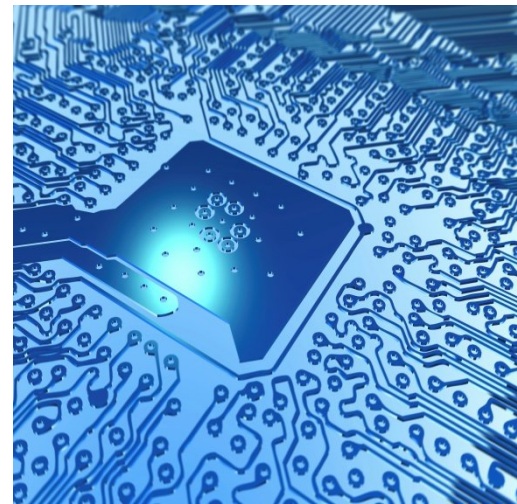Adrian Gjergjizi

Power Systems

Prodajni Specijalist

IBM Power 7 za bolji Oracle!

Agenda

- Partnerstvo IBM-a i Oracle-a

- Power 7 tehnologija

- Oracle na Power-u

- Power7 Marketshare

IBM / Oracle Partnerstvo

Dugogodišnje suradnja

Oracle 23 godine, Peoplesoft 21godina, JD Edwards 32 godine, Siebl 11 godina itd.

Preko 140 000 zajedničkih korisnika

Kombinacija IBM Hardvera i Oracle workload

Vrhunska Oracle znanja

Preko 9000 IBM konzultanata sa znanjem razvoja, prilagodbe i implementacije Oracle alata
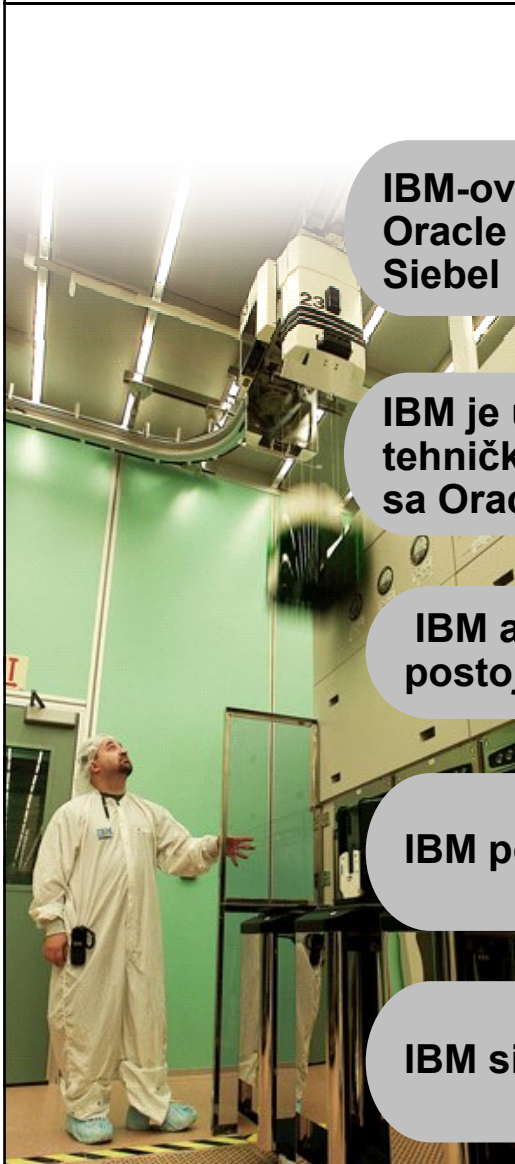
IBM Oracle Competency Centri

Optimizacija Oracle implementacija na IBM tehnologiji
Šest centara u tri zemlje

20 Oracle solution delivery centra

Istraživanje i razvoj

IBM-ovi alati za dimenzioniranje Oracle rješnja

IBM-ovi resursi prisutni su na Oracle lokacijamana gdje testiraju sve važnije Oracle rješenja: Oracle E-Business Suite, Oracle DB, PeopleSoft, JD Edwards i Siebel

IBM je u svrhu dimenzioniranje rješenja razvio vlastit alate te osigurao tehničke specijaliste u Oracleu u Denveru i Redwood Shores-u koji surađuju sa Oracle timom za dimenzioniranje

IBM alati za dimenzioniranje omogućavaju upgrade sizing za korisnike sa postojećim instalacijama.

IBM podaci za sizing vrijede i za najnovije verzije Oracle aplikacija

IBM sizing podaci su bazirani na konkuretnim aktivnostima korisnika

IBM Sustavi pokrivaju cjelokupnu ponudu Oracle proizvoda

| Mainframe Systems System z z/OS, Linux on z	System x Linux, Windows	Power Systems running IBM AIX and Linux	Power Systems running IBM i

IBM System Storage™

Oracle Technology: Database, Fusion Middleware, BIEE		
Oracle E-Business Suite		
Database tier	PeopleSoft Enterprise	
Database tier	Siebel	
	JD Edwards EnterpriseOne	
		JD Edwards World
	Oracle Retail (Retek, ProfitLogic, 360Commerce)	
DB / Fusion MW	i-flex Flexcube Retail	(AIX partition)
	Oracle Communications (BRM, Metasolv)	
	Oracle Transportation Management (OTM, G-Log)	
	Demantra Demand Planning	
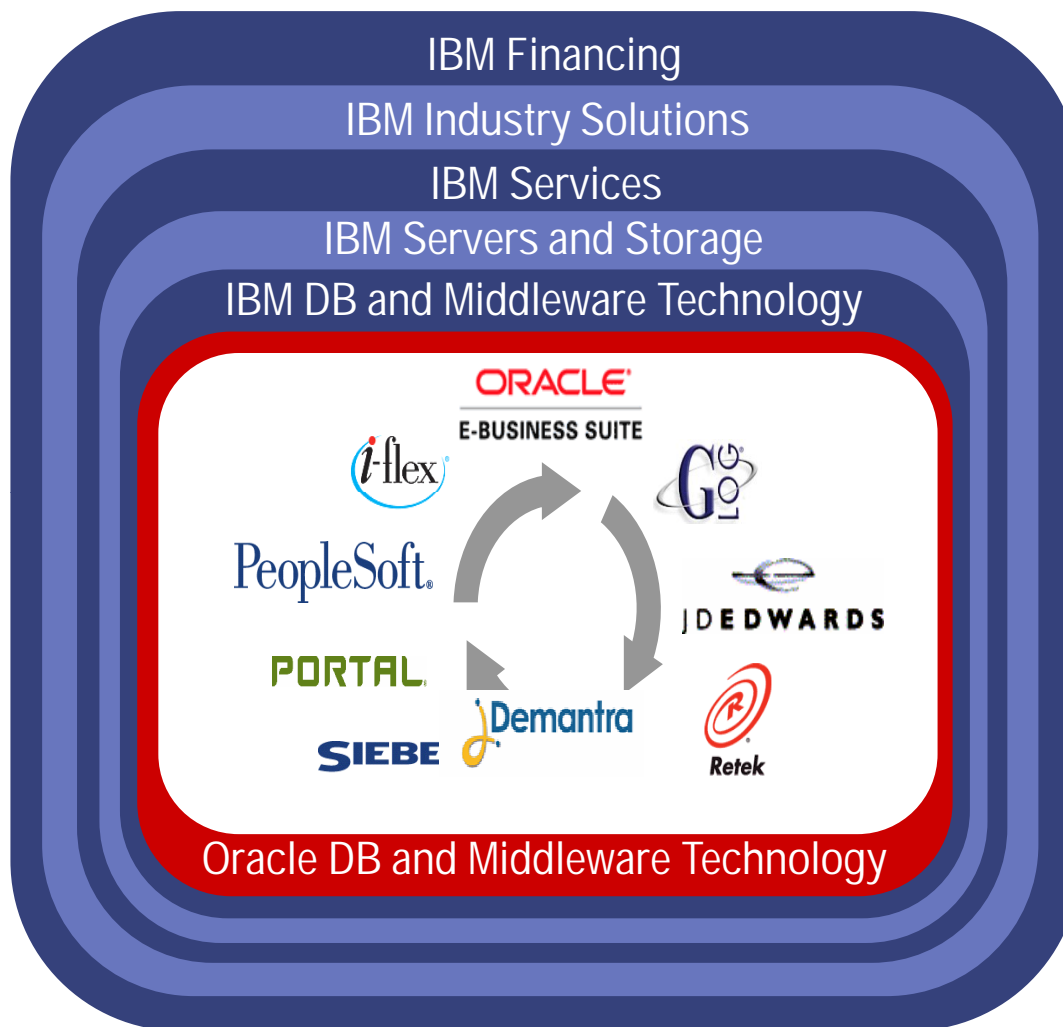
▪ Strateška

– Redoviti sastanci između Oracle's Senior Product Development Direktora iIBM's Senior Product Managementa

– Kvartalne analize poslovanja na Senior Executive razini

– Razmjene tehnoloških postignuća vezano za Power Brand

▪ Operatvna

– Tjedni sastanci Oracle Integrated Solutions (OIS) timova

– Tjedni sastanci vezano za zGrowth Inicijativu

– Sastanci svaka dva tjedna performansnih timova za: EBS, JDE

- Anliza bechmark testova
- Validiranje sizing-a, test planova i status izvršavanja

– Dvo tjedni sastanci IBM i Oracle Sales-a and Integrated Technical Tima

– Mejsečni sastanci development timova

**IBM—a Diamond Level Partner
in the Oracle PartnerNetwork**

Delivering expertise across the Oracle
product portfolio

- "Više od dva desetljeća Oracle i IBM rade zajedno kako bi rješili najzahtjevnije probleme naših korisnika. Postizanjem Dijamantne razine statusa, IBM je još više povećao svoju mogućnost da korisnicima isporuči vrijednost i ekspertizu za cjelokupni portfolio Oracle proizvoda."

Michelle Montalvo, Oracle Vice President, Worldwide Alliances & Channels. "

IBM Recognized as a Diamond Level Partner in Oracle PartnerNetwork

IBM Demonstrates Expertise Across Oracle's Product Portfolio; Dedication to Delivering Value to Joint Customers Worldwide

Redwood Shores, California – August 29, 2011

News Facts

- Oracle today announced that IBM has been named a Diamond level partner, the highest ranking available, in the Oracle PartnerNetwork (OPN) Specialized program.

- A long time Oracle partner, IBM has more than 25 years of experience implementing Oracle technology and more than 10,000 IBM Global Services professionals knowledgeable about Oracle offerings. To date, Oracle and IBM have collaborated on 30,000 successful customer engagements worldwide.

- By achieving a Diamond level status in OPN, IBM continues to demonstrate its vast expertise in Oracle technologies and commitment to helping joint customers maximize the value of their Oracle investments.

- IBM's Specialization achievements span Oracle's product portfolio, including applications, infrastructure, industries, and systems – providing joint customers the end-to-end knowledge, technology and industry know how they need to meet their most critical IT demands.

- IBM has currently achieved 21 Oracle Specializations and 5 Advanced Specializations. In addition it now has thousands of Oracle specialists with deep expertise in Oracle E-Business Suite, Oracle's JD Edwards, Oracle's Siebel, Oracle's Hyperion, Oracle's PeopleSoft and Oracle SOA Suite, amongst others.

Power 7 tehnologija

IBM: WATSON Power 7

- 90 x IBM Power 750 Express servera

- 2880 POWER7 core-a

- POWER7 3.55 GHz chip

- 500 GB per sec on-chip bandwidth

- 10 Gb Ethernet network

- 15 Terabajta memorije

- 20 Terabajta hard diska, clusterirano

- Brzina rada do 80 Teraflopsa

- Pokreće IBM DeepQA softver

- 10 rackova za servere, mrežnu opremu,djeljene diskovne sustave, cluster kontrolerea

Low End / Blades

Mid Range

High End

POWER7
BUILT ON
Power

AIX

i for Business

Linux

IBM Systems Director

PowerHA

PowerVM

IBM Systems Software

BladeCenter PS700 Express
MTM 8406-70Y

BladeCenter PS701 Express
MTM 8406-71Y

BladeCenter PS702 Express
MTM 8406-71Y

BladeCenter PS703 Express
MTM 7891-73X

BladeCenter PS704 Express
MTM 7891-74X

Power 710 Express
MTM 8231-E2B

Power 730 Express
MTM 8231-E2B

Power 720 Express
MTM 8202-E4B

Power 740 Express
MTM 8205-E6B

Power 750 Express
MTM 8233-E8B

Power 755
MTM 8236-E8C

Power 770
MTM 9117-MMB

Power 780
MTM 9179-MHB

Power 795
MTM 9119-FHB

14

Workload-Optimizing Systems

AIX - the future of UNIX

Total integration with i

Scalable Linux ready for x86 consolidation

Virtualization without Limits
✓ Drive over 90% utilization
✓ Dynamically scale per demand

Resiliency without Downtime
✓ Roadmap to continuous availability
✓ High availability systems & scaling

Dynamic Energy Optimization
✓ 70-90% energy cost reduction
✓ EnergyScale™ technologies

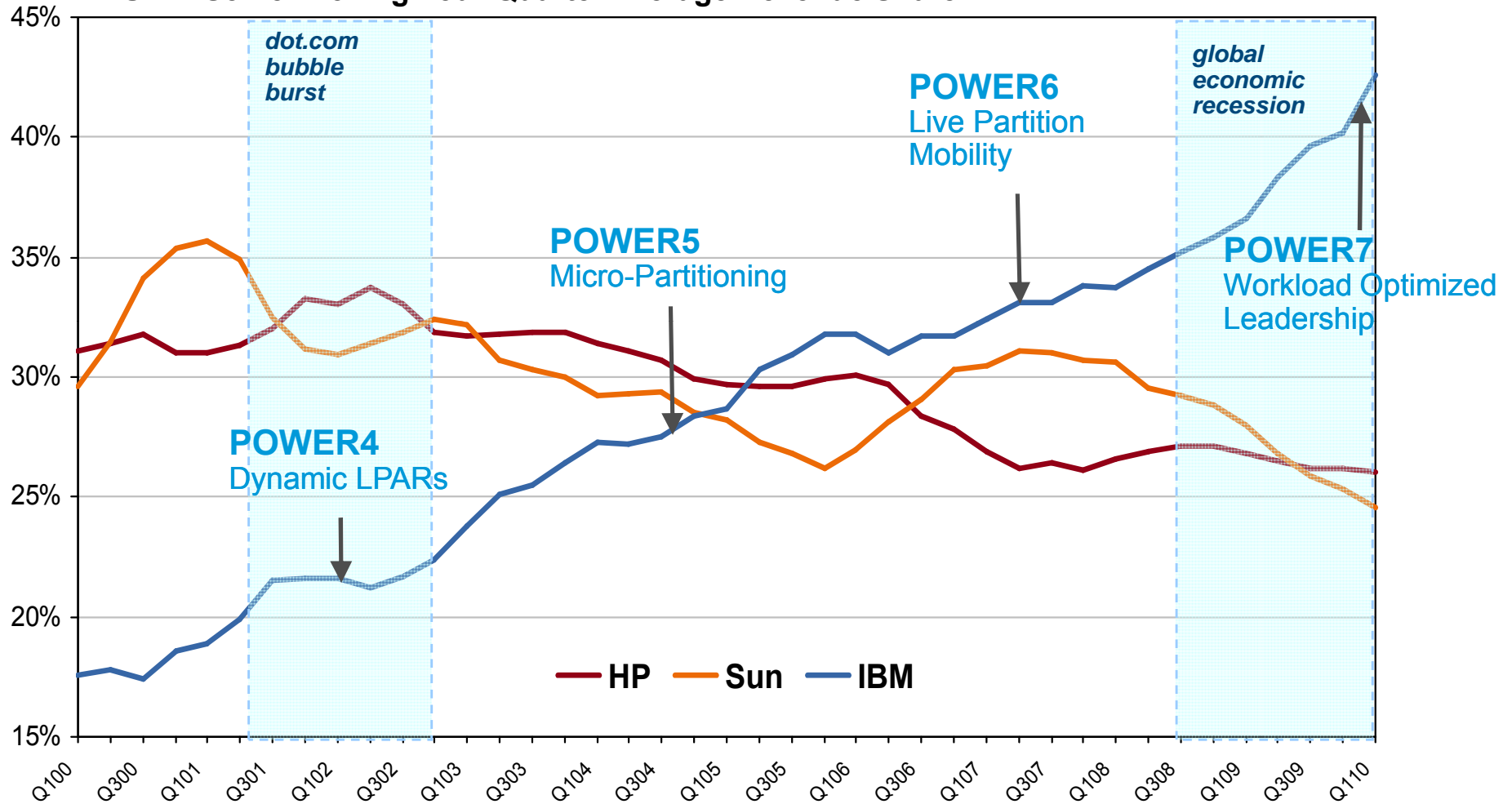### Management with Automation
✓ VMControl to manage virtualization
✓ Automation to reduce task time

…the largest shift of customer spending in UNIX history

UNIX Server Rolling Four Quarter Average Revenue Share

dot.com bubble burst

global economic recession

POWER6
Live Partition Mobility

POWER5
Micro-Partitioning

POWER7
Workload Optimized Leadership

POWER4
Dynamic LPARs

HP — Sun — IBM

POWER8™

POWER7
45 nm

POWER6®
65 nm

POWER5™
130 nm

POWER4™
180 nm
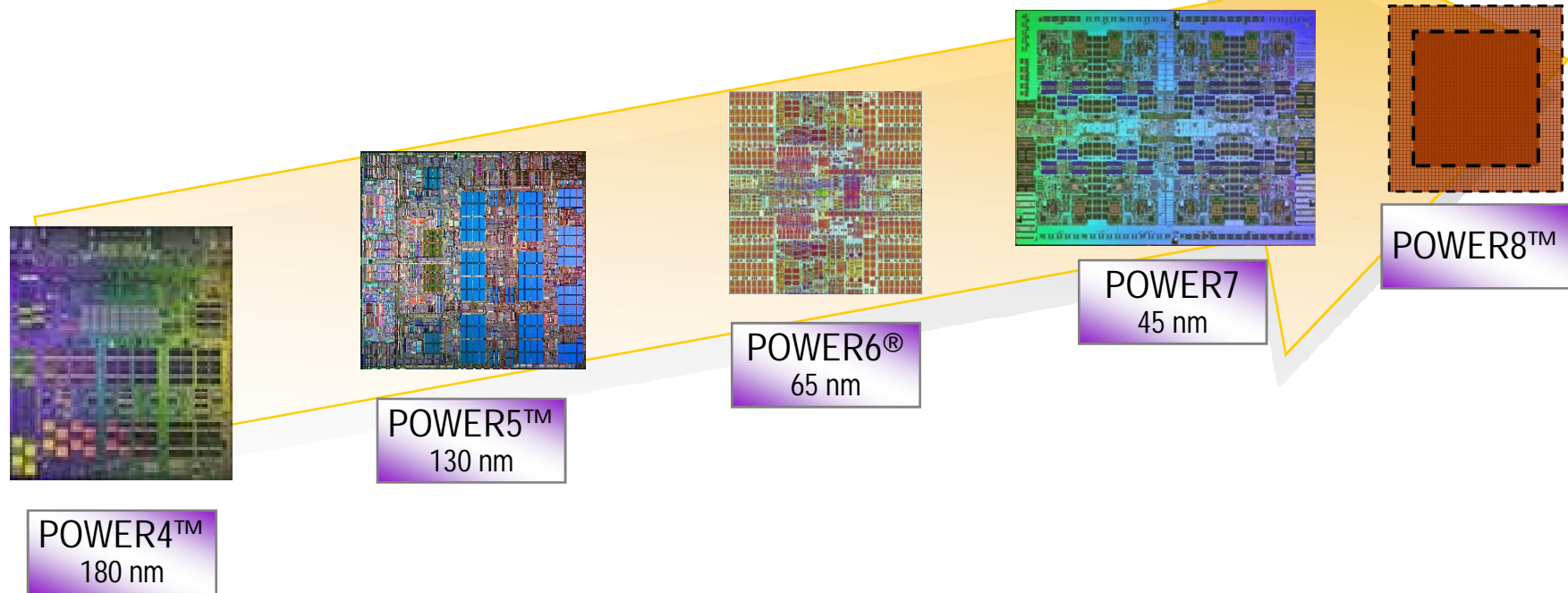
▪ Dual Core ▪ Chip Multi Processing ▪ Distributed Switch ▪ Shared L2 ▪ Dynamic LPARs (32)	▪ Dual Core ▪ Enhanced Scaling ▪ SMT ▪ Distributed Switch + ▪ Core Parallelism + ▪ FP Performance + ▪ Memory bandwidth + ▪ Virtualization	▪ Dual Core ▪ High Frequencies ▪ Virtualization + ▪ Memory Subsystem + ▪ Altivec ▪ Instruction Retry ▪ Dyn Energy Mgmt ▪ SMT + ▪ Protection Keys	▪ Multi Core ▪ On-Chip eDRAM ▪ Power Optimized Cores ▪ Mem Subsystem ++ ▪ SMT++ ▪ Reliability + ▪ VSM & VSX (AltiVec) ▪ Protection Keys+	▪ Concept Phase

2001	2004	2007	2010

POWER7 Dizajn

**Fizički dizajn**

- 8 cores with integrated cache and memory controllers
- 4 / 6 / 8 Core options
- 45nm technology

Features

- 4th Generation SMP Fabric Bus
- 3rd Generation Multi-Threading
- TurboCore
- New Power Bus
- Energy Optimized Design
- Multiple Memory Controllers
- DDR3 memory support
- Enhanced GX System Buses
- On-Chip L2/L3 Cache
- eDRAM L3 Cache
- Industry Standard IO

© 2011 IBM Corporation
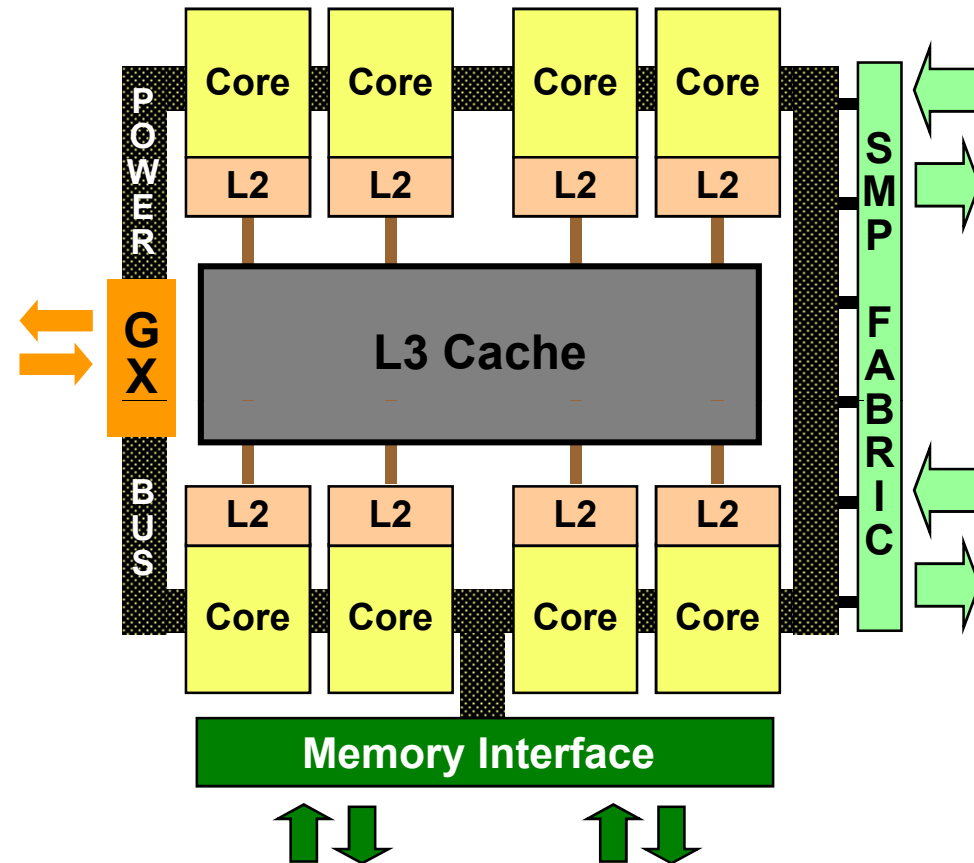
AIX & Power Systems delivers the best reliability of UNIX, Linux, and Windows

54% of IT executives and managers say that they require 99.99% or better availability for their applications

Reliability: *The fewest unscheduled outages*
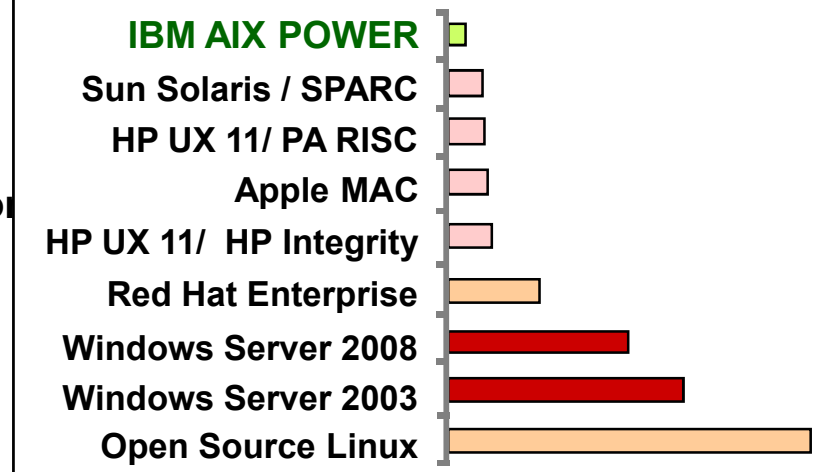
- **Less than one outage per year**

Availability: *The least amount of downtime*

- **15 minutes a year**
- **2.3 times better than the closest UNIX competitor**
- **More than 10X better than Windows**

Serviceability: *The fastest patch time*

- **11 minutes to apply a patch**

Corporate Enterprise Downtime (Hours per Year)

- **IBM AIX POWER**
- **Sun Solaris / SPARC**
- **HP UX 11/ PA RISC**
- **Apple MAC**
- **HP UX 11/ HP Integrity**
- **Red Hat Enterprise**
- **Windows Server 2008**
- **Windows Server 2003**
- **Open Source Linux**

Source: ITIC 2009 Global Server Hardware & Server OS Reliability Survey Results, July 7, 2009   Fully paper is available at ibm.com/aix
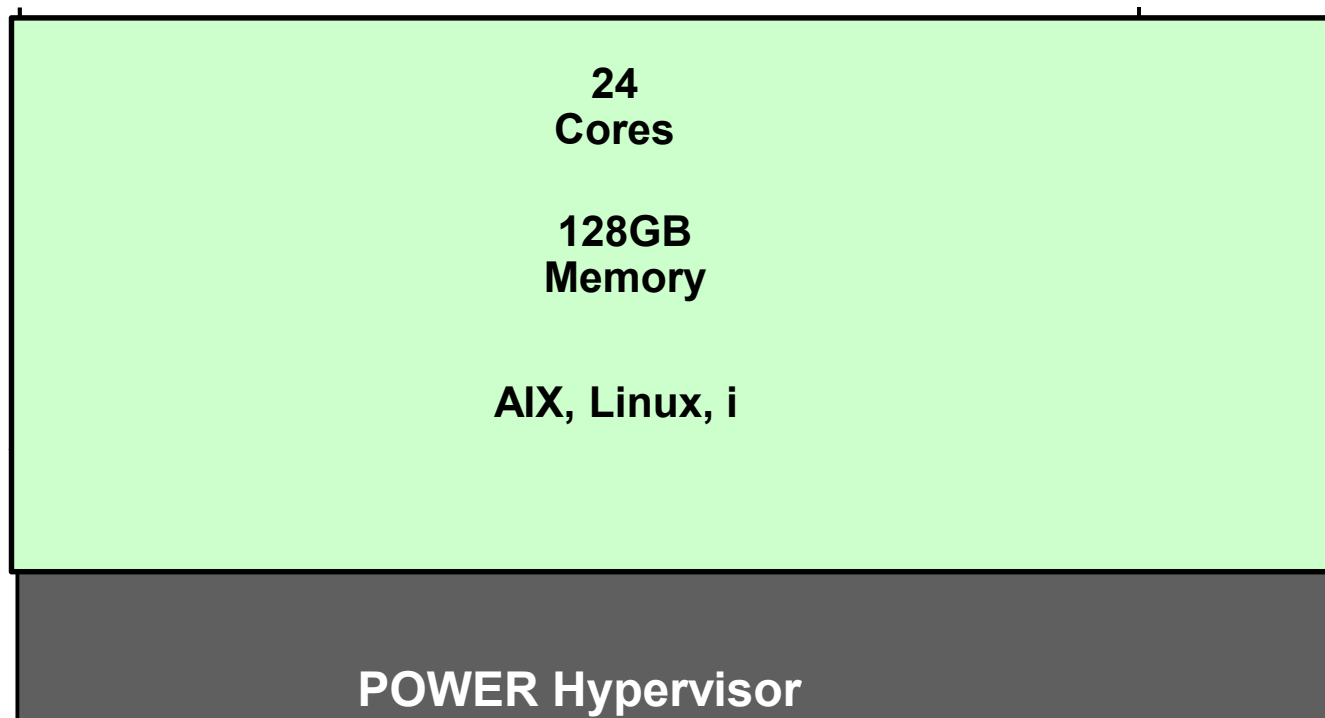
IBM-ova povjest u svijetu virtualizacije

A 40-year track record in virtualization innovation

1967	1973	1987	1999	2004	2007	2009

IBM develops **hypervisor** that would become VM on the mainframe	IBM announces first machines to do **physical partitioning**	IBM announces **LPAR on the mainframe**	IBM announces **LPAR** on POWER™	IBM intro's POWER Hypervisor™ for System p™ and System i™	IBM announces POWER6™, **the first UNIX® servers with Live Partition Mobility**	**IBM ships VMControl** IBM® Systems Director

Power is virtualization
without limits

Power Systems Partitioning - Value to Oracle

**24
Cores**

**128GB
Memory**

AIX, Linux, i

POWER Hypervisor

Power Systems **Virtualization** - Value to Oracle

Dynamically Resizable

Virtual I/O Server Partition	2 Cores	2 Cores	5 Cores	6 Cores							8 Cores
				PowerVM's							
Int Virt Manager	Linux	AIX V5.3	AIX V6.1	Oracle9i	Oracle 10g	Oracle 10g	Oracle 9i	Oracle10g	Oracle11g	Oracle 11g	CUoD
Storage Sharing											
Ethernet Sharing											

Virtual I/O paths

POWER Hypervisor
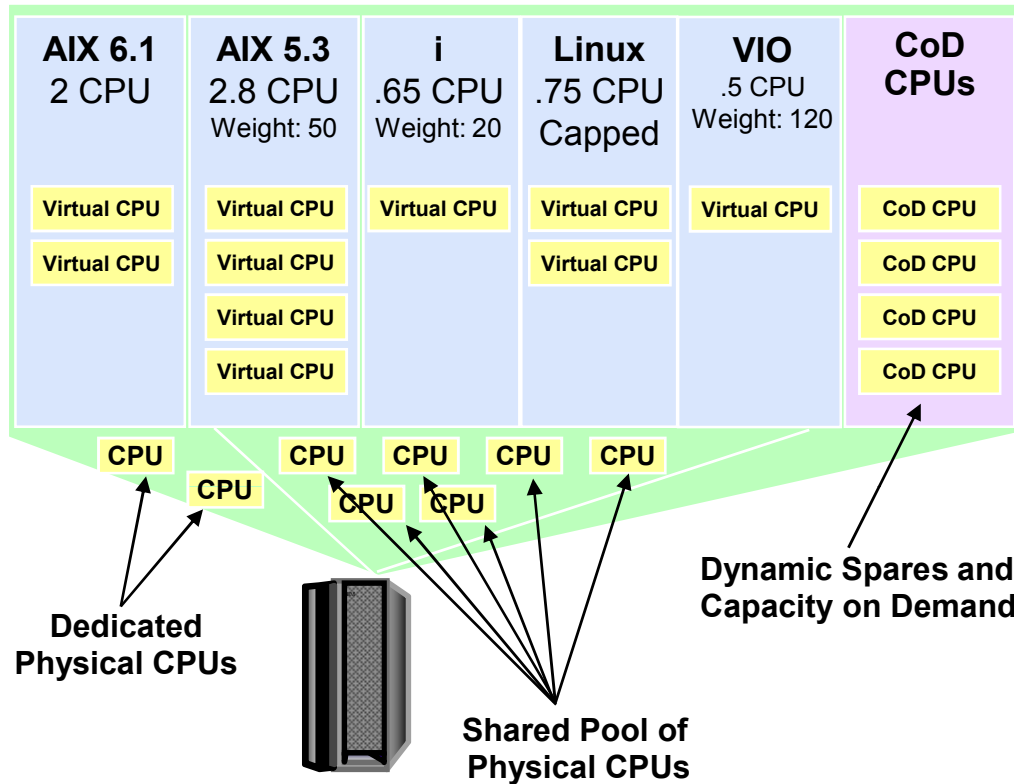
Network

AIX

i for Business
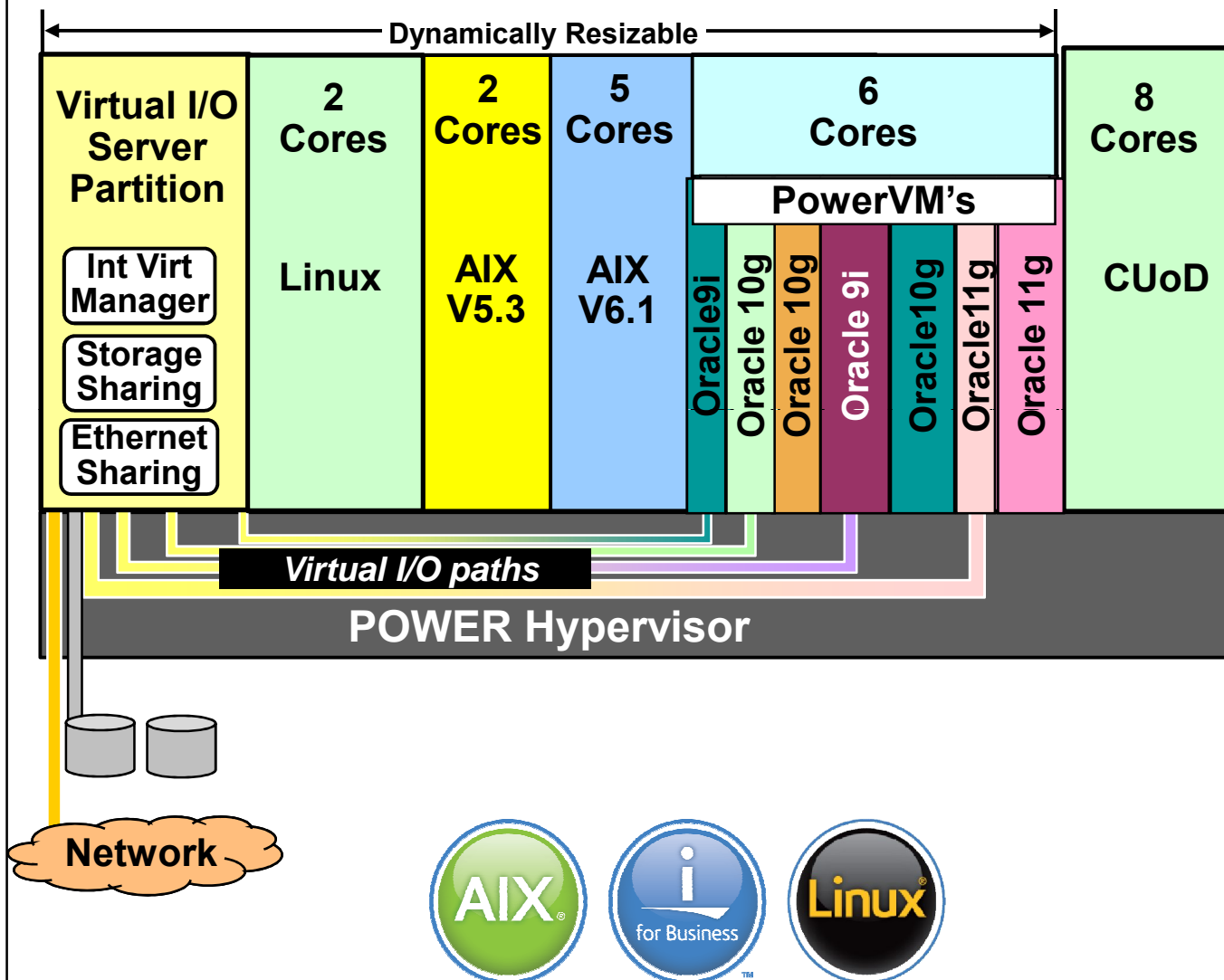
Linux

Micro-Partitioning Feature
- **Share processors across multiple partitions**
- **Minimum partition 1/10th core**
- **254 partition maximum**
- **AIX V5.3/6.1, Linux, & IBM i**

Virtual I/O server
- **Shared Ethernet**
- **Shared SCSI & Fibre Channel attached disk subsystems**

Virtualizacija sa PowerVM-om

AIX 6.1 2 CPU	AIX 5.3 2.8 CPU Weight: 50	i .65 CPU Weight: 20	Linux .75 CPU Capped	VIO .5 CPU Weight: 120	CoD CPUs
Virtual CPU	Virtual CPU	Virtual CPU	Virtual CPU	Virtual CPU	CoD CPU
Virtual CPU	Virtual CPU		Virtual CPU		CoD CPU
	Virtual CPU				CoD CPU
	Virtual CPU				CoD CPU

CPU CPU CPU CPU CPU
CPU CPU CPU

**Dynamic Spares and
Capacity on Demand**

**Dedicated
Physical CPUs**

**Shared Pool of
Physical CPUs**

Scaling

- Up to 1000 partitions
- Partitions up to 256W SMP

Processors

- Dedicated or shared processors
- Shared processor controls
  - # of virtual processors
  - Entitlements
  - Capped and uncapped
  - Weights
- Sub-pool option

I/O

- Adapters - dedicated, shared or combination
- VIO servers, 1 or many

Memory

- From 128MB to all of physical memory
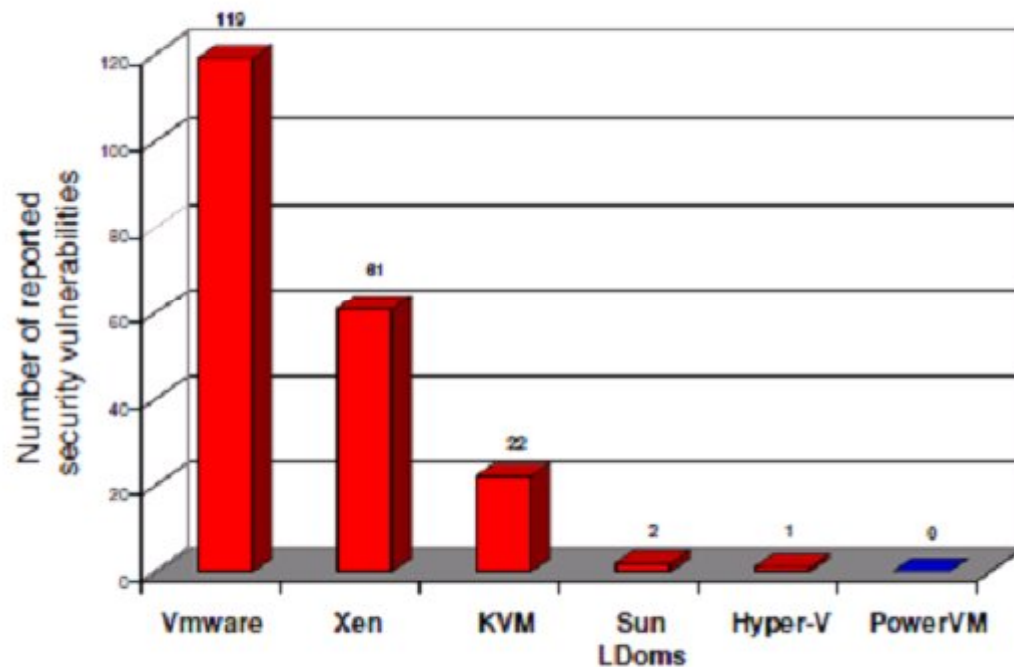- Active Memory Sharing between partitions

Mobility options

- PowerVM Live pertition Mobility
- AIX Live Application Mobility

Capacity on Demand

* Statement of Direction

PowerVM has never had a single reported security vulnerability

Source: National Vulnerability Database, http://nvd.nist.gov/

australian open
The Grand Slam of Asia/Pacific

"Making sure our website can't get hacked into is a key issue. With IBM, we have been able to keep it tightly locked up and prevent unauthorized access."

— Dr. Chris Yates, CIO
Tennis Australia

IBM virtualizacijska rješenja certificirana od Oracle-a

Platform	Virtualization Technology	Operating System	Certified Oracle Single Instance Database Releases	Certified Oracle RAC Database Releases
IBM AIX Power	Dynamic Logical Partitions (DLPAR) and Micro Partitions	AIX 5.3 AIX 6.1	• 10gR2 *Note* • 11gR1 *Note* • 11gR2 *Note*	• 10gR2 • 11gR1 • 11gR2
		AIX 7.1	• 11gR2 *Note*	• 11gR2 *Note*
	Live Partition Migration (LPM)	AIX 5.3 AIX 6.1	• 10gR2 *Note* • 11gR1 *Note* • 11gR2 *Note*	• No
		AIX 7.1	• 11gR2 *Note*	• No
	Workload Partition (WPAR)	AIX 6.1	• 10gR2 *Note* • 11gR2 *Note*	• No

BUILT ON Power™

ORACLE®

Vrijednost Power Tehnologije za Oracle Baze podataka

- **Veće performanse po jezgri i sustavu**
  - Rezulat toga je manja hardverska konfiguracija koja daje iste performanse – ušteda na području hardvera i održavanja
  - Ušteda na troškovima softvera kada se on licencira po jezgri

- **Virtualizacijska tehnologija**
  - Omogućava da na jednom fizičkom serveru radi veći broj logičkih/virtualnih servera
  - Omogućava korisnicima da biraju kada i kako koristit vertikalnu i horizontalnu skalabilnost
  - Bez IBM-ove virtualizacije, jedini izbor je bio horizontalna skalabilnost ili nabavka većeg sustava koji je pod iskorišten kako bi mogao rasti da absorbira budući kapacitet

- **Povećana Iskoristivost**
  - Radi više sa manje procesora
  - Bolji povrat investiranoga novca
  - Uštede na hardveru i softveru

- **Roadmap**
  - IBM sam proizvodi i planira proizvodnju procesora – ne ovismo o nikome
  - Naši procesori i cjelokupni sustavi su dizajnirani u sinergiji – razvoj pojedinog djela se izvodi prema ovisnosti o cjelom sustavu
  - Mi proizvodimo vertiklano integrirano rješenje koje omogućava našim korisnicima najbolje poslovanje u indistriji
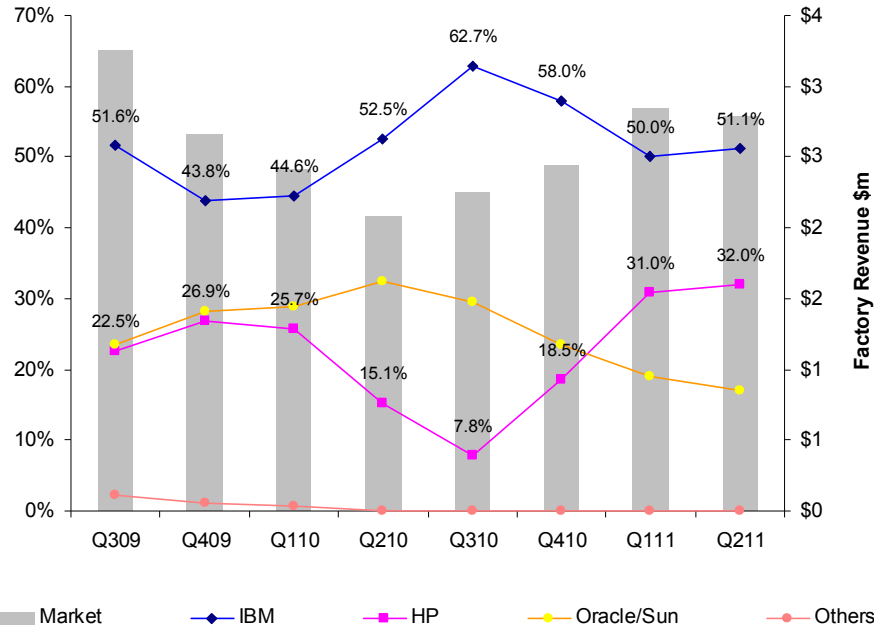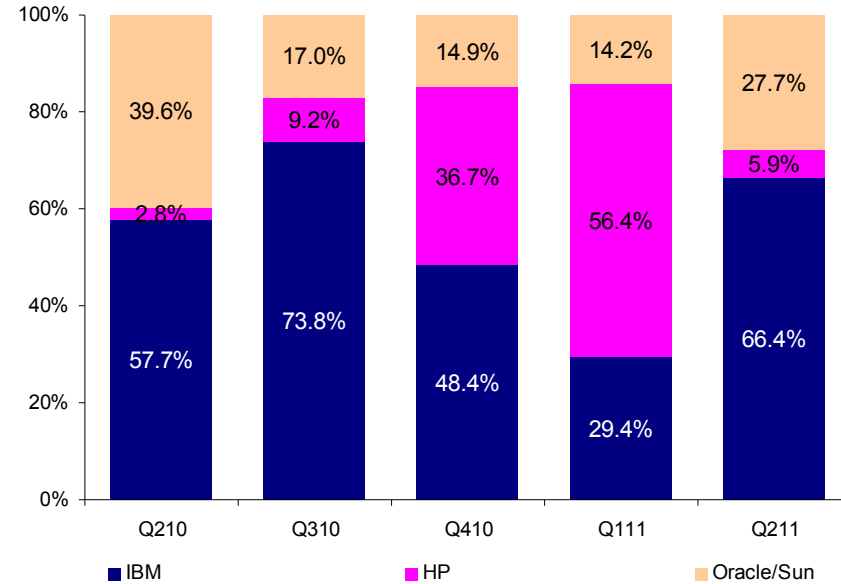
Power 7 Marketshare
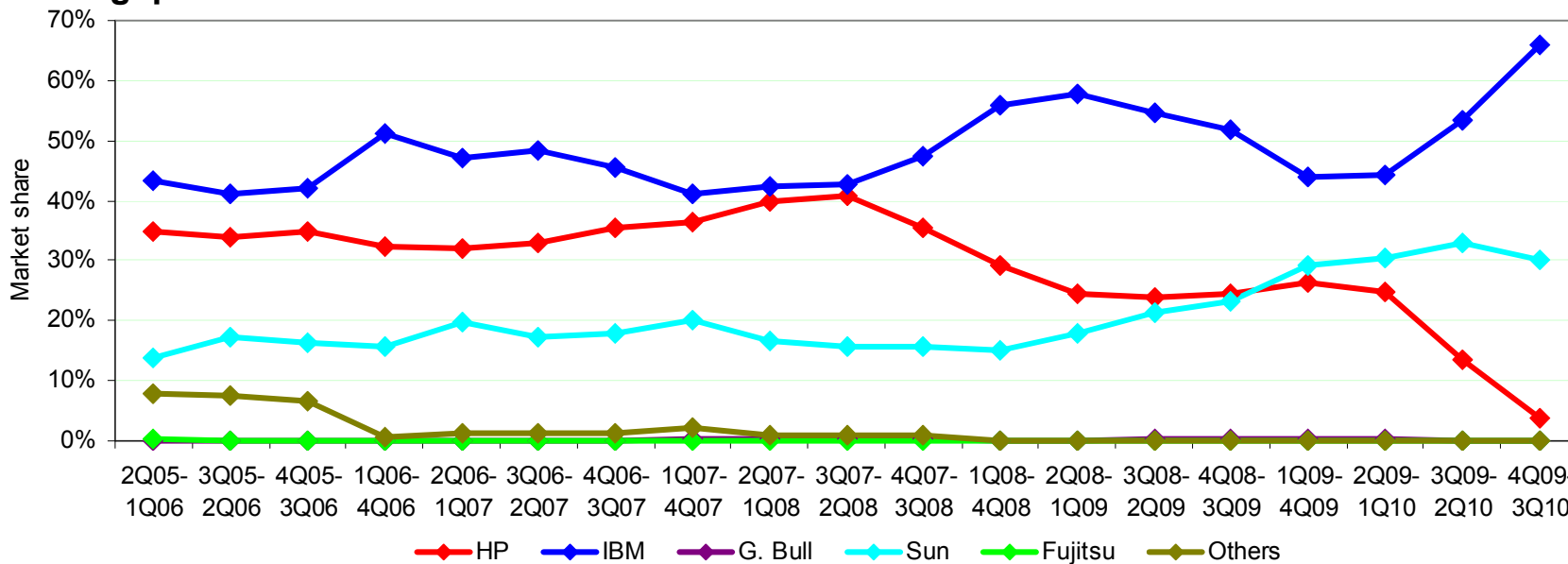
Croatia Risc/Epic Server Share 4 Qtr Rolling Average

Legend	
Market	◆ IBM
■ HP	Oracle/Sun
Others	

Croatia Risc/Epic Server Share

| | IBM | HP | Oracle/Sun |

Q211	YtY Growth		Share		Share Change
	Market	IBM	Q210	Q211	
Bulgaria	-60.6%	-61.8%	82.6%	80.2%	-2.5%
Croatia	-12.3%	0.9%	57.7%	66.4%	8.7%
Czech Republic	74.1%	70.3%	46.2%	45.2%	-1.0%
Hungary	8.0%	-41.0%	66.2%	36.1%	-30.0%
Poland	11.8%	39.9%	53.1%	66.4%	13.3%
Romania	13.7%	54.2%	33.5%	45.5%	11.9%
Slovakia	-87.7%	-100.0%	45.7%	0.0%	-45.7%
Slovenia	-26.5%	97.9%	30.9%	83.3%	52.3%
Rest of CEE	2.2%	29.1%	15.5%	19.5%	4.1%
Turkey	2.7%	14.8%	53.6%	59.9%	6.3%
ECE	-0.4%	7.1%	47.0%	50.5%	3.5%

Risc/Epic Server	Y/Y Gr%	Market Share		Share Change
	Q211	Q210	Q211	Q211 Y/Y
IBM	0.9%	57.7%	66.4%	8.7%
Oracle/Sun	-38.5%	39.6%	27.7%	-11.8%
HP	87.7%	2.8%	5.9%	3.1%
Others	#N/A	0.0%	0.0%	0.0%
Market	-12.3%			

Market share – UNIX Hrvatska

4 rolling quarters

© 2011 IBM Corporation
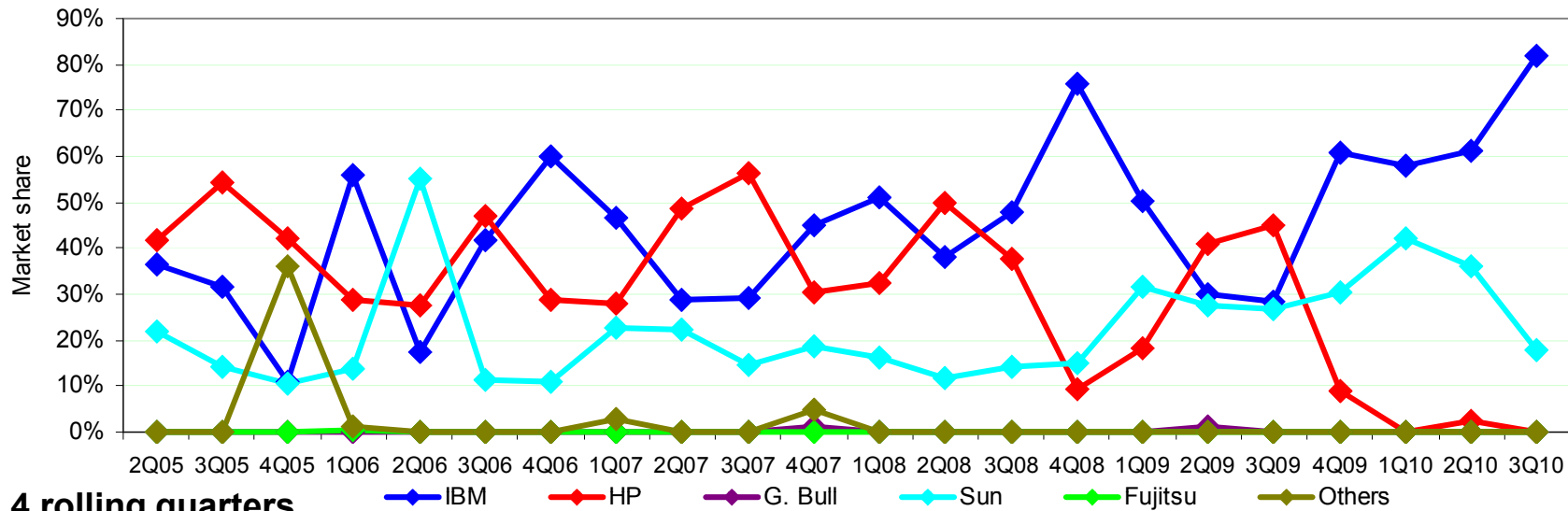
IBM Hardware Market Share of Oracle Ecosystem

IBM Total ~ 37% Oracle Ecosystem Share

Extrapolated Oracle Revenue by IBM Platform

Legend:
- IBM Windows
- Other Windows
- IBM Unix
- Other Unix
- Mainframe
- i5 and OS/400
- IBM Linux x86
- Other Linux x86
- Other Host/Server
- Other Single User

Pie chart labels: Other Single User, Other Linux x86, Other Host/Server, IBM Linux x86, i5 and OS/400, Mainframe, Other Unix, IBM Unix, Other Windows, IBM Windows
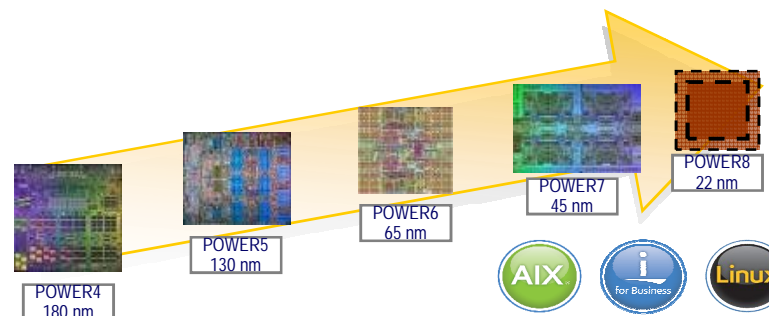
Source: IBM Estimate based upon IDC Data

"5 consecutive quarters of STG revenue growth around Oracle Applications"
Source: IBM Oracle Global Alliance Revenue Report

- Tehnologija
  - Vodeći procesori na tržištu
  - "Green Technology" ugrađena u rješenja
  - Raspon arhitekture od Blade-a do High-enda

- Performase
  - Skalabilnost Power Sustava
  - Vodeće performanse za mnoge aplikacije
  - Najbolje "per core / per system" performase
  - Bandwidth Memorije i I/O jedinica

- Virtualizacija
  - Konsolidacija
  - Virtualizacija Procesora, Memorije i I/O
  - Dinamična migracija Particija i Aplikacija
  - Smanjenje trooškova infrastrukture

- RAS – "Reliability, Availability and Serviceability"
  - RAS funkcionalnosti inspirirane mainframe tehnologijom
  - Hot Add podrška
  - Leadership u dostupnosti Operativnog Sustava

POWER4 180 nm
POWER5 130 nm
POWER6 65 nm
POWER7 45 nm
POWER8 22 nm

AIX   i for Business   Linux

PowerVIM

Virt I/O Server Shared I/O

Hypervisor

Single SMP Hardware System

Exhibit 1: Corporate Enterprise Downtime (Hours per Year)

31

IBM Benchmarking Offerings
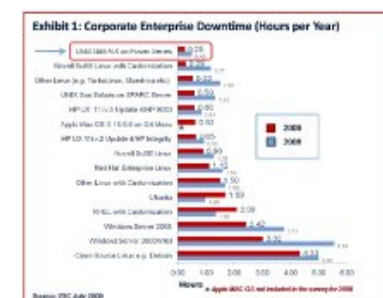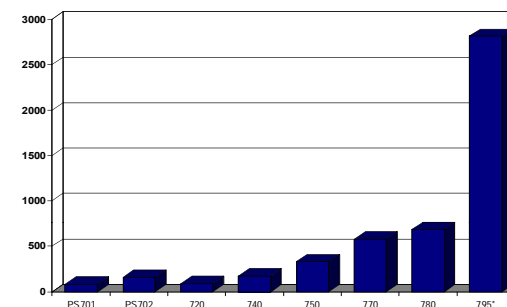
- Provide customer benchmark capability worldwide for IBM servers and storage
  - Rich & Flexible On-Demand Remote Access platform

- Include proof of concept, scaling and performance

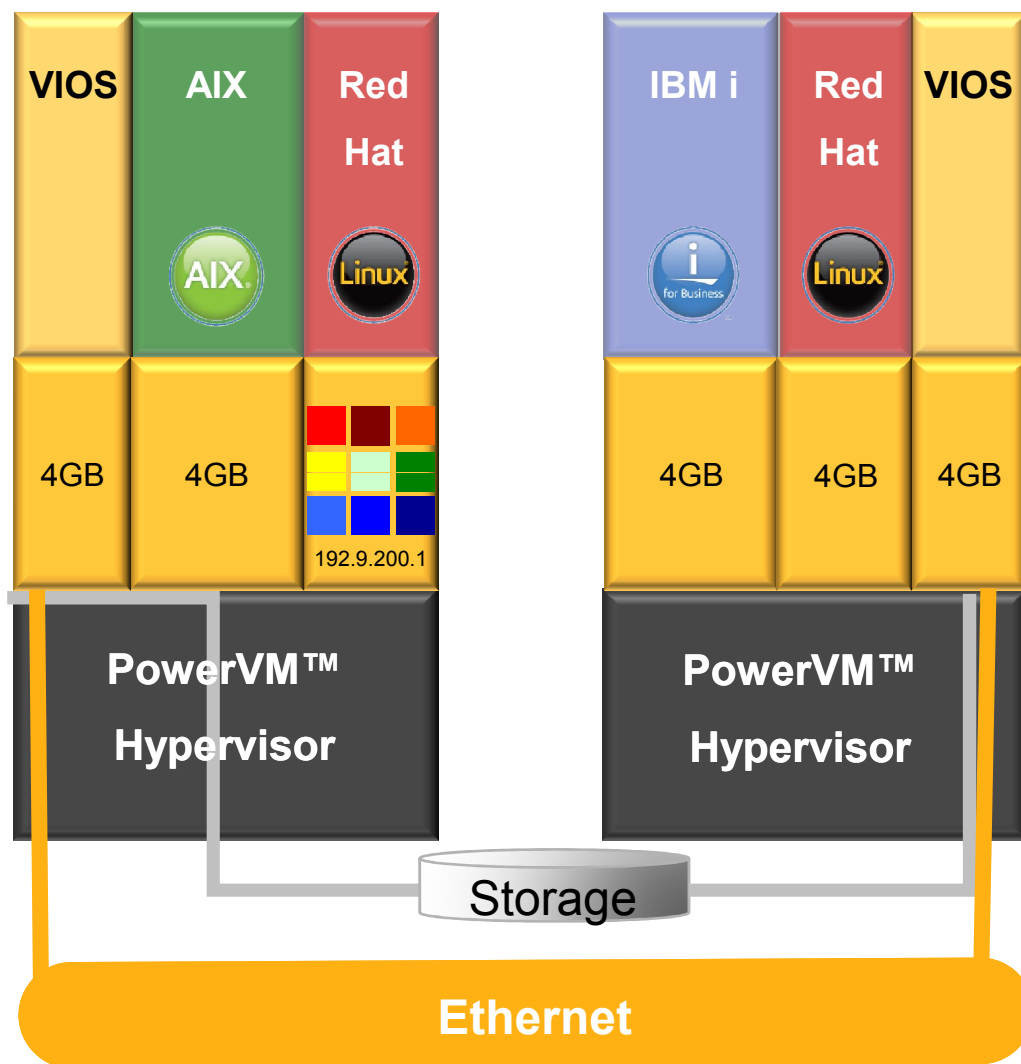- Assist in the execution of ISV application benchmarks
  - Includes OBIEE

System z™   **Power AIX™**   **System x™**

Live Partition Mobility

Što je to?

- ✓ Migracija logičkih particija LPAR-a između dva fizički odjeljena servera radi planiranih isključena sustava
- ✓ Zahtjeva POWER6™ ili bolju tehnologiju
- ✓ LPARs nastavlja sa radom i omogućava usulgu klijentima koji nisu svjesni migracije
- ✓ Aktivne i neaktivne particije
- ✓ Gašenje starog i početak rada novog LPARa garantirano se izvodi unutar 2 sekunde

Poslovna vrijednost

- ✓ Smanjeno vrijeme planiranog pada sustava radi održavanja i sl.
- ✓ Veća kontrola korištenja i lokacije fizičkih resursa
- ✓ Mogućnost dinamičkog upravljanja opterećenja sustava i resursa prema trenutnim ili budućim potrebama

http://www.ibm.com/developerworks/aix/library/au-LPM_troubleshooting/index.html

34

Active Memory™ Expansion

uncompressed mem.

compressed memory
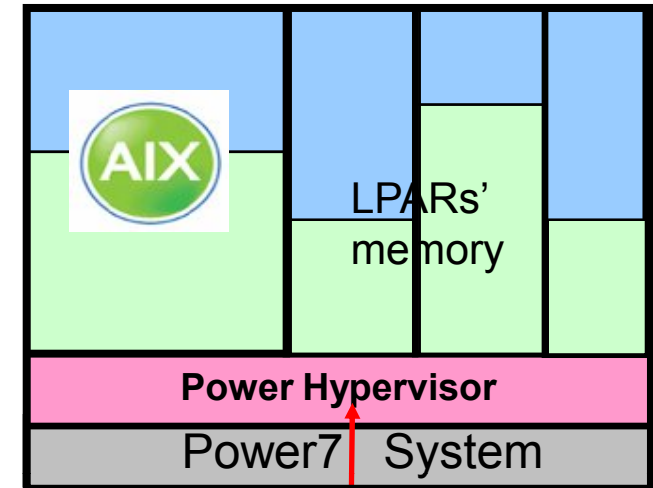
- Inovativna POWER7 tehnologija
  - Za AIX 6.1 ili veće
  - Za POWER7servere

- Koristi kompresiju/dekompresiju kako bi efikasno proširio fizičku memoriju

- Advanced Memory Expansion funkcionalnost se naručuje kao hardver putem feature coda (FC). Cijena ovisi o klasi servera za koju je namjenjena.
  - Power 750 : €2394 (FC4792)
  - Power 770 : €7149 (FC4791)

- AME je testiran na SAP ERP sustavu, čime je potvrđeno da donosi izvrsne karkateristike u proširenju memorije.
  - SAP korisnici mogu koristiti AME trenutno za ne-PROD SAP instance
  - Radi se ne tome da se AME može koristiti i SAP PROD okolini
    - SAP monitoring (CCMS) integracija za AME metriku
    - Testiranje Middleware
    - Informiranje i edukacija SAP podrške

LPARs' memory

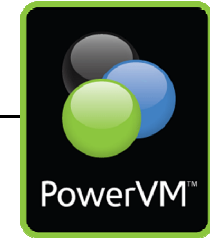**Power Hypervisor**

Power7   System

Hardware Management Console

New LPAR Attribut

- Active Memory Expansion On/Off
- Memory Expansio Factor

35

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PowerVM Leads Virtualization Offerings from HP

PowerVM™

Virtualization capability	HP Integrity VM 4.0	PowerVM Editions	PowerVM Business Benefit
Partition scalability	8 CPUs (max) 64GB RAM	64 CPUs 4TB RAM	Helps improve TCO from consolidating more workloads
Dynamic logical partitioning	VM reboot	Yes	Adapt to changes without downtime
Security/fault isolation	No Certification	EAL 4+ **Certified**	Secured environment for mission critical applications
Support for dedicated I/O	No	Yes	Superior performance for I/O intensive workloads
Dynamic CPU sharing	No	Yes	Highly flexible configuration, with automatic deployment of resources where needed
Cross-platform virtualization	No	Yes (Lx86)	PowerVM is capable of consolidating workloads compiled for four different platforms

PowerVM Delivers Superior Flexibility to Optimize IT Resource Utilization and Boost Responsiveness

Flexibility Factors	VMware ESX 3.5 (in VMware Infrastructure 3)	VMware ESX 4.0 (in VMware vSphere 4.1)	PowerVM
Dynamic virtual CPU changes in VM	No	Add (but not Remove)	Yes
Dynamic memory changes in VM	No	Add (but not Remove)	Yes
Dynamic I/O device changes in VM	No	Some	Yes
Direct access to I/O devices from within VM	No	Some (with VT-d enabled)	Yes
Integrated LPAR and WPAR support	No	No	Yes

Source: http://www.vmware.com/files/pdf/key_features_vsphere.pdf

IBM System features certified by Oracle

➢ **Execution in a micropartition**
  ▪ Allows sharing of processor power between partitions
  ▪ Capping feature allows control of usage to match:
      • Required capacity of partition
      • Oracle treats these as hard partitions for licensing
  ▪ Used extensively in development process

➢ **Exploitation of Simultaneous Multi-Threading (SMT)**
  ▪ One physical POWER7 CPU can simultaneously dispatch four threads
  ▪ No impact to physical processor based licensing requirements
  ▪ Used extensively in Oracle development

➢ **Live Partition Mobility**
  ▪ Certified with 10gr2
  ▪ Follow up 11gR1, R2 and RAC underway

➢ **DB, and RAC with Virtual I/O Server (VIOS)**
  ▪ Fully certified with non-RAC
  ▪ Virtual Network certified with all RAC environments
  ▪ Virtual disk certified with ASM and GPFS RAC environments
      ▪ NPIV recommended GPFS configurations
  ▪ Used extensively in Oracle development

➢ **WPARs with non-RAC DB**

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The following table identifies the supported virtualization/partitioning technologies for Oracle Database and RAC

Platform	Virtualization Technology	Operating System	Certified Oracle Single Instance Database Releases	Certified Oracle RAC Database Releases
IBM AIX Power	Dynamic Logical Partitions (DLPAR) and Micro Partitions	AIX 5.3 AIX 6.1	• 10gR2 *Note* • 11gR1 *Note* • 11gR2 *Note*	• 10gR2 • 11gR1 • 11gR2
		AIX 7.1	• 11gR2 *Note*	• 11gR2 *Note*
	Live Partition Migration (LPM)	AIX 5.3 AIX 6.1	• 10gR2 *Note* • 11gR1 *Note* • 11gR2 *Note*	• No
		AIX 7.1	• 11gR2 *Note*	• No
	Workload Partition (WPAR)	AIX 6.1	• 10gR2 *Note* • 11gR2 *Note*	• No
Linux on Power	Dynamic Logical Partitions (LPAR) DLPAR with shared pool and micro partitions	RHEL SLES	• 10gR2	• No

Oracle Core and Socket-based Database Licensing Applicability for POWER6 and POWER7 processor-based Systems – as of 08/31/10

Power Systems Product Descriptions				Oracle Database Licensing			
				Core License	Socket License		
Power Systems model	Maximum Cores (Processors)	Processor Card Configuration	Maximum Oracle Socket Count	Oracle Enterprise Edition	Oracle Standard Edition One	Oracle Standard Edition	Std. Ed. RAC Cluster size Sockets x nodes
Power 520	4	2c DCM	2	yes	yes	yes	2 x 2
Power 550	8	2c to 4c DCM	4	yes	no	yes	4 x 1
Power 710	8	4c to 8c SCM	1	yes	yes	yes	1 x 4
Power 720	8	4c to 8c SCM	1	yes	yes	yes	1 x 4
Power 730	16	4c to 8c SCM	2	yes	yes	yes	2 x 2
Power 740	16	4c to 8c SCM	2	yes	yes	yes	2 x 2
Power 750	32	6c or 8c SCM	4	yes	no	yes	4 x 1
Power 560	16	4c to 8c to 16c DCM	8	yes	no	no	n/a
Power 570	32	2c to 32c DCM	16	yes	no	no	n/a
Power 770	64	6c or 8c SCM	8	yes	no	no	n/a
Power 780	64	4c or 8c SCM	8	yes	no	no	n/a
Power 575	32	32c DCM	16	yes	no	no	n/a
Power 755	32	8c SCM	4	yes	no	yes	4 x 1
Power 595	64	8c to 64c MCM	32	yes	no	no	n/a

DCM=dual core module, MCM=multi core (>2) module, SCM= Single Chip Module