Power Systems

IBM

Scale-out Hardware with POWER8 Technology

28 April 2014

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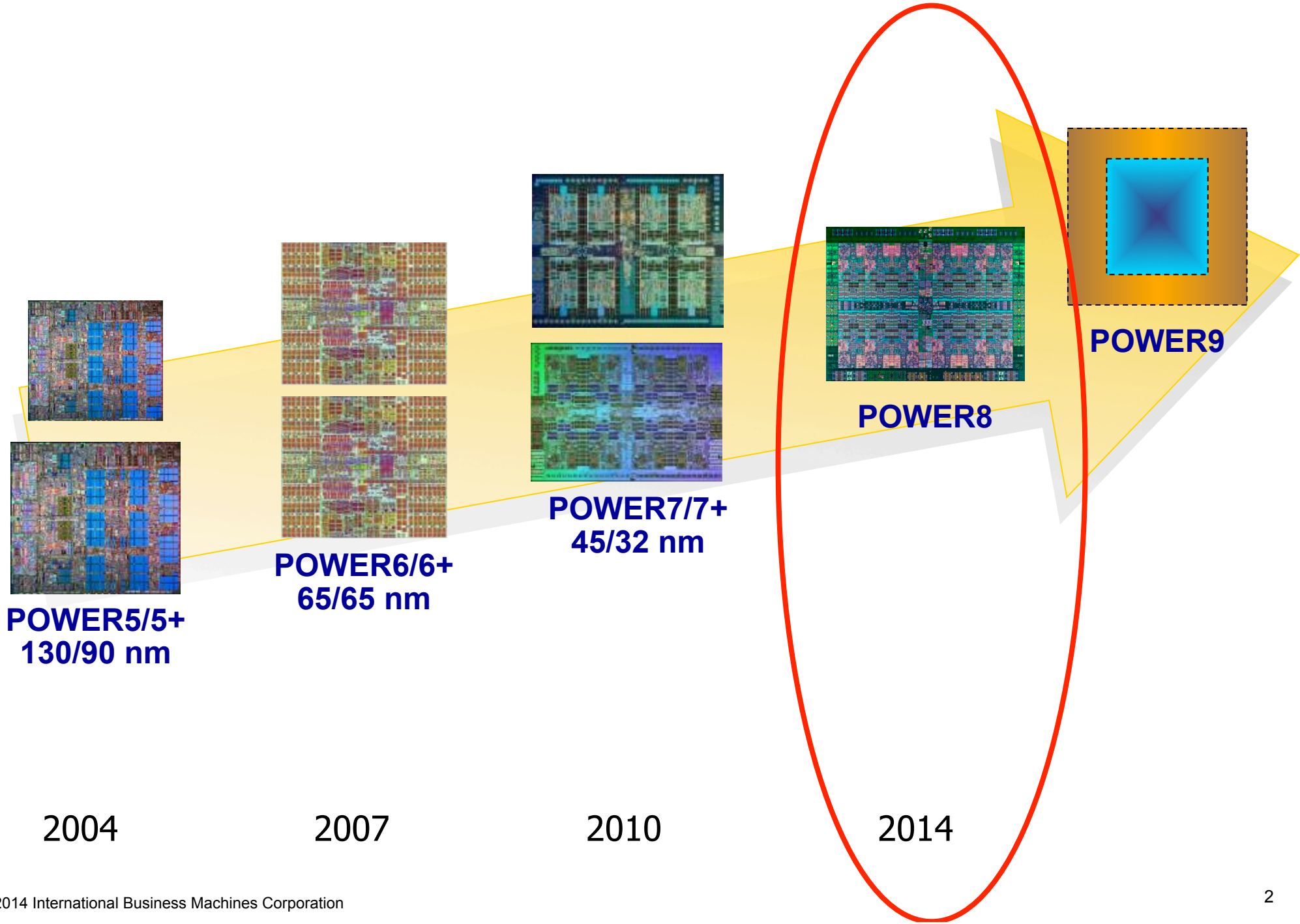
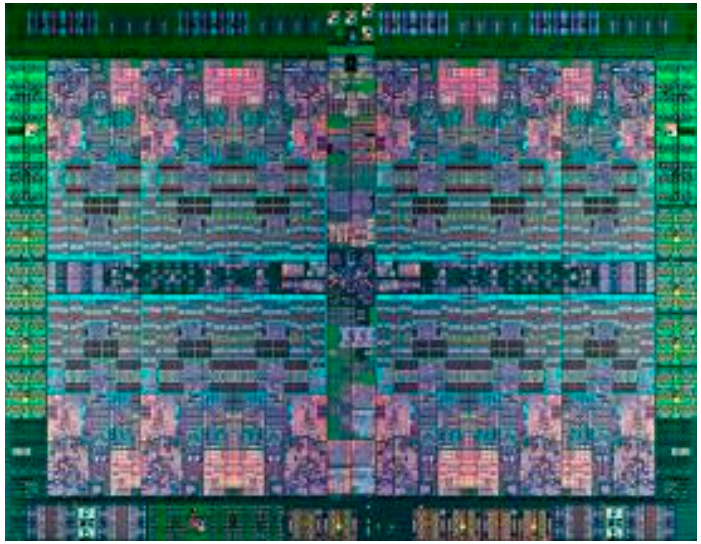
POWER Processor Technology Roadmap



POWER8 Highlights



Announced 2013 at Hot Chips Conference
- **Up to 12 Cores per Socket/Chip**

Significantly Strengthened Cores
- **8 threads per core (SMT8)**
- **Wider fetch / dispatch/issue of instructions**
- **Doubled highly utilized execution units**

Larger Caches:
- **64K D Cache, 32K I Cache, 512K private L2, 8M L3 / Core (96M)**

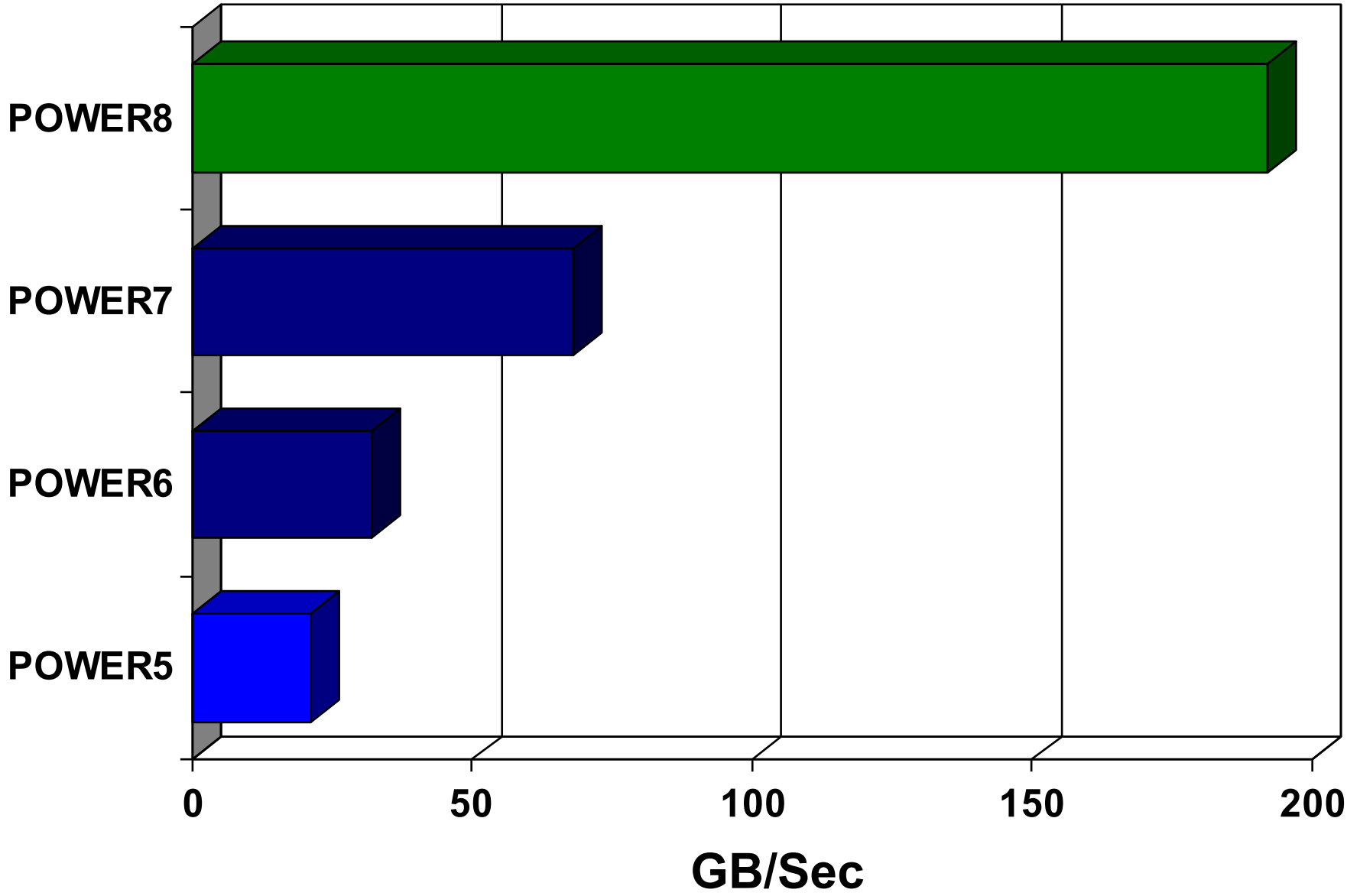
2 Integrated Memory Controllers w/ Improved Latency & Bandwidth
- **~ 25% memory latency improvement via on-chip fastpath interconnect**
- **16MB memory cache / buffer chip**

Integrated SMP Interconnect w/ improved "Flatness"
- **2-Hop fabric topology**

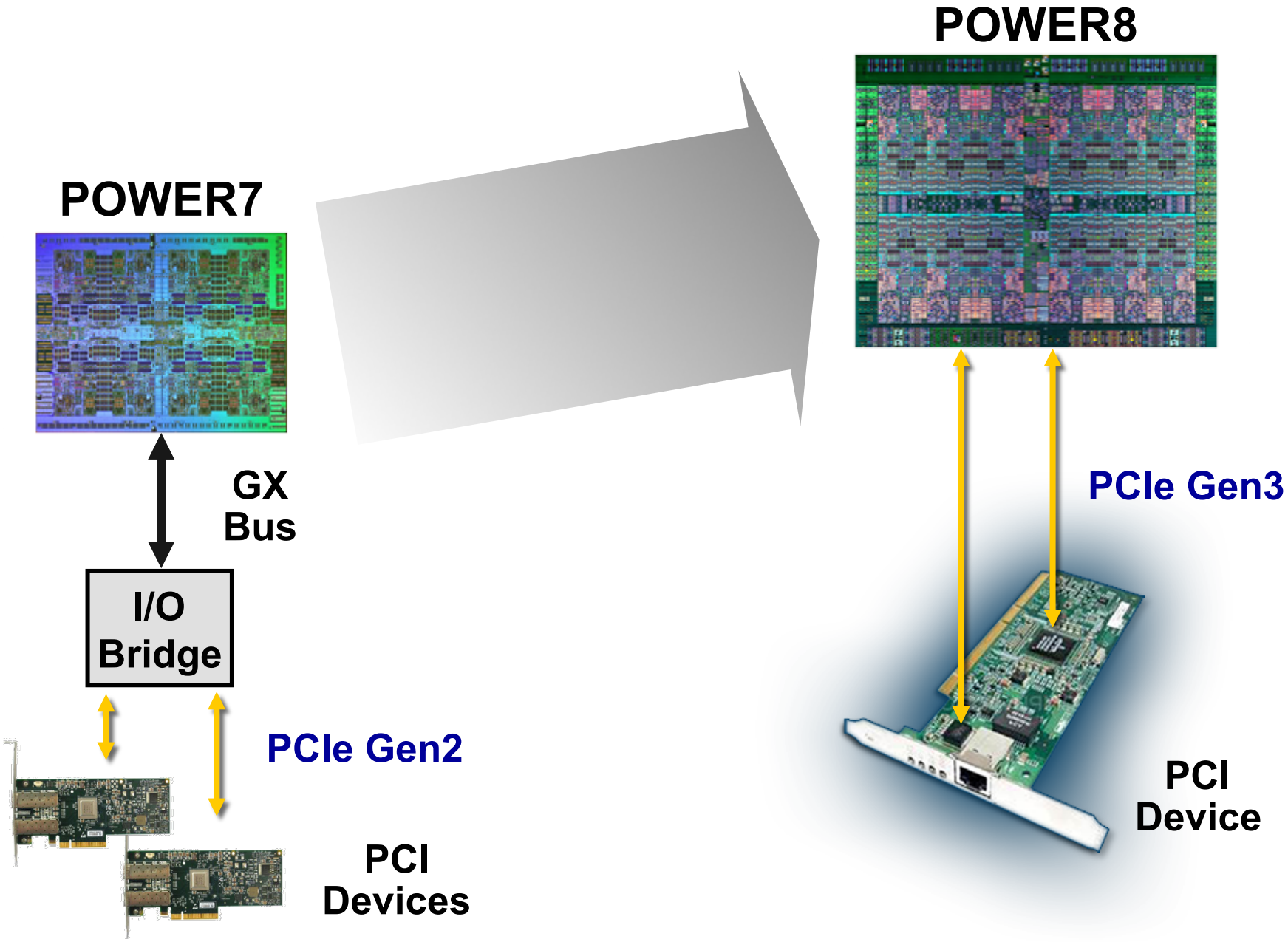
Integrated IO Subsystem
- **On Chip PCIe Controller**

Fine Grained Power Management
- **On Chip Power Management Controller & Power gating**

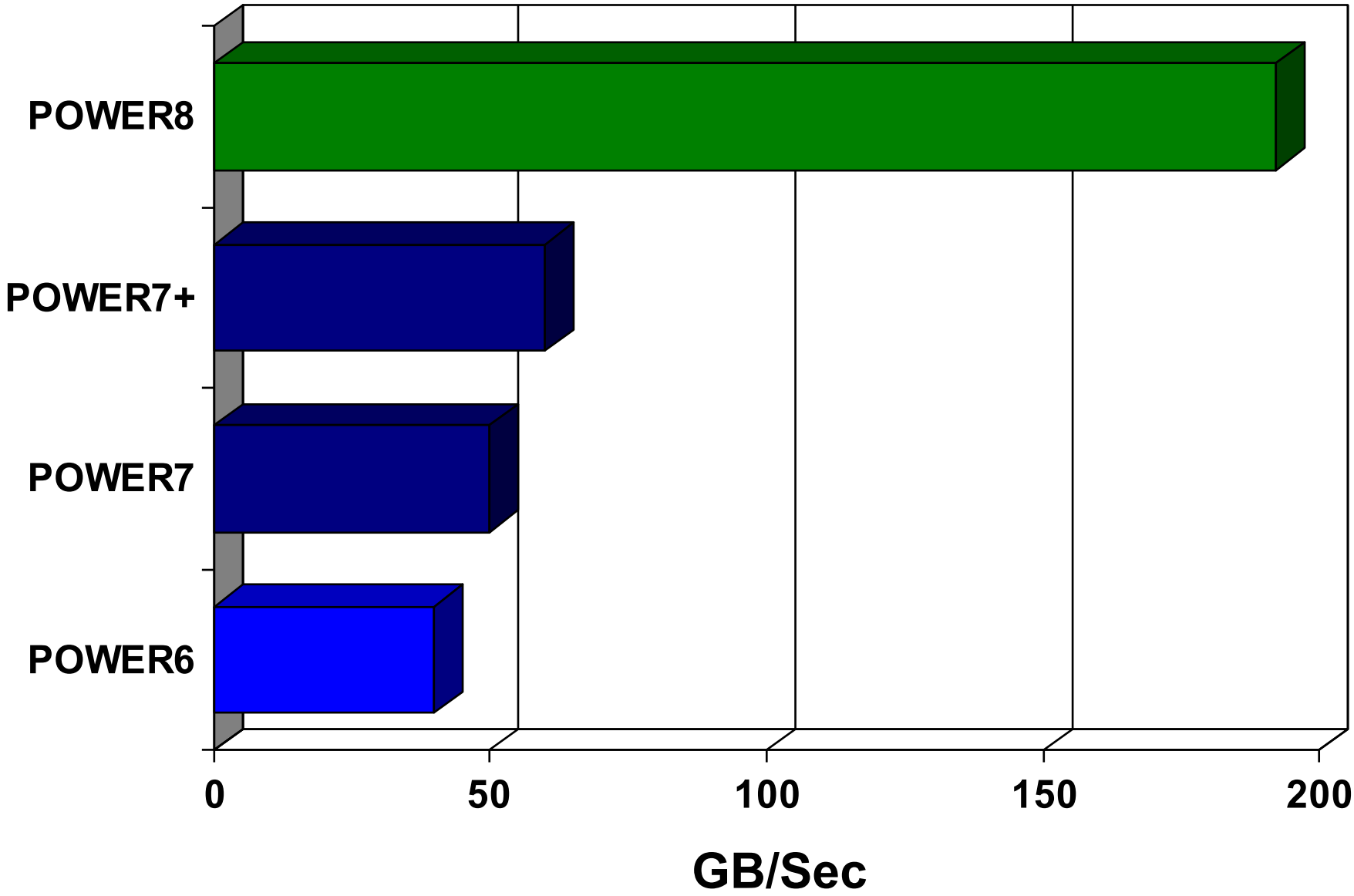
Memory Bandwidth per Socket



POWER8 Integrated PCI Gen 3



IO Bandwidth



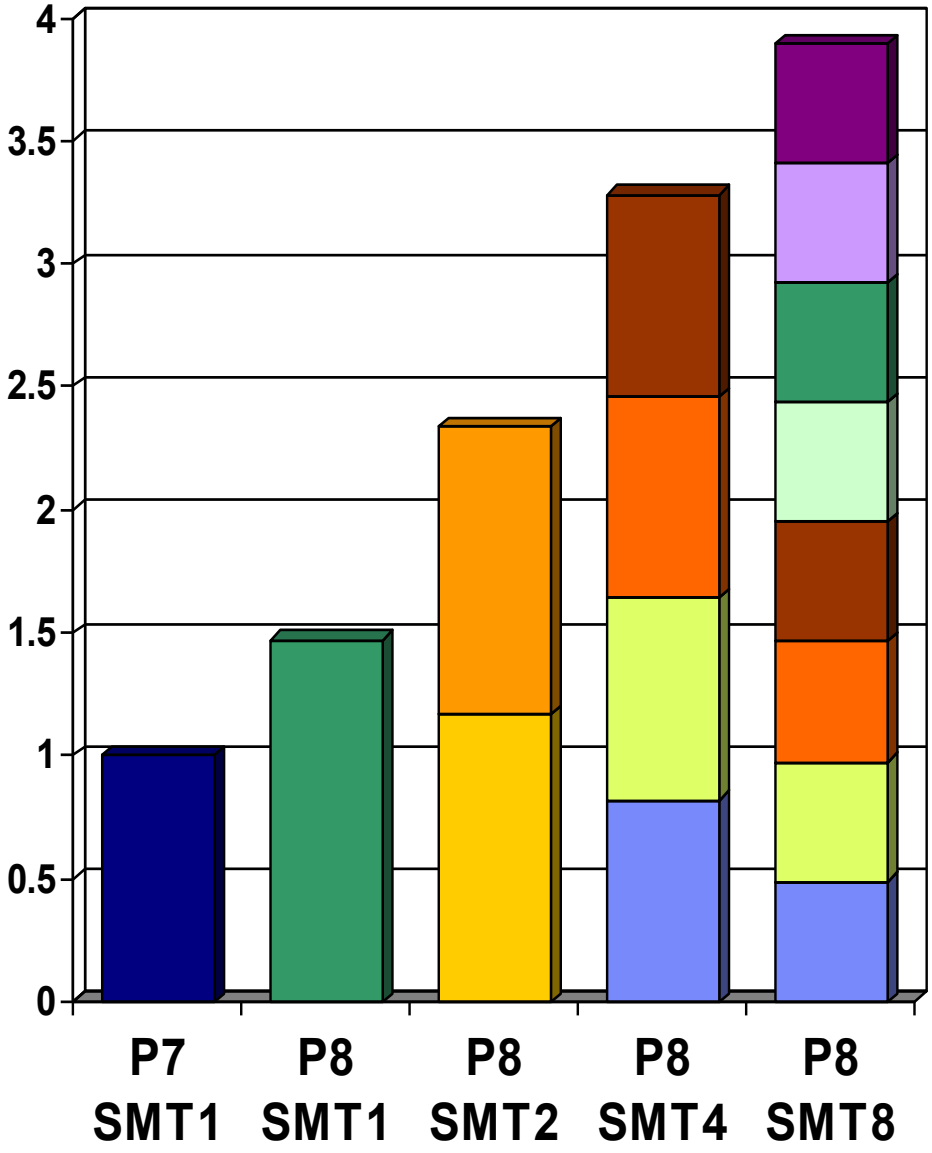
POWER8 Multi-threading Options

SMT1: Largest unit of execution work

SMT2: Smaller unit of work, but provides greater amount of execution work per cycle

SMT4: Smaller unit of work, but provides greater amount of execution work per cycle

SMT8: Smallest unit of work, but provides the maximum amount of execution work per cycle



- Comparison assumes similar GHz between POWER7 and POWER8 servers.
- Actual performance ratios depend on the workload

POWER8 Technology Great for

- IBM i

- AIX

- Linux -- plan to emphasize communication to help promote Power usage in this area

The first generation of systems in the industry built with open innovation to put data to work

Optimize Data and Analytics

- **Solutions & operating systems** optimized for new POWER8 big data & analytics innovations
- **Chip designs** for Java apps, big data/analytics
- **I/O** - PCI-3 for more disk and SSD for faster access and greater efficiency

Enhance Cloud Efficiency

- **Solutions & operating systems** optimized for POWER8 Java & virtualization innovations
- **Virtualization and cloud management** built on OpenStack, KVM, PowerVM
- **Chip designs** for cloud and MSP environments, i.e. KVM micro larger number of partitions

IBM Confidential until Announce

Enable Open Innovation

- Accelerate key emerging workloads with open source community and **OpenPOWER Foundation**
- Engaging new, leading **ecosystem partners to deliver new innovations**

Power System Roadmap

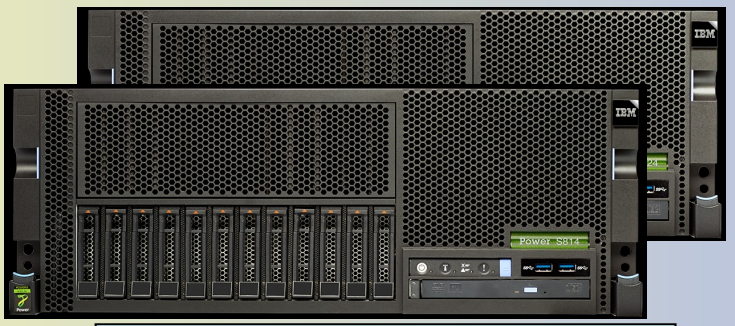
2013 **2014**

POWER8

KVM

PowerVC

PowerVP



4U Systems: S814 & S824

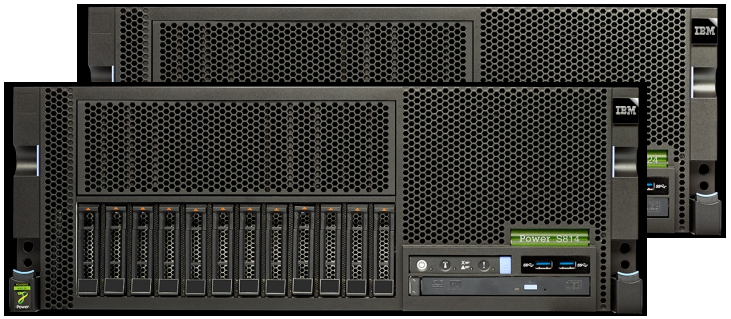
Power Linux Engines

2U System: S822

Enterprise Pools

2U Linux: S822L & S812L

IBM i 4U Focus



4U Systems: S814 & S824

IBM i chose to support just the 4U systems

- 4U offers best/most I/O options
- Limited use of POWER7 2U servers by IBM i clients
- Saved IBM i development/test resources

IBM i Focus: 4U Scale-out Servers

1 socket S814

- 6-core
- 8-core

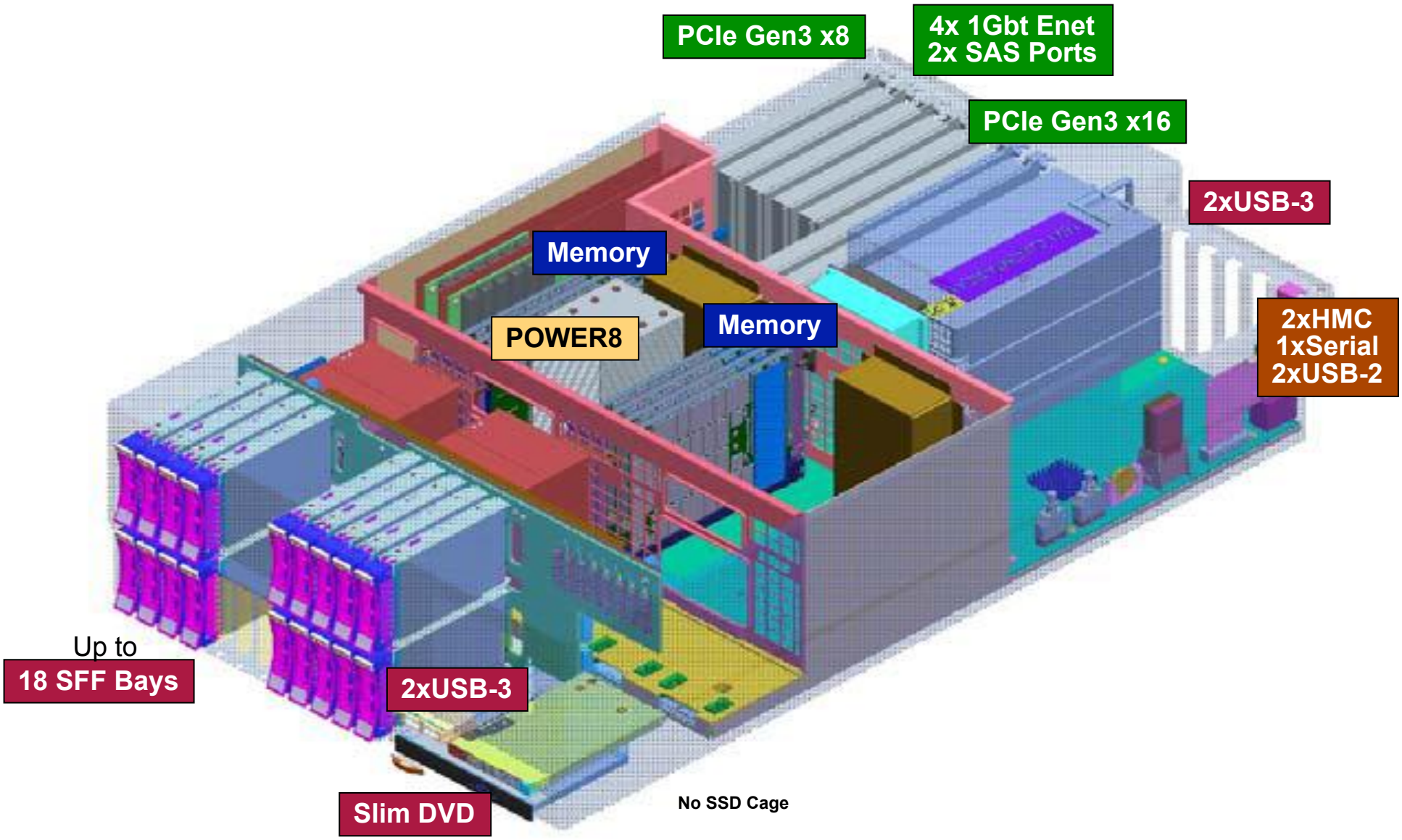
(rack or tower)

2 socket S814

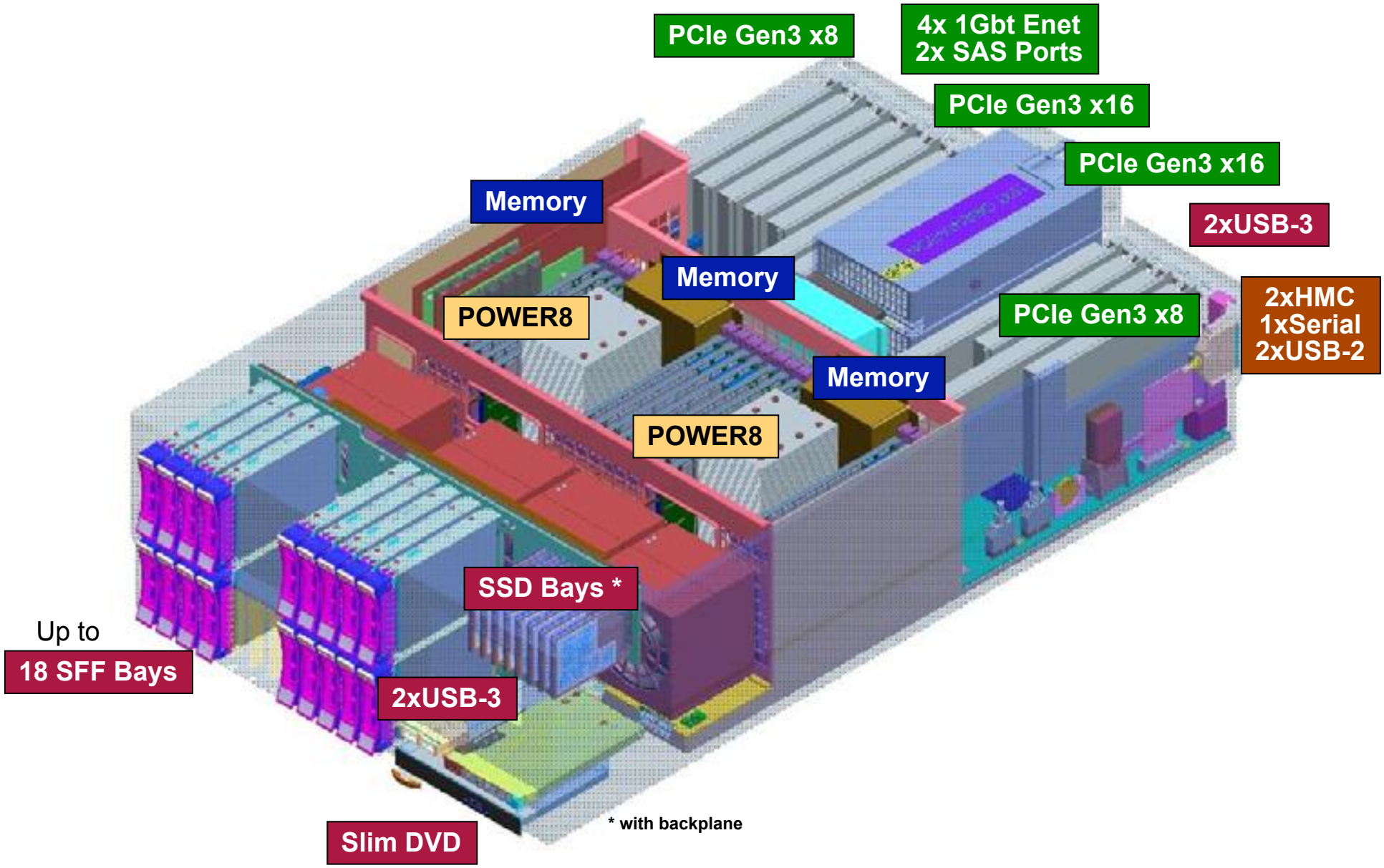
- 6-core or 12-core
- 8-core or 16-core
- 24-core

(rack)

1S4U Layout



2S4U Layout



1S4U Scale-out System

Power S814

- Form Factor: 4U or Tower
- Single Socket
  - Cores: 6 (3.0 GHz) or 8 (3.7 GHz)
  - Memory: Up to 512 GB
  - Slots: 7 PCIe Gen3 Full-high (Hotplug)

- Ethernet: Quad 1 Gbt
- Integrated ports: USB (4/5), Serial (1), HMC (2)
- Internal Storage
  - DVD
  - 12 SFF Bays -- Split Backplane: 6 + 6
  - or 18 SFF Bays with 7GB write cache

- Hypervisor: PowerVM
- OS: AIX, IBM i (P10 software tier), Linux

3 Yr Warranty

2S4U Scale-out System

Power S824

- Single Socket populated
  - Cores: 6 (3.8 GHz) or 8 (4.1 GHz)
  - Memory: Up to 512 GB
  - Slots: 7 PCIe Gen3 full-high (Hotplug)
- Both Sockets populated
  - Cores: 12 (3.8 GHz), 16 (4.1 GHz), or 24 (3.5 GHz)
- Memory: Up to 1 TB
  - Slots: 11 PCIe Gen3 full-high (Hotplug)

- Ethernet: Quad 1 Gbt
- Integrated ports: USB (4/5), Serial (1), HMC (2)
- Internal Storage
  - DVD
  - 12 SFF Bays -- Split Backplane: 6 + 6
  - or 18 SFF bays & 8 SSD bays with 7GB write cache

- Hypervisor: PowerVM
- OS: AIX, IBM i (P20 software tier), Linux

3 Yr Warranty

POWER8 4U Scale-out Comparison – S814

	Power 720	Power System S814
Processor	POWER7+	**POWER8**
Sockets	1	**1**
Cores	4 / 6 / 8	**6 / 8**
Maximum Memory	512 @ 1066 MHz	**512 GB @ 1600 MHz**
Memory Cache	No	**Yes**
Memory Bandwidth	136 GB/sec	**192 GB/sec**
Memory DRAM Spare	No	**Yes**
System unit PCIe slots	6 PCIe Gen2 FH Opt 4 PCIe Gen2 LP	**7 PCIe Gen3 FH**
CAPI (Capable slots)	N / A	**One**
PCIe Hot Plug Support	No	**Yes**
IO bandwidth	40 GB/sec	**96 GB/sec**
Ethernet ports	Quad 1 Gbt (x4 slot)	**Quad 1 Gbt (x8 Slot)**
SAS bays in system unit	6 or 8 SFF-1 bays	**12 SFF-3 bays Or 18 SFF-3 bays**
Integrated write cache	Optional 175 MB	**Optional effectively 7GB**
Easy Tier Support	No	**Yes**
Integrated split backplane	Yes (3 + 3)	**Yes (6 + 6)**
Service Processor	Generation 1	**Generation 2**

POWER8 4U Scale-out Comparison – S824

	Power 740	Power System S824
Processor	POWER7+	**POWER8**
Sockets	1 (upgradeable) / 2	**1 (upgradeable) / 2**
Max Cores	8 / 16	**8 / 24**
Maximum Memory	512GB / 1TB @ 1066 MHz	**512GB / 1TB @ 1600 MHz**
Memory Cache	No	**Yes**
Memory Bandwidth	136 GB/sec	**384 GB/sec**
Memory DRAM Spare	No	**Yes**
System unit PCIe slots	6 PCIe Gen2 FH Opt 4 PCIe Gen2 LP	**7 / 11 PCIe Gen3 FH**
CAPI (Capable slots)	N / A	**Two**
PCIe Hot Plug Support	No	**Yes**
IO bandwidth	60 GB/sec	**192 GB/sec**
Ethernet ports	Quad 1 Gbt (x4 slot)	**Quad 1 Gbt (x8 Slot)**
SAS bays in system unit	6 or 8 SFF-1	**12 SFF-3 bays Or 18 SFF-3 + 8 SSD bays**
Integrated write cache	Optional 175 MB	**Optional effectively 7GB**
Easy Tier Support	No	**Yes**
Integrated split backplane	Yes (3 + 3)	**Yes (6 + 6)**
Service Processor	Generation 1	**Generation 2**

CPW

S814 (1 socket)

- 6-core 3.0 GHz 59,500
- 8-core 3.7 GHz 85,500

S824 (1 or 2 socket)

- 6-core 3.8 GHz 72,000
- 12-core 3.8 GHz 130,000
- 8-core 4.1 GHz 94,500
- 16-core 4.1 GHz 173,500
- 12-core 1-socket not offered
- 24-core 3.5 GHz 230,500

Measured using SMT8

SMT4 would be somewhat lower

CPW

720 POWER7+ (1 socket)		
4-core	3.6 GHz	28,400
6-core	3.6 GHz	42,400
8-core	3.6 GHz	56,300

+40%

+50%

S814 (1 socket)		
4-core	xxxxx	xxxxxx
6-core	3.0 GHz	59,500
8-core	3.7 GHz	85,500

740 POWER7+ (1 or 2 socket)		
6-core	4.2 GHz	49,000
12-core	4.2 GHz	91,700
8-core	3.6 GHz	56,300
16-core	3.6 GHz	106,500
8-core	4.2 GHz	64,500
16-core	4.2 GHz	120,000

+40%

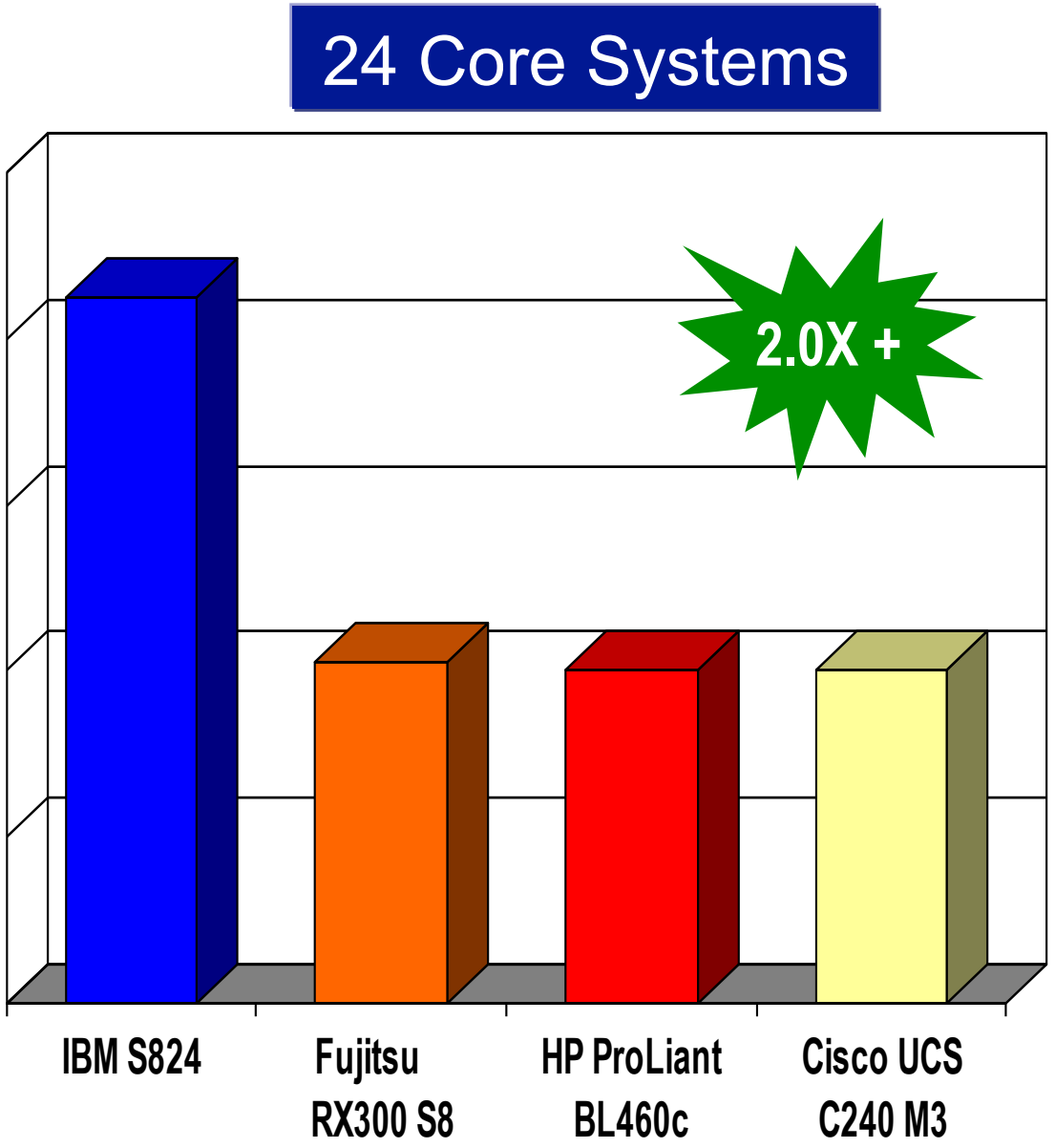
+60%

+90%

S824 (1 or 2 socket)		
6-core	3.8 GHz	72,000
12-core	3.8 GHz	130,000
8-core	4.1 GHz	94,500
16-core	4.1 GHz	173,500
12-core	1-socket not offered	
24-core	3.5 GHz	230,500

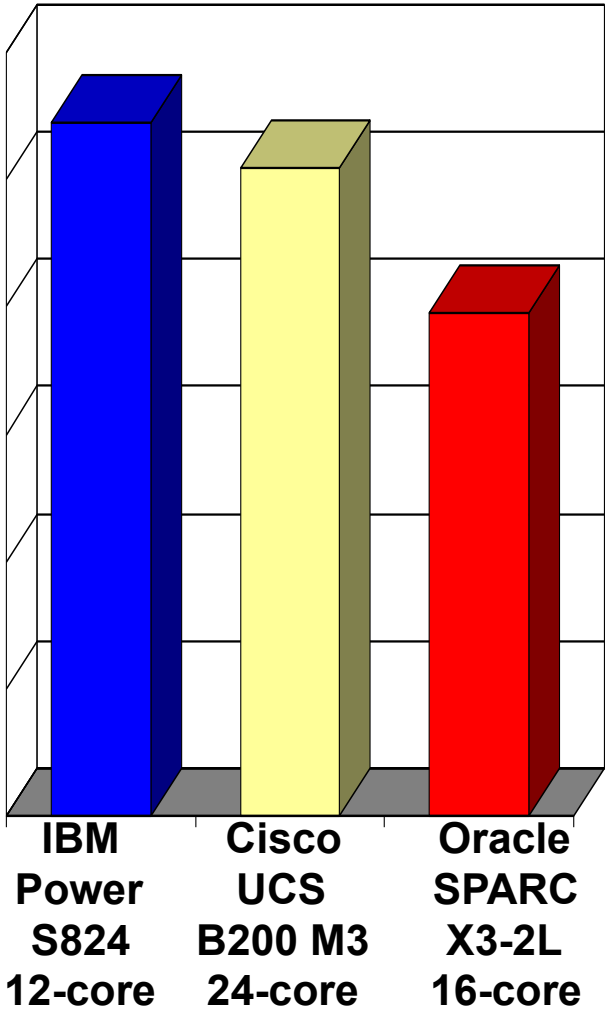
SAP Sales & Distribution 2-Tier ERP 6 Benchmark

2X
Better Performance than nearest Intel competition

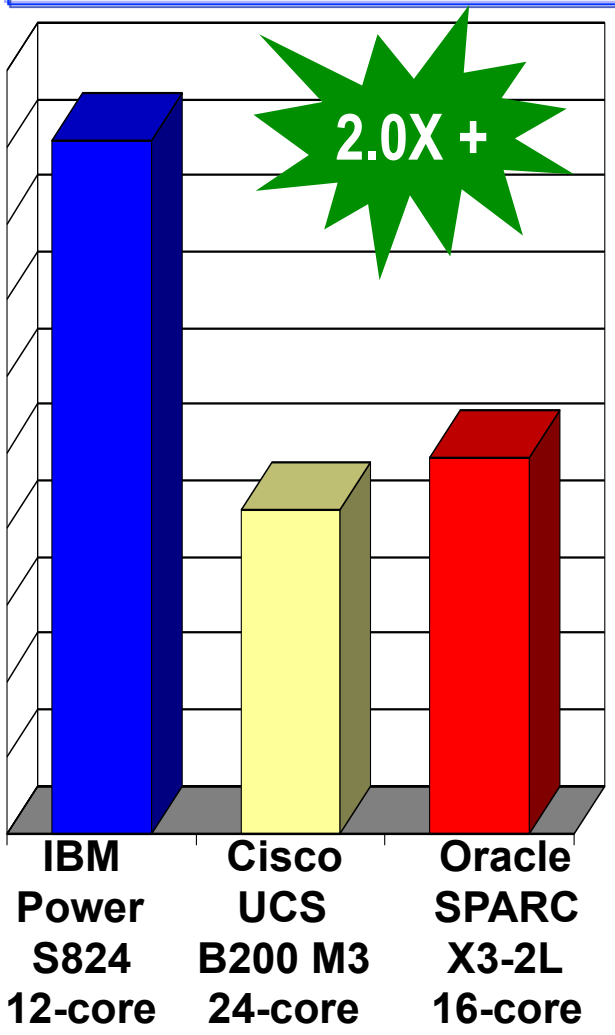


eBS 12.1.3 Payroll Benchmark

Performance Leadership



Per Core Performance



PCIe Gen3 Slots

	4U		2U (no IBM i)	
	1S 4U	2S 4U	1S 2U	2S 2U
Total PCIe slots All hot swap All Gen3	**7**	**11**	**6**	**9**

- **Use 1 of the above slots for a LAN adapter**
- **Use 1 of the above for expanded function backplane**
- **There is no PCI expansion drawer announced. There is an SOD.**

Storage Backplanes

4U server expanded function backplane shown

Backplanes provide

- ***High performance*** integrated SAS controller(s) built on IBM industry leading PCIe Gen3 SAS adapter technology
  - All include RAID 0, 1, 5, 6, 10. Plus hot spare capability
  - Split backplane option with zero-write cache controllers
  - Easy Tier® function* for AIX/Linux**
- 8-18*** SAS bays for 2.5-inch (SFF) HDD or SSD
- 6-8 SAS bays for 1.8-inch SSD*
- One DVD bay
- Option for attaching one EXP24S drawer of HDD or SSD*

* With dual IOA, expanded function backplane with write cache
** IBM i uses own OS capabilities to do Easy Tier like function for all SAS controllers
*** Number varies based on 2U/4U and backplane option selected

4U Storage Backplane Options

IBM i supports ALL three options

Must select one →	Base	Split	Expanded Function *
4U server	**12 SFF SAS bays 1 SAS controller No write cache RAID-0,1,5,6,10 DVD bay** Staged availability Availability plan: - GA Sept	**6+6 SFF SAS bays 2 SAS controllers No write cache RAID-0,1,5,6,10 DVD bay**	**18 SFF SAS bays Dual SAS controllers 7.2**GB cache RAID-0,1,5,6,10 DVD bay 8-bay SSD cage*** External SAS ports Easy Tier function**

* Uses one x8 PCIe slot

** 1.8GB physical write cache provides up to 7.2GB effectively with compression

***SSD cage not available on mdl 41A, Required on mdl 42A with expanded function

Upgrades

No same-serial-number upgrades from Power 7xx to Power S8xx

(Could not pass financial/accounting rules to do so)

Note the Power 770/780 D mdls have an SOD for same-serial-number upgrades and another SOD covering mobile activations

New POWER8 PCIe Adapters

- LAN (IBM i supported through VIOS)
  - 2-port 40GbE NIC & RoCE
  - 2-port 10/1GbE RJ45 (10GBaseT) only $950
  - 4-port 10GbE+1GbE Copper twinax & RJ45 only $1200
  - 4-port 10GbE+1GbE SR optical & RJ45 only $1600
- USB-3 4-port (IBM i native support)
- SAS PCIe3 (IBM i native support)
  - 4-port Tape/DVD only $1000
- PCIe3 FPGA Accelerator Adapter
  - Showinv POWER8 new capabilities

Prices are USA List prices for a Power S824 and are subject to change. Reseller prices may vary.

New I/O Announced 8 April for POWER7/POWER+

PCIe SAS Adapters expanded usage

- PCIe3 4-port zero cache on more models
- PCIe3 4-port huge cache on more models
- PCIe2 3-port large cache on more POWER7 models

New IMFC (#EN10/EN11) for Power 770/780 “C & D” model

- With 10GBase-T and FCoE (CNA)
- With SR-IOV capability “D” model only with new firmware level

NIC SR-IOV for POWER7+ 770/780 with

- Specific 10GE Ethernet adapters #EN0K and #EN0H in Gen2 slots
- Or with newest IMFC #EN10 and #EN11

Enhanced native (nonVIOS) IBM i support of existing adapters

- 16Gb Fibre Channel (Switch still required)
- SR-IOV where supported
- IBM i 7.1 TR8 or 7.2

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28 April 2014

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IBM benchmark results can be found in the IBM Power Systems Performance Report at http://www.ibm.com/systems/p/hardware/system_perf.html.

All performance measurements were made with AIX or AIX 5L operating systems unless otherwise indicated to have used Linux. For new and upgraded systems, AIX Version 4.3, AIX 5L or AIX 6 were used. All other systems used previous versions of AIX. The SPEC CPU2006, SPEC2000, LINPACK, and Technical Computing benchmarks were compiled using IBM's high performance C, C++, and FORTRAN compilers for AIX 5L and Linux. For new and upgraded systems, the latest versions of these compilers were used: XL C Enterprise Edition V7.0 for AIX, XL C/C++ Enterprise Edition V7.0 for AIX, XL FORTRAN Enterprise Edition V9.1 for AIX, XL C/C++ Advanced Edition V7.0 for Linux, and XL FORTRAN Advanced Edition V9.1 for Linux. The SPEC CPU95 (retired in 2000) tests used preprocessors, KAP 3.2 for FORTRAN and KAP/C 1.4.2 from Kuck & Associates and VAST-2 v4.01X8 from Pacific-Sierra Research. The preprocessors were purchased separately from these vendors. Other software packages like IBM ESSL for AIX, MASS for AIX and Kazushige Goto's BLAS Library for Linux were also used in some benchmarks.

For a definition/explanation of each benchmark and the full list of detailed results, visit the Web site of the benchmark consortium or benchmark vendor.

TPC	http://www.tpc.org
SPEC	http://www.spec.org
LINPACK	http://www.netlib.org/benchmark/performance.pdf
Pro/E	http://www.proe.com
GPC	http://www.spec.org/gpc
NotesBench	http://www.notesbench.org
VolanoMark	http://www.volano.com
STREAM	http://www.cs.virginia.edu/stream/
SAP	http://www.sap.com/benchmark/
Oracle Applications	http://www.oracle.com/apps_benchmark/
PeopleSoft - To get information on PeopleSoft benchmarks, contact PeopleSoft directly	
Siebel	http://www.siebel.com/crm/performance_benchmark/index.shtm
Baan	http://www.ssaglobal.com
Microsoft Exchange	http://www.microsoft.com/exchange/evaluation/performance/default.asp
Veritest	http://www.veritest.com/clients/reports
Fluent	http://www.fluent.com/software/fluent/index.htm
TOP500 Supercomputers	http://www.top500.org/
Ideas International	http://www.ideasinternational.com/benchmark/bench.html
Storage Performance Council	http://www.storageperformance.org/results

Revised January 15, 2008

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SPEC	http://www.spec.org
LINPACK	http://www.netlib.org/benchmark/performance.pdf
Pro/E	http://www.proe.com
GPC	http://www.spec.org/gpc
STREAM	http://www.cs.virginia.edu/stream/
Veritest	http://www.veritest.com/clients/reports
Fluent	http://www.fluent.com/software/fluent/index.htm
TOP500 Supercomputers	http://www.top500.org/
AMBER	http://amber.scripps.edu/
FLUENT	http://www.fluent.com/software/fluent/fl5bench/index.htm
GAMESS	http://www.msg.chem.iastate.edu/gamess
GAUSSIAN	http://www.gaussian.com
ABAQUS	http://www.abaqus.com/support/sup_tech_notes64.html select Abaqus v6.4 Performance Data
ANSYS	http://www.ansys.com/services/hardware_support/index.htm select "Hardware Support Database", then benchmarks.
ECLIPSE	http://www.sis.slb.com/content/software/simulation/index.asp?seg=geoquest&
MM5	http://www.mmm.ucar.edu/mm5/
MSC.NASTRAN	http://www.mscsoftware.com/support/prod%5Fsupport/nastran/performance/v04_sngl.cfm
STAR-CD	www.cd-adapco.com/products/STAR-CD/performance/320/index/html
NAMD	http://www.ks.uiuc.edu/Research/namd
HMMER	**http://hmmer.janelia.org/** http://powerdev.osuosl.org/project/hmmerAltivecGen2mod

Revised January 15, 2008

Notes on performance estimates

rPerf for AIX

rPerf (Relative Performance) is an estimate of commercial processing performance relative to other IBM UNIX systems. It is derived from an IBM analytical model which uses characteristics from IBM internal workloads, TPC and SPEC benchmarks. The rPerf model is not intended to represent any specific public benchmark results and should not be reasonably used in that way. The model simulates some of the system operations such as CPU, cache and memory. However, the model does not simulate disk or network I/O operations.

rPerf estimates are calculated based on systems with the latest levels of AIX and other pertinent software at the time of system announcement. Actual performance will vary based on application and configuration specifics. The IBM eServer pSeries 640 is the baseline reference system and has a value of 1.0. Although rPerf may be used to approximate relative IBM UNIX commercial processing performance, actual system performance may vary and is dependent upon many factors including system hardware configuration and software design and configuration. Variations in incremental system performance may be observed in commercial workloads due to changes in the underlying system architecture.

All performance estimates are provided "AS IS" and no warranties or guarantees are expressed or implied by IBM. Buyers should consult other sources of information, including system benchmarks, and application sizing guides to evaluate the performance of a system they are considering buying. For additional information about rPerf, contact your local IBM office or IBM authorized reseller.

==========

CPW for IBM i

Commercial Processing Workload (CPW) is a relative measure of performance of processors running the IBM i operating system. Performance in customer environments may vary. The value is based on maximum configurations. More performance information is available in the Performance Capabilities Reference at: www.ibm.com/systems/i/solutions/perfmgmt/resource.html

Revised April 2, 2007

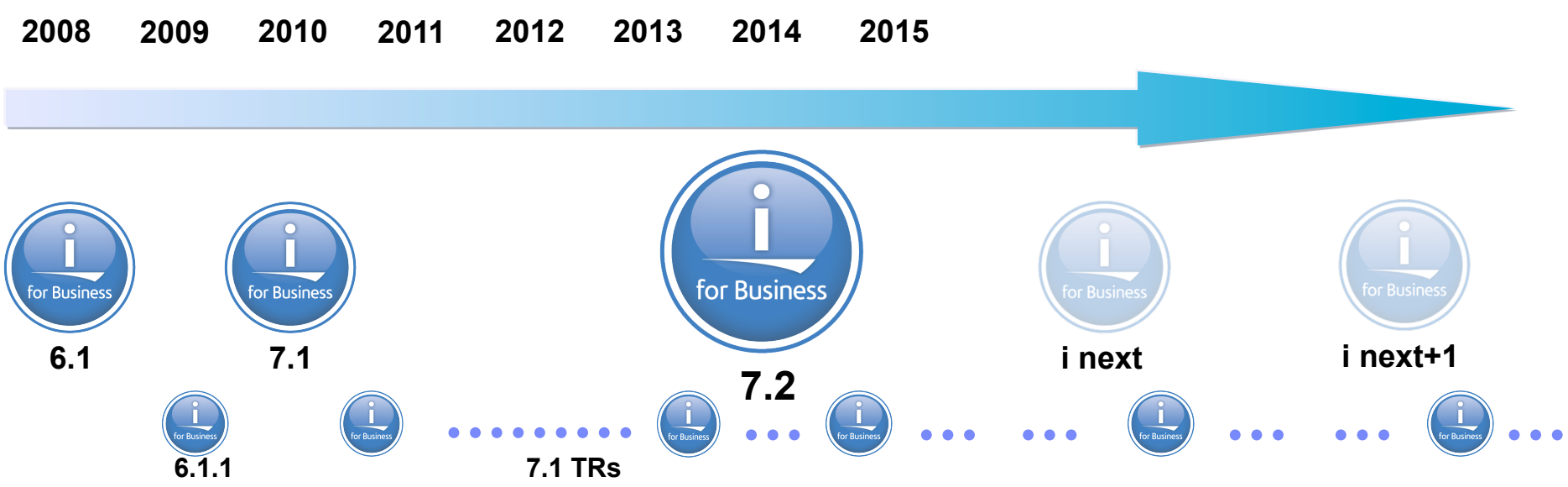
Power Systems

IBM

IBM i 7.2 Brief Overview

Steve Will
IBM i Chief Architect

IBM i Roadmap



- 7.1 Introduced Technology Refreshes
- 7.2 Incorporates 7.1 TRs and adds new capabilities
- TRs will transition to 7.2 over time
- New Releases for pervasive changes beyond scope of TRs

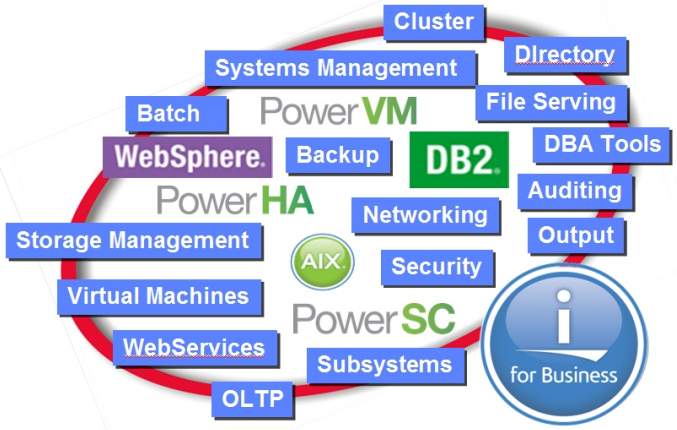
** All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

2

IBM i 7.2 Themes

- Solutions for Today's IT
  - Growth Areas: Mobile, Graphical & Extending Value
  - Delivering Capabilities where needed: Cloud & In-House
  - Applying POWER with POWER8
  - Powerful Advanced Middleware

- Integrating Advanced Technology
  - DB2 Security, Performance & Automation
  - Development Platform, Language Features & Tools
  - Integrated Security & Management
  - Growing Beyond the Limits



Scalable SQE
Data Centric
RCAC
Easy to use
Bet your business on us
Encoded Vector Indexes
Open for Business
Easy to maintain
Intelligent SSD
Secure
Proven
Reliable
DB2 for i

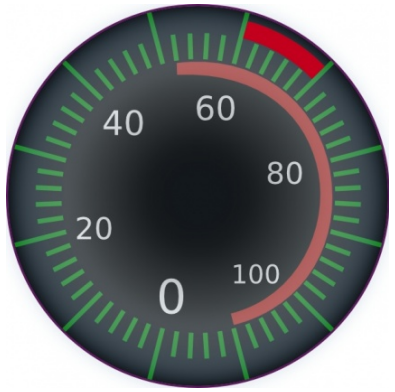
DB2 for i enhancements in IBM i 7.2

Security
- Protect business critical data using data-centric design with RCAC
- Secure remote journaling with SSL

Application development
- Improved ability to build, maintain and extend complex database application architectures

Database Engineering (DBE)
- Timestamp precision control (0 thru 12)
- Partitioned tables automatically reposition a row when updated

Performance
- SQL Query Engine (SQE) supports OPNQRYF & Query/400
- Other SQE enhancements
- Use SQL to see temporary storage consumption



Security - Separation of Duties

Before 7.2

Problem: Anyone who has the authority to grant privileges also has the authority to perform operations that require those privileges.

Should the security administrator be able to access the data within tables?

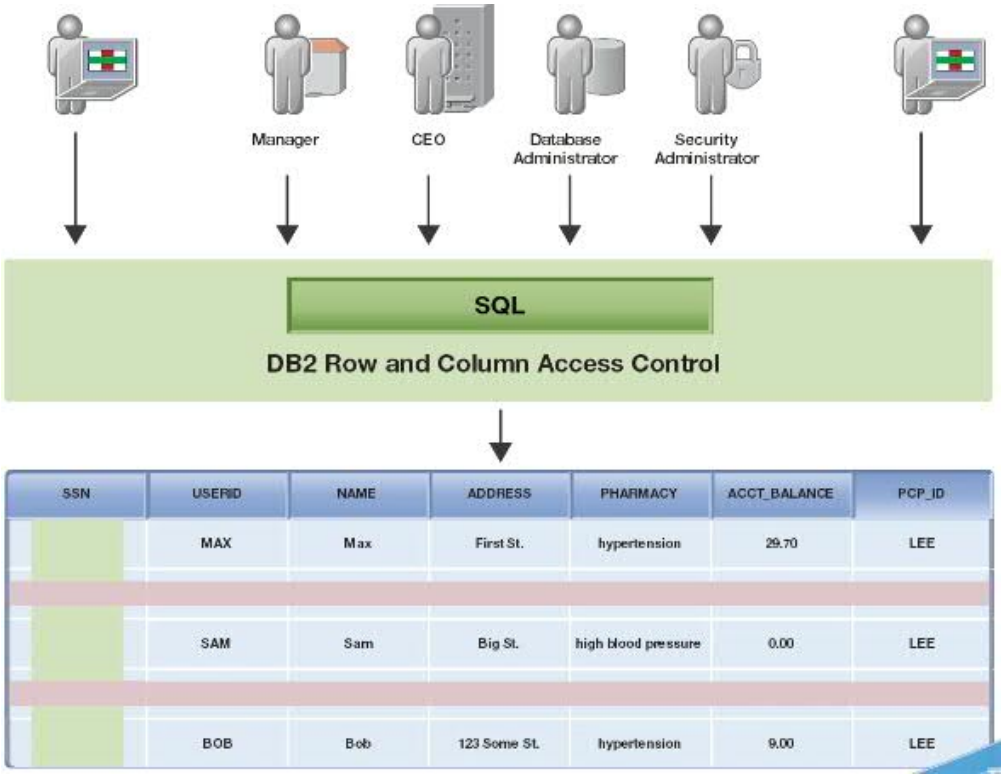
IBM i 7.2 with RCAC

- Enable the management of security, **without exposing the data** to be read or modified.
- A user with security administration function usage (QIBM_DB_SECADM) will be able to grant or revoke privileges on any object to anyone, even if they do not have the SELECT privilege.

What is RCAC?

- Additional layer of data security available with DB2
- Complementary to table level security
- Subsetting access to only the required data for a task
- Controls access to a table at the row, column, or both
- Two sets of rules
  - Permissions for rows
  - Masks for columns

IBM Advanced Data Security for i
(**Boss option 47**)
No Charge



- **IBM Advanced Data Security for i**
  - **No-charge feature - Option 47**

DB2 for i & IBM i 7.2 – Other enhancements

Application Development

- Increased timestamp precision
- Named and Default parameter support on UDF/UDTFs
- Function resolution using casting rules
- Use of ARRAYs within UDF/UDTFs
- Obfuscation of SQL triggers
- Built-in Global Variables
- Expressions on PREPARE & EXECUTE IMMEDIATE
- Autonomous procedures
- CURRENT USER special register
- LPAD and RPAD scalar functions
- TRUNCATE TABLE
- Constants in LANGUAGE SQL routines
- Unified debugger support for SQL functions
- Datetime scalar function improvements

Navigator for DB Application Development

- ***Support of all new SQL features***
  - *Permissions*
  - *Masks*
  - *Named arguments and parameter defaults*
  - *Obfuscation of Triggers*
  - *Arrays in user-defined functions*
  - *Create based ON*

DBA/DBE

- Queued exclusive locks control
- SQL Server Mode detail in collection services
- SQL Details for Jobs enhancement
- Improved VARCHAR & LOB space management
- Automatic record movement between partitions

Navigator for DBA/DBE

- ***Performance Data Investigator (PDI)***
  - *Investigate Data – DB2 category*
  - *SQL Plan Cache perspectives*
  - *Physical vs Logical I/O breakdowns*
  - *And more…*
- ***On Demand Performance Center***
  - *Observance of Native Queries*
  - *Advanced Monitor Compare*

Application Development

RPG

COBOL

for Business

Apache

zend

php

Java

Rational. software

PowerRuby

SAMBA
opening windows to a wider world

7.2

Liberty

7.2

Significant Enhancements to RPG Built into 7.2

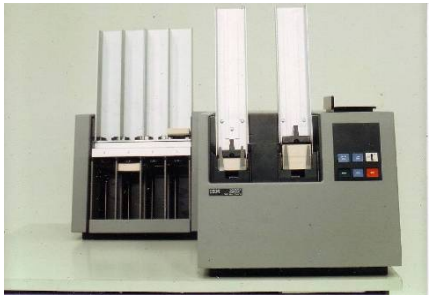
- New Free Format RPG
  - New Syntax; new style
  - Modern behavior
- Conversion tool changes old RPG to RPG Free Format
  - Arcad Converter
  - Linoma Software
- More added only in 7.2
  - Key CCSID & Timestamp support

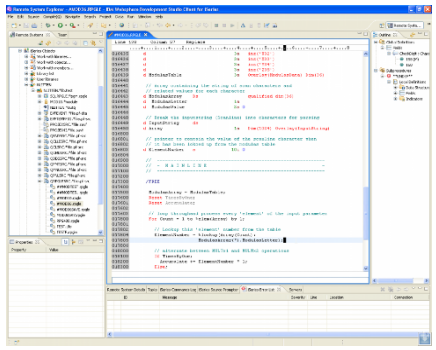
```
ctl-opt bnddir('ACCRCV');

dcl-f custfile usage(*update);
dcl-ds custDs likerec(custRec);
dcl-f report printer;

read custfile custDs;
dow not %eof;
   if dueDate > %date(); // overdue?
      sendOverdueNotice();
      write reportFmt;
      exec sql insert :name, :duedate into
               mylib/myfile;
   endif;
   read custfile custDs;
enddo;
*inlr = '1';

dcl-proc sendOverdueNotice;
   sendInvoice (custDs : %date());
  end-proc;
```





Recent Advancements in Mobile Access for IBM i

- RPG Open Access
- XML Services
- JTOpen Lite
- PHP – Zend Server for IBM i, Zend Studio
- IBM Connections
- IBM Notes Traveler
- IBM Mobile Database
- DB2 WebQuery
- Rational HATS
- And more …

+ PLUS – Tools from Industry Vendors

Integrated Middle Ware on IBM i

- IBM i HTTP Server now running Apache 2.4
  - Improved performance
  - SNI (Server Name Indication) support
  - OCSP (Online Certificate Status Protocol) support
  - Independent Subsystems

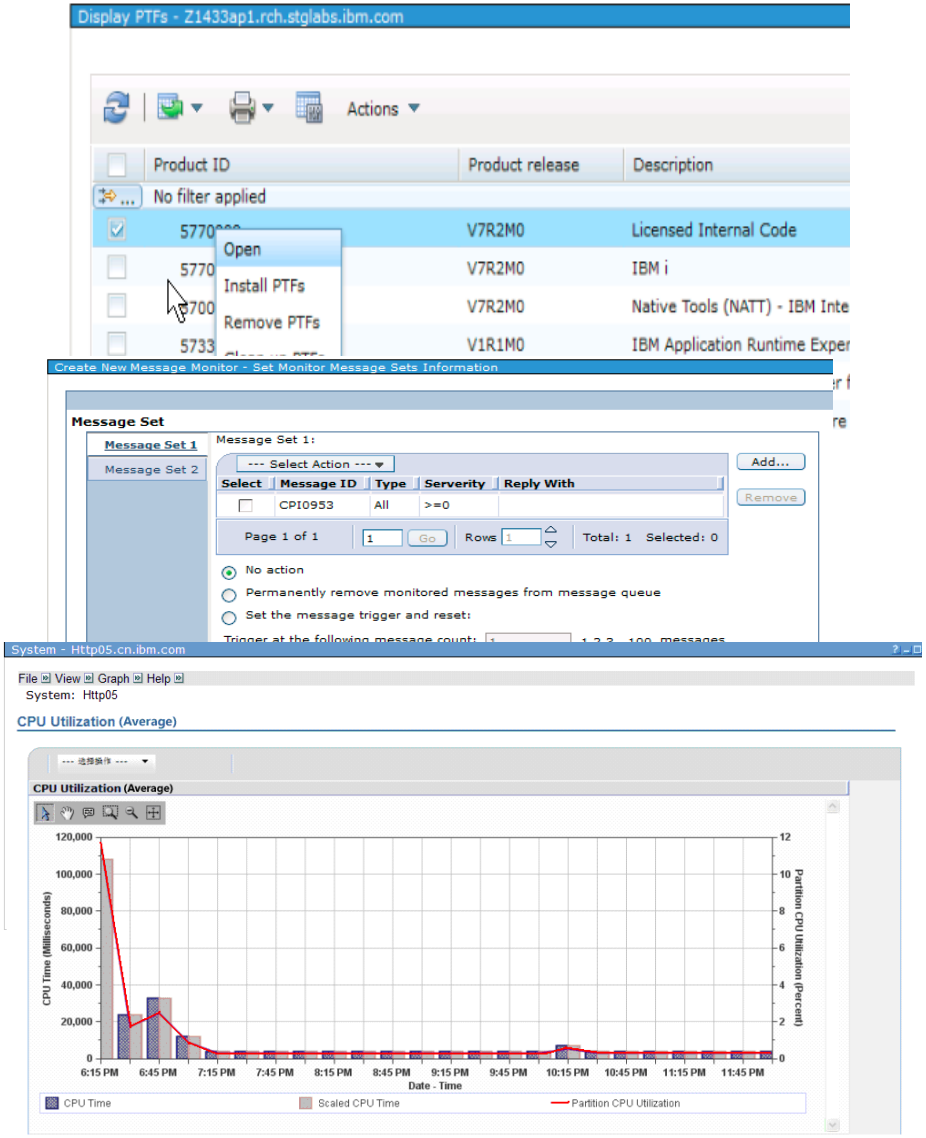
- IBM i Integrated Application Server – now powered by Liberty 8.5
  - Runs on Java 7 & 7.1
  - Updated to the latest web specs - JCA 1.6 , JSR 236
  - Replacement for Tomcat – runs on any platform
  - Upward compatible to full WebSphere

- Integrated Wed Services Server – now powered by WAS Liberty & Jax-WS
  - Faster and better compliance
  - JAX-WS SOAP web service container - Latest industry standard

Managing the System with IBM i 7.2

IBM Navigator for i – new functions

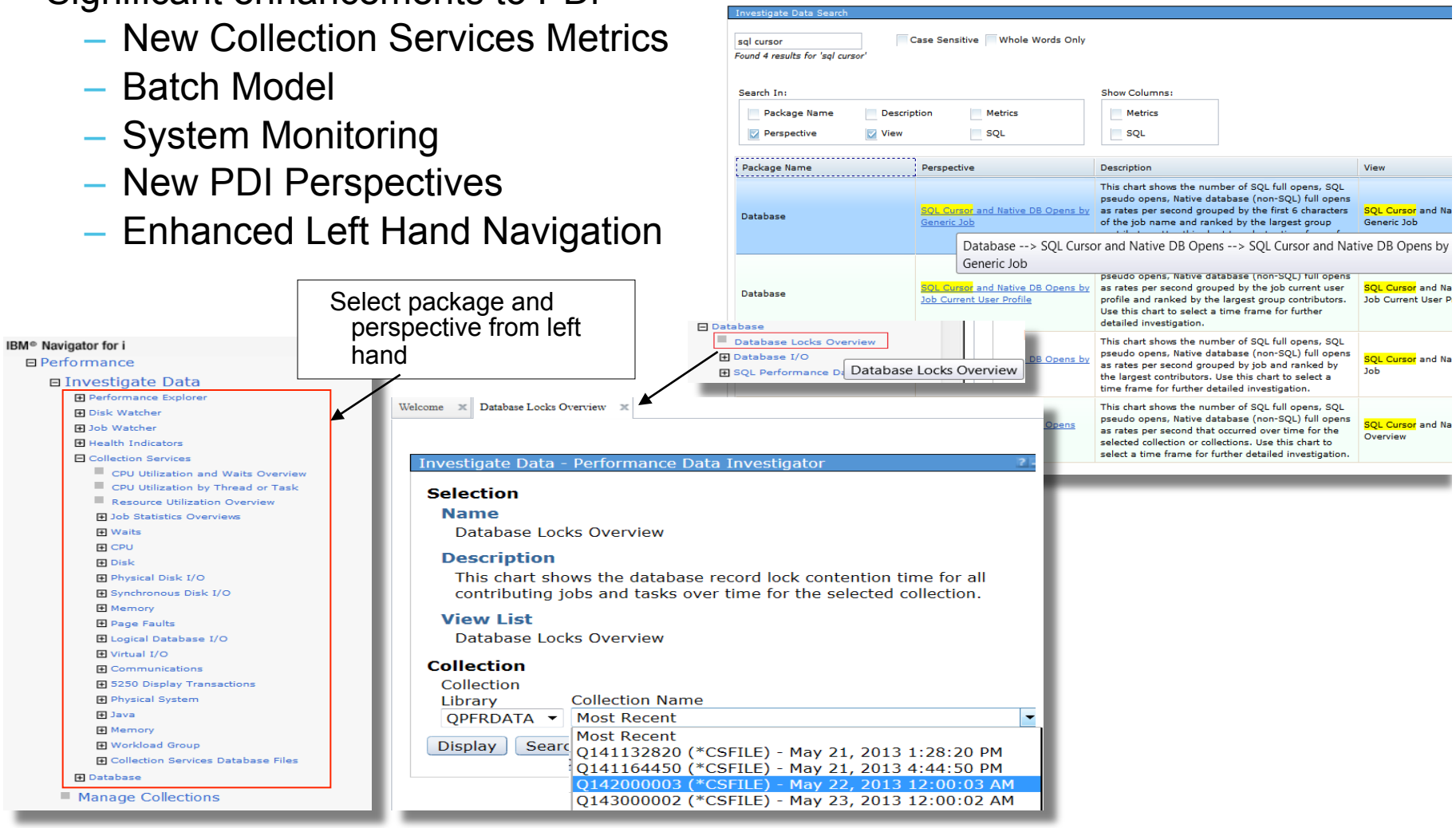
- Performance & Usability
  - New browsers
  - My Favorites
  - Quick Search
- PTF management
  - Installed PTF Navigation
  - Load/apply PTF on single or group systems
- Message Queue monitor
  - Based on the same CIM infrastructure
    Filter messages based on rules
  - Trigger action to handle messages automatically
- System monitor
  - User defined IBM i OS metrics monitor
  - Graphical displays of performance trend
  - User defined event automation
- Database
  - Create new function and procedure
  - DB Performance Metrics



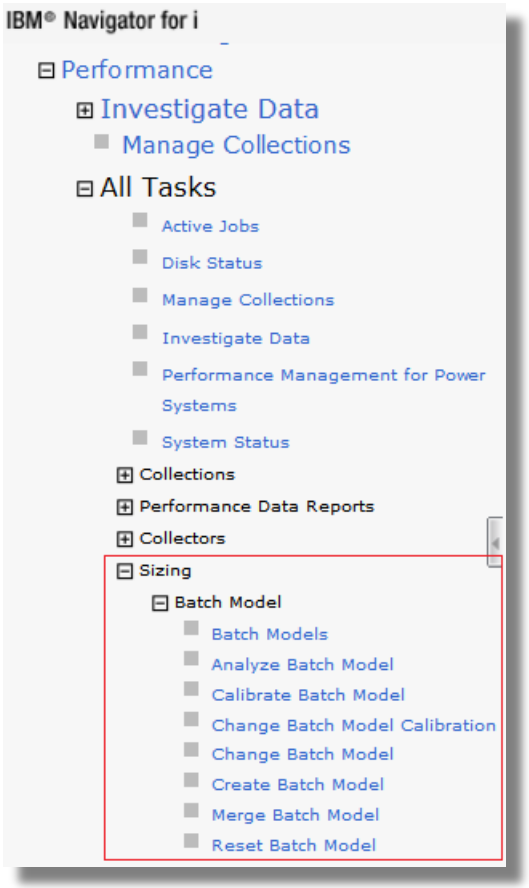
Collection Services & Performance Data Investigator – 7.2

- Significant enhancements to PDi
  - New Collection Services Metrics
  - Batch Model
  - System Monitoring
  - New PDI Perspectives
  - Enhanced Left Hand Navigation

Fast Search – Enter metric see all charts its on!!



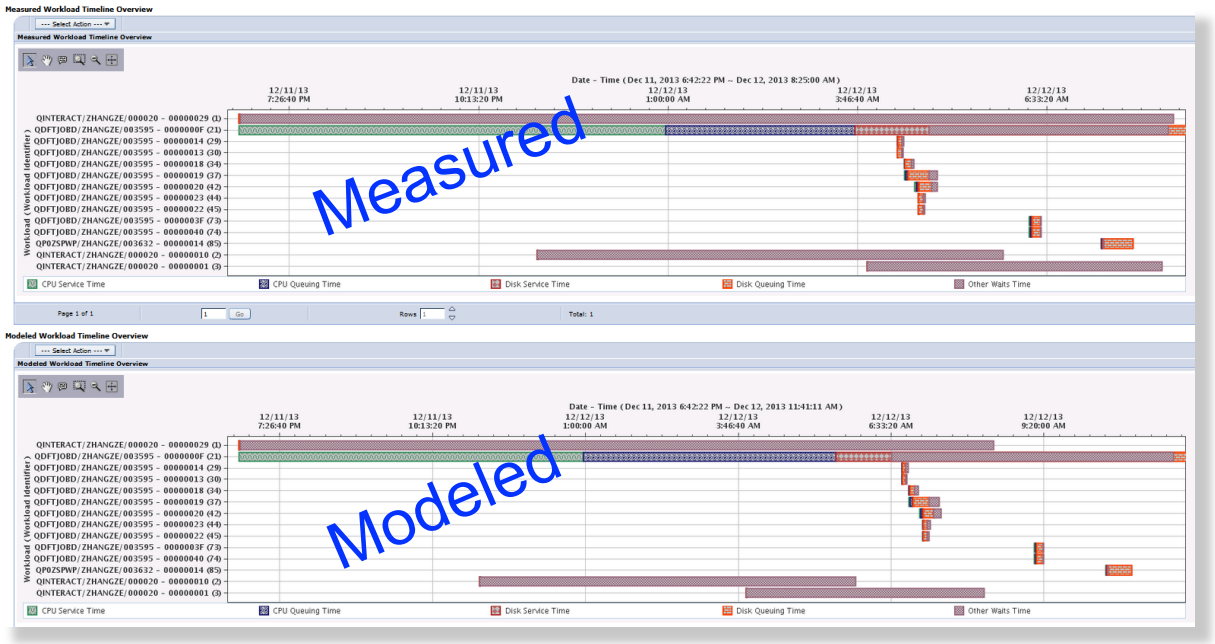
Batch Model



Measure a batch workload

-Adjust hardware, processor, storage (SSD), system settings

Model how these changes effect the Workload performance



Mobile IBM i Access

- iAccess for Web new Mobile interface – shipped with 5770-XH2
- Access your IBM i from **ANY** web enabled mobile device
- Basic System and Management function
  - Job Management
  - Messages
  - Printer output
    - Spool files to PDFs
  - 5250 emulator
  - Run SQL Scripts!
  - Much more

iPhone
iPad
Android
Surface

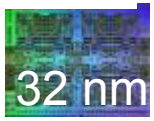
Tech Preview with 7.2 GA

POWER

Power Systems Roadmap

POWER7+ and POWER8 systems deliver compelling application performance, security and application optimization; lower operational management costs; and it will be easier to upgrade to take advantage of new technology.

POWER7+ Systems



PowerVM PowerHA
PowerSC PowerVP

POWER8

4Q2012-1Q2013

2014-2015

IBM i 7.2 runs on IBM POWER6/6+ & POWER7/7+ & POWER8 servers

20

IBM i System Support

http://www-01.ibm.com/support/docview.wss?uid=ssm1platformibmi

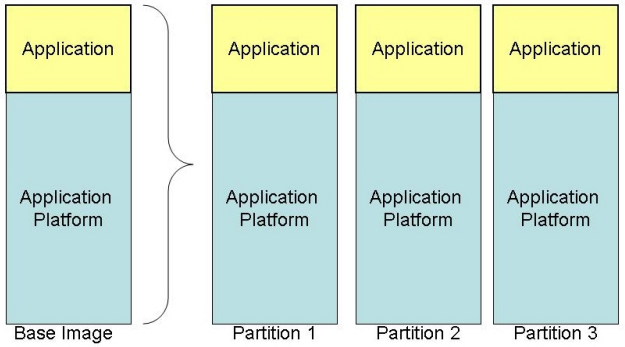
Servers	IBM i 5.4[1]	IBM i 6.1	IBM i 7.1	IBM i 7.2
POWER8			✓ 3	✓
POWER7/7+ PS700/701/702/730/704, Power 710, 720, 730, 740, 750, 760, 770, 780, 795, Pureflex p260/460		✓ 2	✓	✓
POWER6+ JS23/43, 550*, 560 POWER6 JS12/22		✓	✓	✓ 4
POWER6+ 520* POWER6 520*, 550*, 570, 595	✓	✓	✓	✓ 4
POWER5/5+ 515, 520, 525, 550, 570, 595	✓	✓	✓	
800, 810, 825, 870, 890	✓	✓		
270, 820, 830, 840	✓			

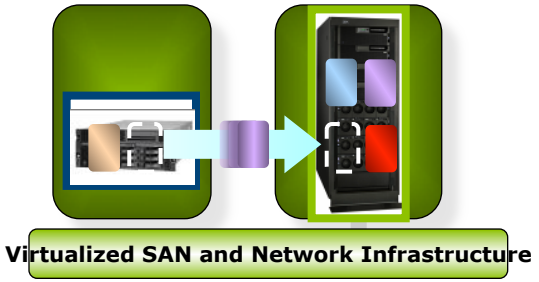
1 – IBM i V5R4 is no longer marketed or supported other than through extended service contracts
2 – POWER7+ 750/760 do not support native I/O. IBM i 6.1 on PureFlex must be client of IBM i 7.1 or later
3 – Requires IBM i 7.1 Technology Refresh 8
4 – no IOP or HSL support

Cloud and Virtualization

IBM i 7.2 – Built in Cloud Capability

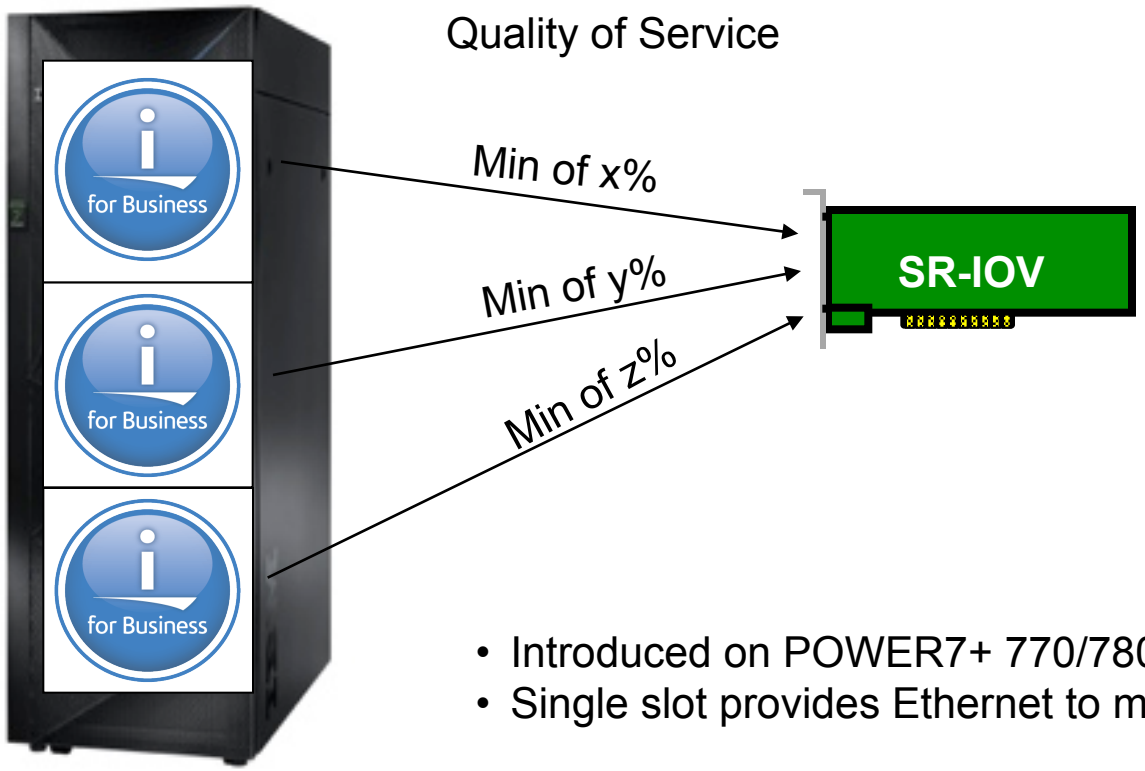
- **Network Installation** of all IBM i software for more efficient operations
- **Suspend/Resume** IBM i partition to optimize resource use
- **VM Image Management** to define and deploy partitions
- **Live Partition Mobility** to keep workloads running while changing systems





SRIOV (Single Root I/O Virtualization) for Ethernet

- Simple virtualization **with** or **without VIOS**
- With quality of service controls to specify minimum bandwidth per partition



- Introduced on POWER7+ 770/780 (“D” models)
- Single slot provides Ethernet to multiple partitions

Integrated Value

Integrated Technology Enhancements

- Security
  - Power 8 in-core Cryptographic Performance Acceleration
  - FTP & TELNET support Kerberos authentication
  - More …

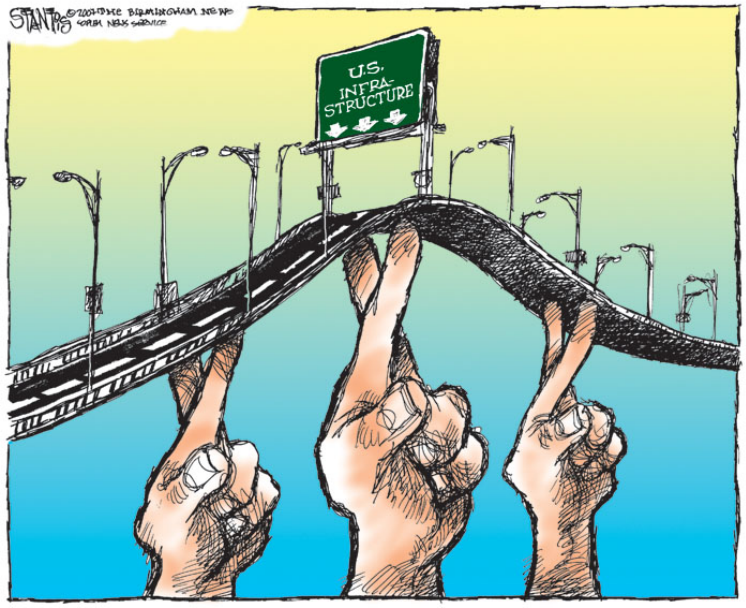
- Operations
  - D-mode IPL support from USB
  - Tape and Tape Library devices - "Online at IPL"
  - More …

- Networking
  - System SSL (Security updates)
  - Retrieve/Update TCP/IP Information
  - More …

- Print
  - CPYSPLF to IFS - Convert to PDF
  - Bar Codes - All defined by BCOCA
  - Advanced Color Image Support
  - More …

Infrastructure Currency

- Enhanced Data in Audit Records
  - Significant changes to record both the "old" and "new" values in many security audit records (prior release audit record data included only the "new" values)
- System SSL (Security updates)
- PASE Updates
  - AIX 7.1
  - OpenSSL



IBM i does not have the "Heartbleed" vulnerability. Never did. No fix needed.

IBM i Middleware Updates

- Java
  - Support for Java 6, Java 7 & Java 7.1
  - Support removed for Java 5 and Java 1.4.2

- SAMBA
  - Fast, modern, lightweight CIFS file server
    - Common Internet File System
  - Better protocol compatibility with current Windows clients
  - SMB 2.0 protocol support

Product Enhancements

PowerHA

PowerVP

BRMS

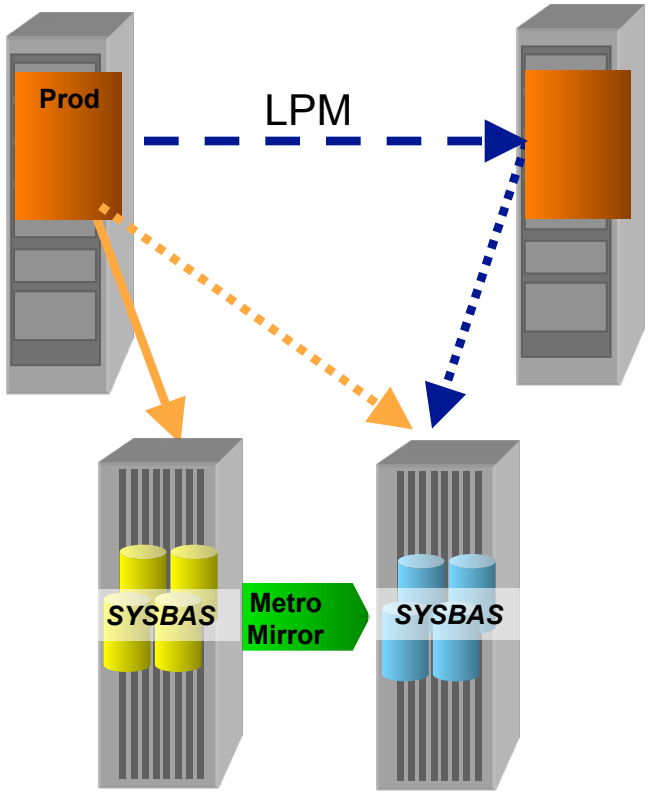
for Business

Application
Runtime
Expert

PowerHA SystemMirror for i Express Edition – Hyperswap

- Provides ability to ‘instantly’ switch access from production IBM i DS8000 instance to remote DS8000
- Switch can happen automatically in case of DS8000 failure
- Switch can be manually triggered for planned maintenance
- Affinity can be defined so an LPM switch triggers a DS8000 switch

- DS8000 storage servers only
- IASP based replication not yet supported



+ More PowerHA 7.2 Enhancements

PowerHA

PowerVP - Virtualization Performance Intelligence

PowerVP provides performance intelligence to proactively address performance issues mapping virtual workloads to physical hardware.

PowerVP

Client Pain Points

- **Complexity and time** required to pinpoint performance bottlenecks
- **Lack of visibility** of placement of VMs within a server's physical hardware
- Difficult to go **back in time** to diagnose detailed performance issues
- Lack of performance health metrics for virtualized workloads

PowerVP Solution

- ✓ *Simplifies management **and** performance **measurement of virtualized systems***
- ✓ *Reduces cost **of resolving performance issues***
- ✓ *Improves detection **of performance bottlenecks before they cause a slowdown***
- ✓ ***Provides a quick view of** performance health*
- ✓ *Visually **shows the** physical resources **a VM is consuming***

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BRMS Enhancements

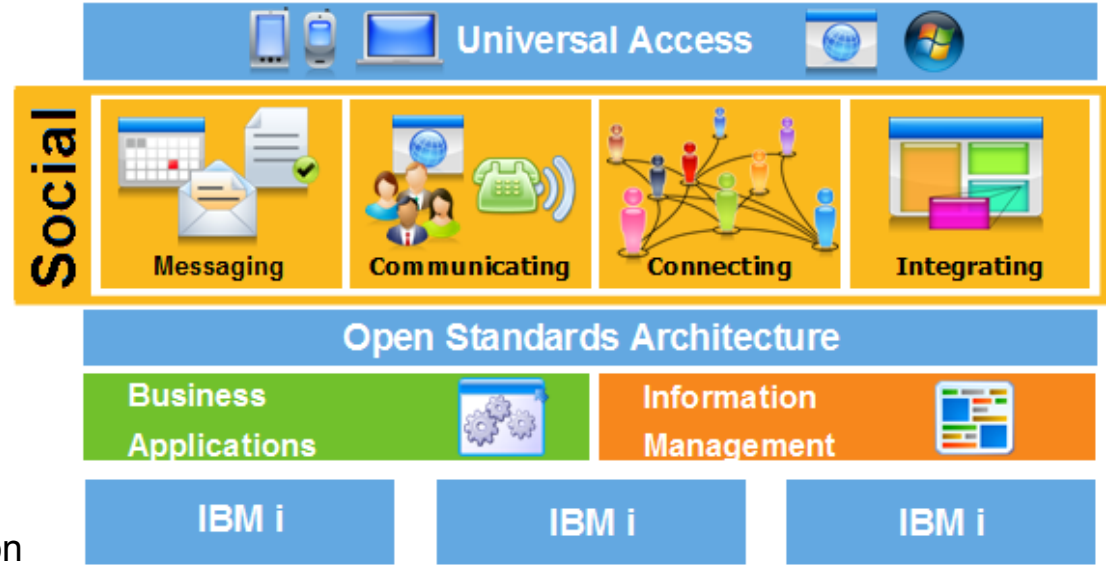
- BRMS Enterprise
  - Dashboard of all BRMS systems
  - Central site monitoring

- Backup with improvements to IFS backups, include and exclude support in BRMS Object List and new ability to save by size of library

- More …

IBM Social Software for IBM i 7.2 Everything Social, Mobile Everywhere!

- IBM Domino 9.0.1
  - Enterprise messaging & collaboration
- IBM Notes Traveler 9.0.1
  - Mobile access to your mail & calendar
- IBM Connections 5.0
  - Enterprise social software
- IBM Sametime 9.0
  - Real-time unified communication
- Additional products
  - IBM Enterprise Integrator 9.0.1
    - Exchange Domino data with 3rd party data source



IBM i Supports Consolidation of x86 Workloads!

For the latest information, see:
https://www.ibm.com/developerworks/ibmi/social
http://www.ibm.com/systems/resources/releasesupport.pdf

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