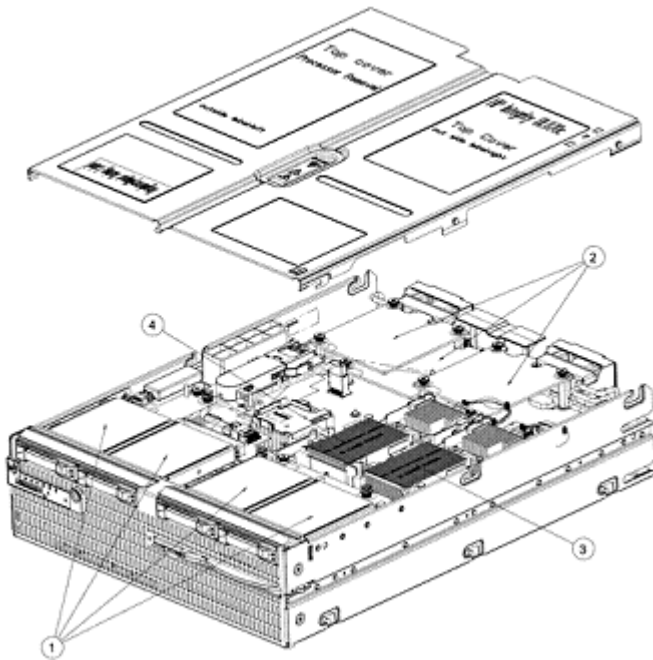
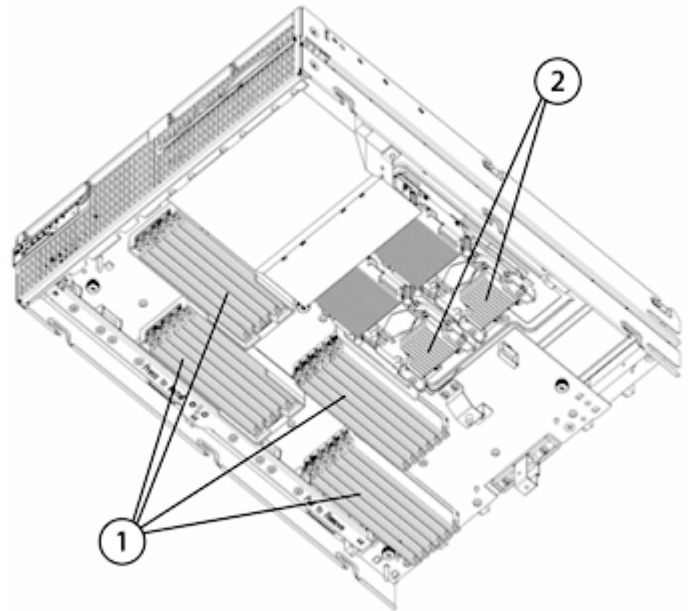


Overview



Top View

1. Four small form factor (SFF) hot-plug drive bays
2. Three PCIe Mezzanine slots
3. Processor 0 of up to four Intel® Itanium® 9100 series processors
4. Processor 1 of up to four Intel® Itanium® 9100 series processors



Bottom View

1. Twenty-four (24) DDR2 DIMM Slots
2. Processor 2 and 3 of up to four Intel® Itanium® 9100 series processors

What's New

- Support for Hot Plug 600GB and 450GB 6G SAS Enterprise Hard Drives

At A Glance

This document covers the HP Integrity BL870c server blade only. For more information on HP BladeSystem c-Class Enclosure and HP BladeSystem c-Class Interconnects 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 BL870c delivers the performance, reliability, and availability on 64-bit operating systems for the ultimate in



Overview

scalability and flexibility in deployment: HP-UX 11i v3/v2, 64-bit versions of Red Hat and SUSE Linux, Microsoft Windows® Server 2008 for Itanium-based systems, Windows Server 2003 (Enterprise and Datacenter editions) for Itanium-based systems, and OpenVMS v8.3. To further enrich your cost-efficient, consolidated Integrity blade infrastructure, HP Virtual Server Environment (VSE) can help with solution components such as HP Integrity Virtual Machines, HP Integrity Essentials Capacity Advisor and Virtualization Manager, HP-UX Workload Manager, HP VSE Reference Architectures, and HP Serviceguard.

HP Integrity BL870c server blade includes:

- **Processor:**
 - Up to four Intel® Itanium® 9100 Series processors
- **Memory:**
 - Up to 192 GB of memory. Supporting (24) DDR2-533 ECC memory DIMMS
- **Storage Controller:**
 - Embedded LSI 1068 SAS RAID Controller integrated on system board
 - Standard SAS controller (RAID 1 only)
- **Internal Drive Support:**
 - Supports up to (4) four small form factor (SFF) SAS hot plug hard drives
- **Network Controller:**
 - Four (4) Embedded Standard Gigabit NICs
 - Plus one (1) additional 10/100 NIC dedicated to Integrity iLO 2 Management
- **Mezzanine Support:**
 - Three (3) additional I/O expansion slots via mezzanine cards.
 - Supports up to (3) mezzanine cards
 - HP NC532m Dual Port Flex-10 10GbE BL-c Adapter
 - NOTE: Supported with HP-UX 11i v3 and Windows; requires 2GB of system memory to be ordered for each card in the blade. To obtain the software and instructions required to run the NC532m in a Windows Integrity environment, please contact: windows_integrity_nic@hp.com
 - HP Blc Emulex LPe1105 FC HBA Opt kit for SAN connectivity
 - HP 4X DDR IB Dual Port Mezzanine HCA for low latency server interconnectivity
 - Dual-Port Fibre Channel Mezzanine (4-Gb) options for SAN connectivity (QLogic).
 - 4X DDR InfiniBand (IB) Mezzanine (20 Gb/s) options for low latency server interconnectivity
 - NOTE: For Linux support See the HPC Cluster Platform 6000 at: <http://www.hp.com/go/hptc>
 - Four-Port GbE Adapter expansion via HP NC364m PCI-Express Quad-Port Adapter
- **Internal USB Support:**
 - Internal USB port on the BL870c
- **Management:**
 - HP Integrity Server Blades Management Software
 - Integrity Integrated Lights Out 2 (iLO 2) management processor www.hp.com/go/integrityilo
 - HP Integrity Integrated Light Out 2 (iLO 2) with Advanced Pack, (factory integrated)
 - HP Integrity Essentials, <http://h20341.www2.hp.com/integrity/w1/en/software/essentials-overview.html>
 - HP System Insight Manager
 - HP System Management Homepage
 - HP-UX 11i Management Software for Integrity Blades, www.hp.com/go/hpuxblades
 - HP Ignite-UX
 - HP-UX Software Assistant (SWA)
 - HP Dynamic Root Disk (DRD)
 - HP BladeSystem Infrastructure Management Software:
 - HP BladeSystem Integrated Manager in HP SIM
 - HP Insight Control Environment for BladeSystem
 - HP BladeSystem c-Class Onboard Administrator
 - HP BladeSystem c-Class Virtual Connect
 - Enterprise Management Software



Overview

- Data Protector Software
- GlancePlus Pak
- Performance Manager and Agent
- Virtualization with HP Virtual Server Environment, www.hp.com/go/vse
 - Intelligent Control
 - HP Capacity Advisor
 - HP Virtualization Manager
 - HP-UX Workload Manager and HP Global Workload Manager
 - HP Systems Insight Manager
 - Partitioning Continuum
 - 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
 - VSE Reference Architectures
 - VSE Suites including HP Capacity Advisor, HP Virtualization Manager, HP Global Workload Manager, HP Integrity Virtual Machines, and VSE Reference Architectures
- **Form Factor:**
 - The BL870c server blade plugs vertically into the BladeSystem c7000 and c3000 tower enclosures and horizontally into the c3000 rack enclosure.
 - HP Integrity BL870c server blade is a full-height, BladeSystem c-Class form factor occupying two (2) full height slots.
 - 16 BL870c server blades can be configured in a fully populated 42U rack.
- **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 4 HP Integrity BL870c 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 2 HP Integrity BL870c 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.
- **Warranty:**
 - Protected by HP Services and a worldwide network of HP Authorized Channel Partners. Three-year parts, 3 Year Labor and 3 Year on-site limited global warranty. Certain restrictions and exclusions apply



Standard Features

Processor	Intel® Itanium® Dual-Core Processors Model 9150N (1.6GHz/2-core/24MB, L3 cache, FSB533) Intel® Itanium® Dual-Core Processors Model 9140N (1.6GHz/2-core/18MB, L3 cache, FSB533) Intel® Itanium® Dual-Core Processors Model 9120N (1.42GHz/2-core/12MB, L3 cache, FSB533)		
Upgradeability	Upgradeable to four (4) processors NOTE: The HP Integrity BL870c supports 1, 2, 3 or 4 processor configurations. Processors must be identical		
Cache Memory	L2 cache per core; 1MB Instruction, 256KB Data		
Chipset	HP zx2		
Memory	Type	PC2-4200 DDR2 DIMMs (DDR2-533)	
	Minimum	4 GB (4 x 1 GB)	
	Maximum	192 GB (24 x 8 GB)	
	NOTE: Memory modules consist of four (4) DIMMs. NOTE: Double Chip Spare is enabled in a single memory module. Double Chip Spare requires identical DIMM types and capacities		
Network Adapter	Four (4) embedded NIC ports, plus one (1) additional management NIC port: Four (4) NIC (LOM) ports via (2) Broadcom 5704 Dual Port Gigabit NIC One (1) additional 10/100 NIC dedicated to Integrity iLO 2 Management		
Expansion Slots	Three Mezzanine slots (two (2) Type II PCIe x8, one (1) Type I PCIe x4)		
Integrated Manageability	Integrity Integrated Lights-Out 2 (iLO 2) Advanced Pack (Factory integrated) HP BladeSystem c-Class Onboard Administrator HP BladeSystem c-Class Virtual Connect		
Storage Controller	LSI 1068 SAS Controller	4 SAS Channels (one to each HDD) Supports RAID 1 only	
Maximum Internal Storage	Hot Plug SAS	2.4TB SAS	4x 600GB SAS
Graphics	Integrated ATI ES1000 1280 x 1024 x 16M color (32 MB DDR memory)		



Standard Features

Graphics Resolution Supported	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
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Fibre Channel on the HP Integrity BL870c server blade

Optional Fibre Channel HBAs are supported by the HP Integrity BL870c. 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 451871-B21)
- Emulex LPe1205 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem (PN 456972-B21)

8Gb Fibre Channel HBAs feature:

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

4Gb Fibre Channel Host Bus Adapters:

- Emulex LPe1105 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem (PN 403621-B21)
- QLogic QMH2462 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem (PN 403619-B21)

4Gb Fibre Channel HBAs feature:

- Optimal performance utilizing PCI Express
- 4/2/1Gb/s auto negotiating speeds
- Dual-ports for redundant path connections
- Two FC HBAs per server blade provide redundant FC HBA support
- Optimized for HP Storage products and supported by third party SAN vendors
- Support for HP-UX, Microsoft® Windows®, OpenVMS, and Linux operating systems environments. HP-UX 11i v3 and v2 are supported on HP BLc QLogic QMH2462 FC HBA. HP-UX 11i v3 is supported on HP BLc Emulex LPe1105 FC HBA.



Standard Features

Smart Array Controller Support

Optional Smart Array Controller is supported by BL860c. The mezzanine circuit board connects directly to the server blade system board.

HP Smart Array P700m/512 4-ports Ext PCIe x8 SAS Controller (PN 508226-B21)

- Provides support for HP Zoned Storage for BladeSystem
- Zoned Storage solution requires compatible HP 600 Modular Disk System and HP 3Gb SAS BL Switch
- Optional HP Smart Array Cache Battery Kit (PN 383280-B21)
- BBWC is required for RAID 6 and highly recommended for RAID 5
- Support for HP-UX 11i v3; HP-UX 11i v2; Microsoft Integrity Windows 2008 and 2003 (6.2); and OpenVMS (8.3-1H1)
- Provides support for HP MSA2000sa
- Support for MSA2000sa also requires HP 3Gb SAS BL Switch
- Optional HP Smart Array P-Series Low Profile Battery (PN 452348-B21)
- BBWC is required for RAID 6 and highly recommended for RAID 5

NOTE: For additional details please see:

<http://h18004.www1.hp.com/products/servers/proliantstorage/arraycontrollers/smarraysp700m/index.html>

Compatible SAN

HP Integrity BL870c server blades are optimized for HP MSA, EVA, and XP

HP USB Options

External USB DVD drive with 7 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
- 7-foot USB extension cable

NOTE: The USB extension cable (PN SH046AA) will be added automatically when the drive is ordered.

NOTE: The USB Y-connector goes between the extension cable (SH046AA) and the 9-inch USB cable fixed with DVD drive.

NOTE: The Y-connector should NOT be placed between the server blade and the 7-foot Extension cable.



Standard Features

Integrity Server Blades Management Software and HP Integrity Essentials Software Plug-ins HP-UX 11i Management Software for HP Integrity BL870c Server Blade and HP BladeSystem

- **Getting Started**
 - HP Systems Insight Manager
 - HP Integrity Essentials 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 Environment for BladeSystem
- **Deploy**
 - HP Ignite-UX
 - Software Distributor-UX
 - Software Package Builder
- **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) 2 (Advanced Pack factory integrated with BL870c)
 - HP Integrity iLO 2 Power Regulation for HP-UX 11i v3
- **Protect**
 - HP-UX Bastille
 - Secure Resource Partitions
 - Data Protector Software
 - Software Assistant (SWA)
 - Security Patch Check and Patch Assessment Tool
- **Optimize**
 - HP Capacity Advisory
 - HP Virtualization Manager
 - HP-UX Workload Manager
 - HP Global Workload Manager
 - Process Resource Manager
 - HP Insight Power Manager
- **Integrate**
 - HP Business Technology Optimization
 - IT Management Software
 - HP Virtual Server Environment Suite for HP-UX 11i 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/c-class/860c/compmatrix.html>

Glossary of Integrity Server Blades

HP BladeSystem Integrated The HP BladeSystem Integrated Manager is a component in HP Systems Manager in HP Systems Insight Manager (SIM) that provides streamlined management for the entire



Standard Features

Management Software Product Description	Insight Manager	HP BladeSystem product family. The HP BladeSystem Integrated Manager enables users to quickly navigate their HP blade environments including blade servers, enclosure infrastructures, racks, and integrated switches, via automatically generated blade rack picture views and hierarchical trees. Users are able to conveniently configure, deploy, and manage individual or groups of blade systems. Additionally, users are able to quickly set up logical collections of blade systems for convenient management and control.
	HP Blades Visualization	Used by System Administrators to identify, associate and group blades into collections, using tables, trees, and picture views, and it can also be used to monitor performance and launch Integrity Essentials. NOTE: For more information about Manageability solutions for Integrity Servers go to: http://h20341.www2.hp.com/integrity/w1/en/software/essentials-overview.html .
	HP GlancePlus Pak	HP GlancePlus Pak provides you with a single product for managing a system's availability and performance. It is an integrated product that includes HP GlancePlus . As an integrated product, the GlancePlus Pak includes the real-time diagnostic capabilities of GlancePlus and the historical data collection capabilities of the Performance Agent. The performance agent is used with other availability and performance management products, thus providing an integrated real-time and historical performance management solution.
	HP Ignite-UX for HP-UX Deployments	HP Ignite-UX is a free toolset that enables a network install of HP-UX onto multiple PA-RISC and/or Integrity servers on a network. It can also be used to create custom install configurations, or golden images, recover systems remotely, create custom recovery media including tape, CD and DVD, and manage and monitor multiple client installation sessions
	HP Capacity Advisor	HP Capacity Advisor is the industry's first lightweight, integrated tool for ongoing capacity planning, simulating placement of application workloads to help IT administrators improve server utilization. Capacity Advisor provides planning capability for the intelligent control of the HP Virtual Server Environment.
	HP Integrity Essentials Foundation Pack for Windows	The HP Integrity Essentials Foundation Pack for Windows contains software designed to simplify the installation, configuration, and management of Microsoft Windows Server environments on HP Integrity Servers. The Smart Setup bootable utility simplifies tasks including system and disk partitioning and the Integrity Support Pack provides necessary drivers and management agents for use with your Windows Server environments
	HP Integrity Essentials Foundation Pack for Linux	The HP Integrity Essentials Foundation Pack for Linux contains software designed to simplify the installation, configuration, and management of Linux on HP Integrity Servers with Linux in a Data Center. HPIEFPL simplifies tasks including system and disk partitioning as well as prepares your system for installing either the RHEL or SLES distribution.

The Smart Setup application is a bootable media that HP recommends to be used prior to installing the operating system distribution. This application media contains the latest documentation, firmware, and tools to help configure and optimize your system. Smart Setup provides the following: a system hardware inventory tool, tools to help configure system internal storage arrays and adapters, installation of the hardware diagnostics tools,



Standard Features

and tools to launch the appropriate Red Hat or Novell distribution installer.

The Support Pack component of HPIEFPL includes HP value added software that can be used to either integrate with existing system management solutions or directly manage an HP Integrity server. Following the installation of the Linux distribution of choice, use the Management media to install additional tools, HP Insight Management Agents, HP WBEM providers, and System Management Homepage (SMH).

- HP System Insight Manager
- HP Insight Manager Agents
- HP System Management Homepage
- Web-based Enterprise Management (WBEM) Solutions
- HP Management Base for Integrity Servers
- OpenPegasus
- HP Array Configuration Utility

HP Virtualization Manager HP Integrity Essentials Virtualization Manager is easy-to-use virtualization management software that reduces complexity by providing unified visualization and management of physical and virtual servers. Virtualization Manager provides a central point of control that allows you to manage all the resources in your [Virtual Server Environment \(VSE\)](#). It is a powerful way to connect IT resources to real business needs.

HP Integrity Integrated Lights Out (iLO) 2
(Advanced Pack factory integrated with BL870c) HP Integrity Integrated Lights Out (iLO) management processors make it simpler, faster, and less costly to remotely manage your Integrity servers. HP Integrity iLO 2, the next generation of iLO management processors, is available in the newest Integrity entry-class servers. Integrity iLO 2 enables a complete remote console experience with the Advanced Pack addition of Virtual Media and Integrated Remote Console (virtual keyboard, video, and mouse). iLO 2 Advanced Pack also enables integration with Insight Power Manager. Integrity BL860c ships with an Integrity iLO 2 Advanced Pack license factory installed - no additional iLO licensing is needed.

HP Onboard Administrator The Onboard Administrator for the HP BladeSystem c7000 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:

- 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

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.



Standard Features

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 Virtual Server Environment for HP Integrity	HP Virtual Server Environment (VSE) for HP Integrity servers and blades provides an automated infrastructure that can adapt in seconds with mission-critical reliability. HP VSE allows you to optimize server utilization in real time by creating virtual servers that can automatically grow and shrink based on business priorities and service-level objectives.
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 and includes Security Patch Check (SPC), and is the HP-recommended utility to use to maintain currency with HP-published security bulletins for HP-UX software.
HP-UX Workload Manager	HP-UX Workload Manager (HP-UX WLM) is a resource management tool that provides automatic 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.
HP Global Workload Manager	HP servers. Using these policies can increase system utilization and facilitate controlled sharing of system resources. In addition, gWLM provides both real-time and historical monitoring of the resource allocation. gWLM consists of a VSE Central Management Server, or CMS. You configure gWLM and monitor your workloads from the system where the CMS software is installed. Also, you use agent software on the systems where you have workloads you want gWLM to manage.
Insight Management Agents	Insight Management Agents should be installed on all HP servers to present system instrumentation, health and configuration information into HP Systems Insight Manager and the HP System Management Homepage. The HP System Management Homepage aggregates systems data from Insight Management Agents and other HP management tools, providing a consolidated browser-based interface for managing individual servers.



Standard Features

	<p>The HP System Management Homepage (SMH) and OS instrumentation (WBEM providers) to support management tools such as SMH and HP SIM are included in the HP-UX Operating Environments Insight Management Agents and The HP System Management Homepage are included on ProLiant Support Packs, and can also be installed using the server profiles provided with the ProLiant Essentials Rapid Deployment Pack For additional information about the Management Agents and the HP System Management Homepage please visit the management Web site at: http://www.hp.com/servers/manage.</p>
Performance Manager and Agent	HP Performance Manager, Agents, and Monitor combine to provide a powerful and flexible distributed management solution. This solution is a single interface for centrally monitoring, analyzing, and forecasting resource utilization for distributed multi-vendor environments, enabling you to offer the best possible level of service in a cost-effective manner.
Process Resource Manager	HP Process Resource Manager (HP PRM) is a resource management tool used to control the amount of resources that processes use during peak system load. HP PRM can manage allocation of the following resources:
	<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
ProLiant Essentials Performance Management Pack (Windows for HP Integrity Servers only)	Performance Management Pack detects, analyzes, and explains hardware bottlenecks on HP Integrity servers running Windows. NOTE: No PMP license is required to manage Integrity servers.
ProLiant Essentials Rapid Deployment Pack (designed for Windows and Linux for HP Integrity Servers only)	Rapid Deployment Pack (RDP) extends HP Systems Insight Manager with a complete deployment solution for HP Integrity server blades running Linux or Windows. RDP provides a central location to configure server hardware, deploy the Windows, Linux operating environments and install HP Integrity Support Pack drivers using images and scripted profiles.
Secure Resource Partitions	One method the HP 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. 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 V2 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.



Standard Features

Insight Control for BladeSystem Management

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

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

- HP Systems Insight Manager
- Extensions for SIM on Microsoft Windows CMS (to manage HP-UX and Linux systems)
- HP BladeSystem Integrated Manager
- Insight Power Manager
- Rapid Deployment Pack (Support for Windows and Linux)
- Performance Management Pack (Support for Windows)

NOTE: For Licensing and Packaging Options please see the options section of this QuickSpecs.

NOTE: Insight Control for BladeSystem is delivered with HP BladeSystem c-Class enclosures with either 8 or 16-server licenses, or 8 server evaluation licenses (30-days). For additional information on HP BladeSystem c-Class Enclosures please visit: HP BladeSystem c3000 Enclosure QuickSpecs at:

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

http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html

NOTE: For additional product and licensing information about Insight Control, HP Systems Insight Manager and Essentials software refer to: <http://www.hp.com/servers/proliantessentials>.

OS Support

HP-UX 11i v3 Update 1 (or later) for Data Center Operating Environment

HP-UX 11i v3 Update 1 (or later) for Virtual Server Environment

HP-UX 11i v3 Update 1 (or later) for High Availability Environment

HP-UX 11i v3 Update 1 (or later) for Base Operating Environment

HP-UX 11i v2 0712 (or later) for Mission Critical Operating Environment

HP-UX 11i v2 0712 (or later) for Enterprise Operating Environment

HP-UX 11i v2 0712 (or later) for Foundation Operating Environment

HP-UX 11i v2 0712 (or later) for Technical Computing Operating Environment

Red Hat Enterprise Linux 4

RedHat Enterprise Linux 5

Novell SUSE Linux Enterprise Linux 10 SP1

Microsoft Windows Server 2008 for Itanium-based Systems

Microsoft Windows Server 2003 for Database Edition for Itanium-based systems

Microsoft Windows Server 2003 Enterprise Edition for Itanium-based systems

OpenVMS I64, Version 8.3-1H1 (or later) for Foundation Operating Environment for Itanium Servers

OpenVMS I64, Version 8.3-1H1 (or later) for Enterprise Operating Environment for Itanium Servers

OpenVMS I64, Version 8.3-1H1 (or later) for Mission Critical Operating Environment for Itanium Servers

NOTE: For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, including how to purchase from HP, please visit our Support Matrix at: <http://www.hp.com/go/supportos>.

NOTE: For a more complete and up to date information on Linux Operating Systems on Integrity or BladeSystem platforms, please visit the Integrity and BladeSystem Linux matrix website:

<http://www.hp.com/go/lxintegritycert>



Standard Features

Supported Software Options	HP Integrity Virtual Machines HP Virtualization Manager HP Capacity Advisor HP Secure Resource Partition HP-UX Workload Manager HP-UX Global Workload Manager HP Virtual Server Environment Suite for HP-UX 11i for HP Integrity server blades HP Serviceguard for HP-UX 11i HP Serviceguard Manager HP Serviceguard Extensions for SAP HP Serviceguard Extensions for Faster Failover HP Integrity iLO 2 Power Regulation supported by HP-UX 11i v3 and Windows Server 2003 (provided with the Integrity iLO 2 Advanced Pack and included with purchase of the HP Integrity BL870c) HP Insight Power Manager GlancePlus Pak Performance Manager and Agent
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Intelligent Manageability	HP Integrity Integrated Lights-Out 2 (iLO 2) Advanced Pack (factory integrated with the HP Integrity BL870c) Virtual serial console (Multiple, mirrored sessions, with previous context and console log buffer) Virtual Media (CD-ROM, DVD-ROM, and ISO file image) Virtual Floppy and USB Flash for Windows environments Virtual Serial Console Virtual Power Button Control Integrated Remote Console (virtual KVM) for Windows environments iLO 2 Power Regulator and integration with Insight Power Manager
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Embedded system health and Integrity fault management Diagnostics and troubleshooting:

- virtual front panel
- log access to Integrity SEL
- FPL 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: For additional details please visit: <http://www.hp.com/go/integrityilo>

NOTE: Integrated Lights-Out 2 (iLO) Advanced Pack features such as Directory Services Integration (LDAP), Integrated Remote Console for Windows and browser accessible Virtual Media are included with the HP Integrity BL870c server blade.



Standard Features

Availability

Dual-Port Fibre Channel Mezzanine Card for redundant SAN connection
Four hot-plug SAS hard drive bays and integrated RAID (LSI 1068) controller on every server blade

Network adapter teaming (network fault tolerance, transmit load balancing, switch-assisted load balancing)

On line memory page deallocation

- ECC protected DDR2 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 and Linux Clusters*
- HP Event Monitoring Service
- HA Monitors for HP-UX
- HA Toolkits for HP-UX and Linux
- HP Mirrordisk/UX* (Included if purchase HP-UX 11i Enterprise or Mission-Critical OEs)
- Extended Campus Cluster*, HP Metrocluster*, and HP Continentalclusters* for HP UX
- HP System Insight Manager (SIM) for proactive fault management
- HP Cluster Extension XP for Linux
- HP Serviceguard Storage Management Suites for HP-UX*

*Fee based software products

Security

Hardware Security

- Power-on password
- Administrator's password
- Integrity Integrated Lights Out 2 has 19 customizable user accounts and SSL encryption
- Integrity Integrated Lights Out 2 can be disabled via a Global Setting
- SSL encryption on web console

Platform security fundamentals

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 feature 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 data, systems and identities. For more details, visit www.hp.com/go/hpux11isecurity

Downloads and documentation

Function

Encrypted volume and file system (EVFS)

EVFS is an operating system service that fills the compliance need to store files in a way that they cannot be read by unauthorized parties who obtain physical access to storage. Files and databases from current applications can be encrypted without changes to the application or underlying storage infrastructure.



Standard Features

Trusted Computing Services (TCS)	HP-UX TCS provides software support for hardware-enforced key management on supported HP Integrity servers. By providing a low-cost embedded security chip option (known as a Trusted Platform Module) in its zx2-based Integrity servers, HP has established a foundation for strong protection of sensitive information - including cryptographic keys, such as for EVFS.
Security containment	HP-UX 11i security containment introduces three core technologies: compartments, fine-grained privileges, and role-based access control. Together, these three components provide a highly secure operating environment without requiring applications to be modified.
Protected Systems: Webserver (PS-Webserver)	PS-Webserver is a pre-configured secure Web services platform built on HP-UX. The secure architecture and run time environment isolates the Internet from backend servers and isolates the Web server from the intranet.
Open SSL	Open SSL offers a general-purpose cryptography library and implementation of the Secure Sockets Layer (SSL v2/v3) and Transport Layer Security (TLS v1) protocols.
Secure Shell	Secure Shell is a powerful software-based approach to encrypted network security. It provides secured remote login. Credentials and data sent over the network are encrypted by SSH-1 or SSH-2 protocols and decrypted once they reach their destination.
IPSec	IPSec adds integrity protection and confidentiality to network communication over the Internet and within the enterprise to applications which lack these capabilities without modifying existing applications.
MD5 Secure Checksum (MD5sum)	MD5sum provides a cryptographic file integrity utility and API based on the standard Message Digest 5 (MD5) algorithm.
HP-UX 11i Internet Express	In addition to the fully-supported features listed above, HP packages a number of limited-support open source products that offer additional data security, including: OpenSC/OpenCT, ClamAV, CyrusSASL, GnuPG, SSLDump, Stunnel, and Tripwire.
Bastille	Bastille is a very easy-to-use security hardening wizard (also known as a lockdown wizard) that enhances the security of an HP-UX 11i host by turning off unneeded services, tightening security configuration settings, configuring IPFilter, etc. It accommodates the various degrees of hardening required for web, application and database servers, and can walk a non-security expert through the hardening decisions.
Host IDS	HIDS enhances host-level security with near real-time automatic monitoring of each configured host for signs of potentially damaging intrusions. HIDS is a standard feature of HP-UX 11i, making HP the only systems vendor to offer its own host intrusion detection product. Read more
Secure resource partitions	Secure Resource Partitions combine kernel level security (via Security Containment) and proven resource management to stack multiple applications within the same operating system.
IPFilter	IPFilter is a stateful firewall (filters IP packets to control packet flow in or out of the system; stateful simplifies and increases security of rule definitions by allowing return traffic based on outbound rules without having to define broader inbound rules). HP's unique dynamic connection allocation provides protection from denial-of-service attacks. IPFilter provides increased security defense by minimizing the number of server exposure points.



Standard Features

- Software Assistant (SWA)** HP-UX SWA is a command-line tool that consolidates, simplifies and helps automate patch and security bulletin management on HP-UX systems. The SWA tool is the HP-recommended utility to maintain currency with HP-published security bulletins for HP-UX software.
- Install-time Security** Install-time Security (ITS) is available to customers running HP-UX 11i v2 or later releases of the operating system, as an install option to lockdown systems during installation. ITS makes HP-UX 11i more secure out-of-the-box when customers select higher security levels. There are four choices, ranging from a highly locked down (DMZ) level with a tightly configured IPFilter firewall blocking most inbound traffic (and many services also disabled or secured) to a maximum compatibility level which installs security tools, but doesn't apply a security level.
- Boot Authentication** A site's security policies may require users to authenticate before they can boot the system into single-user mode. Previously, this feature was only available on a system that had been converted to Trusted Mode. This product now provides secure single-user mode with root password protection, but without the overhead of converting the system to trusted mode.
- Standard Mode Security Extensions** Enhances the system security of HP-UX 11i v2 and v3. Several security features previously available only in trusted mode are now available on standard mode HP-UX 11i systems. Features include enhanced password and user account security, such as password expiration on inactivity history reuse restrictions, auditing, and much more.
- Shadow Passwords** Shadow Passwords enhance system security by hiding user encrypted passwords in a shadow password file. Encrypted passwords previously stored in the publicly readable /etc/passwd file can be optionally moved to the /etc/shadow file, which is accessible only by a privileged user.
- Strong Random Number Generator** The Strong Random Number Generator provides a cryptographically strong, non-reproducible source of true random numbers for applications with strong security requirements, such as for generating encryption keys
- HP-UX 11i Internet Express** In addition to the fully-supported features listed above, HP packages a number of limited-support open source products that offer additional system security, including: Chkrootkit, PAM_passwdqc, DanteSOCKS, Snort, Nessus, Xinetd.
- Identity Management Integration (IdMI)** Providing the most complete and integrated solution for security management, IdMI allows administrators to enforce critical system access and authorizations. In addition to integrated enforcement, with the bundled version of Select Access for IdMI, customers benefit from single-vendor support for this mission critical capability.
- Select Access for IdMI** Select Access for IdMI is a follow-up product to the HP-UX Identity Management Integration feature. This version of Select Access supports complete administration of HP-UX security policy for both user authentication and access control privileged functions within the OS. HP-UX security policy can be centrally controlled and managed through Select Access.



Standard Features

- Role-based Access Control (RBAC)** HP-UX RBAC (a component of security containment) is an alternative to the traditional "all-or-nothing" root user model, which grants permissions to the root user for all operations, and denies permissions to non-root users for certain operations. HP-UX RBAC allows you to distribute administrative responsibilities by creating roles with appropriate authorizations and assigning them to non-root users and groups.
- AAA Server** HP-UX 11i AAA Server provides authentication, authorization and accounting services using the RADIUS and EAP protocols to authenticate and authorize user access to network devices and software applications. The AAA Server also generates usage logs for accounting, auditing and billing purposes.
- Red Hat Directory Server** Red Hat Directory Server is a Lightweight Directory Access Protocol (LDAP) compliant software server that centralizes user profiles, application settings, group data, policies and access control information into a network-based registry. The server is available on HP-UX 11i and operates on both HP 9000 and HP Integrity 64-bit hardware server platforms.
- LDAP-UX Client** With growth, consolidation and a dynamic environment, enterprises need new technologies to manage and verify security in their IT environments. In a highly distributed environment, local processes, security practices and administration methods are often inconsistent, repetitive and difficult to audit. With LDAP-UX Enterprise IT architects can use LDAP directories as one tool to help unify and simplify many of the above-mentioned practices
- Kerberos Server** Kerberos Server provides key distribution facilities to implement the Kerberos authentication protocol in network-distributed enterprises. It operates with an LDAP directory providing integrated identity management for authentication and access control.
- PAM Kerberos Kerberos Client** PAM Kerberos provides transparent Kerberos login support for HP-UX. HP-UX provides Kerberos Client software including libraries, header files, and utilities for implementing secured client/server applications
- HP-UX 11i Internet Express** In addition to the fully-supported features listed above, HP packages a number of limited-support open source products that offer additional identity management, including: Perl-LDAP, sudo, and OpenSAML.

Common Criteria certification

HP-UX 11i v3, the latest release of HP's strategic UNIX operating environment running on HP Integrity server blades in evaluation for 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 expects the certification for EAL4 Common Criteria (ISO 15408) Assurance Level, augmented by ALC_FLR.3 (flaw remediation), using the Controlled Access (CAPP), Role-Based Access Control (RBACPP) Protection Profiles and nPartitions (nPars).

The **HP-UX 11i v2** operating system running on HP Integrity server blades has been successfully evaluated against the requirements for the EAL4 Common Criteria (ISO 15408) Assurance Level, augmented by ALC_FLR.3 (flaw remediation), using the Controlled Access (CAPP) and Role-Based



Standard Features

Access Control (RBAC) Protection Profiles. EAL4+ is sometimes used as the abbreviated form for additional assurances. Details of the evaluation and evaluated configuration are available at: <http://www.commoncriteriaportal.org/files/epfiles/CRP225.pdf> and <http://www.commoncriteriaportal.org/files/epfiles/hp-ux11iv2.pdf>.

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 Enterprise Configurator

The HP eConfigure Enterprise Configurator now provides factory default racking for our HP hardware portfolio. This approach is aligned with our strategic direction to meet the needs and expectations of our valued customers. If you require "custom" rack configuration, please contact HP's Customer Business Center or an Authorized Partner for assistance. For additional information please visit: <http://h30099.www3.hp.com/configurator/>



Service and Support

Service and Support

HP Care Pack Services: Packaged server and storage services for increased uptime, productivity and ROI

When you buy HP server and storage products and solutions, it's also a good time to think about what levels of support you may need. Our portfolio of service options reduce deployment and management worries while helping you get the most out of your server and storage investments. We take a holistic approach to your environment, bridging servers, blades, storage, software and network infrastructures with our packaged HP Care Pack Services for servers and storage.

Protect your business beyond warranty

When it comes to robustness and reliability, standard computing equipment warranties have matured along with technology. Good news that can also create problems stemming from depending on standard warranties designed to only protect against product defects and some downtime causes. Using a standard approach to warranty uplifts, such as HP Care Pack Services, helps reduce downtime risks and provides operational consistency for mission-critical and standard business computing.

HP Care Pack Services: Upgrading or extending standard server and storage warranties cost effectively

HP Care Pack Services offer a standard reactive hardware and software support services suite sold separately, or combined with our Support Plus and Support Plus 24 services. The portfolio also provides a combination of integrated proactive and reactive services, such as Proactive 24 Service and Critical Service. In addition with HP Proactive Select, you can acquire the specific proactive constancy and technical services. HP Proactive Select menu offers a broad set of service options that you can mix and match depending on your specific requirements. Proactive service options include offers for server, storage, network, SAN device, software, environment and education services.

HP server and storage lifecycle support services offers a full spectrum of customer care-from technology support to complex migrations to complete managed services. HP Factory Express provides customization, integration and deployment services for turnkey solutions. HP Education Services offer flexible, comprehensive training on to help your IT staff get the most out of your server and storage investments. HP Financial solutions extend innovative financing and cost-effective asset management programs-from purchase to equipment retirement.

Learn more: www.hp.com/services/servers and www.hp.com/services/storage

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

HP Care Pack Services are sold by HP and HP Authorized Service Partners:

- Services for customers purchasing from HP or an enterprise reseller are quoted using HP order configuration tools.
- Customers purchasing from a commercial reseller can find HP Care Pack Services at <http://www.hp.com/go/lookuptool>



Service and Support

Recommended HP Care Pack Services for optimal satisfaction with your HP product

Recommended Services **3-Year HP Hardware Support Onsite Call-to-Repair (CTR) Service, 6- or 24-hour**
Provides your IT manager with a team of support specialists who will quickly begin troubleshooting the system to help return the hardware to operating condition within 6 or 24 hours of the initial service request to the HP Global Solution Center.

HP is committed to repairing your hardware within a maximum of six or twenty four hours. The benefits include:

- Improved system uptime
- Predictable repair times
- More effective IT resource planning
- Consistent level of hardware support across your multi-technology systems

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EN.pdf>

3-Year HP Hardware Support Onsite Service, 4-hour response, 24x7

Provides you with rapid remote support and if required an HP authorized representative who will arrive on site any time and day of the year to begin hardware maintenance service within 4 hours of the service request being logged.

This service provides a trained HP service specialist to perform an installation that meets HP quality standards, for:

- Help improve or maintain system uptime
- Convenient onsite support
- Committed response time

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EEE>

HP ProLiant Server Hardware Installation

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

- Expedited installation, with all service prerequisites met before the installation is performed
- Installation in accordance with manufacturer's specifications, enhancing the supportability of your HP-installed hardware and software
- Service delivery at a mutually scheduled time
- Allows your IT resources to stay focused on their core tasks and priorities
- Availability of an HP service specialist to answer questions during the onsite delivery of this service

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN>



Service and Support

Optional HP Care Pack Services that will enhance your HP product experience

Optional Services

HP Enhanced Network Installation & Startup for BladeSystem Switches

Provides for the configuration and testing of BladeSystem Ethernet interconnect switches to facilitate proper implementation of network protocols and access to advanced features.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4aa0-5969ENW>

3-Year HP Proactive 24

As an alternative to our recommended support level, for customers who want enhanced operational effectiveness and proactive problem identification:

Provides improved stability, availability and operational effectiveness with an integrated hardware and software support service that combines industry-leading reactive technical assistance with proactive account services, giving your IT manage support from a team of service specialists.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-1614ENUC>

HP Proactive Select Service

Customer needs on demand access to consulting, technical proactive services and education courses

Provides a flexible way to purchase HP best-in-class consultancy and technical services. You can buy Proactive Select Service Credits when you purchase your hardware and then use the credits over the next 12 months.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-3842ENN>

eSupport

HP eSupport is a portfolio of technology-based services that assist you with managing your business environment - from the desktop to the data center.

Support Portal

The HP support portal provides one-stop access to the information, tools and services you need to manage the daily operations of your IT environment.

Features include:

- Access to self-solve tools (including search technical knowledge base)
- Efficient logging and tracking of support cases
- Collaboration with other business and IT professionals
- Download of patches and drivers
- Access to diagnostic tools
- Proactive notification of relevant information

Access to certain features of the support portal requires an HP service agreement. To access the support portal, visit: <http://www.hp.com/support>

HP Insight Remote Support software delivers secure remote support for your HP Servers and Storage, 24 X 7, so you can spend less time solving problems and more time focused on your business. You can have your systems remotely monitored for hardware failure using secure technology that's been proven at thousands of companies around the world. In many cases, you can avoid problems before they occur.



Service and Support

Customer Technical Training

In today's cost-conscious business environment, IT professionals, developers, consultants and users face an interesting challenge: how to keep up with the latest technologies and expand important skills while delivering profitable results on current projects. To help address this challenge, HP offers innovative training solutions that help keep you up-to-date on virtualization, server, storage, Insight Control, Citrix, Microsoft® and open source/Linux-related topics-while spending less time away from business-critical activities.

HP Services Awards

HP Technology Services continues to be recognized for service and support excellence by customers, partners, industry organizations and publications around the world. Recent honors and award reflect our services team's dedications, technical expertise, professionalism and uncompromising commitment to customer satisfaction.

Additional Services Information

To learn more on HP ProLiant servers, HP BladeSystem servers and HP storage products, please contact your HP sales representative or HP Authorized Channel Partner. Or visit: www.hp.com/services/proliant or www.hp.com/services/bladeSystem or <http://www.hp.com/hps/storage>



Models

Base Model

HP Integrity BL870c Base Unit AH232A	Processor(s) Supports up to four (4) processors	None included in base unit
	Cache Memory All processor models	L2 cache per core; 1MB Instruction, 256KB Data
	Memory	None included in base unit
	Network Adapter	4 Embedded NICs: Dual Broadcom 5704 Gigabit NICs plus (1) additional 10/100 NIC dedicated to Integrity iLO 2 Management
	Storage Controller	LSI 1068 SAS Controller
	Hard Drives	No drives included; (4) SFF SAS drive bays
	Internal Storage	SAS: 2.4TB
	Optical Drive	None
	Form Factor	Supports up to 2 BL870c in HP BladeSystem c3000 Enclosure Supports up to 4 BL870c in HP BladeSystem c7000 Enclosure



Configuration Information - Factory Integrated Models

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

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

Configure-to-order servers must start with a CTO Enclosure

NOTE: FIO indicates that this option is a factory installable option.

Step 1: Base Server Blade Configuration

Base Unit	HP Integrity BL870c Server Blade	AH232A
	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)	
	Base unit standard features:	
	Four embedded Gigabit Ethernet NIC ports plus (1) additional 10/100 NIC dedicated to Integrity iLO 2 Management	
	Integrated LSI 1068 hardware RAID controller	
	Four small form factor (SFF) SAS hot plug hard drive bays	
	HP Integrity Integrated Lights-Out 2 Advanced Pack	
	Support for up to 192GB memory with support for 24 DIMM slots	
	Support for up to three c-Class mezzanine cards	

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

HP Processors	NOTE: Select minimum one (1) and maximum four (4) processors).	
	HP BL860c Intel® Itanium 9150N (1.6GHz/2-core/24MB/104W) Processor Kit	AH320A
	HP BL860c Intel® Itanium 9140N (1.6GHz/2-core/18MB/104W) Processor Kit	AH255A
	HP BL860c Intel® Itanium 9120N (1.42GHz/2-core/12MB/104W) Processor Kit	AH256A
HP Memory	NOTE: Select minimum one (1) and maximum six (6) memory modules.	
	HP BL870c 4GB (4x1GB) Single Rank PC2-4200MB/s (DDR2-533) Registered Memory	AH252A
	HP BL870c 8GB (4x2GB) Single Rank PC2-4200MB/s (DDR2-533) Registered Memory	AH253A
	HP BL870c 16GB (4x4GB) Single Rank PC2-4200MB/s (DDR2-533) Registered Memory	AH254A
	HP BL870c 32GB (4x8GB) Single Rank PC2-4200MB/s (DDR2-533) Registered Memory	AM324A
	NOTE: Memory Modules consist of four individual DIMMs.	
	NOTE: DIMMs must be installed in quads.	

Step 3: Choose Additional Options for Factory Integration

HP Hard Drives	NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.	
	SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives	



Configuration Information - Factory Integrated Models

	HP 600GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581286-B21
	HP 450GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581284-B21
	HP 300GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507127-B21
	HP 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512547-B21
	HP 146GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507125-B21
	HP 72GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512545-B21
HP Fibre Channel Mezzanine Options	QLogic QMH2562 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	451871-B21
	Emulex LPe1205 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	456972-B21
	QLogic QMH2462 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	403619-B21
	Emulex LPe1105 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	403621-B21
	NOTE: BL870c supports HP Virtual Connect Fibre Channel Interconnect Modules. See: http://www.hp.com/go/bladeSystem/virtualconnect for complete details.	
HP Ethernet Mezzanine Options	Gigabit Ethernet Mezzanines	
	HP NC364m Quad Port 1GbE BL-c Adapter	447883-B21
	NOTE: Provides four additional 1GbE ports. HP NC 364m Quad Port 1GbE BLc Adapter, (P/N 447883-B21) is supported by HP-UX 11iv3 and v2, OpenVMS, Windows and Linux.	
	HP NC360m Dual Port 1GbE BL-c Adapter	445978-B21
	NOTE: Provides two additional 1GbE ports. HP NC 360m Dual Port 1GbE BLc Adapter, (P/N 445978-B21) is supported by HP-UX v3 and v2; OpenVMS, and Windows.	
	10 Gigabit Ethernet Mezzanines	
	HP NC532m Dual Port 10GbE Multifunction BL-c Adapter	467799-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).	
	NOTE: Supported with HP-UX 11i v3 and Windows; requires 2GB of system memory to be ordered for each card in the blade. To obtain the software and instructions required to run the NC532m in a Windows Integrity environment, please contact: windows_integrity_nic@hp.com	
RAID 1 Configuration Upgrade Option	Factory configured hardware RAID 1	AD248A #106
	NOTE: Ordering AD248A#106 provides factory configuration of the embedded LSI 1068 SAS controller to RAID1.	
	NOTE: Requires two (2) SAS Hard Drives identical in speed and capacity	



Configuration Information - Factory Integrated Models

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 and mezzanine options and power subsystem options; please see the Core Options and Additional sections below; or 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>



Options

HP Processors (field upgrade only)	HP BL860c Intel® Itanium 9150N (1.6GHz/2-core/24MB/104W) Processor Kit	AH320A
	HP BL860c Intel® Itanium 9140N (1.6GHz/2-core/18MB/104W) Processor Kit	AH255A
	HP BL860c Intel® Itanium 9120N (1.42GHz/2-core/12MB/104W) Processor Kit	AH256A

NOTE: HP Integrity BL870c processor upgrade kits contain one processor. Processors must be identical. No mixing of processor models is allowed.

NOTE: The Integrity BL870c only supports 1, 2, 3 or 4 processor configurations.

HP Memory	HP BL870c 4GB (4x1GB) Single Rank PC2-4200MB/s (DDR2-533) Registered Memory	AH252A
	HP BL870c 8GB (4x2GB) Single Rank PC2-4200MB/s (DDR2-533) Registered Memory	AH253A
	HP BL870c 16GB (4x4GB) Single Rank PC2-4200MB/s (DDR2-533) Registered Memory	AH254A
	HP BL870c 32GB (4x8GB) Single Rank PC2-4200MB/s (DDR2-533) Registered Memory	AM324A

NOTE: Memory Modules consist of quads of DIMMs
DIMMS must be installed in quads

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 the specific hard drive QuickSpecs for details.

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

HP 600GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581286-B21
HP 450GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581284-B21
HP 300GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507127-B21
HP 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512547-B21
HP 146GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507125-B21
HP 72GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512545-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:

http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html
(Worldwide)



Options

HP Fibre Channel Mezzanine Options	QLogic QMH2562 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	451871-B21
	Emulex LPe1205 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	456972-B21
	QLogic QMH2462 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	403619-B21
	Emulex LPe1105 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	403621-B21
HP Ethernet Mezzanine Options	Gigabit Ethernet Mezzanines HP NC364m Quad Port 1GbE BL-c Adapter 447883-B21 NOTE: Provides four additional GbE ports. HP NC 364m Quad Port 1GbE BLc Adapter, (P/N 447883-B21) is supported by HP-UX v3 and v2.)	
	10 Gigabit Ethernet Mezzanines HP NC532m Dual Port 10GbE Multifunction BL-c Adapter 467799-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). NOTE: Supported with HP-UX 11i v3 and Windows; requires 2GB of system memory to be ordered for each card in the blade. To obtain the software and instructions required to run the NC532m in a Windows Integrity environment, please contact: windows_integrity_nic@hp.com	
HP Storage Controllers	HP Smart Array P700m/512 4-ports Ext PCIe x8 SAS Controller 508226-B21	
	Optional Upgrades HP Smart Array Cache Battery Kit 383280-B21 NOTE: The P700M will function as a SAS RAID controller when connected to MDS600 disk subsystem via the 3Gb SAS Switch. In the RAID mode, HP-UX 11iv3 and v2, OpenVMS 8.3-1H1, and Integrity for Windows 6.2 are supported. NOTE: The P700M will function as a Pass-Thru when connected to the MAS200sa SAS Storage Array via the 3Gb SAS Switch. In the Pass-Thru mode, HP-UX 11i v3 and Integrity for Windows 6.2 are supported. NOTE: The optional battery is required for RAID 6 and highly recommended for RAID 5 implementations.	
HP USB Options	HP Mobile USB DVD/RW Drive BU516AA#ABA NOTE: The HP Mobile USB DVD/RW solution includes the DVD/RW Drive (BU516AA), power adaptor, power cable and USB Y-connector and 7-foot USB extension cable (SH046AA). NOTE: HP Monster 700 A-A 7ft USB Extension Cable (SH046AA) will be added automatically when the drive is ordered. NOTE: The USB Y-connector goes between the extension cable (SH046AA) and the 9-inch USB cable fixed with DVD drive. NOTE: The Y-connector should NOT be placed between the server blade and the 7-foot Extension cable.	
HP Care Pack Services	NOTE: The HP Care Pack service part numbers below for the Integrity BL870 c-Class server blades, cover the server blade and all HP branded hardware options qualified	



Options

for the server, purchased at the same time or afterwards, internal to the server.

NOTE: HP Care Pack services for the c7000 Enclosure cover the enclosure, power supplies and fans. HP qualified rack options are covered by these services when installed within the same rack. HP Supported Ethernet devices covered include the Ethernet Pass-Through Module, Fibre Channel Pass-Through Module, Cisco Catalyst 3020 Blade Switch and GbE2c Ethernet Blade Switch.

NOTE: The services listed below are available for both Integrity and ProLiant blades, as well as the c7000 enclosure, when ordering flexible services

Support Plus

Support Plus, 1 Year	HA109A1
Support Plus, 3 Years	HA109A3
Support Plus 24, 1 Year	HA110A1
Support Plus 24, 3 Years	HA110A3

HP Proactive Service

HP Proactive Service, 24 Hour, 1 Year	HA111A1
HP Proactive Service, 24 Hour, 3 Year	HA111A3

HP Critical Service

Hardware Only, Critical Service, 7-Day x 24 Hour, 1 Year	HA112A1
Hardware Only, Critical Service, 7-Day x 24 Hour, 3 Years	HA112A3

Installation Services

Integrity BL860c Server Blade Hardware Installation	HA113A1
ProLiant BL c-Class Enclosure and Server Blade Hardware Installation	HA113A1

Installation & Start-up Services

Provides for the Installation and Start-up of ProLiant Essentials Rapid Deployment Pack	HA114A1
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NOTE: Provides installation on a Customer supplied server designated as a Deployment Server. Includes the deployment of a single server. This new server will be deployed using either one of the pre-configured scripts or an image. In addition, the service will provide for the capture and storage of the configuration of the newly deployed server and orientation on product usage. To be delivered during standard office hours, standard office days.

Provides for the Installation and Start-up of Rapid Deployment Pack Implementation of Rapid Deployment Pack (Basic) (Electronic)	HA114A1
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Provides for the Installation and Start-up of System Insight Manager (Electronic)	HA124A1
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HP Installation & Startup Service for HP BladeSystem Infrastructure	HA114A1
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NOTE: Provides for an integrated hardware and software implementation that includes remote service planning, onsite deployment of hardware and software, installation verification testing and customer orientation. Hardware deployment covers the installation of a single BladeSystem enclosure that includes server blades (up to 16), Ethernet network interconnect, and power options. Software deployment covers the installation and configuration, where required of HP BladeSystem Essential Insight Control Datacenter Edition which includes Systems Insight Manager (SIM), HP Rapid Deployment Pack (RDP) and Performance Management Pack (PMP), HP-UX ignite server or HP-UX manual load, and deploy up to two editions of either Windows or Linux, using scripted operating system installation software.

For more information: <http://www.hp.com/services/bladessystemservices>.



Memory

DIMM installation guidelines:

1. All DIMMs must be PC2-4200 DIMMs (DDR2 533MHz)
2. All four DIMM slots in a memory bank must be populated.
3. Banks must be populated in sequential numeric order, starting with bank 0.
4. All four DIMMs in a memory bank must be identical. Install identical DIMMs in quads, starting with DIMM socket A, bank 0.
5. DIMMs must be installed in decreasing capacity with the largest DIMMs installed in the smallest numbered DIMM slot.

HP Integrity BL870c Server Blade

Standard Memory

4 GB Registered PC2-4200, DDR2 533MHz ECC DIMMs (4 x 1 GB)

Memory Bus Bandwidth: 17 GB/s

Standard Memory Plus Optional Memory

Up to 192GB of PC2-4200, DDR2-533 DIMMs memory is available.

Memory		Slot											
Standard	4 GB	0A	0B	0C	0D	2A	2B	2C	2D	4A	4B	4C	4D
		1 GB	1 GB	1 GB	1 GB	Empty	Empty	Empty	Empty	Empty	Empty	Empty	Empty
		1A	1B	1C	1D	3A	3B	3C	3D	5A	5B	5C	5D
		Empty	Empty	Empty	Empty	Empty	Empty	Empty	Empty	Empty	Empty	Empty	Empty
Maximum	192GB	0A	0B	0C	0D	2A	2B	2C	2D	4A	4B	4C	4D
		8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB
		1A	1B	1C	1D	3A	3B	3C	3D	5A	5B	5C	5D
		8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB

HP Memory	HP BL870c 4GB (4x1GB) Single Rank PC2-4200MB/s (DDR2-533) Registered Memory	AH252A
	HP BL870c 8GB (4x2GB) Single Rank PC2-4200MB/s (DDR2-533) Registered Memory	AH253A
	HP BL870c 16GB (4x4GB) Single Rank PC2-4200MB/s (DDR2-533) Registered Memory	AH254A
	HP BL870c 32GB (4x8GB) Single Rank PC2-4200MB/s (DDR2-533) Registered Memory	AM324A

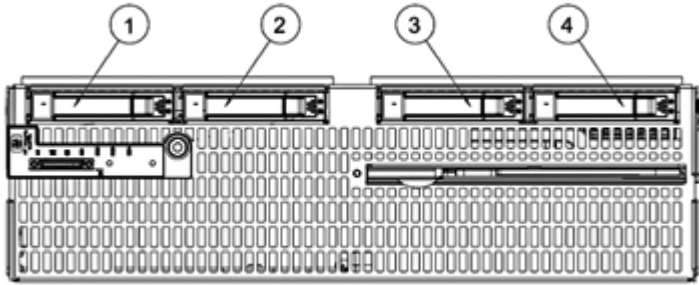
NOTE: Must be installed in quads

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



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

	Quantity Supported	Position Supported	Controller
600GB 6G SAS 10K	4	1-4	LSI 1068
450GB 6G SAS 10K			

Power Specifications

NOTE: To review maximum system power ratings for facilities planning purposes use the Active Answers Blade Power Sizer which is available via the online tool located at URL: <http://h71019.www7.hp.com/ActiveAnswers/cache/347628-0-0-0-121.html>. Please select CTO under Configuration Type



Technical Specifications

System Unit	Dimensions	Height	14.42 in (36.63 cm)
		Depth	20.05 in (50.93 cm)
		Width	4.10 in (10.41 cm)
	Shipping Dimensions	Height	21.50 in (54.61 cm)
		Depth	23.13 in (58.75 cm)
		Width	9.94 in (25.25 cm)
	Weight	Maximum	38 (17 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	10% to 90%
Shipping		10% to 90%	
Storage		10% to 95%	

*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 95% 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 LSI 1068 Controller	Disk Drive and Enclosure Interface	3G SAS (Serial Attached SCSI)
	SAS Connectors	1 internal mini-SAS x4 wide port connector
	Server Interface	PCI-X 66MHz 64-bit provides 0.5GB/s maximum bandwidth
	SAS Speed	x4 3G SAS provides 1.2GB/s maximum bandwidth.
	Cache Memory	No cache memory supported
	Logical Drives Supported	Up to 32 logical volumes
	Maximum Logical Drive Capacity	1.2TB (4 x 300GB)
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space
	RAID Support	RAID 1 (Mirroring)
	Upgradeable Firmware	Upgradeable Firmware



Technical Specifications

Embedded Dual Broadcom 5704 Gigabit NICs	Network Interface	1000Base-Sx	
	Compatibility	IEEE 802.3ab 1000Base-Sx	
	Data Transfer Method	PCI-X 133/66MHz 64-bit	
	Network Transfer Rate (Theoretical Maximum Values)	1000Base-SX	2000 Mb/s
	Connector	RJ-45 (at SWM of enclosure)	
	Cable Support	1000 Base-TX	Cable Support 1000 Base-TX Category 5 UTP up to 328 ft (100 m)

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.

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

