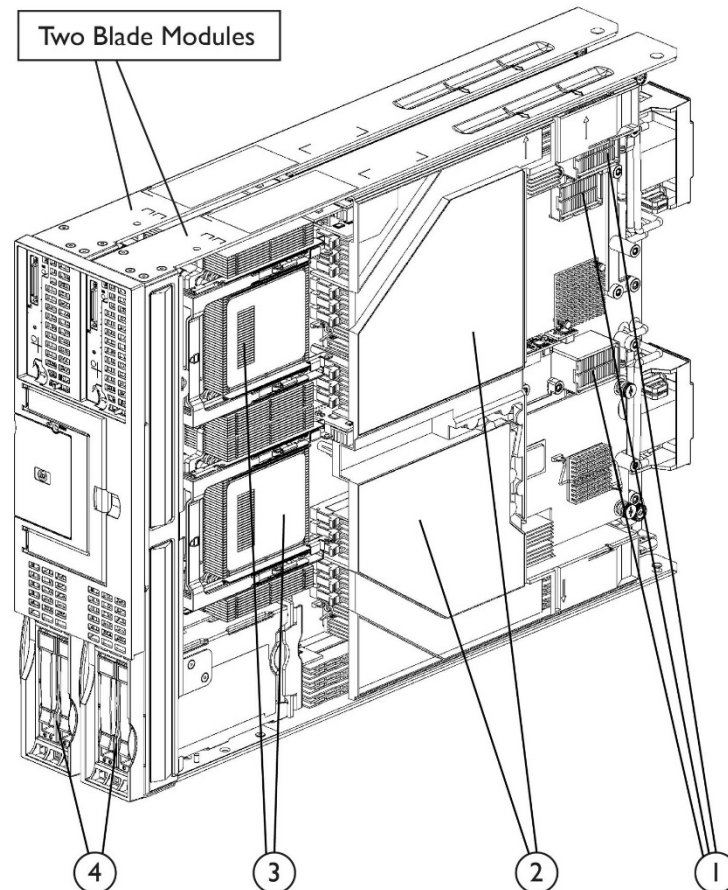## Overview

HPE Integrity BL870c i6 Server Blade

1. 6 x PCIe mezzanine slots (per BL870c i6)

2. 48 x DDR3 DIMM slots (per BL870c i6)

3. 4 x Intel® Itanium® processor 9700 series sockets (per BL870c i6)

4. 4 x SFF SAS HDDs, hot-swap bays (per BL870c i6)

What's New

- Intel® Itanium® processor 9700 series 8-core and 4-core processors
- Higher Frequency and Low Voltage PC3L-12800 Registered CAS 11 Memory DIMMs
- Supports the HP-UX 11iv3 2018 OEUR which has significant enhancements in data management (Veritas 6.1 default installed), Virtualization (un-capped vPars warning), high availability (Serviceguard SMS certified with Oracle RAC 12cR2), Java and Open Source (CIFS, BIND, Apache, PHP updates), Security (deactivate online CPU migration in SRP containers) and, manageability (HP-UX in private cloud environments through HPE Helion OpenStack)
- Support for newer networking and storage solutions, such as the HPE 10GbE Pass-Thru Module II, 3PAR 9450, MSA 2050 and MSA 2052, 12Gb/s SAS and Pure Storage FlashArray//M™.

Hewlett Packard Enterprise

Overview

- Supports the latest HPE Storage arrays – XP7 and 3PAR 8000/2000 All Flash Storage to significantly boost performance and lower TCO
- HPE nPartitions (nPars) for BL8x0c i6 servers, for optimal allocation of resources to manage total cost of ownership and improved mission critical resiliency
- VSI OpenVMS V8.4-2L1 supports BL870c i6 servers. It includes a new release of OpenSSL and Secure Web Server (SWS) for OpenVMS based on Apache HTTP Server Version 2.4-12

At A Glance

This document covers the HPE Integrity BL870c i6 server blade only. For more information on HPE BladeSystem c-Class Enclosure and HPE BladeSystem c-Class Interconnect and Mezzanine Components, please see the following:

- HPE BladeSystem c3000 Enclosure QuickSpecs:
  https://h20195.www2.hpe.com/v2/GetDocument.aspx?docname=c04123379
- HPE BladeSystem c7000 Enclosure QuickSpecs:
  https://h20195.www2.hpe.com/v2/GetDocument.aspx?docname=c04229580
- HPE BladeSystem c-Class Interconnect and Mezzanine Components
- HPE Virtual Connect
  https://www.hpe.com/us/en/integrated-systems/virtual-connect.html
- HPE Server Interconnects
  https://www.hpe.com/us/en/product-catalog/servers/server-interconnects.hits-12.html
- HPE Server Adapters
  https://www.hpe.com/us/en/product-catalog/servers/server-adapters.hits-12.html

The HPE Integrity BL870c i6 delivers the performance, reliability, and availability on HPE'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) v6.4, HPE Integrity Virtual Machines (Integrity VM), HPE Capacity Advisor, HPE Global Workload Manager, and automation through Hewlett Packard Enterprise infrastructure Orchestration. Additionally, High Availability OE (HA-OE) provides high availability via the HPE 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.

HPE Integrity BL870c i6 server blade includes:

- **Processor**:
    - Up to four Intel® Itanium® 9700 Series processors

- **Memory**:
    - Up to 768 GB of memory. Supporting (48) DDR3 registered memory modules (R-DIMMs)

- **Storage Controller**:
    - Two (2) Embedded HPE Smart Array p410i SAS Controllers
    - RAID 1, RAID 0, and HBA mode configuration options
    - Two (2) Embedded SAS read only 512MB cache, one per HPE Smart Array p410i Controller

- **Internal Drive Support**:
    - Supports up to (4) four small form factor (SFF) SAS hot plug hard drives

- **Network Controller**:
    - Eight (8) Integrated HPE 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 HPE Virtual Connect FlexFabric module. Learn more at: **http://www.hpe.com/info/virtualconnect**
      NOTE: BL8x0c i6 server blades require Virtual Connect 3.70 or later when used in Virtual Connect configurations
    - Plus one (1) additional 10/100 NIC dedicated to Integrity iLO 3 Management

Overview

- **Mezzanine Support**:
    - Six (6) additional I/O expansion slots via mezzanine cards.
    - Supports up to (6) mezzanine cards
        - HPE NC553m Dual Port 10Gb FlexFabric Adapter
        - HPE Emulex LPe1205 8Gb FC BL-c HBA (2-port 8Gb Emulex FC HBA)
        - HPE QMH 2562 8Gb FC BL-c HBA (2-port 8Gb QLogic FC HBA)
        - HPE Smart Array P711m/1G FBWC Controller

- **USB Support**:
    - Two (2) Internal USB ports on the BL870c i6
    - Two (2) External USB ports on the BL870c i6 via SUV cable

- **Management**:
    - HPE Integrity Server Blades Management Software
        - Integrity Integrated Lights-Out 3 (iLO 3) management processor
        - HPE Insight Control
        - HPE System Management Homepage
        - HP-UX 11i Management Software for Integrity Blades, **http://www.hpe.com/servers/integrityblades**
            - HPE Ignite-UX
            - HP-UX Software Assistant (SWA)
            - HPE Dynamic Root Disk (DRD)
    - HPE BladeSystem Infrastructure Management Software:
        - HPE BladeSystem c-Class Onboard Administrator
        - HPE BladeSystem c-Class Virtual Connect
    - Enterprise Management Software
        - Data Protector Software
        - GlancePlus Pak
        - Performance Manager and Agent

- **HPE nPartitions (nPars) for BL8x0c i6 servers:**
    - Provide improved scalability, availability, and fault isolation, and a rich set of virtualization options for the BL870c i6. nPartions are seamlessly integrated into the converged infrastructure environment, including Virtual Connect and HPE Insight management tools, such as HPE SIM. System administrators will find nPartition configuration management quick and easy to use
    - Provide electrically isolated hard partitions at the hardware level
        - Support for up to two (2) nPartitions per BL870c i6
        - Reconfigure partitions simply and quickly via iLO GUI
            - Scale up to one (1) 4-socket nPartition or
            - Scale out to two (2) 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 i6
        - Four (4) socket nPartitions are managed like a BL870c i6
        - The Onboard Administrator provides access to each nPartion
        - Other management tools, like HPE SIM, Virtual Connect, and HPE SUM display data for each nPartition as if it were an individual server
    - Each nPartition in a BL870c i6 can be further partitioned through software virtualization tools:
        - HP-UX Virtual Partitions (vPars)
        - Integrity Virtual Machines (Integrity VM)
            - Up to 256 HPE Virtual Machines per nPartition
        - HP-UX Containers

- **Virtualization with HPE Matrix OE** for HPE Integrity servers , **http://www.hpe.com/info/matrixoe**
    - Advanced Infrastructure Management
        - HPE Capacity Advisor (which includes HPE Virtualization Manager)

Overview

- HPE Global Workload Manager
- HPE Matrix OE infrastructure orchestration
- HPE Systems Insight Manager
  – Virtualization Continuum
    - HP-UX Virtual Partitions (vPars) v6.4
    - HPE Integrity Virtual Machines (with HP-UX Guest OS's)
    - HPE Process Resource Manager/pSets
    - HP-UX Containers
  – HPE Matrix OE - Matrix OE Reference Architectures

- **Continuous Availability**
  – HPE Serviceguard for HP-UX 11i
  – HPE Serviceguard Extensions for SAP
  – HPE SErviceguard Extensions for Oracle
  – HPE Continentalclusters

- **Form Factor**:
  – HPE Integrity BL870c i6 server blade is a full-height, double wide (occupies 2 slots) BladeSystem c-Class form factor. The BL870c i6 server blade plugs into the BladeSystem enclosure. In the c7000 enclosure, 4 server blades are supported per 10U enclosure. 4 enclosures can be configured to a standard 42U rack; 16 BL870c i6 server blades can be configured in a fully populated rack. In the c3000 enclosure, 2 BL870c i6 server blades are supported per 6U enclosure.

- **Enclosures**:
  – Hewlett Packard Enterprise offers two different c-Class server blade enclosures to meet your individual needs:
    - The HPE BladeSystem c7000 rack enclosure is 10U high and holds up to 4 HPE Integrity BL870c i6 servers plugged vertically. Four (4) enclosures can be configured to a standard 42U rack
    - The HPE BladeSystem c3000 rack enclosure is 6U high and holds up to 2 HPE Integrity BL870c i6 servers plugged horizontally. Up to 7 enclosures can be configured to a standard 42U rack
    - The HPE 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: **https://www.hpe.com/in/en/product-catalog/servers/bladesystem-enclosures.hits-12.html**.

- **Warranty**:
  – Protected by HPE Services and a worldwide network of Hewlett Packard Enterprise 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.

Standard Features

Processor One of the following depending on Model	**Octo-Core Processors** Intel® Itanium® 9760 2.66GHz/8-core/32MB/170W Processor Intel® Itanium® 9740 2.13GHz/8-core/24MB/170W Processor **Quad-Core Processors** Intel® Itanium® 9750 2.53GHz/4-core/32MB/170W Processor Intel® Itanium® 9720 1.73GHz/4-core/20MB/130W Processor	

Upgradeability	Upgradeable to four (4) processors **NOTE:** The HPE Integrity BL870c i6 supports 2, 3 or 4 processor configurations. Processors must be identical.

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 (4 x 8 GB DIMMs)
	Maximum	768 GB (48 x 16 GB DIMMs)

NOTE: Memory kits consist of two (2) DIMMs.
NOTE: Double Chip Spare is enabled in pairs of 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	Eight (8) Integrated HPE 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 HPE Virtual Connect FlexFabric module. Learn more at: **http://www.hpe.com/info/virtualconnect** **NOTE:** BL8x0c i6 server blades require Virtual Connect 3.70 or later when used in Virtual Connect configurations

Standard Features

One (1) additional 10/100 NIC dedicated to Integrity iLO 3 Management
NOTE: Up to twenty-four additional Gigabit Ethernet ports via the NC364m Quad-port mezzanine adapter, or twelve additional 10 Gigabit Ethernet ports via the NC532m dual-port mezzanine adapter.

Expansion Slots	Six Mezzanine slots, four (4) Type II and two (2) Type I, PCIe x8 Gen2

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

Storage Controller	Two (2) HPE Smart Array p410i 3Gb SAS Controller	4 SAS Channels (one to each HDD) Supports RAID 1, RAID 0, and HBA mode options Two (2) Embedded SAS read only 512MB Cache, one per HPE Smart Array p410i Embedded SAS Controller

Maximum Internal Storage	Hot Plug SAS	4.8TB SAS	4 x 1.2TB 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	Eight (8) ports via Four HPE NC553i 10Gb 2-port FlexFabric Converged Network Adapters integrated on system board
	Dual (2) ports via HPE BLc NC553m Dual Port FlexFabric 10Gb Converged Network Adapter

NOTE: BL8x0c i6 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. HPE NC553m: **https://www.hpe.com/h20195/v2/GetHTML.aspx?docname=c04123265**

Fibre Channel Support	Optional Fibre Channel HBAs are supported by the HPE Integrity BL870c i6. The mezzanine circuit board connects directly to the server blade system board.

8Gb Fibre Channel Host Bus Adapters:
- QLogic QMH2562 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem (PN B9F53A)
- Emulex LPe1205 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem (PN B9F54A)

8Gb Fibre Channel HBAs feature:
- 8/4/2Gb/s auto negotiating speeds

Standard Features

- Dual ports for redundant path connections
- Optimized for HPE Storage and supported by third party SAN vendors
- Support for HP-UX 11i v3

Compatible SAN	HPE Integrity BL870c i6 server blades are optimized for HPE Storage MSA, 3PAR, and XP7 products.

Smart Array Controller Support

Optional Smart Array Controller is supported by BL870c. 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 HPE BladeSystem enclosure:

HPE Smart Array P711m/1G FBWC 4-ports Ext PCIe x8 6G SAS Controller (PN B9F56A)
- Provides support for HPE Zoned Storage for BladeSystem
- Zoned Storage solution requires compatible HPE Storage 600 Modular Disk System and HPE Storage 3Gb SAS BL Switch
- Supports RAID 6 with Advanced Data Guarding (ADG)
- Provides support for HPE P2000 G3 MSA
- Support for HPE P2000 G3 MSA requires HPE Storage 6Gb SAS BL Switch

NOTE: For additional details please see:
https://www.hpe.com/h20195/v2/GetHTML.aspx?docname=c04111558

HPE 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 HPE Integrity Essentials Software Plug-ins

HP-UX 11i Management Software for HPE Integrity BL870c i6 Server Blade and HPE BladeSystem

- **Getting Started**
  - HPE Systems Insight Manager
  - HPE Insight Control for HP-UX 11i
  - HP-UX 11i System Management
  - HPE BladeSystem Integrated Manager in HPE System Insight Manager
  - HPE Onboard Administrator
  - HPE BladeSystem c-Class Onboard Administrator Firmware
  - HPE BladeSystem c-Class Virtual Connect Firmware
  - HPE Insight Control for HP-UX 11i v3 (Included in Base OE)

- **Deploy**
  - HPE Ignite-UX
  - Software Distributor-UX
  - Software Package Builder
  - Dynamic Root Disk (DRD)

- **Monitor**
  - HPE Systems Insight Manager
  - HPE System Management Homepage

Standard Features

- Glance Plus Pak
- Performance Manager and Agent
- HPE Serviceguard Manager

- **Control**
  - HPE Integrity Integrated Lights-Out (iLO) 3 (standard with BL870c i6 servers)
  - Integrity iLO 3 Advanced Pack license (included with BL870c i6 servers)

- **Protect**
  - HP-UX Bastille
  - HP-UX Containers
  - Data Protector Software
  - Software Assistant (SWA)

- **Optimize**
  - HPE Capacity Advisory
  - HPE Global Workload Manager
  - Process Resource Manager
  - HPE Insight Power Manager
  - HP-UX 11i v3 power management

- **Provision**
  - HPE Matrix OE - Matrix OE infrastructure orchestration

- **Integrate**
  - HPE Business Technology Optimization
  - IT Management Software
  - HPE Matrix OE - Matrix OE for HPE Integrity server blades

- **Learn More**
  - For additional information on HPE Integrity server blade management software please visit: **https://www.hpe.com/us/en/servers/management.html**

Glossary of Integrity Server Blades Management Software Product Description	**HPE BladeSystem Integrated Manager in HPE Systems Insight Manager**	The HPE BladeSystem Integrated Manager is a component in HPE Systems Insight Manager (SIM) that provides streamlined management for the entire HPE BladeSystem product family. The HPE BladeSystem Integrated Manager enables users to quickly navigate their HPE 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.
	HPE 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://h20564.www2.hpe.com/hpsc/doc/public/display?docId=emr_na-c00376966**

Standard Features

HPE GlancePlus Pak   HPE GlancePlus Pak provides you with a single product for managing a system's availability and performance. It is an integrated product that includes **HPE 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.

HPE Ignite-UX for HP-UX Deployments   HPE 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.

HPE Capacity Advisor   The capacity planning component of HPE Matrix OE - Matrix OE, HPE 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. HPE 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.

HPE Integrity Integrated Lights-Out (iLO) 3 (factory integrated with BL870c i6)   HPE Integrity Integrated Lights-Out (iLO) management processors make it simpler, faster, and less costly to remotely manage your Integrity servers. HPE iLO functions without additional software and can be accessed from any location via a web browser. HPE 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, nPartition management, iLO power measurement, and integration with Insight Power Manager. No additional iLO licensing is needed.
NOTE: Please see **http://www.hpe.com/info/ilo** for more information

HPE Onboard Administrator   The Onboard Administrator for the HPE BladeSystem enclosure is the brains of the c-Class infrastructure. Together with the enclosure's HPE Insight Display, the Onboard Administrator has been designed for both local and remote administration of HPE BladeSystem c-Class. This module and its firmware provides:
- Wizards for simple, fast setup and configuration
- Highly available and secure access to the HPE BladeSystem infrastructure
- Security roles for server, network, and storage administrators
- Automated power and cooling of the HPE BladeSystem infrastructure
- Agent-less device health and status
- Thermal Logic power and cooling information and control

NOTE: Please see: **https://www.hpe.com/us/en/product-catalog/servers/bladesystem-enclosures/pip.hpe-onboard-administrator.3188465.html** for more information.

HPE Serviceguard Manager   HPE 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

Standard Features

can drill down and proactively manage clusters, systems (nodes), and packages that run applications.

HPE Systems Insight Manager

HPE Systems Insight Manager (HPE SIM) provides a unified, secure and extensible environment to centrally manage servers, storage and other infrastructure devices across multiple operating system platforms.

HPE System Management Homepage

HPE 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 HPE 9000 and HPE Integrity servers running **HP-UX 11i.** By aggregating data from HPE 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 HPE Lights-Out Management processor on ProLiant and Integrity servers.

HPE Matrix OE for HPE Integrity servers

HPE Matrix OE is advanced lifecycle management software for HPE 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 HPE-recommended utility to use to maintain currency with HPE-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.

HPE Global Workload Manager

The workload management capability for HPE Integrity servers is provided by the HPE Global Workload Manager component of HPE Insight Dynamics - VSE. HPE 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.

HPE Matrix OE

HPE 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

Standard Features

infrastructure silos. Delivering infrastructure to the business becomes faster, more efficient, and more reliable.

Performance Manager and Agent

HPE 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

HPE Process Resource Manager (HPE PRM) is a resource management tool used to control the amount of resources that processes use during peak system load. HPE 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-UX 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).

Secure Resource Partitions

One method that HPE Insight Dynamics - VSE uses to improve server resource utilization is to consolidate multiple applications within a single operating system image. Secure Resource Partitions combine kernel level security and proven resource management to stack multiple applications within the same operating system. HPE 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.

Insight Control for BladeSystem Management

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

Standard Features

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

- HPE Systems Insight Manager
- Extensions for SIM on Microsoft Windows CMS (to manage HP-UX)
- HPE 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 HPE BladeSystem c-Class enclosures with either 8 or16-server licenses, or 8 server evaluation licenses (30-days). For additional information on HPE BladeSystem c-Class Infrastructure please visit: HPE BladeSystem c-Class Infrastructure QuickSpecs at: **https://www.hpe.com/h20195/v2/GetHTML.aspx?docname=c04284202**
NOTE: For additional product and licensing information about Insight Control Environment, HPE Systems Insight Manager and Essentials software refer to: **https://www.hpe.com/us/en/software/servers-insight-control.html**.

OS Support	HP-UX 11i v3 Data Center Operating Environment (DC-OE)

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)
VSI OpenVMS V8.4-2L1
NOTE: For complete and up to date information on HP-UX 11i support, please visit the HP-UX 11i website at: **http://www.hpe.com/info/hpux**.

Supported Software Options

HPE Matrix OE for HPE Integrity servers (which is included in HP-UX VSE-OE and DC-OE) includes the following capabilities:

- HP-UX Virtual Partitions (vPars) v6.4
- HPE Integrity Virtual Machines (VM)
- HPE Capacity Advisor
- HPE Global Workload Manager
- HPE Integrity Online VM Migration
- HPE Virtualization Manager
- HPE Serviceguard for HP-UX 11i
- HPE Serviceguard Manager
- HPE Serviceguard Extensions for SAP
- HPE Serviceguard Extensions for Oracle
- HPE Insight Control power management
- GlancePlus Pak
- Performance Manager and Agent
- HA Monitors
- MirrorDisk/UX

Intelligent Manageability

HPE Integrity Integrated Lights-Out 3 (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
- iLO 3 power measurement and integration with Insight Power Manager

Embedded system health and Integrity fault management Diagnostics and troubleshooting:

- virtual front panel

Standard Features

- 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 BL870c i6 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
Four hot-plug SAS hard drive bays and two (2) integrated RAID (HPE Smart Array 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 registered memory modules (R-DIMMs)
- 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
- HPE Serviceguard for HP-UX*
- HPE Serviceguard Extension for RAC for HP-UX*
- HPE Serviceguard Extension for SAP for HP-UX*
- Serviceguard Manager for HP-UX Clusters*
- HPE Event Monitoring Service
- HA Monitors for HP-UX
- HA Toolkits for HP-UX
- HPE Mirrordisk/UX* (Included if purchase HP-UX 11i VSE, DC, or HA OEs)
- Extended Campus Cluster*, HPE Metrocluster*, and HPE Continentalclusters* for HPE UX
- HPE System Insight Manager (SIM) for proactive fault management
- HPE 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

Platform security fundamentals
For the past 34 years Hewlett Packard Enterprise 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

Standard Features

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 evaluation.

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

NOTE: Hewlett Packard Enterprise 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

Standard Features

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	HPE Factory Express offers configuration, customization, integration and deployment services for Hewlett Packard Enterprise 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. Hewlett Packard Enterprise products supported through Factory Express include a wide array of servers and storage: HPE Integrity, HPE ProLiant, HPE Integrity Server Blades, HPE ProLiant Server Blades, HPE BladeSystem, HPE 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: **https://www.hpe.com/us/en/services/factory-express.html.**
HPE 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 HPE's Customer Business Center or an Authorized Partner for assistance. **https://h22174.www2.hpe.com/SimplifiedConfig/Welcome**

Support Services

HPE Technology Services for Integrity Servers

HPE Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Connect to HPE 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 HPE Pointnext operational services

HPE Pointnext operational 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 HPE Pointnext operational services for optimal satisfaction Integrity Servers:

Optimized Care

HPE 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 HPE 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 HPE where we own all cases through to resolution.   Hewlett Packard Enterprise is a leading provider of support services for most operating systems used on HPE BladeSystem with long, successful partnerships with vendors such as Microsoft, Red Hat, VMware, SUSE and others. Purchasing software support from HPE simplifies troubleshooting and shortens time to resolution with one call for hardware or software questions.

https://www.hpe.com/h20195/V2/GetDocument.aspx?docname=4AA5-3259ENW&cc=us&lc=ene

Basic Care

HPE Proactive Care with 24x7 coverage, three year Care Pack Service

HPE Proactive Care helps prevent problems and stabilize IT by utilizing secure, real-time, predictive analytics and proactive consultations when your products are connected to HPE. 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 HPE ProLiant server. **https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA3-8855ENW.pdf**

Related Services

HPE Datacenter Care service

HPE 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 HPE Datacenter Care, you benefit from a personalized relationship with HPE via a single point of accountability for HPE and others' products. For more information, visit **https://www.hpe.com/us/en/services/datacenter-hybrid-services.html**

HPE ProLiant Server Hardware Installation

Provides for the basic hardware installation of Hewlett Packard Enterprise branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner.

https://www.hpe.com/h20195/V2/GetPDF.aspx/5981-9356EN.pdf

Factory Express for Servers and storage

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

Support Services

For more information on Factory Express services for your specific server model please contact your sales representative or go to: **https://www.hpe.com/us/en/services/factory-express.html.**

Data Privacy Services
Protect your data through better media management. HPE 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. **https://www.hpe.com/us/en/services/consulting/security.html**

Additional HPE Pointnext operational services can be found at: **http://www.hpe.com/info/cpc**

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eSupport
Get connected to HPE 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: **https://www.hpe.com/us/en/services/proactive-care-central-enable.html**

HPE Support Center
Personalized online support portal with access to information, tools and experts to support Hewlett Packard Enterprise business products. Submit support cases online, chat with HPE experts, access support resources or collaborate with peers. Learn more **https://support.hpe.com/hpesc/public/home**

The HPE 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.
HPE Insight Remote Support and HPE Support Center are available at no additional cost with a HPE warranty, HPE Pointnext operational or Hewlett Packard Enterprise contractual support agreement.

*The Hewlett Packard Enterprise Support Center Mobile App is subject to local availability

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Parts and Materials
Hewlett Packard Enterprise will provide HPE-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 QuickSpecs, 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 HPE due to malfunction.

Models

HPE Integrity BL870c Base Models

HPE Integrity BL870c i6 Base Unit for c7000 Enclosure AM378A	**Prcessor(s)** Supports up to four (4) processors	Four (4) processor sockets; processor modules are configured to order.
	Cache Memory All processor models	Included with processors.
HPE Integrity BL870c i6 Base Unit for c3000 Enclosure AM379A	**Memory**	Forty eight (48) DIMM sockets; memory DIMMs are configured to order.
	Network Adapter	Eight (8) integrated HPE 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 HPE Virtual Connect FlexFabric module. Learn more at **http://www.hpe.com/info/virtualconnect** **NOTE:** BL8x0c i6 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	Two (2) EMbedded HPE Smart Array p410i SAS Controllers Two (2) Embedded SAS read only 512MB cache, one per HPE Smart Array p410i SAS Controller
	Hard Drives	Four SFF SAS drive bays; hard disk drives are configured to order.
	IO expansion	Six PCIe mezzanine card slots (PCIe Gen2 x8 interface); mezzanine card are configured to order
	Optical Drive	None internal to blade server
	Integrity iLO 3	Integrity iLO 3 Advance Pack license included
	Form Factor	Supports up to 2 BL870c i6 in HPE BladeSystem c3000 Enclosure Supports up to 4 BL870c i6 in HPE 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, Hewlett Packard Enterprise recommends the use of an Hewlett Packard Enterprise approved configurator. Contact your local sales representative for information on CTO product offerings and requirements. 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

Base Unit	HPE Integrity BL870c c7000 Server Blade	AM378A

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 (AM378A#001) or in an even slot (AM378A#002).

	HPE Integrity BL870c c3000 Server Blade	AM379A

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 (AH379A#001) or in an even slot (AH379A#002).

Configurable Model ships with:

Eight (8) integrated HPE NC553i 10Gb FlexFabric adapter ports supporting 10Gb/1Gb autosensing Ethernet, FCoE, Flex-10, and TCP/IP offload engine plus (1) additional 10/100 NIC dedicated to Integrity iLO 3 Management

Two (2) Embedded HPE Smart Array p410i SAS Controller
Two (2) Embedded read only 512MB cache, one per HPE Smart Array p410i SAS Controller

Four (4) small form factor (SFF) SAS hot plug hard drive bays

HPE Integrity Integrated Lights-Out 3

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

HPE Processors **NOTE:** Select minimum two (2) and maximum four (4) processors.

Octo-Core Processors

	HPE BL8x0c i6 Itanium 9740 (2.13GHz/8-core/24MB/170W) Processor Kit	AM383B
	HPE BL8x0c i6 Itanium 9760 (2.67GHz/8-core/32MB/170W) Processor Kit	AM382B

Quad-Core Processor

	HPE BL8x0c i6 Itanium 9720 (1.73GHz/4-core/20MB/130W) Processor Kit	AM385B
	HPE BL8x0c i6 Itanium 9750 (2.53GHz/4-core/32MB/170W) Processor Kit	AM384B

HPE Memory **NOTE:** Select minimum two (2) memory kits per server and maximum twenty four (24) memory kits per server if 4 processors ordered.

	HPE BL8x0c 16GB (2x8GB) Single Rank PC3L-12800 (DDR3-1600) Registered CAS-11 Memory Kit	AM387B

Configuration Information - Factory Integrated Models

HPE BL8x0c 32GB (2x16GB) Dual Rank PC3L-12800 (DDR3-1600) Registered CAS-11 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.
NOTE: Each hard partition (nPar) requires at least one (1) quad of memory DIMMs

Step 3: Choose Additional Options for Factory Integration

HPE 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

HPE Integrity 300GB SAS 12G Enterprise 15K SFF (2.5in) ST 3yr Wty Digitally Signed Firmware HDD	B9F30B
HPE Integrity 600GB SAS 12G Enterprise 15K SFF (2.5in) ST 3yr Wty Digitally Signed Firmware HDD	B9F32B
HPE Integrity 900GB SAS 12G Enterprise 15K SFF (2.5in) ST 3yr Wty Digitally Signed Firmware HDD	Q2C47A
HPE Integrity 300GB SAS 12G Enterprise 10K SFF (2.5in) ST 3yr Wty Digitally Signed Firmware HDD	B9F33B
HPE Integrity 600GB SAS 12G Enterprise 10K SFF (2.5in) ST 3yr Wty Digitally Signed Firmware HDD	B9F34B
HPE Integrity 1.2TB SAS 12G Enterprise 10K SFF (2.5in) ST 3yr Wty Digitally Signed Firmware HDD	B9F36B

NOTE: Though the disks are 12Gb, implementation of the embedded HPE Smart Array RAID controller limits performance of disks.

12G SAS Hot Plug Enterprise Performance Solid State Drives

HPE 400GB SAS 12G Write Intensive SFF (2.5in) ST 3yr Wty Digitally Signed Firmware SSD	873349-B21
HPE 800GB SAS 12G Write Intensive SFF (2.5in) ST 3yr Wty Digitally Signed Firmware SSD	873460-B21
HPE 400GB SAS 12G Write Intensive SFF (2.5in) ST 3yr Wty Digitally Signed Firmware SSD	P04558-B21
HPE 800GB SAS 12G Write Intensive SFF (2.5in) ST 3yr Wty Digitally Signed Firmware SSD	P04562-B21

HPE Security - TPM

HPE 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:
- HPE BladeSystem c-Class Enclosures QuickSpecs:
- HPE BladeSystem c3000 Enclosure QuickSpecs:
  https://h20195.www2.hpe.com/v2/GetDocument.aspx?docname=c04123379
- HPE BladeSystem c7000 Enclosure QuickSpecs:
  https://h20195.www2.hpe.com/v2/GetDocument.aspx?docname=c04229580
- HPE BladeSystem c-Class Interconnect and Mezzanine Components

Configuration Information - Factory Integrated Models

- HPE Virtual Connect
  https://www.hpe.com/us/en/integrated-systems/virtual-connect.html
- HPE Servers Interconnects
  https://www.hpe.com/us/en/product-catalog/servers/server-interconnects.hits-12.html
- HPE Servers Interconnects
  https://www.hpe.com/us/en/product-catalog/servers/server-interconnects.hits-12.html
- HPE Server Adapters
  https://www.hpe.com/us/en/product-catalog/servers/server-adapters.hits-12.html

Additional Options

HPE Integrity Upgrade Kits	HPE Integrity BL8x0c i4 Upgrade Blade	AM394A
	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.	
	HPE Integrity BL8x0c i6 Upgrade BL2 Blade Link	Q7Z99A
	NOTE: Required for BL870c i6 server blade used in odd slot of c7000 or c3000 Enclosures.	
	HPE Integrity BL8x0c i4 BL2-c7E Blade Link Upgrade	AM396A
	NOTE: Required for BL870c i6 server blade used in even slot of c7000 Enclosure.	
	HPE Special Request/Equipment Logistic Service	AM397A
	NOTE: Required for BL870c i6 server blade used in even slot of c3000 Enclosure.	
	HPE Integrity BL8x0c i6 Upgrade BL4 Blade Link	Q8A00A
	NOTE: Required for BL890c i6 server blade used in c7000 Enclosure.	
	HPE Special Request/Equipment Logistic Service	AM399A
	NOTE: Required for BL890c i6 server blade used in c3000 Enclosure.	

HPE Ethernet Interconnects	HPE Virtual Connect FlexFabric 10Gb/24-port Module for c-Class BladeSystem	571956-B21

HPE USB Options	HPE Integrity USB External DVD/RW Drive	AT120B
	NOTE: The HPE 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 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.	

HPE Pointnext operational services	Hewlett Packard Enterprise offers a range of support services and additional services. For a complete listing of services, see: HPE.com external site: **http://www.hpe.com/info/cpc**	
	HPE Critical Service	
	HPE 1Y Critical SVC	HA112A1
	HPE 3Y Critical SVC	HA112A3
	Installation Services	
	HPE Installation SVC	HA113A1
	NOTE: For more information: **http://www.hpe.com/info/cpc**.	

Software Options	VSI OpenVMS V842 Operating Environment Electronic Media	P9R62AAE
	NOTE: For more information visit the VSI website: **https://www.vmssoftware.com**	

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 banks 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.
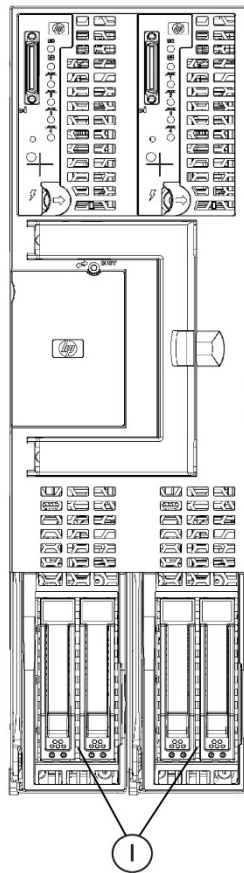
HPE Integrity BL870c i6 Server Blade

Standard Memory

16 GB - HPE BL8x0c 16GB (2x8GB) Single Rank PC3L-12800R (DDR3-1600) Registered CAS-11 Memory Kit
Memory Bus Bandwidth: 6.4GT/s

Standard Memory Plus Optional Memory

Up to 768GB of DDR3 registered memory is available.

Storage

1-4   4 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 Hard Drive

	Quantity Supported	Position Supported	Controller
1.2TB 12G 10K SFF 600GB 12G 10K SFF 300GB 12G 10K SFF 300GB 12G 15K SFF 600GB 12G 15K SFF 900GB 12G 15K SFF	4	1-4	HPE Smart Array P410i Controller

12G 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
400GB/800GB 12G SLC SFF	4	1-4	HPE Smart Array P410i Controller

Power Specifications

NOTE: The HPE Power Advisor is a tool provided by Hewlett Packard Enterprise 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: HPE Power Advisor: **https://www.hpe.com/in/en/integrated-systems/rack-power-cooling.html**

Technical Specifications

System Unit	Dimensions	Height	14.42 in (36.63 cm)
		Depth	19.1 in (48.51 cm)
		Width	4.13 in (10.49 cm)
	Shipping Dimensions	Height	20.50 in (54.61 cm)
		Depth	26.00 in (66.04 cm)
		Width	11.42 in (29.00 cm)
	Weight	Maximum	53 lbs. (24.04 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 HPE p410i Controller	Disk Drive and Enclosure Interface	3Gb SAS (Serial Attached SCSI)
	SAS Connectors	4 internal (SFF8484) x4 wide port connectors.
	Cache Memory Speed	DDR2-800 memory provides up to 4.2GB/s maximum bandwidth
	Server Interface	X1 5.0Gbps PCIe provides 1.0GB/s maximum bandwidth
	SAS Speed	Fourx1 3G SAS provides 1200MB/s maximum bandwidth.
	Cache Memory	Two (2) embedded SAS read only 512MB cache
	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 (Mirroring and striping) (not supported with BL8x0c i6 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**	1000Base-SX IEEE 802.ip QoS, 802.3x flow control, and 802.3ap 10Gb Base-KR
	Compatibility	IEEE 802.3ab 1000Base-Sx
	Data Transfer Method	PCI Express, four lanes (x4)
	Network Transfer Rate (Theoretical Maximum Values)	1Dual 10Gb ports offer up to 40Gb/s bidirectional theoretical throughput
Environment-friendly Products and Approach	**End-of-life Management and Recycling**	Hewlett Packard Enterprise offers end-of-life Hewlett Packard Enterprise product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: **http://www.hpe.com/info/recycle** .To recycle your product, please go to: **http://www.hpe.com/info/recycle** or contact your nearest Hewlett Packard Enterprise sales office. Products returned to Hewlett Packard Enterprise 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 Enterprise web site at: **http://www.hpe.com/info/recycle**. These instructions may be used by recyclers and other WEEE treatment facilities as well as HPE OEM customers who integrate and re-sell Hewlett Packard Enterprise 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	**https://www.hpe.com/us/en/about/environment/msds-specs-more.html**

Summary of Changes

Date	Version History	Action	Description of Change
03-Dec-2018	Version 9	Changed	Overview, Standard Features, Ordering and Configuration, and Storage sections were updated.
		Added	SKUs added in Ordering and Configuration section: P04558-B21, P04562-B21
01-Oct-2018	Version 8	Changed	Configuration Information – Factory Integrated Models, Additional Options and Memory were updated.
04-Sep-2018	Version 7	Changed	Overview, Standard Features, Configuration Information - Factory Integrated or Field Upgrade Models, and Additional Options sections were updated.
		Added	SKU added in Additional Options section: P9R62AAE
		Removed	Obsolete SKUs were deleted: 467799-B21, 451871-B21, 456972-B21, 513778-B21.
08-Jan-2018	Version 6	Changed	Changed HDD SKUs
		Added	SKUs added in Configuration Information - Factory Integrated Models section: B9F30B, B9F32B, Q2C47A, B9F33B, B9F34B, B9F36B.
		Removed	SKUs deleted in Configuration Information - Factory Integrated Models section: 872842-B21, 872844-B21, 872846-B21, 873008-B21, 873010-B21, 873012-B21.
23-Oct-2017	Version 5	Changed	Care Pack naming and Service and Support- Parts and Materials updated.
25-Sep-2017	Version 4	Changed	Configuration Information – Factory Integrated Models and Additional Options sections were updated.
		Added	SKUs added in Configuration Information – Factory Integrated Models and Additional Options sections: 873349-B21, 873460-B21, Q7Z99A, Q8A00A.
		Removed	SKUs removed in Configuration Information – Factory Integrated Models and Additional Options sections: 802576-B21, 802580-B21, 802584-B21, AM395A, AM398A
07-Aug-2017	Version 3	Added	SKU added: 873008-B21
		Removed	SKU deleted: 873010-B21
11-Jul-2017	Version 2	Changed	Standard Features, Configuration Information - Factory Integrated Models, and Storage sections were updated.
		Removed	SKUs were deleted: 785079-B21, 785075-B21, 785073-B21, 785099-B21, 785101-B21, 785103-B21, 785071-B21.
05-Jun-2017	Version 1	Created	New QuickSpecs

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