technical Support | UE395E |
| HP Storage Controllers | Optional Upgrades | |
| | 256 MB Cache Module | 462968-B21 |
| | Battery Kit Upgrade (for BBWC) | 462969-B21 |
| | NOTE: Requires 256 MB Cache Module. | |
| | 512 MB BBWC Cache Module | 462967-B21 |
| | NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13203_div/13203_div.html (Worldwide) | |
| HP InfiniBand Mezzanine Options | HP 4X QDR IB Dual Port Mezzanine HCA for HP BladeSystem c-Class | 492303-B21 |
| | HP 4X DDR IB Dual Port Mezzanine HCA for HP BladeSystem c-Class | 448262-B21 |

## Additional Options

| | | |
|---|---|---|
| HP StorageWorks SB40c Storage Blade | HP StorageWorks SB40c Storage Blade<br>NOTE: Please see the QuickSpecs for Technical Specifications and additional information:<br>http://h18000.www1.hp.com/products/quickspecs/12587_div/12587_div.html (Worldwide) | 411243-B21 |
| HP Expansion Blade | HP PCI Expansion Blade<br>NOTE: Ships with one pre-installed PCI-X connect board. Also includes one PCIe connect board which requires installation.<br>NOTE: Please see the QuickSpecs for Technical Specifications and additional information:<br>http://h18000.www1.hp.com/products/quickspecs/12753_div/12753_div.html | 448018-B21 |
| HP USB and SD Options | HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver) | DC172B |
| HP Care Pack Services | NOTE: The HP Care Pack service part numbers below for ProLiant BL c-Class workstation blades, cover the workstation blade and all HP branded hardware options qualified for the workstation, purchased at the same time or afterwards, internal to the workstation. | |
| | Hardware Services On-site Service | |
| | 4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic | UR334E |
| | 4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic | UR336E |
| | 6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic | UR338E |

## Memory

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

### Memory Population Guidelines

For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool:
www.hp.com/go/ddr3memory-configurator

Some DIMM installation guidelines are summarized below:

- For the HP ProLiant WS460c G6 server with twelve (12) memory slots:
  - There are three (3) channels per processor; six (6) channels per server
  - There are two (2) DIMM slots for each memory channel; twelve (12) total slots.
  - Memory channel 1 consists of the two (2) DIMMs that are closest to the processor
  - Memory channel 3 consists of the two (2) DIMMs that are furthest from the processor
- DIMM slots that are white should be populated first
- Do not mix Unbuffered memory (UDIMMs) with Registered memory (RDIMMs).
- Do not install DIMMs if the corresponding processor is not installed
- If only one processor is installed in a 2CPU system, only half of the DIMM slots are available
- To maximize performance, balance the total memory capacity between all installed processors
- It is not required, but it is recommended to load the channels similarly if possible
- You can only have up to eight (8) ranks installed per channel
- You can only install two quad-rank DIMMs per channel
- You can only install two UDIMMs per channel; if available, the third slot in the channel must remain empty
- Populate DIMMs from heaviest load (quad-rank) to lightest load (single-rank) within a channel
- Heaviest load (DIMM with most ranks) within a channel goes furthest from the chipset
- For memory mirroring mode, channel 3 must be unpopulated. Channels 1 and 2 are populated identically
- For lock-step mode, channel 3 must be unpopulated. DIMMs in channels 1 and 2 will be installed in pairs. The paired slots will be 1,4; 2,5; 3;6 on a 3DPC system or 1,4; 2,5; on a 2DPC system
- No mixing DIMM voltage; all DIMMs must be the same voltage

| DIMM Type | Registered DIMMS (RDIMMs) | | | | |
|---|---|---|---|---|---|
| DIMM Rank | Dual Rank (2R) | | | | Quad Rank (4R) |
| DIMM Capacity | 2GB | 4GB | 8GB | 8GB | 4GB |
| DIMM Native Speed (MHz) | 1333 | 1333 | 1066 | 1333 | 1066 |
| | | | | | |
| 12 slot servers | 12 | 12 | 12 | 12 | 12 |
| | | | | | |
| | 24 | 48 | 96 | 96 | 48 |
| | | | | | |
| 1 DIMM Per Channel | 1333 | 1333 | 1066 | 1333 | 1066 |
| 2 DIMM Per Channel | 1066* | 1066* | 1066 | 1066* | 800 |
| 3 DIMM Per Channel | 800 | 800 | 800 | 800 | not supported |

NOTES:

- Mixing DIMM speeds is allowed, but the system processor speed rules always override the DIMM capabilities
- If you do mix DIMM speeds, the memory bus will default to the minimum clock rate of all DIMMs in the system - even if the slower DIMM is on the other processor
- If you install 1x 1066MHz DIMM in channel 1 and 1x 1333MHz DIMM in channel 2, you still run at 1066MHz
- If you install 1x 1066MHz DIMM in channel 1 and 5x 1333MHz DIMMs with 1 DIMM Per Channel (DPC) in each of the other channels, you run at 1066MHz
- If you install 3DPC in one channel (if applicable) and 1DPC in all other channels, you run at 800MHz

## Memory

- 95 Watt CPU's are required for 1333MHz DIMM speeds
- References to the above MHz speeds are for the various speeds of DDR3 DIMMs; 1333 refers to DDR3-1333, etc.

### HP ProLiant WS460c G6 Workstation Blade DIMM slot and configuration diagrams

### Basic memory slot and population diagram

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

| 12 DIMM SLOTS (6 per CPU node) | | | | | |
|---|---|---|---|---|---|
| | CPU1 | | CPU2 | | |
| | slot # | population order | slot # | population order | |
| Chnl 1 | 1 | D | 1 | D | Chnl 1 |
| | 2 | A | 2 | A | |
| | | | | | |
| Chnl 2 | 3 | E | 3 | E | Chnl 2 |
| | 4 | B | 4 | B | |
| | | | | | |
| Chnl 3 | 5 | F | 5 | F | Chnl 3 |
| | 6 | C | 6 | C | |

### HP ProLiant WS460c G6 Server Blade (1P Model)

### Standard memory configuration (1 CPU model)

- 2GB (2 x 1GB) of PC3-10600 (DDR3-1333) UDIMMs
  or
  4GB (4 x 1GB) of PC3-10600 (DDR3-1333) UDIMMs

| | CPU1 | | CPU2 | | |
|---|---|---|---|---|---|
| | slot # | population order | slot # | population order | |
| Chnl 1 | 1 | D: 1GB DIMM (if 4GB model) | 1 | D: empty | Chnl 1 |
| | 2 | A: 1GB DIMM | 2 | A: empty | |
| | | | | | |
| Chnl 2 | 3 | E: empty | 3 | E: empty | Chnl 2 |
| | 4 | B: 1GB DIMM | 4 | B: empty | |
| | | | | | |
| Chnl 3 | 5 | F: empty | 5 | F: empty | Chnl 3 |
| | 6 | C: 1GB DIMM (if 4GB model) | 6 | C: empty | |

### Standard Memory Plus Optional Memory (1 CPU model)

- 10 GB of PC3-10600 (DDR3-1333) UDIMMs (2 x 1GB plus 4 x 2GB); (2GB memory standard model)
- 8GB of PC3-10600 (DDR3-1333) UDIMMs (4 x 1GB plus 2 x 2GB); (4GB memory standard model)

## Memory

| | CPU1 | | CPU2 | | |
|---|---|---|---|---|---|
| | slot # | population order | slot # | population order | |
| Chnl 1 | 1 | D: 1GB DIMM (if 4GB model), 2GB DIMM (if 2GB model) | 1 | D: empty | Chnl 1 |
| | 2 | A: 1GB DIMM | 2 | A: empty | |
| | | | | | |
| Chnl 2 | 3 | E: 2GB DIMM | 3 | E: empty | Chnl 2 |
| | 4 | B: 1GB DIMM | 4 | B: empty | |
| | | | | | |
| Chnl 3 | 5 | F: 2GB DIMM | 5 | F: empty | Chnl 3 |
| | 6 | C: 1GB DIMM (if 4GB model), 2GB DIMM (if 2GB model) | 6 | C: empty | |

UDIMM maximum configuration (1 CPU model); Standard Memory Replaced with Optional Memory (1 CPU model)

- 12GB, consisting of six (6) 2GB dual-rank PC3-10600 UDIMMs

| | CPU1 | | CPU2 | | |
|---|---|---|---|---|---|
| | slot # | population order | slot # | population order | |
| Chnl 1 | 1 | D: 2GB DIMM | 1 | D: empty | Chnl 1 |
| | 2 | A: 2GB DIMM | 2 | A: empty | |
| | | | | | |
| Chnl 2 | 3 | E: 2GB DIMM | 3 | E: empty | Chnl 2 |
| | 4 | B: 2GB DIMM | 4 | B: empty | |
| | | | | | |
| Chnl 3 | 5 | F: 2GB DIMM | 5 | F: empty | Chnl 3 |
| | 6 | C: 2GB DIMM | 6 | C: empty | |

RDIMM maximum configuration (2 CPU model)

- 96GB, consisting of twelve (12) 8GB dual-rank PC3-8500 RDIMMs

| | CPU1 | | CPU2 | | |
|---|---|---|---|---|---|
| | slot # | population order | slot # | population order | |
| Chnl 1 | 1 | D: 8GB DIMM | 1 | D: 8GB DIMM | Chnl 1 |
| | 2 | A: 8GB DIMM | 2 | A: 8GB DIMM | |
| | | | | | |
| Chnl 2 | 3 | E: 8GB DIMM | 3 | E: 8GB DIMM | Chnl 2 |
| | 4 | B: 8GB DIMM | 4 | B: 8GB DIMM | |
| | | | | | |
| Chnl 3 | 5 | F: 8GB DIMM | 5 | F: 8GB DIMM | Chnl 3 |
| | 6 | C: 8GB DIMM | 6 | C: 8GB DIMM | |

## Memory

UDIMM maximum configuration (2 CPU model)

- 24GB, consisting of twelve (12) 2GB dual-rank PC3-10600 UDIMMs

| | CPU1 | | CPU2 | | |
|---|---|---|---|---|---|
| | slot # | population order | slot # | population order | |
| Chnl 1 | 1 | D: 2GB DIMM | 1 | D: 2GB DIMM | Chnl 1 |
| | 2 | A: 2GB DIMM | 2 | A: 2GB DIMM | |
| | | | | | |
| Chnl 2 | 3 | E: 2GB DIMM | 3 | E: 2GB DIMM | Chnl 2 |
| | 4 | B: 2GB DIMM | 4 | B: 2GB DIMM | |
| | | | | | |
| Chnl 3 | 5 | F: 2GB DIMM | 5 | F: 2GB DIMM | Chnl 3 |
| | 6 | C: 2GB DIMM | 6 | C: 2GB DIMM | |

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

- 1GB = 1024MB
- 2GB = 2048MB
- 4GB = 4096MB
- 8GB = 8192MB

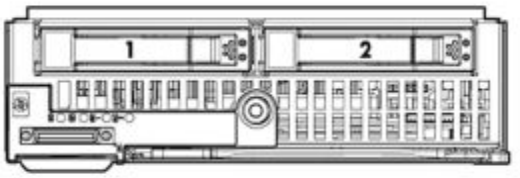
Following are memory options available from HP:

| | | |
|---|---|---|
| HP Memory | Registered DIMMs (RDIMMs) | |
| | HP 2GB 2Rx8 PC3-10600R-9 Kit | 500656-B21 |
| | HP 4GB 2Rx4 PC3-10600R-9 Kit | 500658-B21 |
| | HP 4GB 4Rx8 PC3-8500R-7 LP Kit | 500660-B21 |
| | HP 8GB 2Rx4 PC3-10600R-9 Kit | 500662-B21 |
| | HP 8GB 2Rx4 PC3-8500R-7 Kit | 516423-B21 |
| | Unbuffered with ECC DIMMs (UDIMMs) | |
| | HP 1GB 1Rx8 PC3-10600E-9 Kit | 500668-B21 |
| | HP 2GB 2Rx8 PC3-10600E-9 Kit | 500670-B21 |

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

Storage

1-2 2 x SFF SAS Hot Plug Hard Drives




Hard Drives

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

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

| | Quantity Supported | Position Supported | Controller |
|---|---|---|---|
| 300GB 3G SAS 10K<br>146GB 3G SAS 15K<br>146GB 3G SAS 10K<br>72GB 3G SAS 15K<br>72GB 3G SAS 10K | 2 | 1-2 | HP Smart Array P410i Controller |

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:<br>HP BladeSystem c3000 Enclosure QuickSpecs:<br>http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html<br>HP BladeSystem c7000 Enclosure QuickSpecs:<br>http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html<br><br>To review typical system power ratings use the HP BladeSystem Power Sizer which is available via the online tool located at URL:<br>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.<br><br>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:<br>HP BladeSystem c3000 Enclosure QuickSpecs: | |

http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html
HP BladeSystem c7000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html

| | | |
|---|---|---|
| HP Smart Array P410i Controller | Disk Drive Interface | 3Gb (6Gb Capable) SAS (Serial Attached SCSI)<br>1.5Gb (3Gb Capable) SATA (Serial Advanced Technology Attachment) |
| | Server Interface | x4 PCI Express host interface |
| | Cache Memory | 0 MB (none) standard<br>Optional 256MB or 512MB Cache Memory |
| | Logical Drives Supported | 2 (with standard 0MB cache) |
| | Maximum Logical Drive Capacity | 32 (with optional 256MB cache)<br>64 (with optional 512MB cache) |
| | Host Memory Addressing | 64-bit, supporting servers memory space greater than 4 GB |
| | RAID Support | RAID 1( Mirroring)<br>RAID 0 (Striping) |
| | Upgradeable Firmware | Controller: Upgradeable Firmware with Recovery ROM feature<br>Online Drive Flash (with SAS drives) requires 256MB or 512MB module |
| Embedded NC532i Dual Port Flex-10 10GbE Multifunction Server Adapter | Type | Integrated dual-port KR 10GbE |
| | Network Processor | Broadcom 57711 |
| | Data Transfer Method | x4 PCI Express Generation 2 |
| | Network Transfer Rate | Two ports, each at 20 Gbps full duplex; 40 Gbps aggregate full duplex theoretical bandwidth<br>NOTE: Each port is autosensing 1 Gb / 10 Gb, and can interoperate with 1 Gb HP BladeSystem c-Class interconnect components.<br>NOTE: Each port on the NC532i adapter transmits from the server at only 20 Gbps (theoretical) full duplex.<br>NOTE: Initially at time of product launch, device driver will only support 1Gbps speed and Flex-10 will not be supported. Requires 1Gbps capable interconnect switches in enclosure. |
| | IEEE Compliance | 802.1p, 802.1q, 802.3u, 802.3ad, 802.3ae, 802.3ap (10GBase-KX4), 802.3x and 802.3z |
| NVIDIA Quadro FX 770M graphics adapter | Memory size | 256 MB or 512MB |
| | Memory type | GDDR-3 |
| | Memory interface | 128-bit |
| | Card type | MXM-II form factor |
| | I/O interface | PCIe (x16); Note: HP WS460c G6 I/O slot is PCIe x8 |
| | Max power consumption | 35W (256MB), 38W (512MB) |
| | Precision | 128-bit color, 12-bit sub-pixel, 4X Full-Scene Anti-Aliasing |
| | API | DirectX 10, Shader Model 4.0; OpenGL2.1 |
| | Upgradeable Firmware | Upgradeable Firmware |

Technical Specifications

| | |
|---|---|
| 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.<br><br>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.