



IBM System z

# *z9 Enterprise Class and HP Integrity Superdome - Features Overview and Comparison*

*IBM*

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Processors and Memory	HP Integrity Superdome	IBM z9 Enterprise Class
Number of Processors	Up to 128 ( HP UX 11 iv3 req'd for 128 way single image)	Up to 54
Technology / Packaging	<p>Itanium 2 (1.6GHz)            Itanium 2 9040 (1.6GHz)            Itanium 2 9050 (1.6GHz)</p> <p>HP Montecito            Dual Core            First Generation            1.6GHz Copper            250MHz cell, 500MHz xBar            Event-based switch threading            x86 HW compatibility removed            Foxtan technology disabled</p>	<p>1- 4 CMOS based MultiChip Modules (MCMs). The MCMs are configured in a book package, with each book composed of a MultiChip Module (MCM), memory cards, and self-timed interconnects. The MCMs, which measure approximately 95 x 95 millimeters, contain the processor unit (PU) dual core chips (cycle time of .58 NS ( 1.724 GHz ), the cache structure chips, the processor storage controller chips, and the clock chip.</p>
Cache per processor	9MB / 18MB / 24MB L3 or 32MB L4	<p>Level 1 cache sizes of 256 KB for instructions and 256 KB for data</p> <p>Each MCM provides support for 40 MB sharde level 2 cache for total of 160MBs shared L2</p>



Processors and memory	HP Integrity Superdome	IBM z9 Enterprise Class	
Memory	Cell boards can have either four 1.6 GHz 9M Itanium 2 processors (giving each core 16 GB of memory) or four dual-core Montecito chips (giving each core only 8 GB of memory). Even the largest Superdome with 16 cell boards is limited to 1 TB of memory.	Up to 128 GB per book and up to 512 GB per system.	
PCI-X	An 8-cell Integrity Superdome (32 or 64 processor cores) can be expanded to 96 PCI-X slots and the 16-cell Superdome (64 or 128 cores) can be expanded to 192 PCI-X slots.	<p>Feature max features</p> <p>ESCON, 16 port</p> <p>FICON Express4</p> <p>FICON Express2*</p> <p>FICON Express*</p> <p>ICB-3 link</p> <p>ICB-4</p> <p>ISC-3</p> <p>OSA-Express2</p> <p>OSA-Express*</p> <p>Crypto Express2</p>	<p>Maximum connections</p> <p>69 1024 channels</p> <p>84 336 channels</p> <p>84 336 channels</p> <p>80 120 channels</p> <p>N/A 16 links</p> <p>N/A 16 links</p> <p>12 48 links</p> <p>24 48 ports</p> <p>24 48 ports</p> <p>8 16 PCI-X adapters</p>

RAS	HP Integrity Superdome	IBM z9 Enterprise Class (subset)
	<p>Redundant cell board components, error checking and correcting (ECC) on CPU and memory paths, flexible clustering solutions, online addition and replacement of PCI-X I/O cards, and dynamic processor (HP-UX 11i and Windows® only) and memory (HP-UX 11i) de-allocation.</p> <p>"State-of-the-art" technologies include double chip sparing and link retries</p>	<ul style="list-style-type: none"> <li>•Transparent CP sparing</li> <li>•Fault-tolerant interconnect design</li> <li>•Dynamic memory sparing</li> <li>•N+1 power supply technology</li> <li>•Concurrent channel, OSA-E. coupling link maintenance</li> <li>•Concurrent power and thermal maintenance</li> <li>•Concurrent licensed internal code (LIC)</li> <li>•Maintenance for CP, SAP, SE, PR/SM., LPAR, HMC, OSA-Express2</li> <li>•Dynamic I/O reconfiguration</li> <li>•System assist processor (SAP) reassignment and sparing</li> <li>•Sparing for storage protect preservation keys</li> <li>•Concurrent Hardware Management Console (HMC) and support element</li> <li>•Redundant I/O Interconnect</li> </ul>

COD	HP Integrity Superdome	IBM z9 Enterprise Class
	iCAP	CuoD
	Cell iCAP	CuoD for Memory
	TiCAP	Reserve Capacity on Demand
	Bundled TiCAP ( IAC )	Trial Capacity on Demand
	Global instant Capacity on Demand ( GiCAP ) Pay for Use	On / Off Capacity on Demand

RAS D/R	HP Integrity Superdome	IBM z9 Enterprise Class
	HP ServiceGuard is a <b>software</b> solution	<b>GDPS</b> is an application-transparent, world-class clustering solution combining S/W, M/W, H/W, Interconnect, and services

## Security

## HP Integrity Superdome

## IBM z9 Enterprise Class

no mention of security features in HP Superdome specifications

- Open architecture, distributed transaction enablement
- Advanced encryption standard (AES)
- Pseudo random number generator (PRNG)
- SSL acceleration for Linux and z/OS
- Certified for LPAR isolation
- Certified for EAL5
- Secure hash algorithm-256 (SHA-256)
- CP assist for cryptographic function
- Tamper-proof cryptographic support
- Designed for FIPS 140-2 Level 4
- Configurable Crypto Express2 (secure coprocessor or SSL acceleration)
- Remote key load for ATMs
- Support for clear and secure key

Virtualization	HP Integrity Superdome	IBM z9 Enterprise Class
	<p>HP cluster offering (Serviceguard) only supports <b>16 nodes in a cluster</b>.</p> <p>HP offers nPar hard partitions aligned on cell board boundaries. The nPars offer a granularity of <b>four or eight cores</b> (Madison single core or Montecito dual-chip module).</p> <p>Note that <b>HP is still unable to support dynamic reconfiguration of nPars</b>.</p> <p>HP vPars allow software partitioning on a per-core basis. Late 2005, HP finally introduced Integrity Virtual Machines (IVM), which includes subprocessor partitions and shared I/O on its Integrity servers. Currently Integrity Virtual Machines <b>only support HP-UX 11i guests. A target date for Linux support has not yet been announced by HP.</b></p>	<p>Intelligent Resource Director</p> <p>z/OS Workload Manager</p> <p>Up to 60 LPARs</p> <p>Parallel Sysplex allows connection of up to 32 z/OS systems</p> <p>GDPS is a multisite or single site end-to-end application availability solution that provides the capability to manage remote copy configuration and storage subsystems to automate parallel sysplex operation tasks and perform failure recovery from a single point of control.</p> <p>z/VM allows for hundreds of Linux images</p>



Software	HP Integrity Superdome	IBM z9 Enterprise Class
Operating system (min version)	HP-UX 11i V2, Windows Server 2003 Datacenter Edition and Red Hat Linux Enterprise AS3	<p>z/OS: z/OS 1.4 and subsequent releases</p> <p>z/VM: z/VM 4.4, z/VM 5.1 and subsequent releases</p> <p>Linux on System z: Red Hat RHEL 3 and subsequent releases, SUSE SLES 8 and subsequent releases, Linux as z/VM guest</p> <p>z/VSE: z/VSE V3.1, V4.1* (* when available)</p> <p>VSE: VSE/ESA 2.7 and subsequent releases</p>
Networking	10/100Base-T Ethernet	TCP/IP, SNA, Hipersockets ( exclusive ) 10Gb OSA Express2

**System  
Management****HP Integrity Superdome****IBM z9 Enterprise Class**

- Support Management Station (SMS) runs the Superdome scan tools which enhance the diagnosis and testability of Superdome.
- Superdome Partition Manager - which allows users to launch as GUI from SAM create and modify partitions and display a complete hardware inventory.
- Service control - provides increased efficiency through multi-system management tools.

Tivoli OMEGAMON XE for z/OS  
Tivoli OMEGAMON for Linux  
Tivoli OMEGAMON for z/VM

## Environmentals

## HP Integrity Superdome

Height: 196 cm (77.17 in)  
 Width: 152.4 cm (60 in)  
 Depth: 122 cm (48.03 in)

Weight : 1,196 kg (2,637 lbs)

Heat Dissipation :  
 87,877 kj/hr (83,288 Btu/hr) (max) -  
 66877 Btu/hr (typical)

Power Consumption :  
 24,392 W (max) - 19600 W (typical)

## IBM z9 Enterprise Class

**Model S08, Minimum**  
 Weight 1212 kg (2672 lbs)  
 Footprint 2.49 Sq meters (26.78 Sq. ft)  
 Service 5.45 Sq meters (58.69 Sq. ft)  
 Input 6.3 kW  
 Heat 21.5 KBTU/hr  
 Air CFM 905, m3/m  
 Height 194.1 cm (76.4 inches)

**Model S38, maximum**  
 Weight 2003 kg (4407 lbs)  
 Footprint 2.49 Sq. meters (26.78 Sq. ft)  
 Service 5.45 Sq. meters (58.69 Sq. ft)  
 Input 18.3 kW  
 Heat 62.4 KBTU/hr  
 Air CFM 1965, m3/m  
 Height 194.1 cm (76.4 inches)

## HP Integrity Superdome versus IBM z9 EC summary

	HP Integrity Superdome	IBM z9 EC
Base technology	Itanium	CMOS
Operating systems	HP-UX, Windows, Linux	z/OS, z/VM, Linux
Virtualization	IVM, nPars, vPARS	LPAR, z/VM, Linux
Clustering technology	Service Guard ( Fail over only )	Parallel Sysplex ( Full data sharing )
Security	Some security within HP-UX OS, no crypto hardware	Cryptographic hardware security server
Specialized processors	n/a	zAAP, zIIP, IFL

## z9 EC Exclusives

Security / cryptography	A third generation cryptographic hardware feature, the Crypto Express2 allows for up to <b>48,000 SSL handshakes per second</b> . Certified at FIPS 140-2 Level 4
Specialized processors	<p><b>zIIP - z9 Integrated Information Processor (zIIP) -</b> Customer-inspired specialty engine for the IBM System z9 is designed to help improve resource optimization and lower the TCO of eligible workloads. DB2 exploits zIIP for complex queries</p> <p><b>zAAP - z9 Application Assist Processor (zAAP) -</b> Specialty engine allows you to integrate and run Java workloads on the same server as your database and run Java workloads for a significantly lower total cost of ownership than previously possible</p> <p><b>IFL - Integrated Facility For Linux -</b> Specialty engine allows the mainframe to support new workloads and open standards. zLinux provides an open, economical application enabling platform with a wealth of available applications. The System z platform provides users with the ability to “scale out,” deploying large numbers of virtual Linux servers to provide high levels of service while at the same time helping reduce expense and complexity</p>
Parallel sysplex	Using parallel sysplex clustering, up to 32 System z servers can be coupled together providing for 99.999% availability and dynamic workload management. Exclusive Integrated Coupling Facility (ICF) enables read and write data sharing between all systems in the sysplex with full data integrity
Virtualization	<b>Hipersockets</b> - Network communications between Linux and z/OS partitions at memory speeds

## Footnotes and References

**1. IDEAS Competitive Positioning White Paper:** "HP Integrity Superdome (Itanium) vs. System p5 – Enterprise Servers" ; DOC ID: 0H5HPS63 ; UPDATED: 11/28/06

**2. IBM System z9 Enterprise Class Data Sheet ;**

[http://www.ibm.com/common/ssi/fcgi-bin/ssialias?infotype=pm&subtype=sp&pdf=yes&appname=STG\\_ZS\\_USEN&htmlfid=ZSD01096USEN](http://www.ibm.com/common/ssi/fcgi-bin/ssialias?infotype=pm&subtype=sp&pdf=yes&appname=STG_ZS_USEN&htmlfid=ZSD01096USEN)

**3. HP Integrity Superdome Specifications:**

<http://h20341.www2.hp.com/integrity/cache/342370-0-0-0-121.html>

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