QuickSpecs
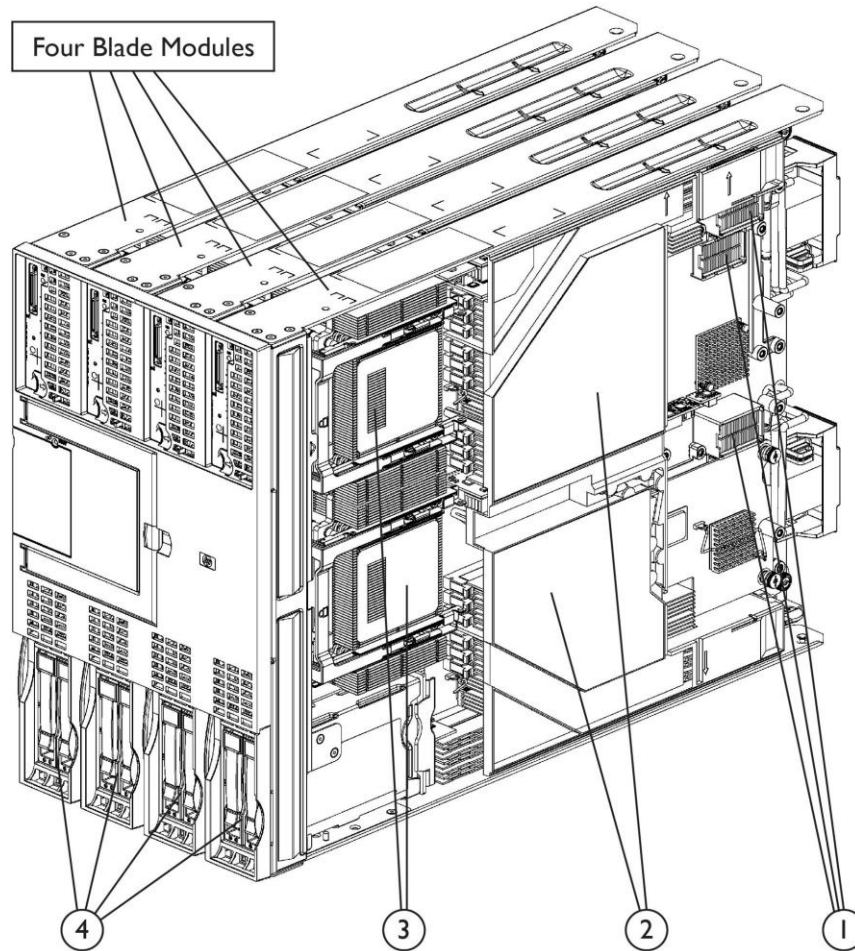
Overview

HP Integrity BL890c i4 Server Blade

HP Integrity BL890c i4 Server Blade

1. 12 x PCIe mezzanine slots (per BL890c i4)
2. 96 x DDR3 DIMM slots (per BL890c i4)
3. 8 x Intel® Itanium® processor 9500 series sockets (per BL890c i4)
4. 8 x SFF SAS HDDs, hot-swap bays (per BL890c i4)

What's New

- Intel® Itanium® processor 9500 series 8-core and 4-core processors
- 33% increase in memory bandwidth via 6.4GT/s Quick Path Interconnect (QPI) links
- Faster (1067 MT/s) and Low Voltage PC3L-10600 Registered CAS 9 Memory DIMMs
- Dynamic CKE, for economical use of power resources
- Eight integrated 10Gb Converged Network Controllers in an FCoE LAN on Motherboard (LOM) implementation
- Integrated SAS read only 512MB cache
- HP nPartitions (nPars) for BL8x0c i4 servers, for optimal allocation of resources to manage total cost of ownership and improved mission critical resiliency

At A Glance

This document covers the HP Integrity BL890c i4 server blade only. For more information on HP BladeSystem c-Class Enclosure and HP BladeSystem c-Class Interconnect and Mezzanine Components, please see the following QuickSpecs:

Overview

- 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 and Mezzanine Components:
  http://h18004.www1.hp.com/products/blades/components/c-class-interconnects.html
  http://h18004.www1.hp.com/products/blades/components/c-class-adapters.html

The HP Integrity BL890c i4 delivers the performance, reliability, and availability on HP's 64-bit operating system HP-UX 11i v3 for the ultimate in scalability and flexibility in deployment. To further enrich your cost-efficient, consolidated Integrity blade infrastructure, Virtual Server OE (VSE-OE) can help with solution components such as HP-UX Virtual Partitions (vPars) v6.1, HP Integrity Virtual Machines (Integrity VM), HP Capacity Advisor, HP Global Workload Manager, and automation through HP Infrastructure Orchestration. Additionally, High Availability OE (HA-OE) provides high availability via the HP Serviceguard clustering technology and Data Center OE (DC-OE) brings the best of the virtualization capabilities along with high availability together in one integrated OE.

HP Integrity BL890c i4 server blade includes:

- **Processor**:
  - Up to eight Intel® Itanium® 9500 Series processors
- **Memory**:
  - Up to 1.5 TB of memory. Supporting (96) DDR3 registered memory modules (R-DIMMs)
- **Storage Controller**:
  - Four (4) Embedded HP Smart Array p410i SAS Controllers
  - RAID 1 and RAID 0, and HBA mode configuration options
  - Four (4) Embedded SAS read only 512MB cache, one per embedded HP Smart Array p410i SAS controller
- **Internal Drive Support**:
  - Supports up to (8) eight small form factor (SFF) SAS hot plug hard drives
- **Network Controller**:
  - Sixteen (16) integrated HP NC553i 10Gb FlexFabric adapter ports supporting 10Gb/1Gb autosensing Ethernet, FCoE, Flex-10, and TCP/IP offload engine
    NOTE: FlexFabric capability requires OS drivers and the use of an HP Virtual Connect FlexFabric module. Learn more at: www.hp.com/go/virtualconnect
    NOTE: BL8x0c i4 server blades require Virtual Connect 3.70 or later when used in Virtual Connect configurations
- **Mezzanine Support**:
  - Twelve (12) additional I/O expansion slots via mezzanine cards.
  - Supports up to (12) mezzanine cards
    - HP NC553m Dual Port 10Gb FlexFabric Adapter
      NOTE: A maximum of 8 HP BLc NC553m Dual Port 10Gb Adapters are supported with BL890c i4
    - HP NC551m Dual Port 10Gb FlexFabric Adapter
      NOTE: A maximum of 8 HP BLc NC553m Dual Port 10Gb Adapters are supported with BL890c i4
    - HP NC552m 10Gb 2-port Flex-10 Ethernet Adapter
    - HP NC532m Dual Port Flex-10 10GbE BL–c Adapter
      NOTE: A maximum of 8 HP BLc NC532m Dual Port Flex-10 10Gb Adapters supported with BL890c i4.
    - HP Emulex LPe1205 8Gb FC BL-c HBA (2-port 8Gb Emulex FC HBA)
    - HP QMH 2562 8Gb FC BL-c HBA (2-port 8Gb QLogic FC HBA)
    - HP Smart Array P711m/1G FBWC 6G SAS Controller
    - HP Smart Array P700m/512 Controller
    - HP 4X QDR IB CX-2 Dual Port Mezz HCA for HP BladeSystem c-Class
    - HP NC364m 4-port 1GbE BL-c Adapter
    - HP NC360m 2-port 1GbE BL-c Adapter
- **USB Support**:
  - Four (4) Internal USB ports on the BL890c i4
  - Two (2) External USB ports on the BL890c i4 via SUV cable

Overview

- **Management**:
    - ○ HP Integrity Server Blades Management Software
        - ▪ Integrity Integrated Lights-Out 3 (iLO 3) management processor
        - ▪ HP Insight Control
        - ▪ HP System Management Homepage
        - ▪ HP-UX 11i Management Software for Integrity Blades, www.hp.com/go/hpuxblades
            - ▪ HP Ignite-UX
            - ▪ HP-UX Software Assistant (SWA)
            - ▪ HP Dynamic Root Disk (DRD)
    - ○ HP BladeSystem Infrastructure Management Software:
        - ▪ HP BladeSystem c-Class Onboard Administrator
        - ▪ HP BladeSystem c-Class Virtual Connect
    - ○ Enterprise Management Software
        - ▪ Data Protector Software
        - ▪ GlancePlus Pak
        - ▪ Performance Manager and Agent
    - ○ **HP nPartitions (nPars) for BL8x0c i4 servers:**
        - ▪ Provide improved scalability, availability, and fault isolation, and a rich set of virtualization options for the BL890c i4. nPartions are seamlessly integrated into the converged infrastructure environment, including Virtual Connect and HP Insight management tools, such as HP SIM. System administrators will find nPartitions configuration management quick and easy to use
        - ▪ Provide electrically isolated hard partitions at the hardware level
            - ▪ Support for up to four (4) nPartitions per BL890c i4
            - ▪ Reconfigure partitions simply and quickly via iLO GUI
                - ▪ Scale up to one (1) 8-socket nPartition or
                - ▪ Scale out to two (2) 4-socket nPartitions
                - ▪ Scale out to four (4) 2-socket nPartitions
                - ▪ Reboot required when re-configuring
                - ▪ Fault isolation cannot be serviced independently
        - ▪ Each nPartition is managed just like a similarly sized server
            - ▪ Two (2) socket nPartitions are managed like a BL860c i4
            - ▪ Four (4) socket nPartitions are managed like a BL870c i4
            - ▪ Eight (8) socket nPartitions are managed like a BL890c i4
            - ▪ The Onboard Administrator provides access to each nPartion
            - ▪ Other management tools, like HP SIM, Virtual Connect, and HP SUM display data for each nPartition as if it were an individual server
        - ▪ Each nPartition in a BL890c i4 can be further partitioned through software virtualization tools:
            - ▪ HP-UX Virtual Partitions (vPars)
            - ▪ Integrity Virtual Machines (Integrity VM)
                - ▪ Up to 256 HP Virtual Machines per nPartition
            - ▪ HP-UX Containers
- **Virtualization with HP Matrix OE for HP Integrity servers**, www.hp.com/go/insightdynamics/integrity
    - ○ Advanced Infrastructure Management
        - ▪ HP Capacity Advisor (which includes HP Virtualization Manager)
        - ▪ HP Virtualization Manager
        - ▪ HP Global Workload Manager and HP-UX Workload Manager
        - ▪ HP Matrix OE infrastructure orchestration
        - ▪ HP Systems Insight Manager
    - ○ Virtualization Continuum
        - ▪ HP-UX Virtual Partitions (vPars) v6.1
        - ▪ HP Integrity Virtual Machines (with HP-UX Guest OS's)
        - ▪ HP Process Resource Manager/pSets
        - ▪ HP-UX Containers
    - ○ Continuous availability
        - ▪ HP Serviceguard for HP-UX 11i
        - ▪ HP Serviceguard Extensions for SAP

Overview

- ▪ HP Serviceguard Extensions for Oracle
- ▪ HP Continentalclusters
- **Form Factor:**
    - ○ HP Integrity BL890c i4 server blade is a full-height, quadruple wide (occupies 4 slots) BladeSystem c-Class form factor. The BL890c i4 server blade plugs into the BladeSystem enclosure. In the c7000 enclosure, 2 server blades are supported per 10U enclosure. 4 enclosures can be configured to a standard 42U rack; 8 BL890c i4 server blades can be configured in a fully populated rack. In the c3000 enclosure, 1 BL890c i4 server blade is supported per 6U enclosure.
- **Enclosures**:
    - ○ HP offers two different c-Class server blade enclosures to meet your individual needs:
        - ▪ The HP BladeSystem c7000 rack enclosure is 10U high and holds up to 2 HP Integrity BL890c i4 servers plugged vertically. Four (4) enclosures can be configured to a standard 42U rack
        - ▪ The HP BladeSystem c3000 rack enclosure is 6U high and holds 1 HP Integrity BL890c i4 server plugged horizontally. Up to 7 enclosures can be configured to a standard 42U rack
        - ▪ The HP BladeSystem c3000 Enclosure targets three separate market segments:
            - ▪ Remote sites needing between 2 and 8 server blades
            - ▪ Mid-sized companies with between 3 and 100 servers in their company
            - ▪ Enterprise accounts with special datacenter requirement, such as DC power, or very limited rack power and cooling capacity.
    - ○ Server blades, storage blades, and interconnect modules are all designed to fit into the c7000 and c3000 enclosures. For additional enclosure information, please see: http://h18004.www1.hp.com/products/blades/components/enclosures/c-class/index.html.
- **Warranty**:
    - ○ Protected by HP Services and a worldwide network of HP Authorized Channel Partners. Three-year parts, 3 Year Labor and 3 Year on-site limited global warranty. Certain restrictions and exclusions apply

Standard Features

Processor One of the following depending on Model	**Octo-Core Processors** Intel® Itanium® 9560 2.53GHz/8-core/32MB/170W Processor Intel® Itanium® 9540 2.13GHz/8-core/24MB/170W Processor **Quad-Core Processor** Intel® Itanium® 9550 2.4GHz/4-core/32MB/170W Processor Intel® Itanium® 9520 1.73GHz/4-core/20MB/130W Processor
Upgradeability	Upgradeable to eight (8) processors **NOTE:** The HP Integrity BL890c i4 supports 4, 5, 6, 7, or 8 processor configurations. Processors must be identical.
Cache Memory One of the following depending on Model	L2 cache per core; 512KB Instruction, 256KB Data L3 cache; up to 24MB, see processor specifics
Cache Memory One of the following depending on Model	Level 1 (L1) on core 32KB cache; 16KB Instruction/16KB Data Level 2 (L2) on core cache; 512KB Instruction/256KB Data Up to 32MB shared Last Level Cache (LLC) per processor, see processor specifics above Total 54MB on-die cache
All Processors support	Single bit cache error correction 50 bit physical addressing 64 bit virtual addressing Integrated memory controllers and Scalable Memory Interconnect (SMI) Intel Instruction Replay Technology Enhanced instructions-level parallelism Enhanced Intel Hyper Threading, with Dual-Domain Multi-Threading support Intel Cache Safe Technology Residual error protection for floating point operations Thermal logic technologies Dynamic CKE, for additional power savings with memory DIMMs
Chipset	Intel Boxboro

Memory	Type	DDR3 registered memory modules (R-DIMMs)
	Minimum	32 GB (8 x 4 GB DIMMs) or (4 x 8 GB DIMMs)
	Maximum	1.5 TB (96 x 16 GB DIMMs)

NOTE: Memory kits consist of two (2) DIMMs.
NOTE: Double Chip Spare is enabled in a pairs DIMMs.
NOTE: Memory must be loaded in quads (two memory kits, 4 DIMMs)
NOTE: Each hard partition (nPar) requires at least one (1) quad of memory DIMMs

Network Adapter	Sixteen (16) Integrated HP NC553i 10Gb FlexFabric adapter ports supporting 10Gb/1Gb autosensing Ethernet, FCoE, Flex-10 and TCP/IP offload engine **NOTE:** FlexFabric capability requires OS drivers and the use of an HP Virtual Connect FlexFabric module. Learn more at: www.hp.com/go/virtualconnect **NOTE:** BL8x0c i4 server blades require Virtual Connect 3.70 or later when used in Virtual Connect configurations One (1) additional 10/100 NIC dedicated to Integrity iLO 3 Management

Standard Features

Expansion Slots	Twelve Mezzanine slots, eight (8) Type II and four (4) Type I, PCIe x8 Gen2

Integrated Manageability	Integrity Integrated Lights-Out 3 (iLO 3)
	Factory installed Integrity iLO 3 Advanced Pack License
	HP BladeSystem c-Class Onboard Administrator
	HP BladeSystem c-Class Virtual Connect

Storage Controller	Four (4) HP Smart Array p410i 3Gb SAS Controller	8 SAS Channels (one to each HDD) Supports RAID 1, RAID 0, and HBA mode options Four (4) Embedded SAS read only 512MB cache, one per HP Smart Array p410i Embedded SAS Controller

Maximum Internal Storage	Hot Plug SAS	7.2TB SAS	8 x 900GB SAS

Graphics	Integrated ATI RN50 1280 x 1024 x 16M color (128 MB DDR memory)	
	Resolution Color Depths	Depths 1280 x 1024, 16.7M , 64k, 256,16 1024 x 768, 16.7M, 64k, 256, 16 800 x 600, 16.7M, 64k, 256, 16 640 x 480, 16.7M, 64k, 256, 16

FlexFabric Support	Sixteen (16) ports via Eight (8) Embedded HP NC553i 10Gb 2-port FlexFabric Converged Network Adapters integrated on system board.
	Dual (2) ports via HP BLc NC553m Dual Port FlexFabric 10Gb Converged Network Adapter Dual (2) ports via HP BLc NC551m Dual Port FlexFabric 10Gb Converged Network Adapter
	NOTE: BL8x0c i4 server blades require Virtual Connect 3.70 or later **NOTE:** Each port supports 10GbE Ethernet or 8Gb FCoE traffic. **NOTE:** Please see the QuickSpecs for Technical Specifications and additional information and for HP-UX support. HP NC551m: http://h18004.www1.hp.com/products/quickspecs/13649_div/13649_div.html HP NC553m: http://h18004.www1.hp.com/products/quickspecs/13737_div/13737_div.html

InfiniBand Support	Optional InfiniBand HCAs are supported by the HP Integrity BL860c i4 Server Blade. The mezzanine circuit board connects directly to the server blade system board.
	HP 4X QDR InfiniBand ConnectX-2 Dual Port Mezzanine HCA for c-Class BladeSystem (PN 592519-B21)
	Features:
	- Negotiates to DDR/QDR speeds - Dual ports for redundant path connections - Support for HP-UX 11i v3 - Supported with HP 4X QDR InfiniBand Switch Module for c-Class BladeSystem (PN 489184-B21). - For details specifications, please visit: http://www.hp.com/products1/serverconnectivity/adapters/infiniband/specifications.html

Fibre Channel Support	Optional Fibre Channel HBAs are supported by the HP Integrity BL890c i4. The mezzanine circuit board connects directly to the server blade system board.

Standard Features

8Gb Fibre Channel Host Bus Adapters:
- QLogic QMH2562 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem (PN 451871-B21)
- Emulex LPe1205 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem (PN 456972-B21)

8Gb Fibre Channel HBAs feature:
- 8/4/2/1Gb/s auto negotiating speeds
- Dual ports for redundant path connections
- Optimized for HP Storage and supported by third party SAN vendors
- Support for HP-UX 11i v3, Microsoft® Windows for Integrity (6.2)

Compatible SAN	HP Integrity BL890c i4 server blades are optimized for HP Storage MSA, EVA, and XP products.

Smart Array Controller Support

Optional Smart Array Controller is supported by BL890c i4. The mezzanine circuit board connects directly to the server blade system board, and provides connection to off-blade SAS storage via a SAS interconnect switch module in the HP BladeSystem enclosure.

HP Smart Array P711m/1G FBWC 4-ports Ext PCIe x8 6G SAS Controller (PN 513778-B21)
- Provides support for HP Zoned Storage for BladeSystem
- Zoned Storage solution requires compatible HP Storage 600 Modular Disk System and HP Storage 3Gb SAS BL Switch
- Supports RAID 6 with Advanced Data Guarding (ADG)
- Provides support for HP P2000 G3 MSA
- Support for HP P2000 G3 MSA requires HP Storage 6Gb SAS BL Switch

NOTE: For additional details please see:
http://h18004.www1.hp.com/products/quickspecs/14035_div/14035_div.html

HP USB Options

External USB DVD drive with 6 ft USB extension cable is supported with c7000 enclosures.

The solution includes the following components:
- External USB DVD drive with 9-inch USB cable
- Power adaptor, power cable and USB Y-connector
- 6-foot USB extension cable

NOTE: The USB Y-connector goes between the extension cable (SH046AA) and the 9-inch USB cable fixed with DVD drive.
NOTE: The Y-connector should NOT be placed between the server blade and the 6-foot Extension cable.

Integrity Server Blades Management Software and HP Integrity Essentials Software Plug-ins

HP-UX 11i Management Software for HP Integrity BL890c i4 Server Blade and HP BladeSystem

- **Getting Started**
  - HP Systems Insight Manager
  - HP Insight Control for HP-UX 11i
  - HP-UX 11i System Management
  - HP BladeSystem Integrated Manager in HP System Insight Manager
  - HP Onboard Administrator
  - HP BladeSystem c-Class Onboard Administrator Firmware
  - HP BladeSystem c-Class Virtual Connect Firmware
  - HP Insight Control for HP-UX 11i v3 (included in BASE OE)
- **Deploy**
  - HP Ignite-UX
  - Software Distributor-UX

Standard Features

- o Software Package Builder
- o Dynamic Root Disk (DRD)
- **Monitor**
  - o HP Systems Insight Manager
  - o HP System Management Homepage
  - o Glance Plus Pak
  - o Performance Manager and Agent
  - o HP Serviceguard Manager
- **Control**
  - o HP Integrity Integrated Lights-Out (iLO) 3 (standard with BL890c i4 servers)
  - o Integrity iLO Advanced 3 Pack License (included with BL890c i4 servers)
- **Protect**
  - o HP-UX Bastille
  - o HP Containers
  - o Data Protector Software
  - o Software Assistant (SWA)
- **Optimize**
  - o HP Capacity Advisory
  - o HP Global Workload Manager
  - o Process Resource Manager
  - o HP Insight Power Manager
  - o HP-UX 11i v3 power management
- **Provision**
  - o HP Matrix OE - Matrix OE infrastructure orchestration
- **Integrate**
  - o HP Business Technology Optimization
  - o IT Management Software
  - o HP Matrix OE - Matrix OE for HP Integrity server blades
- **Learn More**
  - o For additional information on HP Integrity server blade management software please visit: http://h18004.www1.hp.com/products/servers/integrity-bl/c-class/860c/compmatrix.html

Glossary of Integrity Server Blades Management Software Product Description	HP BladeSystem Integrated Manager in HP Systems Insight Manager	The HP BladeSystem Integrated Manager is a component in HP Systems Insight Manager (SIM) that provides streamlined management for the entire HP BladeSystem product family. The HP BladeSystem Integrated Manager enables users to quickly navigate their HP blade environments including blade servers, enclosure infrastructures, racks, and integrated switches, via automatically generated blade rack picture views and hierarchical trees. Users are able to conveniently configure, deploy, and manage individual or groups of blade systems. Additionally, users are able to quickly set up logical collections of blade systems for convenient management and control.
	HP Blades Visualization	Used by System Administrators to identify, associate and group blades into collections, using tables, trees, and picture views, and it can also be used to monitor performance and launch Integrity Essentials. **NOTE:** For more information about Manageability solutions for Integrity Servers go to: http://h20341.www2.hp.com/integrity/w1/en/software/essentials-overview.html.

Standard Features

HP GlancePlus Pak	HP GlancePlus Pak provides you with a single product for managing a system's availability and performance. It is an integrated product that includes HP GlancePlus. As an integrated product, the GlancePlus Pak includes the real-time diagnostic capabilities of GlancePlus and the historical data collection capabilities of the Performance Agent. The performance agent is used with other availability and performance management products, thus providing an integrated real-time and historical performance management solution.
HP Ignite-UX for HP-UX Deployments	HP Ignite-UX is a free toolset that enables a network install of HP-UX onto multiple PA-RISC and/or Integrity servers on a network. It can also be used to create custom install configurations, or golden images, recover systems remotely, create custom recovery media including tape, CD and DVD, and manage and monitor multiple client installation sessions.
HP Capacity Advisor	The capacity planning component of HP Matrix OE - , HP Capacity Advisor offers the industry's first lightweight, integrated tool for ongoing capacity planning by simulating the placement of application workloads to help IT administrators improve server utilization. It captures real-world server utilization data to pre-test different scenarios before making changes to critical applications. HP Virtualization Manager, which is included with Capacity Advisor and Global Workload Manager, provides a central point of control that allows you to manage all the resources in your virtualized environment and a powerful way to connect IT resources to real business needs.
HP Integrity Integrated Lights-Out (iLO) 3 (factory integrated with BL890c i2)	HP Integrity Integrated Lights-Out (iLO) management processors make it simpler, faster, and less costly to remotely manage your Integrity servers. HP iLO functions without additional software and can be accessed from any location via a web browser. HP Integrity systems with iLO 3 ships with a built in Advanced Pack License so your Integrity blade is instantly ready to use iLO Virtual Media and iLO power measurement. Integrity iLO Advanced features enabled in this release: Virtual Media, LDAP directory services, nPartitions management, iLO power measurement, and integration with Insight Power Manager. No additional iLO licensing is needed. **NOTE:** Please see www.hp.com/go/integrityilo for more information
HP Onboard Administrator	The Onboard Administrator for the HP BladeSystem enclosure is the brains of the c-Class infrastructure. Together with the enclosure's HP Insight Display, the Onboard Administrator has been designed for both local and remote administration of HP BladeSystem c-Class. This module and its firmware provides: • Wizards for simple, fast setup and configuration • Highly available and secure access to the HP BladeSystem infrastructure • Security roles for server, network, and storage administrators • Automated power and cooling of the HP BladeSystem infrastructure • Agent-less device health and status • Thermal Logic power and cooling information and control **NOTE:** Please see: http://www.hp.com/go/onboardadministrator for more information.

Standard Features

HP Serviceguard Manager	HP Serviceguard Manager (included with the Serviceguard product) is a graphical user interface (GUI) that provides configuration, administration, and monitoring capabilities for Serviceguard, Serviceguard Extension for Oracle RAC, Metrocluster, and Continentalclusters. Using Serviceguard Manager, operators see color-coded icons that provide a big-picture view of multiple clusters. From this big-picture view, operators can drill down and proactively manage clusters, systems (nodes), and packages that run applications.
HP Systems Insight Manager	HP Systems Insight Manager (HP SIM) provides a unified, secure and extensible environment to centrally manage servers, storage and other infrastructure devices across multiple operating system platforms.
HP System Management Homepage	HP System Management Homepage is a web-based interface that consolidates and simplifies the management of individual ProLiant servers running Microsoft Windows or Linux operating systems, or HP 9000 and HP Integrity servers running HP-UX 11i. By aggregating data from HP Insight Management Agents and other management tools, the System Management Homepage provides a secure and intuitive interface to review in-depth hardware configuration and status data, performance metrics, system thresholds and software version control information. The System Management Homepage can also be used to access the HP Lights-Out Management processor on ProLiant and Integrity servers.
HP Matrix OE for HP Integrity servers	HP Matrix OE is advanced lifecycle management software for HP Integrity servers which enables you to instantly adjust to dynamic business demands - with the new addition of infrastructure orchestration, not only can you easily plan, configure, and automate your physical and virtual resources in the same way, but now you can also provision and modify a complex infrastructure in minutes.
HP-UX Software Assistant (SWA)	HP-UX Software Assistant (SWA) is a command-line based tool that consolidates and simplifies patch management and security bulletin management on HP-UX systems. The SWA tool is new for HP-UX releases as of January 2007, includes Security Patch Check (SPC), and is the HP-recommended utility to use to maintain currency with HP-published security bulletins for HP-UX software.
HP-UX Workload Manager	HP-UX Workload Manager (HP-UX WLM) is a resource management tool that provides automatic processor resource allocation and application performance management based on your service-level objectives (SLOs) and business priorities. WLM is most effective managing applications that are processor-bound. It automatically adapts system or partition CPU resources (cores) to the demands, SLOs, and priorities of the running applications. (A core is the actual data processing engine within a processor, where a single processor can have multiple cores, and a core can support multiple execution threads through Hyper-Threading, introduced with HP-UX 11i v3, as discussed below.) It adjusts the CPU allocation of a group of processes known as a workload, basing adjustment on the current needs and performance of the applications in that workload.
HP Global Workload Manager	The workload management capability for HP Integrity servers is provided by the HP Global Workload Manager component of HP Insight Dynamics -

Standard Features

	VSE. HP Global Workload Manager (gWLM) is an intelligent policy engine that automatically allocates resources among multiple workloads to increase server utilization while meeting service levels for high-priority applications. Designed to work across multiple HP-UX 11i, OpenVMS and Linux environments, the workload management features are ideal for large, centralized IT environments that host applications for many departments.
HP Matrix OE	HP Matrix OE capabilities let you provision infrastructure in minutes to automatically activate physical and virtual servers, storage, and networking from pools of shared resources. Whether you need a single virtual machine or infrastructure for a complex three-tier application, Matrix OE finds available resources, streamlines the approval process, and automatically provisions and configures what's needed across infrastructure silos. Delivering infrastructure to the business becomes faster, more efficient, and more reliable.
Performance Manager and Agent	HP Performance Manager, Agents, and Monitor combine to provide a powerful and flexible distributed management solution. This solution is a single interface for centrally monitoring, analyzing, and forecasting resource utilization for distributed multi-vendor environments, enabling you to offer the best possible level of service in a cost-effective manner.
Process Resource Manager	HP Process Resource Manager (HP PRM) is a resource management tool used to control the amount of resources that processes use during peak system load. HP PRM can manage allocation of the following resources:

- CPU: Ensures a minimum allocation of CPU; can also simultaneously cap CPU resource usage for each group in the configuration. (Starting with HP-UX 11i v3, per-group capping is available.)
- Memory: Ensures a minimum allocation of private real memory; can also cap private memory usage. Allows you to allocate an exact amount of shared memory.
- Disk bandwidth: Ensures a minimum allocation of disk bandwidth

HP Containers	One method that Matrix OE uses to improve server resource utilization is to consolidate multiple applications within a single operating system image. HP-UX Containers combine kernel level security and prove resource management to stack multiple applications within the same operating system. HP-UX Containers and HP-UX Workload Manager can dedicate specific resources to specific applications within an operating system image, avoiding resource contention issues. Using HP-UX Containers11i v3 Security Containment, organizations can ensure that application instances cannot access processes or file from other applications or the system. This ensures that multiple application instances run securely in a consolidated environment, providing the benefits of consolidation while preserving the security of a scale out environment. For software licensing purposes, the maximum number of CPUs in HP-UX Containers can be capped. This capability is part of the HP-UX Base Operating Environment (BOE).
Software Distributor-UX	Software Distributor (SD) is the HP-UX administration tool set used to deliver and maintain HP-UX operating systems and layered software applications. SD is delivered as part of HP-UX; you do not need to download it separately.

Standard Features

Insight Control for BladeSystem Management	Insight Control for BladeSystem delivers foundation management for HP BladeSystem lifecycles, including hardware resource deployment, health monitoring, software version control, performance monitoring, and power management.

Integrity blades are supported with the following ICE components, installed automatically when using the wizard-based integrated installer:

- HP Systems Insight Manager
- Extensions for SIM on Microsoft Windows CMS (to manage HP-UX)
- HP BladeSystem Integrated Manager
- Insight Power Manager

NOTE: For Licensing and Packaging Options please see the options section of this QuickSpecs.
NOTE: Insight Control Environment for BladeSystem is delivered with HP BladeSystem c-Class enclosures with either 8 or16-server licenses, or 8 server evaluation licenses (30-days). For additional information on HP BladeSystem c-Class Infrastructure please visit: HP BladeSystem c-Class Infrastructure QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/12517_div/12517_div.html
NOTE: For additional product and licensing information about Insight Control Environment, HP Systems Insight Manager and Essentials software refer to: http://www.hp.com/servers/proliantessentials.

OS Support	HP-UX 11i v3 Data Center Operating Environment (DC-OE) HP-UX 11i v3 Virtual Server Environment (VSE-OE) HP-UX 11i v3 High Availability Environment (HA-OE) HP-UX 11i v3 Base Operating Environment (BOE)

NOTE: For more complete and up to date information on HP-UX 11i support, please visit the HP-UX 11i website at: http://www.hp.com/go/hpux11iblades.

Supported Software Options	HP Matrix OE for HP Integrity servers (which is included in HP-UX VSE-OE and DC-OE) includes the following capabilities: HP-UX Virtual Partitions (vPars) v6.1 HP Integrity Virtual Machines (VM) HP Capacity Advisor HP Global Workload Manager HP Integrity Online VM Migration HP Virtualization Manager HP Serviceguard for HP-UX 11i HP Serviceguard Manager HP Serviceguard Extensions for SAP HP Serviceguard Extensions for Oracle HP Insight Control power management GlancePlus Pak Performance Manager and Agent HA Monitors MirrorDisk/UX

Intelligent Manageability	HP Integrity Integrated Lights-Out (iLO 3) Remote Management Virtual serial console (Multiple, mirrored sessions, with previous context and console log buffer) Virtual Media Virtual Power Button Control LDAP Directory Services

Standard Features

iLO 3 power management integration with Insight Power Manager

Embedded system health and Integrity fault management Diagnostics and troubleshooting:
- virtual front panel
- log access to Integrity System Event Log
- Forward Progress Log Blade power consumption reading

Dedicated LAN Connectivity
Automatic IP Configuration via DHCP/DNS/WINS browser
Command Line and scripted access Industry Standard RC4, 128-bit Secure Sockets Layer (SSL) and Secure Shell (SSH) Security
Directory Services Integration (LDAP)
Support for 19 user accounts with customizable access privileges

NOTE: iLO 3 Advanced Pack license is included with every BL890c i4 server blade.

Availability

Dual-Port Fibre Channel Mezzanine Card for redundant SAN connection
Eight hot-plug SAS hard drive bays and four (4) integrated RAID (HP p410i) controllers on every server blade

Network adapter teaming (network fault tolerance, transmit load balancing, switch-assisted load balancing) supported on integrated LOMs and with add-in Mezzanine cards.

- ECC protected DDR3 memory
- Memory double chip spare to overcome two DRAM chip failures
- Dynamic Processor resilience and deallocation with HP-UX
- Journal file system with HP-UX*
- Auto reboot
- HP Serviceguard for HP-UX*
- HP Serviceguard Extension for RAC for HP-UX*
- HP Serviceguard Extension for SAP for HP-UX*
- Serviceguard Manager for HP-UX Clusters*
- HP Event Monitoring Service
- HA Monitors for HP-UX
- HA Toolkits for HP-UX
- HP Mirrordisk/UX* (Included if purchase HP-UX 11i VSE, DC, or HA OEs)
- Extended Campus Cluster*, HP Metrocluster*, and HP Continentalclusters* for HP UX
- HP System Insight Manager (SIM) for proactive fault management
- HP Serviceguard Storage Management Suites for HP-UX*

NOTE: *Fee based software products

Security

Hardware Security
- Administrator's password
- Integrity iLO 3 access control- 19 customizable local user accounts with assignable rights for power, console, configuration, etc.
- OA and Integrity iLO 3 Directory Services Integration (LDAP)
- Integrity iLO 3 access via SSL encryption or SSH
- Integrity iLO 3 access methods via web, SSH, etc. can be disabled
- SSL encryption on web console
- Trusted Platform Module (TPM) option for secure cryptographic key storage, integrates with HP-UX security features

Standard Features

Platform security fundamentals

For the past 25 years HP has been building one of the most trustworthy and secure UNIX operating systems on the market. Designed for the optimal protection against both external and internal threats. HP-UX 11i offers industry-leading breadth and depth of UNIX security features. Focused on comprehensive security integration aimed at proactively mitigating risk, reducing compliance cost and accelerating time to implementation, HP-UX security solutions significantly lower IT costs. This set of fully integrated and complementary features is designed to provide layered security with in-depth protection of all your enterprise assets by protecting all these aspects of data, systems, data and identity security. HP-UX independently validates its comprehensive security portfolio through Common Criteria security evaluations. For more details, visit www.hp.com/go/hpux11isecurity

Protecting systems:

One critical factor in enterprise security is system minimization and hardening. HP-UX 11i offers a set of security features designed to address known and unknown vulnerabilities by running only the services that are needed, thus minimizing a potential point of attack. The following security features have built-in mechanisms not only to minimize and harden the system, but also to detect and react to attack in real time:

- Bastille system hardening
- Host Intrusion Detection System
- Secure Resource Partitions
- IPFilter - firewall technology
- Software Assistant (security bulletin currency)
- Install-time Security
- Boot Authentication
- Standard Mode Security Extensions
- Shadow Passwords
- Strong Random Number Generator

Protecting data:

HP-UX 11i offers data protection in many forms: protecting data in transit, in use and at rest. By using security features designed to protect data in its three forms, HP-UX 11i customers can minimize possible breaches not only in terms of data loss, but in customer trust as well. Several security features offer data protection capabilities to HP-UX customers:

- Encrypted volume and file system
- Trusted Computing Services
- Security containment
- OpenSSL
- IPSec
- Secure Shell
- MD5sum

Protecting Identity:

In modern day global enterprise companies, managing identity is not an easy task , especially as identity management requirements grow to include employees, contractors, partners and suppliers across many countries with various privacy protection laws and regulation. HP-UX 11i dramatically simplifies this critical task by integrating various identity management technologies which offer ease of use and adherence to compliance regulation:

- Identity Management Integration
- Select Access for IdMI
- Role-based Access Control
- AAA Server

Standard Features

- HP Directory Server for HP-UX
- LDAP-UX Client
- Kerberos Server
- Kerberos Client Services
- PAM Kerberos

NOTE: HP also offers many additional security features available through open source software for HP-UX.

Common Criteria certification

Many enterprise and government customers require this vendor-independent security certification because it increases confidence in the product's security assurance, functionality, quality and effectiveness. Many governments, including the United States, require certification for government IT procurement.

Certification evaluations are only conducted by the evaluation agency after release of the product. HP-UX 11i v3 has been actively evaluated to the Common Criteria (CC) Security standards for many years. A history of our achievements include:

- February 2003: Certification of HP-UX 11i V1 achieves A CC to Evaluation Assurance Level 4
- May 2006: Certification of HP-UX 11i V2 to the current EAL4 Common Criteria
- May 2008: Certification of HP-UX 11iV3 achieved including hard partitions (nPars)
- December 2009: Certification of HP-UX 11iV3 to CCOPP profile including soft partitions (vPars)

Common Criteria certifications continue to be an integral part of our HP-UX comprehensive security portfolio. HP-UX 11i v3 has successfully completed a new Commercial off the Shelf (COTS) Compartmentalized Operations Protection Profile (CCOPP) evaluation. This new CCOPP evaluation encompasses the extensive range of security solution for HP-UX 11i v3 including soft partitioning or Virtual partitions (vPars) as well as the previously certified hard partitions (nPars).

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 Integrity Server Blades, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSA1xxx, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches. For more information on Factory Express services for your specific server model please contact your sales representative or go to: http://www.hp.com/go/factory-express.
HP Simple Configurator	SCE is a guided self service tool to help sales and non technical people provide customers with initial configurations in 3 to 5 minutes. You may then send the configuration on for configuration help, or use in your existing ordering processes. If you require "custom" rack configuration or configuration for products not available in SCE, please contact HP's Customer Business Center or an Authorized Partner for assistance. http://www.hp.com/products/configurator

Support Services

HP Technology Services for Integrity Servers

HP Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Connect to HP to help prevent problems and solve issues faster. Our support technology lets you to tap into the knowledge of millions of devices and thousands of experts to stay informed and in control, anywhere, any time.

Protect your business beyond warranty with HP Care Pack Services
HP Care Pack Services enable you to order the right service level, length of coverage and response time as you purchase your new server, giving you full entitlement for the term you select.

Recommended HP Care Pack Services for optimal satisfaction Integrity Servers:

Optimized Care

HP Proactive Care Advanced - 24x7 coverage, three year Care Pack Service
Achieve a higher return on your product investment with the personal attention from a locally assigned Account Support Manager who delivers recommendations designed to improve availability and performance. Leverage your system's ability to connect to HP for automated problem detection and rapid critical event management to increase stability and reduce unplanned downtime. This recommendation provides 24x7 coverage with four-hour response for hardware and two-hour callback for supported software. Collaborative call management comes with Proactive Care Advanced or you may choose full support from HP where we own all cases through to resolution.   HP is a leading provider of support services for most operating systems used on HP BladeSystem with long, successful partnerships with vendors such as Microsoft, Red Hat, VMware, SUSE and others. Purchasing software support from HP simplifies troubleshooting and shortens time to resolution with one call for hardware or software questions.
http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA5-3259ENW&cc=us&lc=en

Basic Care

HP Proactive Care with 24x7 coverage, three year Care Pack Service
HP Proactive Care helps prevent problems and stabilize IT by utilizing secure, real-time, predictive analytics and proactive consultations when your products are connected to HP. This Care Pack Service combines three years' proactive reporting and advice with our 24x7 coverage and enhanced escalation management, four hour hardware response time and two hour call back for software questions on leading industry standard software running on your HP ProLiant server.
http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA3-8855ENW.pdf

Related Services

HP Datacenter Care service
HP Datacenter Care helps you improve IT stability and security, increase the value of IT, and enable agility and innovation. It is a structured framework of repeatable, tested, and globally available services "building blocks." You can deploy, operate, and evolve your datacenter wherever you are on your IT journey. With HP Datacenter Care, you benefit from a personalized relationship with HP via a single point of accountability for HP and others' products. For more information, visit
www.hp.com/services/datacentercare

HP ProLiant Server Hardware Installation
Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner.
http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf

Factory Express 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. For more information on

Support Services

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

Data Privacy Services
Protect your data through better media management. HP Data privacy services help manage and protect sensitive data to reduce
the risk of unauthorized access to private information and help meet compliance requirements. Our retention services allow you
to keep drives and other devices upon failure, our removal services provide convenient data sanitization and our recovery services
allow you to safely retire IT assets and capture any remaining value from the hardware. www.hp.com/services/dataprivacy
Additional HP Care Pack services can be found at: http://www.hp.com/go/cpc

eSupport

Get connected to HP to improve your support experience
Prevent problems with innovative, automated monitoring tools and proactive services. Combining Proactive Care Services with
our remote support technology such as Insight Online provides you with expert advice and personalized, cloud-based automated
IT support, helping to prevent unplanned down time and solve problems quickly. For more information, visit:
www.hp.com/go/proactiveinsightexperience

HP Support Center
Personalized online support portal with access to information, tools and experts to support HP business products. Submit support
cases online, chat with HP experts, access support resources or collaborate with peers. Learn more http://www.hp.com/go/hpsc

HP's Support Center Mobile App* allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you
can get access to personalized IT support anywhere, anytime.
HP Insight Remote Support and HP Support Center are available at no additional cost with a HP warranty, HP Care Pack or HP
contractual support agreement.

*HP' Support Center Mobile App is subject to local availability

Parts and Materials

HP will provide HP-supported replacement parts and materials necessary to maintain the covered hardware product in operating
condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in
the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or
replaced as part of these services.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by HP due to
malfunction.

Models

Base Models

HP Integrity BL890c i4 Base Unit for c7000 Enclosure AM380A	**Processor(s)** Supports up to eight (8) processors	Eight (8) processor sockets, processor modules are configured to order
	Cache Memory All processor models	Included with processor
HP Integrity BL890c i4 Base Unit for c3000 Enclosure AM381A	**Memory**	Ninety six (96) DIMM sockets; memory DIMMs are configured to order
	Network Adapter	Sixteen (16) integrated HP NC553i 10Gb FlexFabric adapter ports supporting 10Gb/1Gb autosensing Ethernet, FCoE, Flex-10, and TCP/IP offload engine **NOTE:** FlexFabric capability requires OS drivers and the use of an HP Virtual Connect FlexFabric module. Learn more at: www.hp.com/go/virtualconnect **NOTE:** BL8x0c i4 server blades require Virtual Connect 3.70 or later when used in Virtual Connect configurations One (1) additional 10/100 NIC dedicated to Integrity iLO 3 Management
	Storage Controller	Four (4) Embedded HP Smart Array p410i SAS Controllers Four (4) Embedded SAS read only 512MB cache, one per HP Smart Array p410i SAS Controller
	Hard Drives	Eight SFF SAS drive bays; hard disk drives are configured to order
	IO expansion	Twelve (12) PCIe Mezzanine card slots (PCIe Gen2 x8 interface); mezzanine cards are configured to order
	Optical Drive	None internal to blade server
	Integrity iLO 3	Integrity iLO 3 and Integrity iLO 3 Advanced Pack license included
	Form Factor	Supports 1 BL890c i4 in HP BladeSystem c3000 Enclosure Supports up to 2 BL890c i4 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 servers must start with a CTO Enclosure
NOTE: FIO indicates that this option is a Factory Installable Option.

Step 1: Choose Required Base Server Blade Configuration

HP Models	HP Integrity BL890c i4 c7000 Server Blade	AM380A
	NOTE: Choose the base models.	
	NOTE: Adding Option code "#0D1" to the Server Blade P/N will integrate the configured blade into the enclosure (which must be on the same order)	
	NOTE: When adding Option code "#0D1," must select whether server blade should be installed in an odd slot of the c7000 enclosure (AM380A#001) or in an even slot (AM380A#002).	
	HP Integrity BL890c i4 c3000 Server Blade	AM381A
	NOTE: Choose the base models.	
	NOTE: Adding Option code "#0D1" to the Server Blade P/N will integrate the configured blade into the enclosure (which must be on the same order)	
	NOTE: When adding Option code "#0D1," must select whether server blade should be installed in an odd slot of the c3000 enclosure (AM381A#001) or in an even slot (AM381A#002).	

Base unit standard features:

Sixteen embedded 10 Gigabit Ethernet NIC ports plus (1) additional 10/100 NIC dedicated to Integrity iLO 3iLO 3 Management

Four Integrated HP Smart Array p410i SAS Controller for internal HDDs

Eight small form factor (SFF) SAS hot plug hard drive bays

HP Integrity Integrated Lights-Out 3

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

HP Processors	**NOTE:** Select minimum four (4) and maximum eight (8) processors.	
	Octo-Core Processors	
	HP BL8x0c i4 Itanium 9540 (2.13GHz/8-core/24MB/170W) Processor Kit	AM383A
	HP BL8x0c i4 Itanium 9560 (3GHz/8-core/32MB/170W) Processor Kit	AM382A
	Quad-Core Processor	
	HP BL8x0c i4 Itanium 9520 (1.73GHz/4-core/20MB/130W) Processor Kit	AM385A
	HP BL8x0c i4 Itanium 9550 (2.4GHz/4-core/32MB/170W) Processor Kit	AM384A
HP Memory	**NOTE:** Select minimum four (4) and maximum forty eight (48) memory kits.	

Configuration Information - Factory Integrated Models

HP BL8x0c i4 8GB (2x4GB) Single Rank PC3L 10600 (DDR3-1333) Registered CAS-9 Memory Kit	AM386A
HP BL8x0c i4 16GB (2x8GB) Dual Rank PC3L 10600 (DDR3-1333) Registered CAS-9 Memory Kit	AM387A
HP BL8x0c i4 32GB (2x16GB) Dual Rank PC3L 10600 (DDR3-1333) Registered CAS-9 Memory Kit	AM388A

NOTE: Memory kits consist of two individual DIMMs.

NOTE: DIMMs must be installed in quads. Therefore, memory kits must be ordered two (2) at a time, to reach quads (4 DIMMS) to be installed.

Step 3: Choose Additional Options for Factory Integration

HP Hard Drives

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

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

HP 1.2TB 12G SAS 10K rpm SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive	785079-B21
HP 900GB 12G SAS 10K rpm SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive	785075-B21
HP 600GB 12G SAS 10K rpm SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive	785073-B21
HP 450GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581284-B21
HP 300GB 12G SAS 15K rpm SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive	785099-B21
HP 450GB 12G SAS 15K rpm SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive	785101-B21
HP 600GB 12G SAS 15K rpm SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive	785103-B21
HP 300GB 12G SAS 10K rpm SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive	785071-B21
HP 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512547-B21

NOTE: Though the disks are 6Gb/12Gb, implementation of the embedded HP Smart Array SAS RAID controller limits performance of disks.

12G SAS Hot Plug Enterprise Performance Solid State Drives

HP 200GB 12G SAS Write Intensive SFF 2.5-in 3yr Wty Solid State Drive	802576-B21
HP 400GB 12G SAS Write Intensive SFF 2.5-in 3yr Wty Solid State Drive	802580-B21
HP 800GB 12G SAS Write Intensive SFF 2.5-in 3yr Wty Solid State Drive	802584-B21

HP Ethernet Mezzanine Options

HP NC364m Quad Port 1GbE BL-c Adapter	447883-B21

NOTE: Provides four additional 1GbE ports.

HP NC360m Dual Port 1GbE BL-c Adapter	445978-B21

NOTE: Provides two additional 1GbE ports.

HP NC552m 10Gb 2-port Flex-10 Ethernet Adapter	610609-B21

NOTE: Provides Flex-10 connectivity when used in conjunction with the HP Virtual Connect Flex-10 10Gb Ethernet Module for the c-Class BladeSystem Option (P/N 455880-B21).

HP NC532m Dual Port 10GbE Multifunction BL-c Adapter	467799-B21

NOTE: Maximum of 8 HP BLc NC532m Adapter Opt. Kits supported per BL890c i4.

QuickSpecs

Configuration Information - Factory Integrated Models

Provides Flex-10 connectivity when used in conjunction with the HP Virtual Connect Flex-10 10Gb Ethernet Module for the c-Class BladeSystem Option (P/N 455880-B21).

HP FlexFabric Mezzanine Options	HP NC553m 10Gb 2-port FlexFabric Adapter	613431-B21

NOTE: Provides Ethernet and FCoE connectivity when used in conjunction with HP Virtual Connect FlexFabric 10Gb/24-Port Module (PN 571956-B21).

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
HP NC551m:
http://h18004.www1.hp.com/products/quickspecs/13649_div/13649_div.html
HP NC553m:
http://h18004.www1.hp.com/products/quickspecs/13737_div/13737_div.html
HP Virtual Connect FlexFabric Module
http://h18004.www1.hp.com/products/quickspecs/13652_div/13652_div.html

HP Fibre Channel Mezzanine Options	Emulex LPe1205 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	456972-B21
	QLogic QMH2562 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	451871-B21

NOTE: BL890c i4 supports HP Virtual Connect Fibre Channel Interconnect Modules. See: http://www.hp.com/go/bladesystem/virtualconnect for complete details.

HP Infiniband Mezzanine Options	HP 4X QDR InfiniBand ConnectX-2 Dual Port Mezzanine HCA for c-Class BladeSystem	592519-B21

NOTE: Provides DDR/QDR InfiniBand connectivity when used in conjunction with HP BLc 4X QDR IB Switch for HP BladeSystem c-Class (PN 489184-B21).
NOTE: For more support details, please visit the following web-page:
http://www.hp.com/products1/serverconnectivity/adapters/infiniband/specifications.html

HP Security - TPM	HP Integrity BL8x0c i4 Trusted Platform Module	AM392A

NOTE: The TPM must be installed by the factory.

Step 4: Choose Additional Options for Field Upgrades

NOTE: For additional options, please refer to the "Core Options" and "Additional Options" section below. For additional options, including server blade enclosures interconnect, mezzanine options and power subsystem options; please see the Core Options and Additional sections below; or the following:

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 and Mezzanine Components:
http://h18004.www1.hp.com/products/blades/components/c-class-interconnects.html
http://h18004.www1.hp.com/products/blades/components/c-class-adapters.html

Core Options

HP Ethernet Mezzanine Options	HP NC364m Quad Port 1GbE BL-c Adapter **NOTE:** Provides four additional GbE ports.	447883-B21
	HP NC360m Dual Port 1GbE BL-c Adapter **NOTE:** Provides two additional GbE ports.	445978-B21
	HP NC532m Dual Port 10GbE Multifunction BL-c Adapter	467799-B21
	NOTE: Maximum of 8 HP BLc NC532m Adapter Opt. Kits supported per BL890c i4. Provides Flex-10 connectivity when used in conjunction with the HP Virtual Connect Flex-10 10Gb Ethernet Module for the c-Class BladeSystem Option (P/N 455880-B21).	
	HP NC552m 10Gb 2-port Flex-10 Ethernet Adapter **NOTE:** Provides Flex-10 connectivity when used in conjunction with the HP Virtual Connect Flex-10 10Gb Ethernet Module for the c-Class BladeSystem Option (P/N 455880-B21).	610609-B21
HP FlexFabric Mezzanine Options	HP NC553m 10Gb 2-port FlexFabric Adapter **NOTE:** Provides Ethernet and FCoE connectivity when used in conjunction with HP Virtual Connect FlexFabric 10Gb/24-Port Module (PN 571956-B21).	613431-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: HP NC551m: http://h18004.www1.hp.com/products/quickspecs/13649_div/13649_div.html HP NC553m: http://h18004.www1.hp.com/products/quickspecs/13737_div/13737_div.html HP Virtual Connect FlexFabric Module http://h18004.www1.hp.com/products/quickspecs/13652_div/13652_div.html	
HP Fibre Channel Mezzanine Options	Emulex LPe1205 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	456972-B21
	QLogic QMH2562 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	451871-B21
HP Processors (field upgrade only)	**Octo-Core Processors**	
	HP BL8x0c i4 Itanium 9540 (2.13GHz/8-core/24MB/170W) Processor Kit	AM383A
	HP BL8x0c i4 Itanium 9560 (3GHz/8-core/32MB/170W) Processor Kit	AM382A
	Quad-Core Processors	
	HP BL8x0c i4 Itanium 9520 (1.73GHz/4-core/20MB/130W) Processor Kit	AM385A
	HP BL8x0c i4 Itanium 9550 (2.4GHz/4-core/32MB/170W) Processor Kit	AM384A
	NOTE: HP Integrity BL890c i4 processor upgrade kits contain one processor. Processors must be identical. No mixing of processor models is allowed.	
	NOTE: The HP Integrity BL890c i4 supports 4, 5, 6, 7, or 8 processor configurations. Processors must be identical.	
HP Memory	HP BL8x0c i4 8GB (2x4GB) Single Rank PC3L 10600 (DDR3-1333) Registered CAS-9 Memory Kit	AM386A
	HP BL8x0c i4 16GB (2x8GB) Dual Rank PC3L 10600 (DDR3-1333) Registered CAS-9 Memory Kit	AM387A
	HP BL8x0c i4 32GB (2x16GB) Dual Rank PC3L 10600 (DDR3-1333) Registered CAS-9 Memory Kit	AM388A
	NOTE: Memory kits consist of pairs of DIMMs DIMMs must be installed in quads. Therefore, memory kits must be ordered two (2) at	

Core Options

a time, to reach quads (4 DIMMs) to be installed.

NOTE: DIMMs must be installed in decreasing capacity with the largest DIMMs installed in the lowest numbered slots.
NOTE: Each hard partition (nPar) requires at least one (1) quad of memory DIMMs

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

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

HP 1.2TB 12G SAS 10K rpm SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive	785079-B21
HP 900GB 12G SAS 10K rpm SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive	785075-B21
HP 600GB 12G SAS 10K rpm SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive	785073-B21
HP 450GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581284-B21
HP 300GB 12G SAS 15K rpm SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive	785099-B21
HP 450GB 12G SAS 15K rpm SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive	785101-B21
HP 600GB 12G SAS 15K rpm SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive	785103-B21
HP 300GB 12G SAS 10K rpm SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive	785071-B21
HP 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512547-B21

NOTE: Though the disks are 6Gb/12Gb, implementation of the embedded HP Smart Array SAS RAID controller limits performance of disks
NOTE: Please see the QuickSpecs for Technical Specifications and additional information related to HDDs:
http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html
(Worldwide)

12G SAS Hot Plug Enterprise Performance Solid State Drives

HP 200GB 12G SAS Write Intensive SFF 2.5-in 3yr Wty Solid State Drive	802576-B21
HP 400GB 12G SAS Write Intensive SFF 2.5-in 3yr Wty Solid State Drive	802580-B21
HP 800GB 12G SAS Write Intensive SFF 2.5-in 3yr Wty Solid State Drive	802584-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information related to HDDs:
http://h18000.www1.hp.com/products/quickspecs/14038_div/14038_div.html
(Worldwide)

Additional Options

HP Integrity Upgrade Kits	HP Integrity BL8x0c i4 Upgrade Blade **NOTE:** At least one (1) processor must be purchased with each upgrade blade; other components may also be ordered. All processors in the upgraded server blade must be of the same type.	AM394A
	HP Integrity BL8x0c i4 BL2 Blade Link Upgrade **NOTE:** Required for BL870c i4 server blade used in odd slot of c7000 or c3000.	AM395A
	HP BL8x0c i4 Upgrade BL2-c7E Blade Link **NOTE:** Required for BL870c i4 server blade used in even slot of c7000.	AM396A
	HP BL8x0c i4 Upgrade BL2-c3E Blade Link **NOTE:** Required for BL870c i4 server blade used in even slot of c3000.	AM397A
	HP Integrity BL8x0c i4 BL4 Blade Link Upgrade **NOTE:** Required for BL890c i4 server blade used in c7000.	AM398A
	HP BL8x0c i4 Upgrade BL4-c3 Blade Link **NOTE:** Required for BL890c i4 server blade used in c3000.	AM399A
HP Smart Array Controller	HP Smart Array P711m/1G 6Gb FBWC 4-ports Ext Mezzanine SAS Controller **NOTE:** The P711M will function as a SAS RAID controller when connected to MDS600 disk subsystem via the HP BLc 6Gb SAS Switch. In the RAID mode, HP-UX 11i v3 is supported. **NOTE:** The P711m will function as a Pass-Thru when connected to the HP P2000G3 SAS Storage Array via the HP BLc 6Gb SAS Switch. In the Pass-Thru mode, HP-UX 11i v3 is supported. For more details please see QuickSpec: http://h18004.www1.hp.com/products/quickspecs/14035_div/14035_div.html	513778-B21
HP Infiniband Mezzanine Options	HP 4X QDR InfiniBand ConnectX-2 Dual Port Mezzanine HCA for c-Class BladeSystem **NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12586_div/12586_div.html	592519-B21
HP Ethernet Interconnects	HP Virtual Connect FlexFabric 10Gb/24-port Module for c-Class BladeSystem **NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13652_div/13652_div.html	571956-B21
HP USB Options	HP Integrity USB External DVD/RW Drive **NOTE:** The HP Integrity USB External DVD-RW drive solution includes the External DVD drive (AT120B) with 9 inch USB cable, power adaptor, power cable and Y-connector and 6-foot USB extension cable. **NOTE:** The USB Y-connector goes between the extension cable (SH046AA) and the 9-inch USB cable fixed with DVD drive. **NOTE:** The Y-connector should NOT be placed between the server blade and the 6-foot Extension cable.	AT120B
HP Care Pack Services	HP offers a range of support services and additional services. For a complete listing of services, see: HP.com external site: http://www.hp.com/services/bladesystemservices **HP Critical Service**	

QuickSpecs

Additional Options

HP CP 1Y Critical Service	HA112A1
HP CP 3Y Critical Service	HA112A3

Installation Services

HP CP Installation	HA113A1

NOTE: For more information: http://www.hp.com/services/bladesystemservices.

Memory

DIMM installation guidelines:
1. All DIMMs must be DDR3 registered memory modules (R-DIMMs)
2. All four DIMM slots in a memory bank must be populated. For each CPU, the memory blanks are designated as follows: first bank consists of pairs A and B, second bank consists of pairs C and D and the third bank consists of pairs E and F.
3. Banks must be populated in sequential Alphabetic order, starting with bank A and B for CPU0, followed by banks A and B for CPU1, etc.
4. All four DIMMs in a memory bank must be identical. Install identical DIMMs in quads, starting with DIMM pairs A and B CPU0.
5. DIMMs must be installed in decreasing capacity with the largest DIMMs installed in the smallest numbered DIMM slot.

HP Integrity BL890c i4 Server Blade

Standard Memory
32 GB PC3L 10600 DDR3 1333MHz ECC DIMMs (8 x 4 GB DIMMs) or (4 x 8 GB DIMMs)
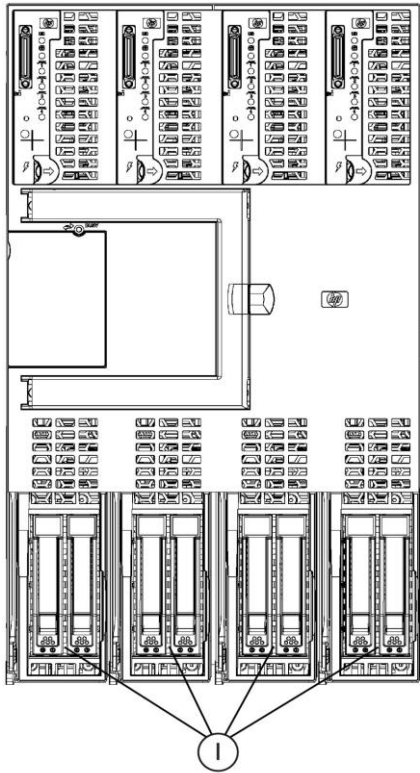Memory Bus Bandwidth: 6.4GT/s

Standard Memory Plus Optional Memory
Up to 1.5 TB of DDR3 registered (R-DIMMs) memory is available.

Following are memory options available from HP:

HP Memory		
	HP BL8x0c i4 8GB (2x4GB) Single Rank PC3L 10600 (DDR3-1333) Registered CAS-9 Memory Kit	AM386A
	HP BL8x0c i4 16GB (2x8GB) Dual Rank PC3L 10600 (DDR3-1333) Registered CAS-9 Memory Kit	AM387A
	HP BL8x0c i4 32GB (2x16GB) Dual Rank PC3L 10600 (DDR3-1333) Registered CAS-9 Memory Kit	AM388A
	The following memory options are also supported as field upgrades (no factory installation)	
	HP Integrity BL8x0c i2 8GB (2x4GB) PC3-10600 Registered CAS 9 Memory Kit	AM327A
	HP Integrity BL8x0c i2 16GB (2x8GB) PC3-10600 Registered CAS 9 Memory Kit	AM328A

NOTE: Must be installed in quads. Therefore, memory kits must be ordered two (2) at a time, to reach quads (4 DIMMs) to be installed.

NOTE: DIMMs must be installed in decreasing capacity with the largest DIMMs in the smallest numbered slots.

NOTE: Each hard partition (nPar) requires at least one (1) quad of memory DIMMs

Storage

1   8 x SFF SAS Hot Plug Hard Drives

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

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

	Quantity Supported	Position Supported	Controller
1.2TB 12G 10K SFF	8	1-8	HP Smart Array p410i Controller
900GB 12G 10K SFF			
600GB 12G 10K SFF			
450GB 6G 10K SFF			
300GB 12G 10K SFF			
300GB 12G 15K SFF			
450GB 12G 15K SFF			
600GB 12G 15K SFF			
146GB 6G 15K SFF			

6G SAS Hot Plug Enterprise Performance Solid State Drives

	Quantity Supported	Position Supported	Controller
200GB/400GB/800GB 12G SAS SLC	8	1-8	HP Smart Array p410i Controller

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Power Specifications

NOTE: The HP Power Advisor is a tool provided by Hewlett-Packard to assist in the estimation of power consumption and proper selection of components including power supplies at a system, rack, and multi-rack level. A variety of additional features are also provided including a condensed bill of materials, a cost of owner ship calculator, and a power report. For additional information please visit: HP Power Advisor: http://h18004.www1.hp.com/products/solutions/power/index.html

Technical Specifications

System Unit	Dimensions	Height	14.42 in (36.63 cm)
		Depth	19.10 in (48.51 cm)
		Width	8.29 in (20.82 cm)
	Shipping Dimensions	Height	20.50 in (54.61 cm)
		Depth	26.00 in (66.04 cm)
		Width	15.94 in (40.49 cm)
	Weight	Maximum	106lbs. (48.08 kg)
	Temperature Range*	Operating	10° to 35° C (50° to 95° F)
		Non-Operating	-40° to 60° C (-40° to 140° F)
		Storage	-20° to 60° C (-4° to 140° F)
		Maximum Wet Bulb Temperature	30° C (86° F)
	Relative Humidity**	Operating	15% to 80%
		Shipping	10% to 90%
		Storage	10% to 90%

*All temperature ratings shown are for sea level. An altitude derating of 1°C per 304.8 m (1.8°F per 1,000 ft) to 3048 m (10,000 ft) is applicable. No direct sunlight allowed. Upper operating limit is 3,048m (10,000 ft) or 70 Kpa/10.1 psia. Upper non-operating limit is 9,144 m (30,000 ft) or 30.3 KPa/4.4 psia.

**Storage maximum humidity of 90% is based on a maximum temperature of 45°C (113°F). Altitude maximum for storage corresponds to a pressure minimum of 70 KPa.

SAS RAID HP p410e Controller	Disk Drive and Enclosure Interface	3Gb SAS (Serial Attached SCSI)
	SAS Connectors	8 internal (SFF8484) x4 wide port connector
	Cache Memory Speed	DDR2-800 memory provides up to 4.2 GB/s maximum bandwidth
	Server Interface	X1 5.0Gbps PCIe provides 1GB/s maximum bandwidth
	SAS Speed	Eight x 1 3G SAS provides 2400MB/s maximum bandwidth
	Cache Memory	Four (4) integrated SAS read only 512MB cache, one per HP Smart Array p410i SAS controller
	Logical Drives Supported	Up to 32 logical volumes
	Maximum Logical Drive Capacity	Up to 64 logical
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space
	RAID Support	RAID 0 (striping) and 1 (Mirroring), and RAID 0+1 (mirrored and striped) (not supported with BL8x0c i4 blades)

Technical Specifications

	Upgradeable Firmware	Upgradeable Firmware with Recovery ROM features Online Drive Flash requires 256MB, 512MB, or 1GB cache module
Embedded Dual NC553i 10Gb 2-port FlexFabric NICs with Flex-10 support	**Network Interface**	10000Base-Sx
	Compatibility	IEEE 802.3ib QoS 802.3x flow control, and 802.3ap 10GBase-KR
	Data Transfer Method	PCI Express, four lanes (x4)
	Network Transfer Rate (Theoretical Maximum Values)	1 Dual 10Gb ports offer up to 40Gb/s bidirectional theoretical throughput
Environment-friendly Products and Approach	**End-of-life Management and Recycling**	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.
		The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.
Regulatory Compliance	**Regulatory Model Number**	RSVLA-BC11
	Electromagnetic Interference	Complies with FCC Rules and Regulations, Part 15, as a Class A digital device. Manufacturer's Declaration to EN55022 Class A, VCCI Registered, Class A, KC (Korea Certification), BMSI Taiwan, CSA Certified, compliant with IEC 60950, UL 60950, EN 60950 and EN41003
	Safety	UL Listed, CSA Certified, TUV GS Mark compliant with EN 60950 and EN 41003
	More detailed regulatory documents and certifications	http://docs.hp.com/en/hw.html

Summary of Changes

Date	Version History	Action	Description of Change:
01-Jun-2015	From Version 7 to 8	Added	Skus added in onfiguration Information - Factory Integrated Models and Core options: • 802576-B21 • 802580-B21 • 802584-B21
		Removed	Skus removed in configuration Information - Factory Integrated Models and Core options: • 632492-B21 • 632494-B21
		Changed	Information updated in storage section.
30-Mar-2015	From Version 6 to 7	Changed	Configuration Information - Factory integrated models and Storage sections were updated
		Added	Skus Added: • 785079-B21 • 785075-B21 • 785073-B21 • 785099-B21 • 785101-B21 • 785103-B21 • 785071-B21
		Removed	Skus deleted: • 718160-B21 • 619291-B21 • 581286-B21 • 627117-B21 • 507127-B21
01-Dec-2014	From Version 5 to 6	Changed	Standard Features, Support Services, Configuration Information - Factory Integrated Models, Core Options and Memory sections were updated
		Added	Technology Services for Integrity Servers and Protect your business beyond warranty with HP Care Pack Services sections were added to Support Services
		Removed	Obsolete skus deleted: • 580151-B21 • 580151-B21
18-Apr-2014	From Version 4 to 5	Changed	Service and Support and Basic Care were revised.
20-Dec-2013	From Version 3 to 4	Changed	Changed a Note in the Processors section.
10-Dec-2013	From Version 2 to 3	Added	HP 1.2TB 6G SAS 10K rpm SFF Dual Port Enterprise 3yr Warranty Hard Drive was added to Hard Drives.
25-Mar-2013	From Version 1 to 2	Changed	Updated the following Sections Overview Section- Verbiage Updated Standard Features- Verbiage Updated Models- Verbiage Updated Configuration Information- Verbiage Updated

Summary of Changes

trademarks of Intel Corporation in the U.S. and other countries.

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

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