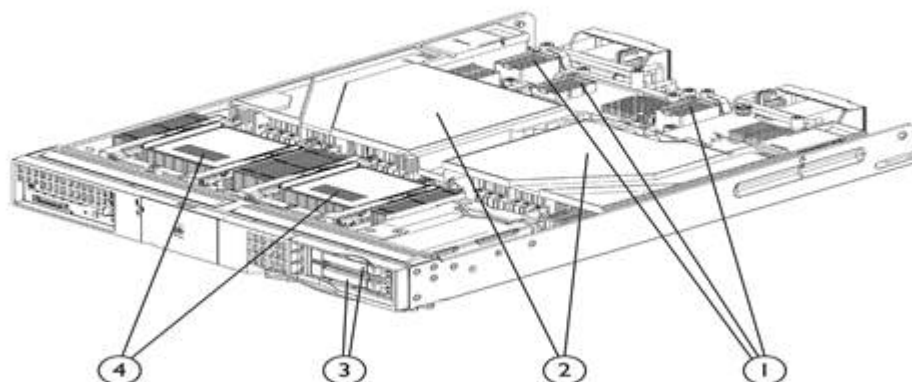


Overview



- | | |
|--|--|
| <ol style="list-style-type: none"> 1. 3 x PCIe Mezzanine Slots 2. 24 x DDR3 DIMM Slots | <ol style="list-style-type: none"> 3. 2 x SFF SAS HDDs, hot-swap bays 4. Two Intel® Itanium® processor 9300 series sockets |
|--|--|

What's New

- Support for HP-UX Virtual Partitions (vPars) v6.0
- Support for HP 300GB 6G SAS 15K SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive
- Support for HP NC553m Dual Port 10Gb FlexFabric Adapter (Ethernet and FCoE)
- Support for HP Smart Array P711m 6G SAS Controller

At A Glance

This document covers the HP Integrity BL860c i2 server blade only. For more information on HP BladeSystem c-Class Enclosures and HP BladeSystem c-Class Interconnect and Mezzanine Components, please see the following:

- 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 BL860c i2 delivers the performance, reliability, and availability on 64-bit operating systems (HP-UX 11i v3, Microsoft Windows® Server 2008 R2 for Itanium-based systems and OpenVMS v8.4) for the ultimate in scalability and flexibility in deployment. To further enrich your cost-efficient, consolidated Integrity blade infrastructure, HP Insight Dynamics - VSE for HP Integrity servers can help with solution components such as HP-UX Virtual Partitions (vPars) v6.0, HP Integrity Virtual Machines, HP Capacity Advisor and Virtualization Manager, HP Global Workload Manager and HP-UX Workload Manager, HP Insight Dynamics - VSE infrastructure orchestration HP Insight Dynamics - VSE Reference Architectures, and HP Serviceguard.

HP Integrity BL860c i2 server blade includes:

- **Processor**
 - Up to two Intel® Itanium® 9300 Series processors
- **Memory**
 - Up to 384 GB of memory. Supporting (24) DDR3 registered memory modules (R-DIMMs)

Overview

- **Storage Controller**
 - Embedded HP p410i SAS RAID Controller integrated on system board
 - RAID 1, RAID 0, and HBA mode configuration options
- **Internal Drive Support**
 - Supports up to (2) two small form factor (SFF) SAS hot plug hard drives
- **Network Controller**
 - Four (4) NIC ports via two (2) embedded NC532i Dual Port Flex-10 Multifunction Server Adapters
 - NOTE Flex-10 capability requires OS drivers and the use of an HP Virtual Connect Flex-10 10GbE Ethernet module. Learn more at www.hp.com/go/virtualconnect
 - NOTE BL8x0c i2 server blades require Virtual Connect 3.00 or later when used in Virtual Connect configurations
 - NOTE Each port is autosensing 1Gb/10Gb, and can interoperate with 1Gb HP BladeSystem c-Class interconnect components
 - Plus one (1) additional 10/100 NIC dedicated to Integrity iLO 3 Management
- **Mezzanine Support**
 - Three (3) additional I/O expansion slots via mezzanine cards.
 - Supports up to (3) mezzanine cards
 - HP NC553m Dual Port 10Gb FlexFabric Adapter
 - HP NC551m Dual Port 10Gb FlexFabric Adapter
 - HP NC552m 10Gb 2-port Flex-10 Ethernet Adapter
 - HP NC532m Dual Port Flex-10 10GbE BL-c Adapter
 - 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**
 - One (1) internal USB port on the BL860c i2
 - Two (2) External USB ports on the BL860c i2 via SUV cable
- **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 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
- **Virtualization with HP Insight Dynamics - VSE** www.hp.com/go/insightdynamics/integrity
 - Advanced Infrastructure Management
 - HP Capacity Advisor
 - HP Virtualization Manager
 - HP Global Workload Manager and HP-UX Workload Manager
 - HP Insight Dynamics - VSE infrastructure orchestration
 - HP Systems Insight Manager
 - Partitioning Continuum

Overview

- HP-UX Virtual Partitions (vPars) v6.0
- HP Integrity Virtual Machines (with HP-UX guest OS's and Windows Guest OS's)
- HP Process Resource Manager/pSets
- Secure Resource Partitions
- Continuous availability
 - HP Serviceguard for HP-UX 11i
 - HP Serviceguard Extensions for SAP
 - HP Serviceguard Extensions for Faster Failover
- HP Insight Dynamics - VSE Reference Architectures
- **Form Factor**
 - HP Integrity BL860c i2 server blade is a full-height, BladeSystem c-Class form factor. The BL860c i2 server blade plugs into the BladeSystem enclosure. In the c7000 enclosure, 8 server blades are supported per 10U enclosure. 4 enclosures can be configured to a standard 42U rack—32 BL860c i2 server blades can be configured in a fully populated rack. In the c3000 enclosure, 4 BL860c i2 server blades are 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 8 HP Integrity BL860c i2 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 up to 4 HP Integrity BL860c i2 servers 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. Hard drives have either a one year or three year warranty—refer to specific hard drive QuickSpecs for details.
- **NEBS Compliance**
 - The HP BladeSystem c7000/BL860c i2 configuration offers a NEBS Level 3 DC powered option, which enables equipment operability in network facility environments. NEBS compliance is a requirement for Telecom Carriers and their Equipment Providers that are seeking to install equipment in central offices. They view compliance as key to ensuring personnel safety, protection of property, and operational reliability. There are three distinct certification levels specified in SR-3580, Network Equipment-Building System (NEBS) Criteria Levels. All carrier-grade (CG) products released by HP are evaluated to the NEBS Level 3 criteria, which provides the maximum assurance of equipment operability in network facility environments. The Physical Components are described in GR-63-CORE, while the Electromagnetic Compatibility (EMC) and Safety components are described in GR-1089-CORE.
 - This BL860c i2 system has met NEBS Level 3 and ETSI Certifications—NEBS NRTL Certified to NEBS Level-3 Criteria (GR-63-CORE, GR-1089-CORE) and ETSI Certified to EN 300 019, EN 300 386, and EN 300 753.

Standard Features

Processor

One of the following depending on Model

Quad-Core Processors

Intel® Itanium® 9320 (1.33GHz/4-core/16MB/155W)†up to 1.46 GHz with Turbo) Processor

Intel® Itanium® 9340 (1.6GHz/4-core//20MB/185W)†up to 1.73 GHz with Turbo) Processor

Intel® Itanium® 9350 (1.73GHz/4-core/24MB/185W)†up to 1.86 GHz with Turbo) Processor

Dual-Core Processor

Intel® Itanium® 9310 (1.6GHz/2-core/10MB/130W) Processor

Upgradeability

Upgradeable to two (2) processors

NOTE—The HP Integrity BL860c i2 only supports 1 or 2 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

Chipset

Intel Boxboro

Memory

Type DDR3 registered memory modules (R-DIMMs)

Minimum 8 GB (4 x 2 GB DIMMS or 2 x 4 GB DIMMs)

Maximum 384 GB (24 x 16 GB)

NOTE—Memory modules are DIMM pairs.

NOTE—Double Chip Spare is enabled in pairs of DIMMs. Double Chip Spare requires identical DIMM types and capacities. Double Chip Spare is not supported with 2GB DIMMs†when any number of 2GB DIMMs are installed in the system, there is no double chip spare.

Network Adapter

Four (4) NIC ports via (2) NC532i Dual Port Flex-1010GbE Multifunction Server Adapter

NOTE—Flex-10 capability requires OS drivers and the use of an HP Virtual Connect Flex-10 10GbE Ethernet module. Learn more at www.hp.com/go/virtualconnect

NOTE—BL8x0c i2 server blades require Virtual Connect 3.00 or later

NOTE—Each part is autosensing 1Gb/10Gb, and can interoperate with 1Gb HP BladeSystem c-Class interconnect components.

One (1) additional 10/100 NIC dedicated to Integrity iLO 3 Management

Up to twelve additional Gigabit Ethernet ports via the NC364m Quad-port mezzanine adapter or six additional 10 Gigabit Ethernet ports via the NC552m or the NC532m dual-port mezzanine adapters.

Expansion Slots

Three Mezzanine slots, two (2) Type II and one (1) 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

HP p410i 3Gb SAS Controller

2 SAS Channels (one to each HDD)

Supports RAID 1, RAID 0, and HBA mode options

Zero (0) cache, no cache options

Standard Features

Maximum Internal Storage	Hot Plug SAS	1.8TB SAS	2 x 900GB SAS
Graphics	Integrated ATI RN-50 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	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 i2 server blades require Virtual Connect 3.15 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 i2 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= <ul style="list-style-type: none"> • 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 		
Fiber Channel Support	Optional Fibre Channel HBAs are supported by the HP Integrity BL860c i2. The mezzanine circuit board connects directly to the server blade system board. 8Gb Fibre Channel Host Bus Adapters= <ul style="list-style-type: none"> • 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= <ul style="list-style-type: none"> • 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 		
Compatible SAN	HP Integrity BL860c i2 server blades are optimized for HP Storage MSA, EVA, and XP products.		

Standard Features

Smart Array Controller Support

Optional Smart Array Controller is supported by BL860c i2. 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://www8.hp.com/h20195/v2/GetDocument.aspx?docname=c04111558>

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 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 BL860c i2 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
- Software Package Builder
- Dynamic Root Disk (DRD)

● Monitor

- HP Systems Insight Manager
- HP System Management Homepage
- Glance Plus Pak
- Performance Manager and Agent
- HP Serviceguard Manager

● Control

- HP Integrity Integrated Lights-Out (iLO) 3 (standard with BL860c i2 servers)
- Integrity iLO 3 Advanced Pack license (included with BL860c i2 servers)

● Protect

Standard Features

- HP-UX Bastille
- Secure Resource Partitions
- Data Protector Software
- Software Assistant (SWA)
- **Optimize**
 - HP Capacity Advisory
 - HP Virtualization Manager
 - HP-UX Workload Manager
 - HP Global Workload Manager
 - Process Resource Manager
 - HP Insight Power Manager
 - HP-UX 11i v3 power management
- **Provision**
 - HP Insight Dynamics - VSE infrastructure orchestration
- **Integrate**
 - HP Business Technology Optimization
 - IT Management Software
 - HP Insight Dynamics - VSE for HP Integrity server blades
- **Learn More**
 - For additional information on HP Integrity server blade management software please visit <http://h18004.www1.hp.com/products/servers/integrity-bl/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://www.hp.com/go/integrityessentials
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 and HP OpenView Performance Agent. 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 Insight Dynamics - VSE, HP Capacity Advisor offers the industry's first lightweight, integrated tool for ongoing	

Standard Features

	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	The configuration management component of HP Insight Dynamics - VSE, HP Virtualization Manager provides a central point of control that allows you to manage all the resources in your environment, providing a powerful way to connect IT resources to real business needs. With its easy-to-use interface you can see all your available virtual and physical resources and how they are being used.
HP Integrity Integrated Lights-Out (iLO) 3 (factory integrated with BL860c i2)	HP Integrity Integrated Lights-Out (iLO) management processors make it simpler, faster, and less costly to remotely manage your Integrity servers. HP Integrity iLO 3 ships with a built-in Advanced Pack License. iLO Advanced features enabled in this release—Virtual Media, LDAP directory services, 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 new 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— <ul style="list-style-type: none"> ● 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.
HP Serviceguard Manager	HP Serviceguard Manager is a graphical user interface (GUI) that provides configuration, administration, and monitoring capabilities for Serviceguard, Serviceguard Extension for 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 and Integrity 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 Insight Dynamics - VSE for HP Integrity servers	HP Insight Dynamics - VSE is advanced lifecycle management software for HP Integrity servers which allows you to instantly adjust to dynamic business demands - with the new addition of infrastructure orchestration, not only can

Standard Features

	<p>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.</p>
HP-UX Software Assistant (SWA)	<p>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.</p>
HP-UX Workload Manager	<p>HP-UX Workload Manager (HP-UX WLM) is a resource management tool that provides automatic CPU resource allocation and application performance management based on your service-level objectives (SLOs) and business priorities. WLM is most effective managing applications that are CPU-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.</p>
HP Global Workload Manager	<p>The workload management capability for HP Integrity servers is provided by the HP Global Workload Manager component of HP Insight Dynamics - 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.</p>
HP Insight Dynamics infrastructure orchestration	<p>HP Insight Dynamics infrastructure orchestration 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, Insight Dynamics 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.</p>
Performance Manager and Agent	<p>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.</p>
Process Resource Manager	<p>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-</p> <ul style="list-style-type: none"> ● 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
Secure Resource	<p>One method that HP Insight Dynamics - VSE uses to improve server resource</p>

Standard Features

Partitions	utilization is to consolidate multiple applications within a single operating system image. Secure Resource Partitions combine kernel level security and provide resource management to stack multiple applications within the same operating system. HP Process Resource Manager and HP-UX Workload Manager can dedicate specific resources to specific applications within an operating system image, avoiding resource contention issues. Using HP-UX 11i v3 Security Containment, organizations can ensure that application instances cannot access processes or files 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 a Secure Resource Partition can be capped.
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.

OS Support

HP-UX 11i v3 Data Center Operating Environment (DC-OE)
 HP-UX 11i v3 Virtual Server Operating Environment (VSE-OE)
 HP-UX 11i v3 High Availability Operating 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>

OpenVMS 8.4 (choice of Mission Critical, Enterprise, or Foundation Operating Environment)

NOTE For more complete and up to date information on OpenVMS support, please visit the OpenVMS website at www.hp.com/go/openvms

Microsoft Windows Server 2008 for Itanium-based systems

NOTE For more complete and up to date information on Windows support, please visit the Windows website at www.hp.com/go/integrity/windows

Supported Software Options

HP Insight Dynamics - VSE for HP Integrity servers (included within both the VSE-OE and DC-OE), which includes the following capabilities for Integrity blades:

- HP-UX Virtual Partitions (vPars) v6.0
- HP Integrity Virtual Machines for HP-UX
- HP Virtualization Manager
- HP Capacity Advisor
- HP-UX Workload Manager or HP Global Workload Manager
- HP Online Integrity VM Guest Migration
- HP Secure Resource Partitions
- HP Serviceguard for HP-UX 11i
- HP Serviceguard Manager
- HP Serviceguard Extensions for SAP
- HP Serviceguard Extensions for Faster Failover
- HP Insight Control power management
- GlancePlus Pak
- Performance Manager and Agent

Intelligent Manageability

HP Integrity Integrated Lights-Out 3 (iLO 3)
 Virtual serial console (Multiple, mirrored sessions, with previous context and console log buffer)

Standard Features

Virtual Power Button Control
 LDAP Directory Services
 iLO 3 power measurement and 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 BL860c i2 server blade. iLO 3 Advanced Pack features enabled in this release are Virtual Media, LDAP Directory Services Integration, iLO power measurement, and integration with Insight power manager.

Availability

Dual-Port Fibre Channel Mezzanine Card for redundant SAN connection
 Two hot-plug SAS hard drive bays and integrated RAID (HP Smart Array p410i) controller 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-OE, HA-OE or DC-OE)
- 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*
- NEBS Level 3 Certified (GR-63-CORE, GR-1089-CORE)

NOTE=*Fee based software products.

Industry Standard Compliance

- ACPI 2.0 Compliant
- PCIe 2.0 Compliant
- WOL Support
- USB 2.0 Support

Security

Hardware Security

- Administrator's password
-



Standard Features

- 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

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

Standard Features

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

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

SCE is a guided self service tool to help sales and non technical people provide customers with initial

Standard Features

Configurator

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 a 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>

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.

NOTE—Care Pack Services availability may vary by product and country.

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 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 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

Support Services

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

HP Integrity BL860c i2 Base Model

<p>HP Integrity BL860c i2 (2P) AD399A</p>	<p>Processor(s) Supports up to two (2) processors</p> <p>Cache Memory</p> <p>Memory</p> <p>Network Adapter</p>	<p>Two (2) processor sockets—processor modules are configured to order</p> <p>Included with processors</p> <p>Twenty four (24) DIMM sockets—memory DIMMs are configured to order.</p> <p>Four (4) NIC ports via (2) NC532i Dual Port Flex-10/10GbE Multifunction Server Adapter</p> <p>NOTE—Flex-10 capability requires OS drivers and the use of an HP Virtual Connect Flex-10 10GbE Ethernet module. Learn more at www.hp.com/go/virtualconnect</p> <p>NOTE—BL8x0c i2 server blades require Virtual Connect 3.00 or later when used in Virtual Connect configurations</p> <p>NOTE—Each part is autosensing 1Gb/10Gb, and can interoperate with 1Gb HP BladeSystem c-Class interconnect components.</p>
	<p>Storage Controller</p>	<p>One (1) additional 10/100 NIC dedicated to Integrity iLO 3 Management Integrated HP Smart Array p410i SAS Controller</p>
	<p>Hard Drives</p>	<p>Two SFF SAS drive bays—hard disk drives are configured to order</p>
	<p>IO expansion</p>	<p>Three PCIe mezzanine card slots (PCIe Gen2 x8 interface)—mezzanine cards are configured to order.</p>
	<p>Optical Drive</p>	<p>None internal to blade server</p>
	<p>Integrity iLO 3</p>	<p>Integrity iLO 3 and Integrity iLO 3 Advance Pack license included.</p>
	<p>Form Factor</p>	<p>Up to 8 supported in HP BladeSystem c7000 Enclosure Up to 4 supported in HP BladeSystem c3000 Enclosure</p>

Configuration Information - Factory Integrated Models

NOTE This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on CTO product offerings and requirements.

NOTE HP does not allow factory integration of options into standard models listed above.

Configure-to-order servers must start with a CTO Chassis.

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

Step 1 Base Server Blade Configuration

HP Models	<p>HP Integrity BL860c i2 Server Blade AD399A</p> <p>NOTE Adding Option code 0D1 to the Server Blade PN will integrate the configured blade into the enclosure (which must be on the same order).</p> <p>Configurable Model ships with</p> <ul style="list-style-type: none"> Four embedded 10 GB Ethernet NIC ports with Flex-10 support plus (1) additional 10/100 NIC dedicated to Integrity iLO 3 Management Integrated HP Smart Array p410i SAS Controller for internal HDDs Two small form factor (SFF) SAS hot plug hard drive bays HP Integrity Integrated Lights-Out 3
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Step 2 Choose Required Options (one of the following from each list unless otherwise noted)

HP Processors	<p>NOTE Select minimum one (1) and maximum two (2) processors.</p> <p>Quad-Core Processors</p> <ul style="list-style-type: none"> HP BL8x0c i2 Itanium 9320 (1.33GHz/4-core/16MB/155W) Processor Kit AH386A HP BL8x0c i2 Itanium 9340 (1.6GHz/4-core//20MB/185W) Processor Kit AH387A HP BL8x0c i2 Itanium 9350 (1.73GHz/4-core/24MB/185W) Processor Kit AH388A <p>Dual-Core Processor</p> <ul style="list-style-type: none"> HP BL8x0c i2 Itanium 9310 (1.6GHz/2-core/10MB/130W) Processor Kit AH385A
HP Memory	<p>NOTE Select minimum one (1) (2x4GB DIMMs) module or two (2) (2x2GB DIMMs) per server, and maximum of six (6) modules per server (12 modules if 2 processors ordered)</p> <ul style="list-style-type: none"> HP BL8x0c i2 4GB (2x2GB) PC3-10600 Registered CAS 9 Memory Kit AM326A 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 HP BL8x0c i2 32GB (2x16GB) PC3-10600 Registered CAS-9 Memory Kit AM363A <p>NOTE Memory Modules consist of pairs of DIMMs.</p> <p>NOTE DIMMs must be installed in pairs.</p> <p>NOTE Minimum memory requirement is 8GB.</p>

Step 3 Choose Additional Options for Factory Integration

HP Hard Drives	<p>NOTE Hard drives have either a one year or three year warranty refer to specific hard drive QuickSpecs for details.</p> <p>SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives</p> <ul style="list-style-type: none"> 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
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Configuration Information - Factory Integrated Models

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 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
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NOTE— Provides four additional Gigabit Ethernet ports per I/O expansion slot.
NOTE— BL860c i2 supports HP Virtual Connect Ethernet Interconnect Modules. See <http://www.hp.com/go/bladefactory/virtualconnect> for complete details.

HP NC360m Dual Port 1GbE BL-c Adapter	445978-B21
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NOTE— Provides two additional Gigabit Ethernet ports per I/O expansion slot.

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

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

QLogic QMH2562 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	451871-B21
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Emulex LPe1205 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	456972-B21
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NOTE— BL860c i2 supports HP Virtual Connect Fibre Channel Interconnect Modules. See <http://www.hp.com/go/bladefactory/virtualconnect> for complete details.

HP Infiniband Mezzanine Options

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

Configuration Information - Factory Integrated Models

[specifications.html](#)

HP Security - TPM

HP Integrity BL8x0c i2 Trusted Platform Module

AM331A

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	447883-B21
	NOTE Provides four additional Gigabit Ethernet ports per each I/O expansion slot.	
	HP NC360m Dual Port 1GbE BL-c Adapter	445978-B21
	NOTE Provides two additional Gigabit Ethernet ports per each I/O expansion slot.	
	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 Provides Flex-10 connectivity when used in conjunction with the 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 Fiber 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	Quad-Core Processors	
	HP BL8x0c i2 Itanium 9320 (1.33GHz/4-core/16MB/155W) Processor Kit	AH386A
	HP BL8x0c i2 Itanium 9340 (1.6GHz/4-core//20MB/185W) Processor Kit	AH387A
	HP BL8x0c i2 Itanium 9350 (1.73GHz/4-core/24MB/185W) Processor Kit	AH388A
	Dual-Core Processor	
	HP BL8x0c i2 Itanium 9310 (1.6GHz/2-core/10MB/130W) Processor Kit	AH385A
	NOTE HP Integrity BL860c i2 processor upgrade kits contain one processor. Processors in a given server blade must be identical. No mixing of processor models is allowed.	
	NOTE The Integrity BL860c i2 only supports 1 or 2 processor configurations.	

HP Memory	HP BL8x0c i2 4GB (2x2GB) PC3-10600 Registered CAS 9 Memory Kit	AM326A
	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
	HP BL8x0c i2 32GB (2x16GB) PC3-10600 Registered CAS-9 Memory Kit	AM363A
	NOTE Memory Modules consist of pairs of DIMMs.	
	NOTE DIMMS must be installed in pairs.	
	NOTE Double chip sparing is not supported if 2GB DIMMs are present in the server.	

Core Options

NOTE—DIMMs must be installed in decreasing capacity with the largest DIMMs installed in the lowest numbered slots.

HP Hard Drives

NOTE—Hard drives have either a one year or three year warranty—refer to 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 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 Smart Array Controller	<p>HP Smart Array P711m/1G 6Gb FBWC 4-ports Ext Mezzanine SAS Controller</p> <p>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.</p> <p>NOTE— The P711mM 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.</p> <p>For more details please see QuickSpecs— http://h18004.www1.hp.com/products/quickspecs/14035_div/14035_div.html</p>	513778-B21
Optional Upgrade		
	<p>HP Smart Array P-Series Low Profile Battery</p> <p>NOTE— The P700M will function as a SAS RAID controller when connected to MDS600 disk subsystem via the Storage 3Gb SAS Switch. In the RAID mode, HP-UX 11i v3 and Integrity for Windows 6.2 are supported.</p> <p>NOTE— The P700M will function as a Pass-Thru when connected to the MSA2300sa G2 SAS Storage Array via the Storage 3Gb SAS Switch. In the Pass-Thru mode, HP-UX 11i v3 and Integrity for Windows 6.2 are supported.</p> <p>NOTE— The optional battery is required for Advanced Data Guarding (enabled with SSAP), RAID 6, and is highly recommended for RAID 5 implementations</p> <p>NOTE— Please see the QuickSpecs for Technical Specifications and additional information— http://h18000.www1.hp.com/products/quickspecs/13175_div/13175_div.html</p>	452348-B21
HP Infiniband Mezzanine Options	<p>HP 4X QDR InfiniBand ConnectX-2 Dual Port Mezzanine HCA for c-Class BladeSystem</p> <p>NOTE— Please see the QuickSpecs for Technical Specifications and additional information— http://h18000.www1.hp.com/products/quickspecs/12586_div/12586_div.html</p>	592519-B21
HP Ethernet Interconnects	<p>HP Virtual Connect FlexFabric 10Gb/24-port Module for c-Class BladeSystem</p> <p>NOTE— Please see the QuickSpecs for Technical Specifications and additional information— http://h18000.www1.hp.com/products/quickspecs/13652_div/13652_div.html</p>	571956-B21
HP Storage Blades	<p>HP D2200sb PCIe Storage Blade</p> <p>NOTE— Please see QuickSpecs for Technical Specifications and additional options at— http://h18004.www1.hp.com/products/quickspecs/13714_div/13714_div.html</p>	AP880A
HP USB Options	<p>HP Integrity USB External DVD/RW Drive</p> <p>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.</p> <p>NOTE— The USB Y-connector goes between the extension cable and the 9-inch USB cable fixed with DVD drive.</p> <p>NOTE— The Y-connector should NOT be placed between the server blade and the 6-foot Extension cable.</p>	AT120B

Additional Options

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

HP Critical Service

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/bladessystemservices>

Memory

DIMM installation guidelines²

1. All DIMMs must be DDR3 registered memory modules (R-DIMMs)
2. Both DIMM slots in a memory bank must be populated. A memory bank in this case is identical with a memory pair. A PCU will drive banks A through F.
3. Banks must be populated in sequential Alphabetic order, starting with bank A for CPU0, followed by bank A for CPU1, etc.
4. Both DIMMs in a memory bank must be identical.
5. DIMMs must be installed in decreasing capacity with the largest DIMMs installed in the smallest numbered DIMM slot.

HP Integrity BL860c i2 Server Blade

Standard Memory

8 GB Registered PC3-10600 DDR3 1333MHz ECC DIMMs (2 x 4 GB)
 Memory Bus Bandwidth²=4.8GT/s

Standard Memory Plus Optional Memory

Up to 384GB of DDR3 registered memory is available.

Following are memory options available from HP²

HP Memory	HP BL8x0c i2 4GB (2x2GB) PC3-10600 Registered CAS 9 Memory Kit	AM326A
	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
	HP BL8x0c i2 32GB (2x16GB) PC3-10600 Registered CAS-9 Memory Kit	AM363A

NOTE²—Must be installed in pairs.

NOTE²—DIMMs must be installed in decreasing capacity with the largest DIMMs smallest numbered slot.

Storage

1 2 x SFF SAS Hot Plug Hard Drives



Hard Drives

SAS Hot Plug SFF Enterprise (ENT) Drives

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

	Quantity Supported	Position Supported	Controller
	2	1-2	HP Smart Array P410i Controller
1.2TB 12G 10K SFF			
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

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

	Quantity Supported	Position Supported	Controller
	2	1-2	HP Smart Array P410i Controller
200GB/400GB/800GB			
6G SLC SFF			

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 ownership 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	20.02 in (50.85 cm)
		Width	2.03 in (5.16 cm)
	Shipping Dimensions	Height	21.50 in (54.61 cm)
		Depth	26.0- in (66.04 cm)
		Width	10.00 in (25.4 cm)
	Weight	Maximum	26.5 lbs (12.02 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.

Embedded SAS RAID HP Smart Array p410i Controller	Disk Drive and Enclosure Interface	3Gb SAS (Serial Attached SCSI)
	SAS Connectors	2 internal (SFF8484) x4 wide part connectors
	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	Two x1 3G SAS provide 600MB/s maximum bandwidth.
	Cache Memory	Not supported.
	Logical Drives Supported	Up to 2 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), RAID 1 (mirroring), and 1+0 (Mirrored and Striped) (not supported with BL8x0c i2 blades)
	Upgradeable Firmware	Upgradeable Firmware with Recovery ROM features Online Drive Flash requires 256MB, 512MB, or 1GB cache module

Embedded Dual NC532i 10 Gigabit NICs	Network Interface	1000Base-Sx
	Compatibility	IEEE 802.1p QoS 802.3x flow control, and 802.3ap 10GBase-KR
	Data Transfer Method	PCI Express, four lanes (x4)
	Network Transfer Rate (Theoretical Maximum Values)	1Dual 10Gb parts offer up to 40Gb/s bidirectional theoretical throughput

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.

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.

Summary of Changes

Date	Version History	Action	Description of Change
01-Jun-2015	From Version 21 to 22	Changed	Information updated in storage section.
		Added	Skus added in Configuration 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
30-Mar-2015	From Version 20 to 21	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 19 to 20	Changed	Standard Features, 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 507125-B21 512545-B21 580151-B21 508226-B21 411243-B21 BS580A AQ697A
18-Apr-2014	From Version 18 to 19	Changed	Service and Support and Basic Care were revised.
10-Dec-2013	From Version 17 to 18	Added	HP 1.2TB 6G SAS 10K rpm SFF Dual Port Enterprise 3yr Warranty Hard Drive was added to Hard Drives.
24-Sep-2012	From Version 16 to 17	Changed	Changes made in Standard Features section.
07-May-2012	From Version 15 to 16	Changed	Memory was revised throughout.
10-Feb-2012	From Version 14 to 15	Changed	Changes made to the USB Options sections. And the Support Services section was added.

Summary of Changes

14-Nov-2011	From Version 13 to 14	Changed	FlexFabric Support, Smart Array Controller Support, Supported Software Options, HP FlexFabric Mezzanine Options and Hard Drives were revised.
30-Sep-2011	From Version 12 to 13	Changed	Changes made within the Overview, Standard Features, Configuration Information and Options sections.
02-Aug-2011	From Version 11 to 12	Changed	Hard Drives Descriptions changes made.
20-Jun-2011	From Version 10 to 11	Changed	6G SAS Hot Plug Enterprise Performance Solid State Drives were added to Hard Drives
09-May-2011	From Version 9 to 10	Changed	<p>HP Ultrium Tape Drives were removed from Additional Options</p> <p>Processor descriptions were revised</p> <p>Maximum internal storage was increased to 1.8TB</p> <p>HP 900GB 6G SAS 10K rpm SFF Enterprise Drive was added to Hard Drives</p>
15-Apr-2011	From Version 8 to 9	Added	<p>FlexFabric Support and InfiniBand Support were added to Standard Features</p> <p>HP BLc NC551m Dual Port FlexFabric 10Gb Converged Network Adapter was added to HP Ethernet Mezzanine Options</p> <p>HP c-Class Mezzanine Options was added to Step 3</p>
18-Mar-2011	From Version 7 to 8	Changed	<p>HP Ethernet Interconnects was added to Additional Options</p> <p>Processors, Memory and Hard Drive product descriptions were revised</p> <p>HP USB Options was added to Standard Features and Additional Options</p>
15-Nov-2010	From Version 6 to 7	Changed	Smart Array Controller product descriptions were modified and HP BL8x0c i2 32GB (2x16) PC3-10600R-9 Kit was added to Memory.
08-Oct-2010	From Version 5 to 6	Changed	Hot Plug SAS Maximum Internal Storage was increased to 1.2TB, 8Gb Fibre Channel Host Bus Adapter product descriptions were revised in Fibre Channel Support, Smart Array Controller Support was updated, HP 450GB and 600GB 6G SAS 10K rpm SFF Dual Port Enterprise Hard Drives were added to Hard Drives and ProLiant BL c-Class Enclosure and Server Blade Hardware Installation and Delivers onsite hardware installation, system configuration and startup of server platforms and components were removed from HP Care Pack Series.
20-Aug-2010	From Version 4 to 5	Changed	Note was added to HP Onboard Administrator in Glossary of Integrity Server Blades Management Software Product Description and HP BladeSystem c3000 tower enclosure was removed from At A Glance Enclosure.
09-Aug-2010	From Version 3 to 4	Changed	Revised the images to reflect the correct callout line style.
19-Jul-2010	From Version 2 to 3	Changed	<p>Maximum memory was increased to 192 GB</p> <p>Power Specifications note was completely revised</p> <p>What's New was added to the Overview</p> <p>OpenVMS 8.4 and Microsoft Windows Server 2008 for</p>

Summary of Changes

07-May-2010	From Version 1 to 2	Changed	Itanium-based systems were added to OS Systems HP BL8x0c i2 16GB Memory was added Changes made within the Standard Features, Models and Technical Specifications sections.
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