

HP Integrity Servers

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Superior choice to meet a broad range of needs *servers for all workloads*



Access Tier	Application Tier	Data Tier
<ul style="list-style-type: none">•Web•Infrastructure•Mail•File/Print	<ul style="list-style-type: none">•ERP•CRM•SCM•BI•HPC	<ul style="list-style-type: none">•OLTP•Data Warehousing•Operational Data Store



Small scale, well-defined workloads



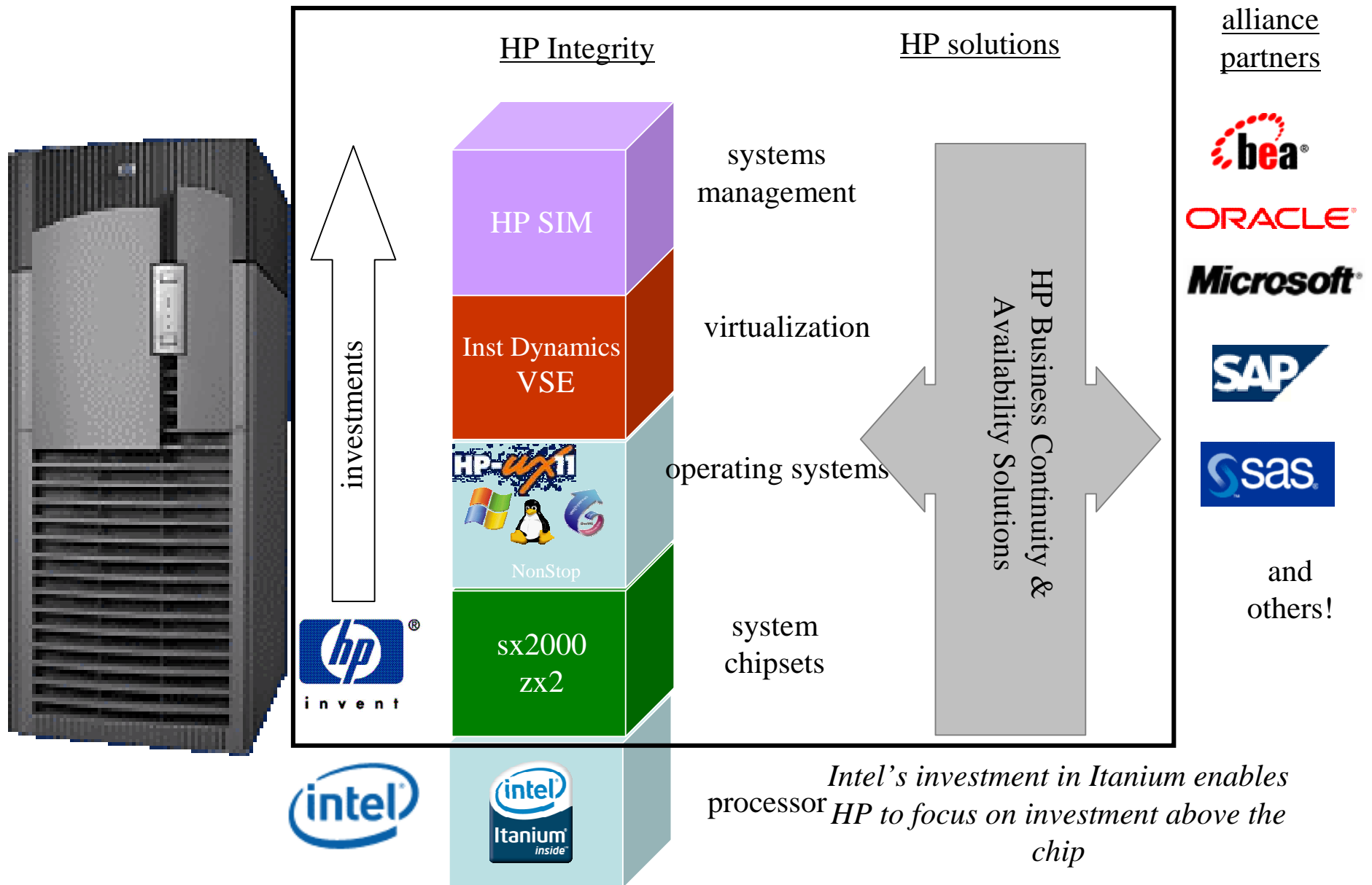
Large scale, complex workloads

Intel® Itanium® Processor Family Roadmap

Processor Generation	Intel® Itanium® Processor 9000, 9100 Series	Tukwila	Poulson	Kittson
Highlights	Dual Core	Quad Core (2 Billion Transistors)	Ultra Parallel Micro-architecture	
New Technologies	<ul style="list-style-type: none"> • 24MB L3 cache • Hyper-Threading Technology • Intel® Virtualization Technology • Intel® Cache Safe Technology • Lock-step data integrity technologies (9100 series) • DBS Power Management Technology (9100 series) 	<ul style="list-style-type: none"> • 30MB On-Die Cache, Hyper-Threading • QuickPath Interconnect • Dual Integrated Memory Controllers, 4 Channels • Mainframe-Class RAS • Enhanced Virtualization • Common chipset w/ Next Gen Xeon® processor MP • Voltage Frequency Mgmt • ~2x Perf Vs 9100 Series • Scalable buffered memory 	<ul style="list-style-type: none"> • Advanced multi-core architecture • Hyper-threading enhancements • Instruction-level advancements • 32nm process • Large On-Die Cache • New RAS features • Scalable buffered memory 	9th Itanium Generation Product <ul style="list-style-type: none"> • Socket compatible with Tukwila & Poulson • Scalable buffered memory
Targeted Segments	Mission Critical Segment (Database, Business Intelligence, ERP...)	Looks ahead new development		
Availability	2006-07	Mid-2009	Future	Future

HP Integrity

HP innovates on top of standards based processor



HP Integrity Systems

Used by the World's Leading Corporations

100%
of all CME
customers on the
Global 100 list

100%
of all Wholesale
Healthcare companies
on the Global 100 list

90%
of all Automotive
companies on the
Global 100 list

80%
of all Oil & Gas
companies on the
Global 100 list

63%
of the entire Fortune
100 list

62%
of all FSI customers on
the Fortune 100 list

60%
of all MDI
customers on the
Fortune 100 list



Integrity RAS Features Meet Customer Challenges Head On

Keep systems running

Double-Chip Spare – provides RAID level availability with less cost and no degraded performance
Intel Cache-Safe Technology – Provides “spare” CPU memory locations



Safeguard uptime for applications and processes

Electrically isolated partitions – provide better containment of catastrophic errors over virtual partitions
DPR (Dynamic Processor Recovery) and APR (Automated Process Recovery) – isolate application and OS faults from other processes
PCI-X error handling and recovery – isolates I/O errors from other processes



Reduce downtime

Easy Service for Entry level – fast repair and recovery in the event of an error or upgrade
Enhanced Machine Check Architecture - pinpoints failures for better debug of applications and hardware errors



Integrity provides half the unplanned downtime with 3 times OLTP throughput

Thermal Logic for Integrity Servers

Facilities Infrastructure	Overall data center efficiency <ul style="list-style-type: none"> • Data center best practices • Data center services 	<ul style="list-style-type: none"> • Dynamic Smart Cooling enabled • Liquid cooling rack enabled
Dynamic Management	Power monitoring and management <ul style="list-style-type: none"> • HP Insight Power Manager • HP Integrity iLO 2 • OS optimization and tools 	Consolidation platform <ul style="list-style-type: none"> • Virtualization via VSE • Virtual Connect for HP BladeSystem • Storage Thin Provisioning • Dynamic Capacity Management
Components	Acoustics and airflow management <ul style="list-style-type: none"> • Integrity office-friendly server • Fan speed control based on workload for maximum efficiency System performance efficiency <ul style="list-style-type: none"> • Leading performance/watt benchmarks 	Power conversion technologies <ul style="list-style-type: none"> • Energy-efficient power supplies for 15%+ efficiency improvement • Three-phase UPS and PDR enabled

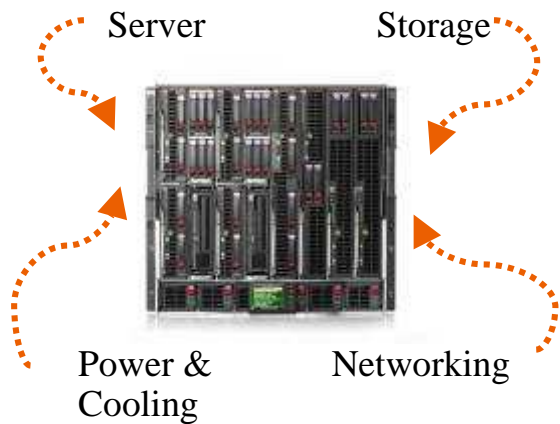
Contributions to the Improved Performance-Per-Watt Characteristics on Integrity Servers

Processor	Dual-Core Intel® Itanium® Processor consumes 27 watts less power than the previous-generation single-core processor	27 W of reduction per CPU chip brings another 40 W of power savings in cooling requirements, for a total savings of 67 W per socket
zx2 Chipset	Contributes to higher performance; and improved performance/watt	Increased front-side-bus (FSB) bandwidth by 33-65% Increased memory and I/O bandwidth ~100%
Memory	New DDR2 memory technology lowers the supply voltage	Provides 15% to 18% power reduction per DIMM, compared to DDR1, while delivering increased memory bandwidth and capacities
Disk drives	2.5" SAS drives offer a 50% power reduction compared to 3.5" SCSI	Delivers increased density and improved bandwidth
RAS	zx2 chipset provides significant improvements in system Reliability, Availability and Serviceability features	Memory double-chip-sparing reduces memory error repair rates by up to 17x, and memory related downtime by up to 3x.

HP BladeSystem strategy

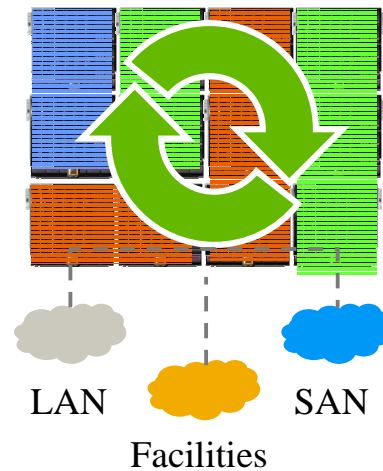
Rethinking 40 years of racked, stacked and wired infrastructure to free your untapped potential

Blade Everything



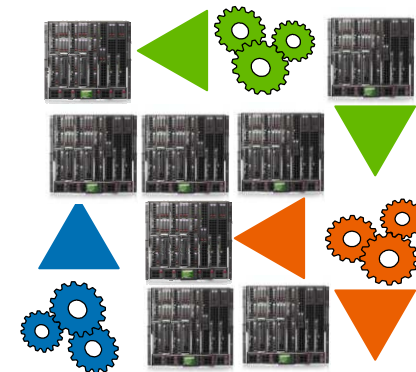
Reduce time & cost to buy, build and maintain

Virtually Connect Everything



Reduce time & cost to buy, build and maintain

Automate Everything



Align resources to the business outcomes

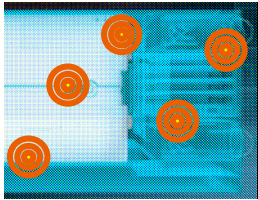


BladeSystem strategy takes aim at the top pain-points of today's infrastructures



Cost

Consolidated and shared infrastructure significantly lowers acquisition costs



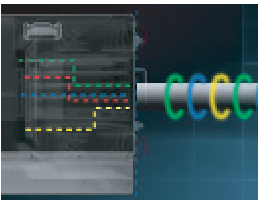
Energy

Dynamic management and control over power and cooling saves energy



Time

Intelligence, control & optimization improves productivity, simplifies tasks



Change

Virtualization of network, storage and servers frees untapped resources



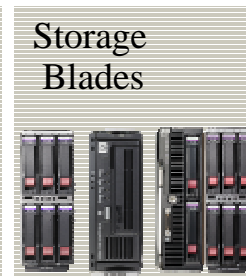
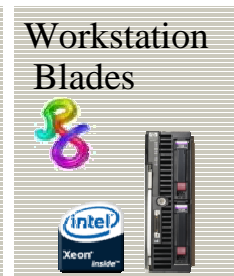
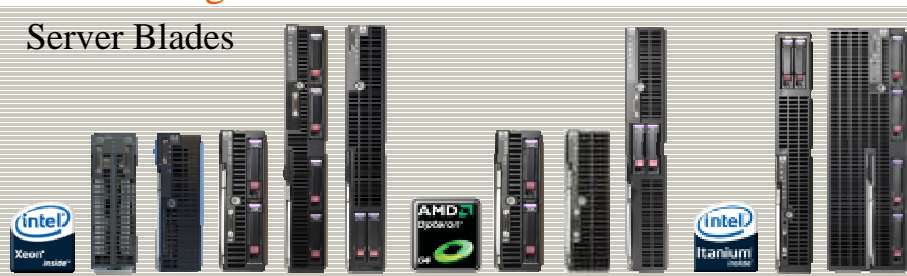
Results of Blade Everything

The industry's most complete portfolio

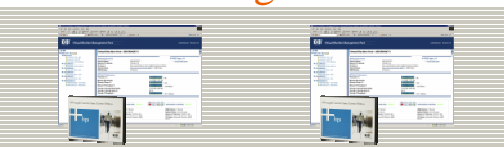
Enclosures



A Full Range of 2P and 4P Blades



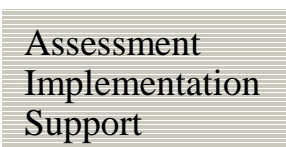
Unified Management



Choice of Power

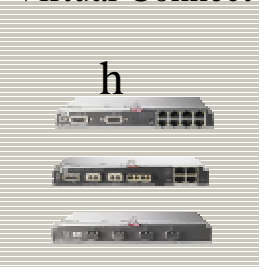


Services

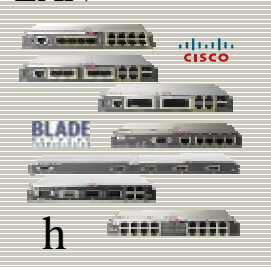


Interconnect choices for LAN, SAN, and Scale-Out Clusters

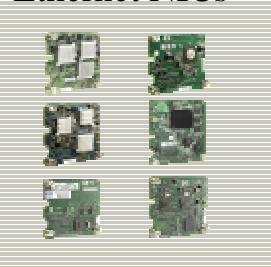
Virtual Connect



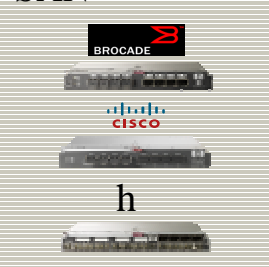
LAN



Ethernet NICs



SAN



Fibre Channel



InfiniBand 4X DDR



Integrity BL860c Server Blade

Processors and Chipset

- Up to 2 Intel® Itanium® 9100 series processors
 - DC 1.66GHz 18MB FSB667
 - DC 1.42GHz 12MB FSB533
 - SC 1.6GHz 12MB FSB533
- HP zx2 Chipset

I/O Subsystem

- 4 GbE NIC ports standard
- 3 mezzanine expansion I/O slots
 - 4-port GbE expansion; 2-port 4xFC; 4xDDR IB; pass-thru
- Mgmt LAN, 100Base-T, USB, VGA, RS232 serial port
- 2 SAS (Serial Attached SCSI) Channels

Memory

- 2 GB to 48 GB
- PC4200 ECC double chip spare DDR2
- Support for up to 48GB memory in 12 DIMM slots

Management

- Integrity Integrated Lights Out (iLO 2)
- Integrity iLO 2 Advanced Pack license included with blade

HP-ux11



Microsoft Windows Server



Peripherals

- 2 hot-plug SFF SAS HDDs
- External DVD/CD-RW

Form Factor

- Full height c-Class blade
- 8 BL860c in c7000; 4 in a c3000
- 32 BL860c's in a 42U rack
- Designed for data center and utility closet operation (5–35°C)
- Integrity, ProLiant & StorageWorks in one enclosure

High Availability

- Redundant, hot-plug, modular, pooled power & fans for HA and efficiency via BladeSystem enclosure
- Optional redundant enclosure manager
- Dual SAS channels
- Dynamic processor resilience
- Double chip sparing for exceptional availability

Operating Systems

- HP-UX 11i v3 and 11i v2
- Microsoft Windows Server
- Red Hat and SUSE Linux
- OpenVMS



Integrity BL870c Server Blade

Processors and Chipset

- Up to 4 Intel® Itanium® 9100 series processors
 - DC 1.6GHz 24MB FSB533
 - DC 1.6GHz 18MB FSB533
 - DC 1.42GHz 12MB FSB533
- HP zx2 Chipset



I/O Subsystem

- 4 GbE NIC ports standard
- 3 mezzanine expansion I/O slots
 - 4-port GbE expansion; 2-port 4xFC; 4xDDR IB
- Mgmt LAN, 100Base-T, USB, VGA, RS232 serial port
- 2 SAS (Serial Attached SCSI) Channels

Memory

- 4 GB to 192 GB
- PC4200 ECC double chip spare DDR2
- Support for up to 192GB memory in 24 DIMM slots

Management

- Integrity Integrated Lights Out (iLO 2)
- Integrity iLO 2 Advanced Pack license included with blade



HP-ux11i



Windows Server



Peripherals

- 4 hot-plug SFF SAS HDDs
- External DVD/CD-RW

Form Factor

- Double wide, full height c-Class blade
- 4 BL870c in c7000; 2 in a c3000
- 16 BL870c's in a 42U rack
- Designed for data center and utility closet operation (5–35°C)
- Integrity, ProLiant & StorageWorks in one enclosure

High Availability

- Redundant, hot-plug, modular, pooled power & fans for HA and efficiency via BladeSystem enclosure
- Optional redundant enclosure manager
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Operating Systems

- HP-UX 11i v3 and 11i v2
- Microsoft Windows Server
- Red Hat and SUSE Linux
- OpenVMS



Customers benefit from HP's leading modular infrastructure efficiencies

- Save space and energy (BL870c vs. rack-mount configuration)
 - Over 2.5 times within the same space
 - Up to 25% power savings
- Streamline management with Systems Insight Manager
 - Cutting the time of IT maintenance tasks from 50 to 90 percent or more
- Optimize resource utilization with HP Virtual Server Environment
- Wire once with HP Virtual Connect
 - Reduction in number of cables
- Same Integrity operating system tools



