

Power Systems October Announcement Overview



October 10, 2014



Power Systems: Open Innovation to Put Data to Work



Designed for Big Data

First server processor
generation optimized for big
data and analytics with
POWER8 innovative design



Open Innovation Platform

Delivering an open server
ecosystem revolutionizing the
way IT is developed and
delivered



Superior Cloud Economics

Superior cloud
price/performance advantages
and security to move data-
centric applications to the
cloud

Accelerating Power Systems Momentum: 4Q Offering Highlights

Designed for Big Data



- Enhanced scale-out systems with up to 2 TB / system
- Scalable enterprise systems for the most demanding data environments
- New solutions for emerging, unstructured data requirements

Open Innovation Platform



- New Linux distributions and capability
- Open innovation from OpenPower Foundation
- High-performance, enterprise IFLs
- OpenStack-based virtualization management

Superior Cloud Economics



- Simplified Hybrid Cloud Management
- Superior economic efficiency and enhanced business flexibility from Enterprise Pools

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

POWER8 Enterprise Systems Overview



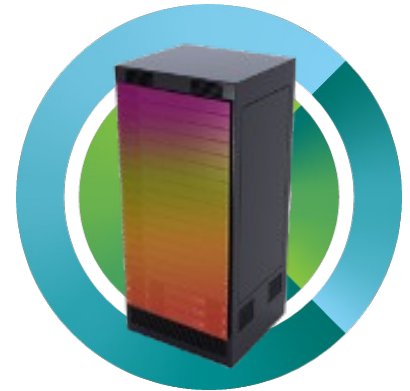
Power Enterprise Systems built on POWER8

Announcing Enterprise Pools on Power 770 & 780 and Statement of Direction for POWER8 support

IBM plans to...

- Bring POWER8 capability to the full Power Systems portfolio
 - Deliver the most scalable, highest performing enterprise-class Power System with an advanced version of the POWER8 processor.
- Provide upgrade paths
 - From the current POWER7+ Power 770 and 780 servers to enterprise-class POWER8 processor-based servers.
- Preserve client investment in Power Systems
 - Enable POWER8 processor-based Power systems to interoperate and share Mobile Capacity on Demand (COD) resources with Power 795 or POWER7+ Power 770, 780 systems in a single Power Enterprise Pool.

POWER8 Enterprise Systems



- Architectural strengths of Power 795
- Modularity & efficiencies of Power 770/780
- Performance and innovation of POWER8
- Greater Scalability & Reliability
- Increased Efficiency (Space, Energy)

Enterprise POWER8 Server*

- ✓ New system design
- ✓ Increased system performance
- ✓ Large-scale, dynamic resource sharing
- ✓ New I/O scale & flexibility
- ✓ Reduced footprint
- ✓ Improved energy efficiency
- ✓ 24x7 Warranty
- ✓ PowerCare



Upgrades from POWER7+
Power Enterprise Pool interoperability
with Mobile CoD

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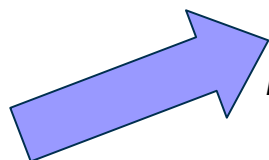
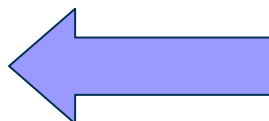
Evolving the best aspects of enterprise Power servers

Power 795 Attributes

- § Largest scale & most capacity
- § No primary node
- § Isolated resources – service processor, clock, oscillators
- § Largest memory footprint
- § Redundant thermal monitoring



Architectural strengths of Power 795 Modularity & efficiencies of Power 770/780

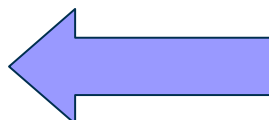


POWER8 Attributes

- § Increase system performance and scale
- § Increase memory footprint/core
- § New I/O scale & flexibility
- § No primary nodes
- § Isolated resources (service processor, clock, oscillators)
- § 19" Rack mount
- § Modular, energy efficient
- § Blind swap I/O adapters
- § Integrated on-chip thermal monitoring

Power 770 & 780 Attributes

- § 19" Rack mount
- § Modular, energy efficient
- § Blind swap I/O Adapters
- § Integrated Ethernet adapter
- § Internal disk/media



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

POWER8 Midrange & High-end Servers*

Power E880

9119-MHE

192 cores*

1-4 node*, 4-16S* (12c)

Up to 16 TB Memory

128* cores @ 4.35 GHz

1-4-node*, 4-16S (8c)

Up to 16 TB Memory

Power E870

9119-MME

80 cores @ 4.19 GHz

1-2-node, 4 - 8S (10c)

Up to 8TB* Memory

64c @ 4 GHz

1-2-node, 8S (8c)

Up to 8TB* Memory

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

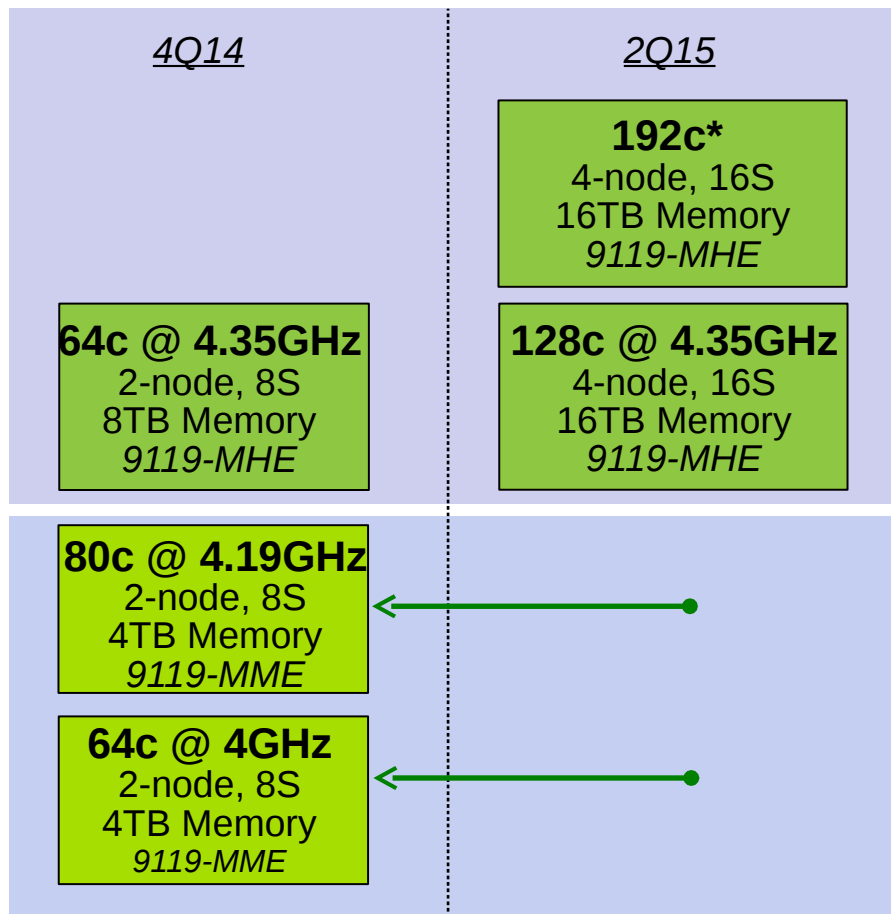
IBM Confidential

POWER8 Midrange & High-end Roadmap*

1 or 2 Nodes



Minimum 8 cores active
Minimum 256GB / 50% active
0 or 2 PCIe I/O Drawers



- AIX 7.1 TL03, AIX 6.1 TL9
- IBM i 7.2 TR1, IBM i 7.1 TR9
- RHEL 7, RHEL 6.5 or later
- SLES 11 SP3

1 - 4 Nodes



- Minimum 8 cores active
- Minimum 256GB / 50% active
- 1 – 4 PCIe I/O Drawers

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Enterprise Power Systems with POWER8

Power E870

- Up to 80 cores @ 4.19 GHz
- Up to 64 cores @ 4.0 GHz
- 32 or 40 core nodes (5U)
- Up to 8TB* Memory
- 1 or 2 Nodes per system

Increased system scale

Increased performance per-core

Up to 20 VMs per-core

Enterprise RAS

Increased energy efficiency

Elastic Capacity on Demand

Share resources in Power Enterprise Pool

Power E880

- Up to 128* cores @ 4.35GHz
- Up to 192* cores
- 32 or 48 core nodes (5U)
- Up to 16* TB Memory
- 1 to 4 Nodes per system

Increased system scale

Increased performance per-core

Up to 20 VMs per-core

Enterprise RAS

Increased energy efficiency

Built-in Elastic Capacity on Demand

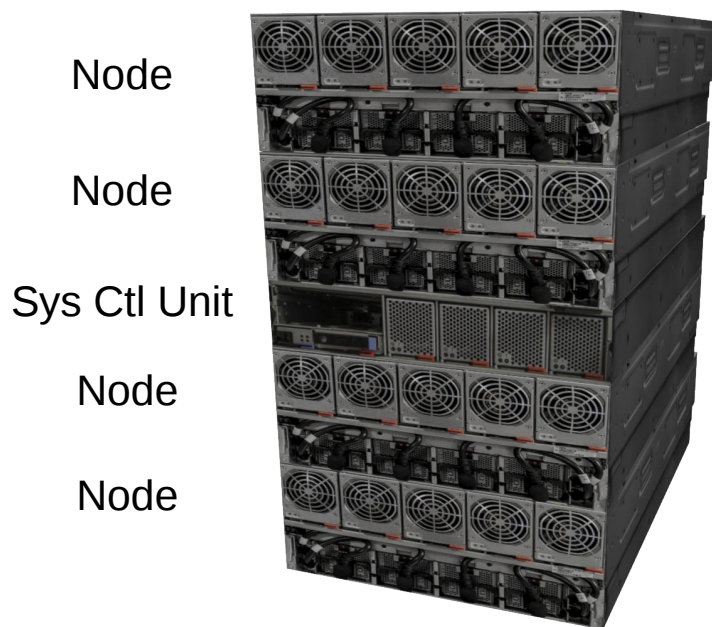
Share resources in Power Enterprise Pool

*E880 supports 2 nodes, 64 cores, 8 TB Memory in 2014. Statement of Direction for 128-core system with 4 nodes, 16TB in 2015.

*E870 supports up to 4TB Memory in 2014 in 2014. Statement of Direction to support 8TB Memory maximum in 2015.

Enterprise POWER8 system structure

CEC



22U in 19" rack

I/O Drawers



PCIe Expansion



EXP24S
2U SAS HDD/SSD

System Control Unit:



2U Form factor

External FSP

Clock / Oscillator Support

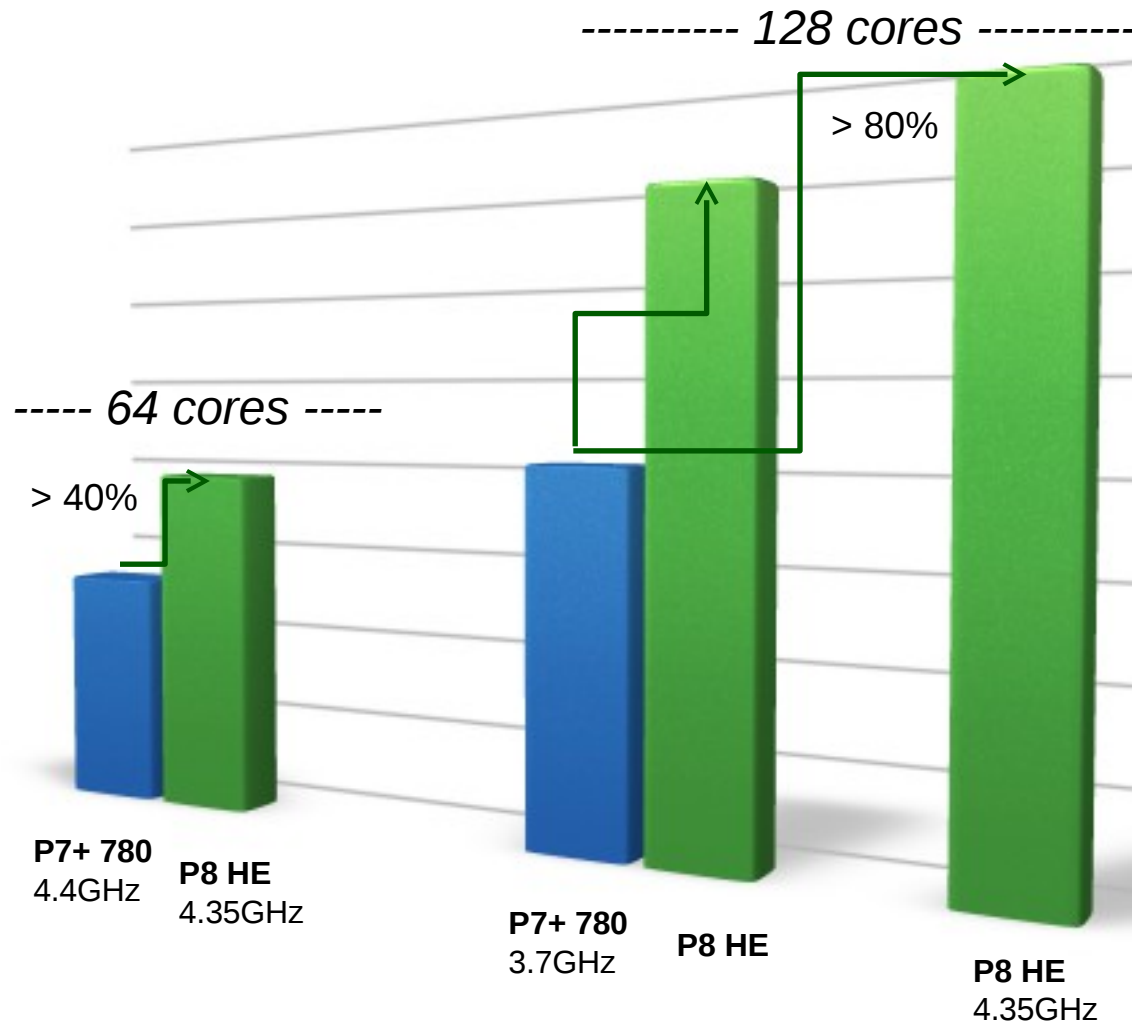
Optional DVD

19" Form Factor

Connect multiple nodes

Required on all systems

POWER8 High-end rPerf Projection

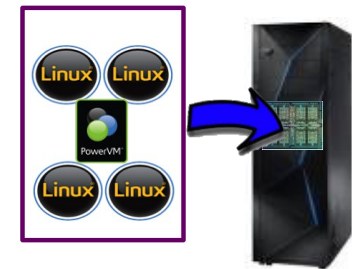


Power Integrated Facility for Linux

Flexible, affordable, high-performance capacity for Linux applications

- Simplify operations and reduce complexity by co-locating applications on a more scalable and reliable server
- Streamline access to data and applications via secure, high-performance virtual networking
- Grow seamlessly and accelerate deployment of new applications and services
- Reduce overhead by leveraging existing production and disaster recovery infrastructure

Power IFL



Virtual stack consisting of :

- § 4 x CUoD core activations
- § 32 GB CUoD memory activations
- § 4 x PowerVM for PowerLinux license entitlement
- § Scales in increments of 4 cores

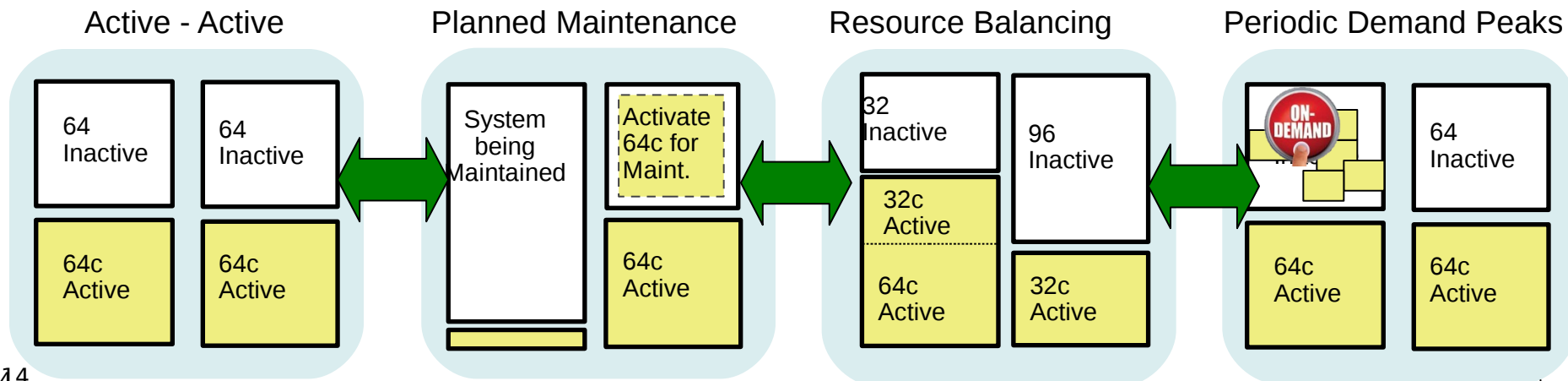
Available on Power 770, 780 & 795



Power Enterprise Pools with Mobile and Elastic COD delivers both flexibility and economic efficiency

Multi-system infrastructure providing a highly available and flexible IT infrastructure to support clients' most demanding business objectives

- Clients purchase the capacity needed and may allocate & rebalance virtual processor and memory resources within the capacity pool
- Elastic On/Off Processor and memory enables clients to address periodic spikes in demand
- Live Partition Mobility enables clients to migrate running workloads between systems to enable continuous availability



Primary Transition Scenarios for 2-step to POWER8

Single system upgrade

1. Purchase new or Upgrade to POWER7+
2. Model upgrade to POWER8



Delivers great price/performance; may lower cost of transition to POWER8 with POWER7+ upgrade

Power Enterprise Pool for migration or box swap

1. Purchase a POWER7+ or 795 server with new Mobile CoD activations
2. Purchase a new POWER8 server & integrate with POWER7+ in a Power Enterprise Pool
3. Transition capacity & applications to POWER8 via Mobile CoD and PowerVM
4. Use POWER7 or 795 system for HA, etc. or remove from environment



Key option for investment preservation, risk reduction and high availability / flexibility with Pools

Mobile CoD features will convert via RPQ from POWER7 to POWER8 at no additional charge!

Power Systems Q4 2014 Scale-Out Offerings



Power Systems - POWER8 Scale-Out Offerings April Launch



**Power Systems
S812L**



**Power Systems
S822L**



**Power Systems
S822**



**Power Systems
S814**



**Power Systems
S824L**



**Power Systems
S824**



7.1, TL3 SP3
6.1 TL9 SP3



7.1, TL3 SP3
6.1 TL9 SP3



7.2 and 7.1 TR8



7.1, TL3 SP3
6.1 TL9 SP3




7.2 and 7.1 TR8

SOD only


 **redhat.**
RHEL7.0 & 6.5 BE

 **redhat.**
RHEL7.0 & 6.5 BE


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RHEL7.0 & 6.5 BE


 **redhat.**
RHEL7.0 & 6.5 BE

 **SUSE**
SLES 11
SP3 BE

 **SUSE**
SLES 11
SP3 BE

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 **ubuntu.** 14.04 ^{LE}
Supported by Canonical


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 **PowerVM** BE

 **PowerVM** BE

 **PowerVM** BE

 **PowerVM** BE

 **PowerVM** BE

 **KVM** BE/LE

 **KVM** BE/LE

16 GB, 32 GB, 64 GB DIMM Options



OpenPOWER™

Power Systems - POWER8 Scale-Out Offerings October Launch

Expanding the POWER8 Linux Scale-out Portfolio



Power S824L: Incorporating the innovation of the OpenPOWER Community Partnership with Nvidia to tackle the high performance analytic workloads



Power S812L: Announced in April
10 and 12 core ship support across Geos between 7/20 and 9/10

Delivering smaller core offerings, uniquely suited for IBM i clients



Power S814: Announced in April
4 core offering available 6/17 offering P05 level pricing for IBM i
6 and 8 core offerings available 6/10

Delivering on the promise of Optimization for Big Data

Doubling the memory capacity to 2 TB in the S824

GA: Dec

128GB DIMMS will either be to have 1 TB or 2 TB configurations, no mix and match of DIMM sizings.

If buy 1 TB now can MES upgrade to different add'l DIMMS later



October 6 Launch – POWER S824L System



Power S824L
(8247-42L)

*20 core and 24 core
offerings avail 10/31*

Target Markets: HPA/Technical Compute – leverage GPU, no virtualization needed
Big Data and Analytics Play – Financial Analytics

Specifications: 2 Socket, 4U, with up to 2 Nvidia GPU installed *(no non-GPU Version currently in plan)*
Support only Ubuntu 14.10
No Virtualization (FW does not support PowerVM or PowerKVM)

Run analytics workloads that extract patterns from large amounts of data 8X faster with the Power System S824L scale-out server, leveraging NVIDIA GPU technology to quickly discover fresh opportunities. This is the first solution borne of the OpenPOWER Foundation, now with seven active work groups focused on innovating across the full hardware and software stack and increasing investments in opening the POWER architecture



Power Systems - POWER8 Scale-Out Offerings October Launch

Differentiated value for the Telecommunications space

NEBS/ETSI compliant configurations available on the S822L & S822. Will be same model numbers but a specific feature code that will drive specific tested configurations



Expanded Linux Distro, delivering the promise of ease of porting

SUSE SLES12 (LE) Release 10/2014



Expanded Flexibility for PowerKVM Virtualization

Mixed Endian VM support on a single PowerKVM host and PCIe hot plug support
Support for SLES 12. RHEL 6.6 and Ubuntu 14.10



CAPI "Tech Preview" for early adopters



CAPI card and Support documentation will be made available for early adopters who wish to innovate custom logic / accelerator logic on an FPGA attached via CAPI

Power Systems - POWER8 Scale-Out Offerings



**Power Systems
S812L**

**Power Systems
S822L**

**Power Systems
S822**

**Power Systems
S814**

**Power Systems
S824L**

**Power Systems
S824**



7.1, TL3 SP3
6.1 TL9 SP3



7.1, TL3 SP3
6.1 TL9 SP3



7.2 and 7.1 TR8



7.1, TL3 SP3
6.1 TL9 SP3



7.2 and 7.1 TR8

SOD only

redhat.
RHEL7.0 & 6.5 BE

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SUSE
SLES 11
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PowerVM BE



PowerVM BE



PowerVM BE



PowerVM BE



PowerVM BE

KVM BE/LE

KVM BE/LE

16 GB, 32 GB, 64 GB DIMM Options

ubuntu. 14.10^{LE}
Supported by Canonical

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SUSE
SLES 12^{LE}
10/2014

SUSE
SLES 12^{LE}
10/2014

20 and 24 core
offerings avail 10/31

ubuntu. 14.10^{LE}
Supported by Canonical

**128GB
DIMM
Option
In 1 TB or 2
TB configs**

April Launch

October Launch

Driving industry innovation

OpenPOWER is an **Open** development Community

- Built on the premise of Open Source Software and Hardware
- Opening the entire stack for innovation, from chip to software
- Removes proprietary boundaries
- Little Endian Linux simplifies software migration to POWER



OpenPOWER fosters **Collaboration** across multiple stakeholders

- Collaboration of multiple thought leaders on multiple projects in parallel
- Building an ecosystem to provide choice and flexibility in systems
- Delivering set of compelling, shared building blocks
- Engage directly with end users



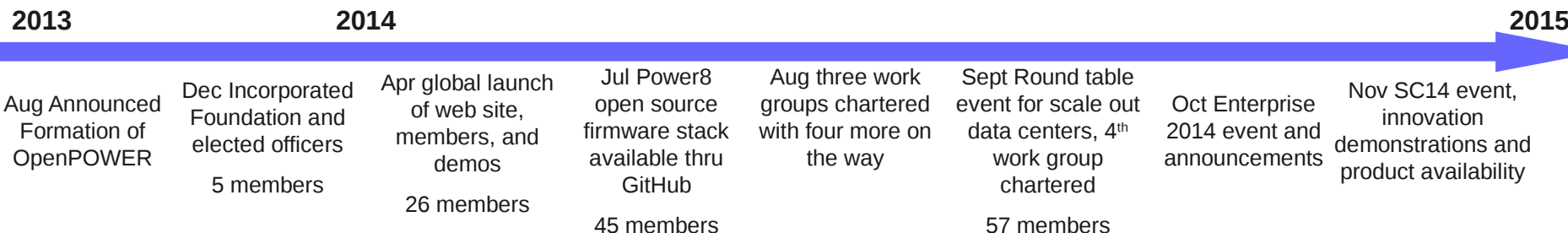
OpenPOWER leverages the **Performance** of leading POWER architecture

- Built for demands of big data and analytics
- Incredible innovation and differentiation options
- Includes SOC design, Bus Specifications, Reference Designs, FW OS and Open Source Hypervisor



The goal of the OpenPOWER Foundation is to create an open ecosystem, using the POWER Architecture to share expertise, investment, and server-class intellectual property to serve the evolving needs of customers.

Giving ecosystem partners a license to innovate



2015 will host the first OpenPOWER Foundation Summit, see numerous innovations come to light, and welcome an increasing diversity of stakeholders including software providers and end users.

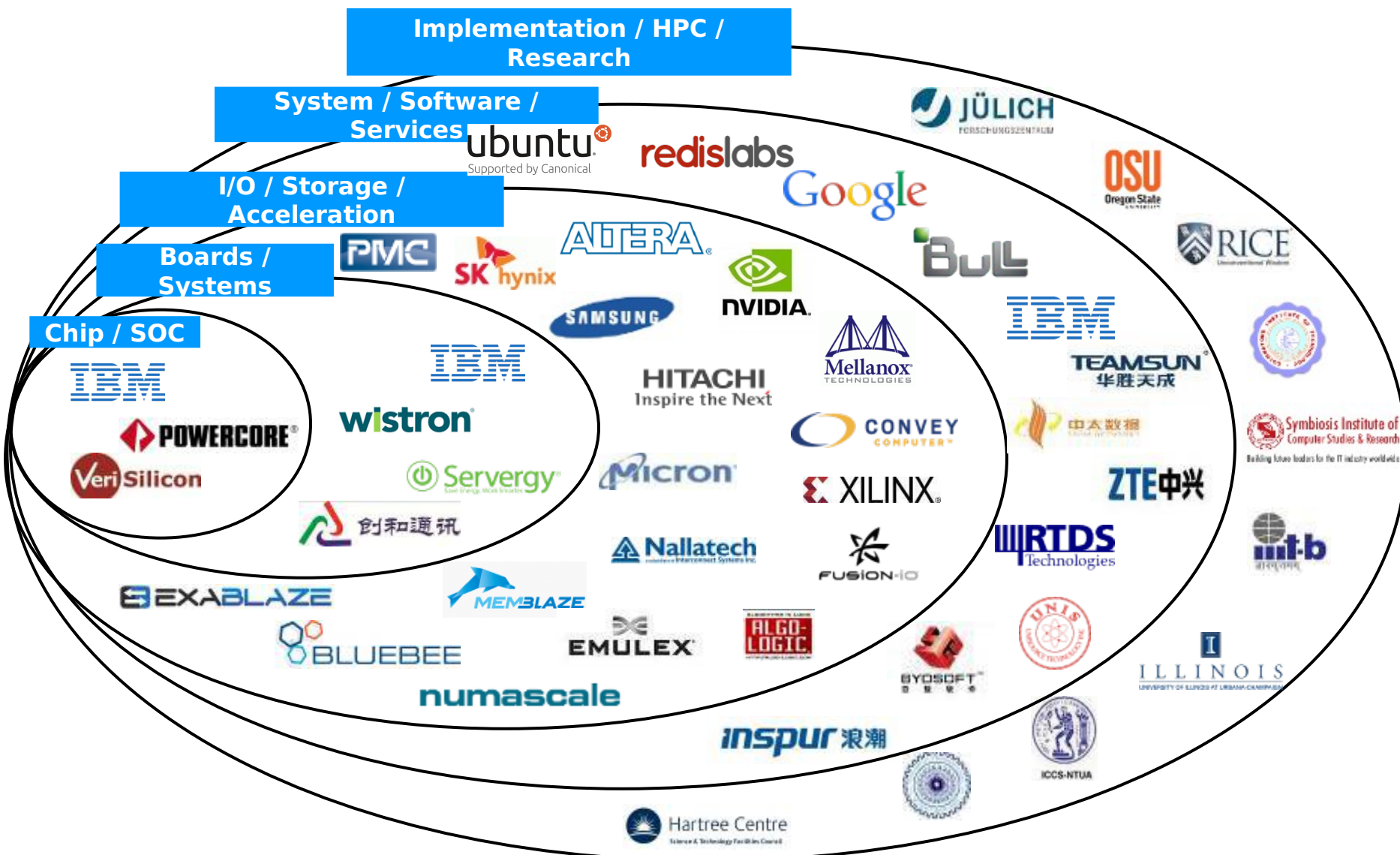
What does the OpenPOWER Foundation mean to the industry?

- OpenPOWER creates greater choice for customers
- Open and collaborative development model on the Power platform accelerates and enables innovation
- New innovation broaden the capability and value of the Power platform
Game changer on the competitive landscape of the server industry

Platinum Members

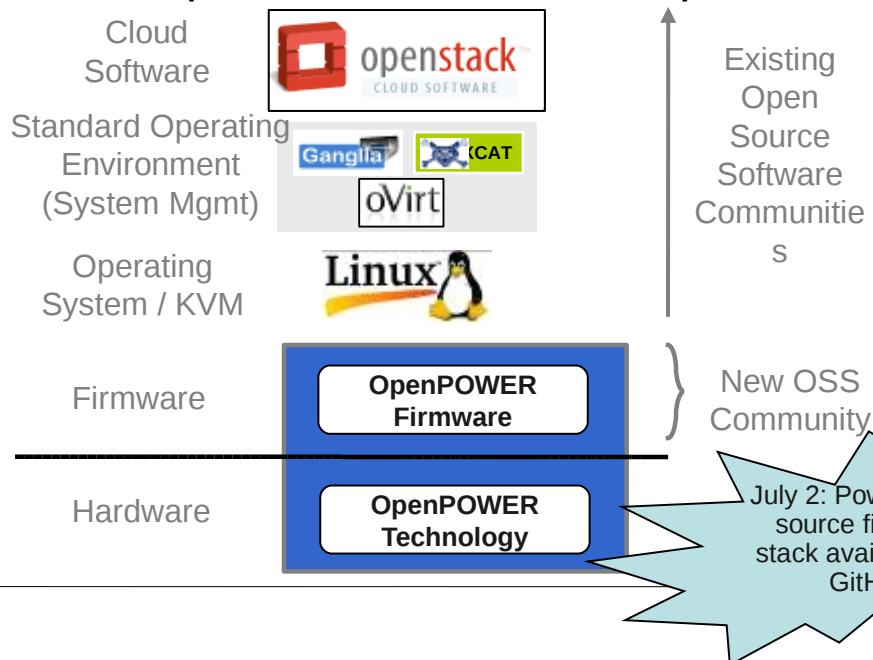


Building collaboration and innovation at all levels



Ecosystem Enablement

Power Open Source Software Stack Components

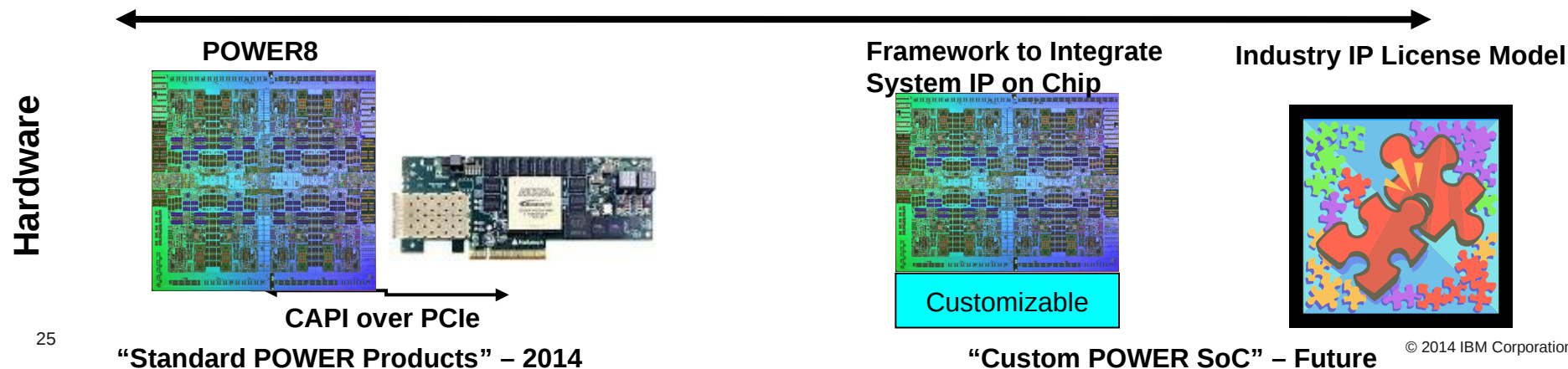


System Operating Environment Software Stack

A modern development environment is emerging based on tools and services



Multiple Options to Design with POWER Technology Within OpenPOWER



Demonstrations of OpenPOWER innovation



NoSQL KVS Acceleration with CAPI Flash (Sure Lock)

- IBM POWER8 Linux Server
- TMS Flash - CAPI attached

NoSQL based solution with IBM Flash and CAPI. Attaching large flash arrays to the processor, without overhead, to drive down costs of large NoSQL deployments.



Financial Risk Modeling with CAPI Accelerator (Monte Carlo)

featuring Altera technology

- IBM POWER8 Linux Server
- Altera FPGA Computing Card

Monte Carlo financial simulations run on an Altera FPGA accelerator via CAPI compared to published non-CAPI best case performance for dedicated workload acceleration.



KVS Acceleration with RDMA (Gun Hi)

featuring Mellanox technology

- IBM POWER8 Linux Server
- Mellanox RDMA interface
- IBM Research HydraDB software

POWER8 network acceleration for Big Data utilities high speed RDMA networking with acceleration technology to reduce latency by 10x when working with big data, reducing infrastructure requirements.



Big Data and Java Workload Acceleration (Espresso)

featuring NVIDIA technology

- IBM POWER8 Linux Server
- Apache Hadoop/Mahout
- NVIDIA GPU / CUDA
- IBM Java with new GPU Framework

Exploit GPUs for customized acceleration directly from Java. Ideal for Big Data and Analytic Java workloads. Demo uses GPU exploitation for 8x acceleration of a machine learning algorithm for Big Data segmentation.



KVS Acceleration with CAPI FPGA

featuring Xilinx technology

- IBM POWER8 Linux Server
- Xilinx FPGA Computing Card

Compare performance of Key Value Store on a normal configuration, to an acceleration using a Xilinx CAPI attached FPGA accelerator.



Watson on Power in SoftLayer (Tornado)

- IBM POWER8 Linux Server
- Watson Engagement Advisor
- Watson ISV (MD Buyline) Smart Advisor

SoftLayer is now providing Watson as a service on a Power System, and Tornado demonstrates that service with an application.

POWER8 Evaluation System is single socket ATX form factor, BMC based evaluation board. Designed and fulfilled by Tyan Corporation, accepting inquiries and orders for development.

Summary of CAPI Advantages

Accelerator performance

Coherency and Address Translation provide improved access to memory / cache data & interaction with system processors

CPU efficiency

eliminates the overhead of managing the I/O subsystem

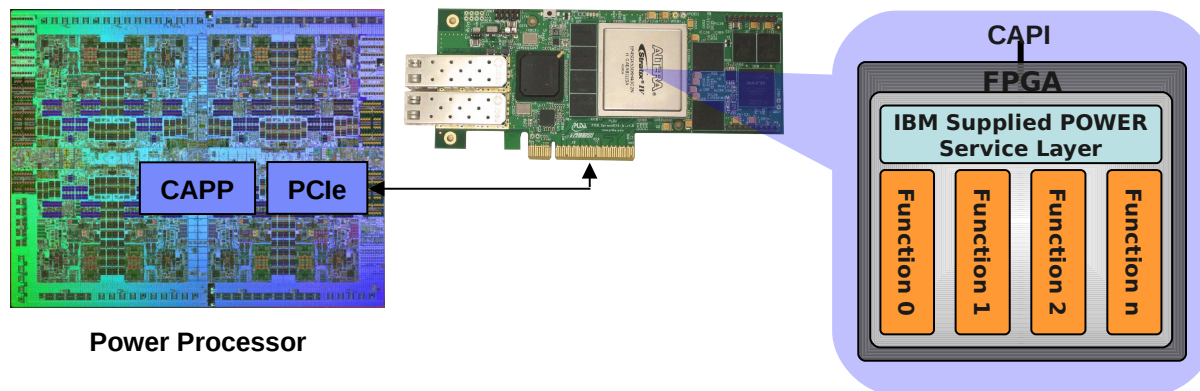
Wide applicability

able to accelerate in new ways, eg pointer chasing
enables a broader set of workloads as candidates for acceleration

Programmer Efficiency

focus on the workload rather than on communicating with the device

CAPI Overview



Typical I/O Model Flow



Flow with a Coherent Model



Advantages of Coherent Attachment Over I/O Attachment

- **Virtual Addressing & Data Caching**
 - Shared Memory
 - Lower latency for highly referenced data
- **Easier, More Natural Programming Model**
 - Traditional thread level programming
 - Long latency of I/O typically requires restructuring of application
- **Enables Applications Not Possible on I/O**
 - Pointer chasing, etc...

Monte-Carlo CAPI Acceleration



Running
1 million iterations

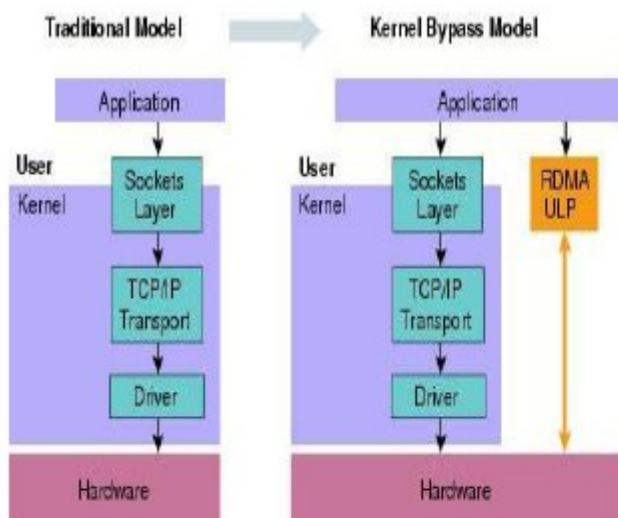
At least
250x Faster
with CAPI FPGA +
POWER8 core

Full execution of a Heston
model pricing for a single
security:

1. SOBOL sequence generator (pRNG)
2. Inverse Normal to create the non-linear distribution
3. Path-generation
4. Pay-off function

Easier to Code: reduces C code writing by **40x** compared to non-CAPI FPGA

Business analytics acceleration



IBM Power Systems and Mellanox® Technologies partnering to simultaneously accelerate the network and compute for NoSQL workloads

10x
Higher
Throughput

Dramatically faster
responsiveness to
customers!

Utilizing high speed
interconnect with
RDMA (Ethernet,
InfiniBand)

10x
Lower Latency

Increasing your
datacenter
efficiency!

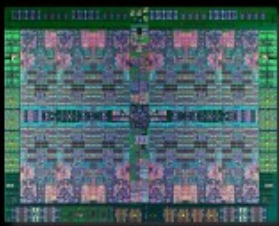
Leveraging POWER8
high throughput low
latency I/O

"Applications that historically struggled with scalability and performance can now benefit from In-Memory processing," said Terri Virnig, Vice President, IBM Power Ecosystem. "Our collaborative efforts with Mellanox resulted in a robust architecture with Power8-based systems and high-performance interconnects designed to tackle the Big Data processing requirements of today."

IBM & NVIDIA Accelerating Computing

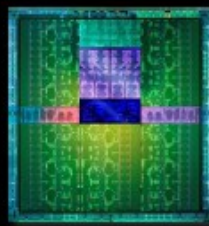
**Next-Gen IBM
Supercomputers and
Enterprise Servers**

**Long term roadmap
integration**



**POWER
CPU**

+



**Tesla
GPU**

OpenPOWER Foundation

**Open ecosystem built on
Power Architecture**



Google



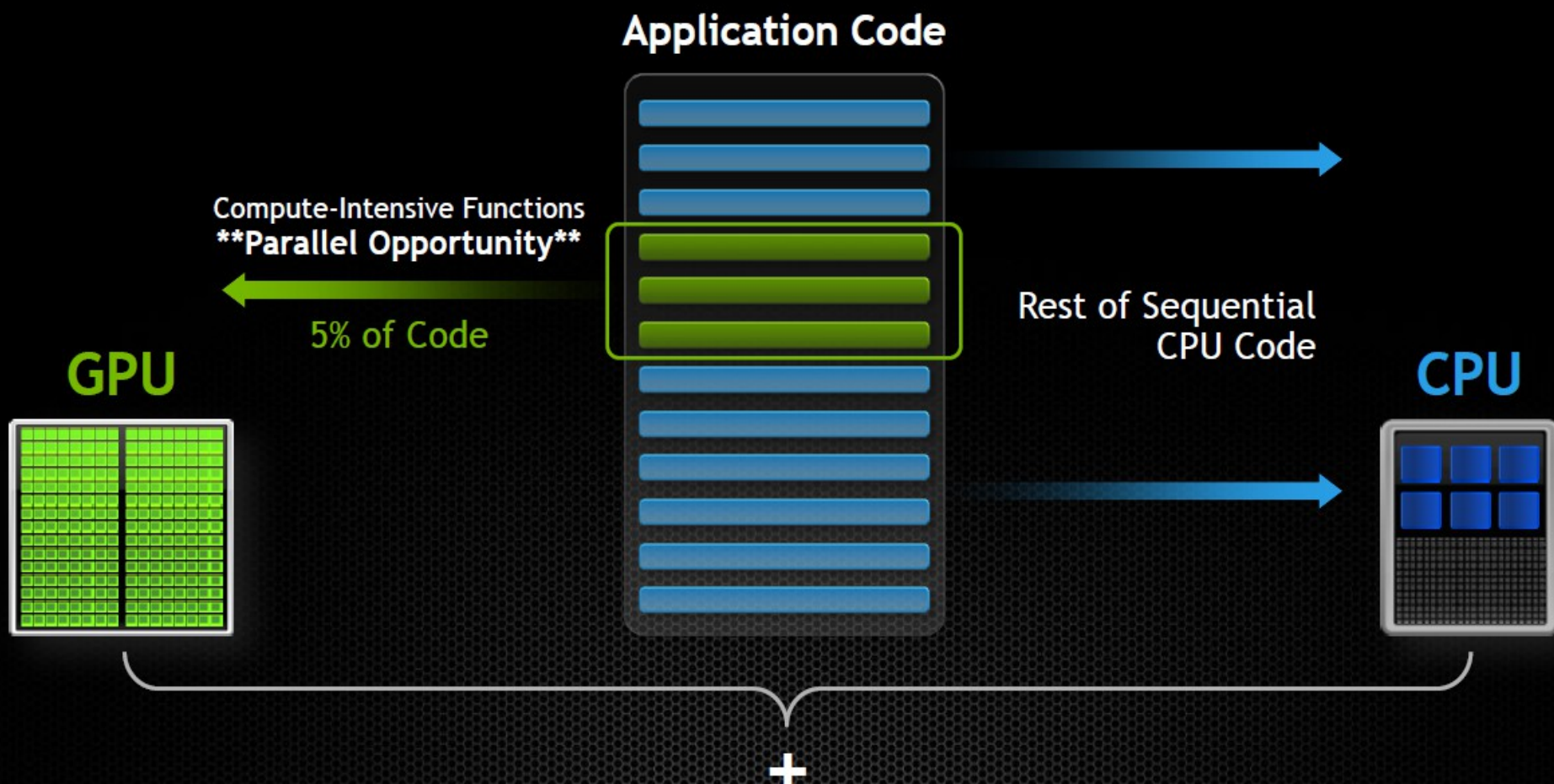
TYAN

& 30+ more...

1st GPU-Accelerated POWER-Based Systems Available in Oct 2014

How GPU Acceleration Works

The Right Processor for the Job



GPU Acceleration Coming to Java

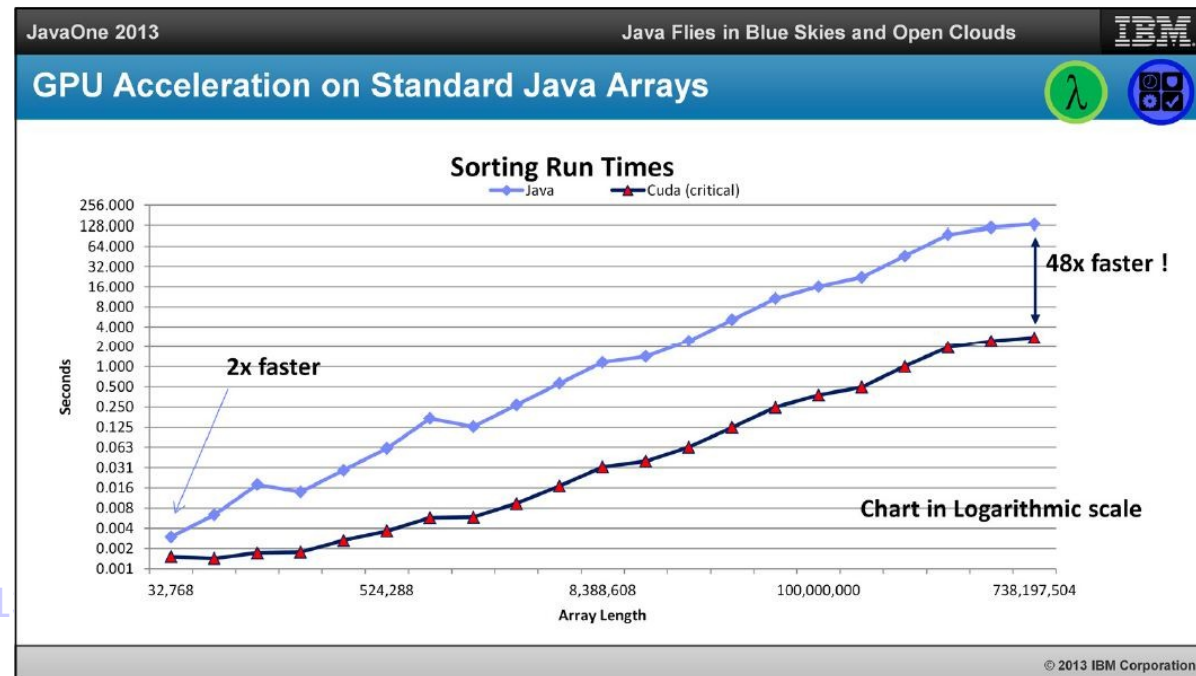
- “Duimovich also referenced **OpenPOWER**, which is a new ecosystem around the POWER architecture driving innovation to the platform by leveraging the power of open markets and partners like NVIDIA. **The Java on GPU development is one in a series of impacts of the OpenPOWER announcement.**” - **John Duimovich**, IBM's Chief Technology Officer of Java

- <http://blogs.nvidia.com/blog/2013>



GPU Acceleration Coming to Java, Says IBM Exec

By Sumit Gupta on September 22, 2013

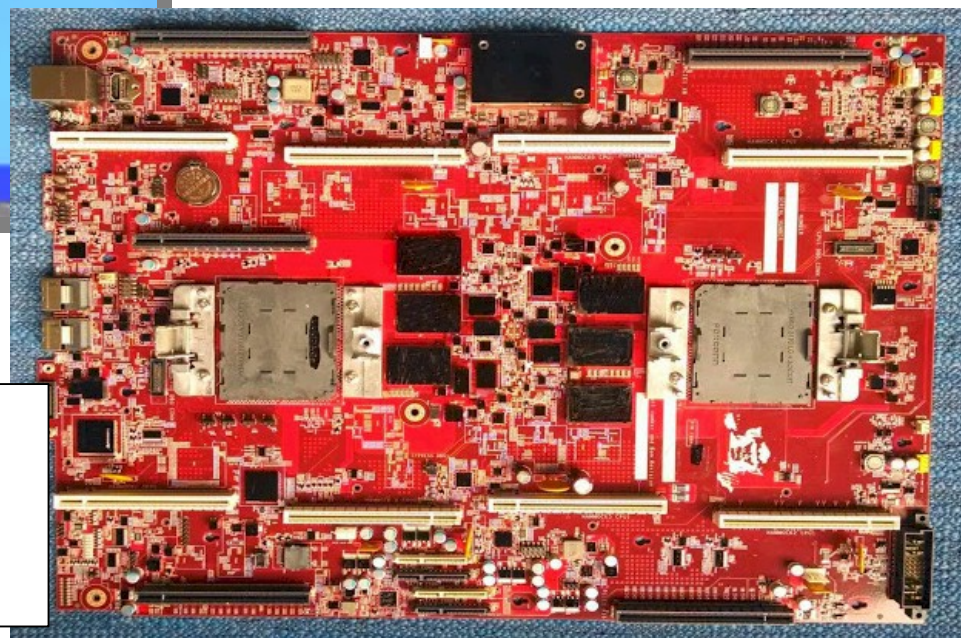


Non-IBM POWER8 products



The Tyan reference (ATX) board, SP010, measures 12" by 9.6"

- › one single-chip module (SCM)
- › four DDR3 memory slots
- › four 6 Gb/sec SATA peripheral connectors
- › two USB 3.0 ports
- › two Gigabit Ethernet network interfaces
- › keyboard and video
- › intended for developers



The Google reference board

- › two single-chip module (SCM)
- › four modified SATA ports
- › Google use only

OVH : FIRST LARGE MSP POWER8 ADOPTION

Client & Challenge

Client : OVH

First French and European MSP : 170.000 INTEL x86 servers, 12 DataCenters and 700 000 customers.

Industry : They currently support wide public Cloud offerings : VoIP, PaaS & SaaS, Web hosting, VPS, CMS, blogs, e-commerce platforms, Open Source distributions, Anti-DDoS protection, LAMP, Panels, databases.

Challenge :

Proof that **POWER8** can bring higher performance than INTEL for various applications and environments including **MySQL**, **PostgreSQL**, **Hadoop** and Cloud virtualization.

Proof that POWER8 servers will be able to integrate seamlessly in OVH current **Cloud OpenStack infrastructure** in compliance to their internal procedures.

After some porting and performance improvement efforts in IBM LTC Lab at Toulouse on a POWER8 pre-GA system around the **OVH OpenSource** and hardware stacks, the POWER pre-GA server was shipped to OVH which conducted the tests with dedicated support from various worldwide IBM Labs.

OVH tests showing POWER8 superior performance compared to INTEL and better flexibility and VM density with **PowerKVM**, with large room of improvement convinced OVH to propose to their customers a **Cloud POWER8 offering** in September 2014.

IBM POWER8 - Solution and Benefits

Solution

First WW PowerKVM Power8 signing of a large European MSP :

- 133 x S822L POWER8 servers sold for 1 M€
- Ubuntu PowerLinux
- PowerKVM Virtualisation
- Openstack Cloud infrastructure



Key Client Benefit

- POWER8 performance and scalability vs INTEL
- POWER8 saving costs compared to INTEL with better economics compared to VmWare/ usual solutions
- POWER8 enablement for new workloads

Why we Won and Lessons learned

- Strong IBM POWER8 and OpenPower Strategy & Roadmap (CAPI)
- OVH CEO and Sales team relationship : together in Google/OpenPower April announcement in San Francisco
- OVH CTO and Pre-Sales team relationship
- Continuous and day to day STG POWER Research Labs support : LTC Labs worldwide support, SWG performance labs support

Applications



Power Solutions Overview for October Launch



Big Data and Analytics

BLU Acceleration – Power Sys Edition
New pre-installed, optimized Power Enterprise System with DB2 with BLU Acceleration and InfoSphere DataStage option



IBM Data Engine for Analytics

Adjustable storage and compute resources that are easy to deploy for data intense workloads like Hadoop and align to specific LOB requirements for faster time to value.

Solution for Analytics – Power Systems Edition
New pre-installed, optimized Power Enterprise System with Cognos Business Intelligence and/or SPSS predictive analytics and DB2 BLU option



IBM Solution for Flash Optimized NoSQL – Power Systems Edition

CAPI attached Flash for in-memory NoSQL data stores provides higher workload density to x86 RAM only systems to lower infrastructure costs up to 3x



Mobile

Mobile Scale-Out Sales Offering with WorkLight + WAS

New Power Enterprise System options and enhanced with latest WorkLight and WAS releases



Cloud and MSPs

Private Cloud: Solution Edition for Cloud
New Power Enterprise System options & enhanced IBM Cloud Manager, PowerKVM, PowerVC with 1 button configs



Public Cloud: Power Systems Solution for Service Providers with new Power Enterprise System options and enhanced IBM Cloud Manager, PowerKVM, PowerVC and SUSE LE Linux



Public Cloud: Solution Edition for Scale Out Cloud with enhanced PowerKVM, PowerVC, IBM Cloud Manager and SUSE LE Linux (in addition to Ubuntu LE)



Hybrid Cloud: IBM Cloud Manager with OpenStack 'single pane of glass' advanced VM workload placement and best practices for creating secure connection for on premise to off premise clouds built on Open APIs w/ IBM enhancements & support for new PowerVC functions



Power Solutions for Data-Centric Workloads

Relational Databases

Accelerate business processes by enabling: instant insight from real-time operational data; simplified IT landscape by consolidating transactions and reporting; reduced tuning and indexing



NoSQL

Extending analytics capability to include unstructured or semi-structured data with increased scalability and flexibility
Column or Distributed Data Store
Document
Key-value or Associative Array
Graph



Map Reduce

Expand ability to analyze more and different data types; scalable data architecture & a parallel, distributed programming model for processing large data sets.

Open source community innovation with Apache Hadoop

**2:1 Core Performance,
Memory Bandwidth &
Memory Capacity**

**DB2 BLU
Oracle in-memory
SAP HANA on Power**

**Reduce complexity, space (>12X)
and cost with CAPI Flash to
substitute physical memory**

**Redis, Cloudbant,
Mongo DB,
Cassandra, etc.**

**High performance, data
centric design with GPFS &
Compression
4x Lower Storage**



IBM Data Engine for Analytics (IDEA)

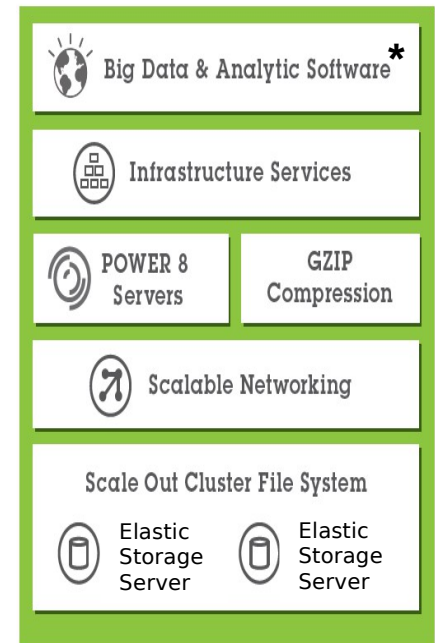


Align your analytics infrastructure to your enterprise strategy with an infrastructure that enables business speed analytics

A customized infrastructure solution with integrated software optimized for Big Data & Analytics workloads

Benefits

- **Rapid Deployment (Less than 1 day*):**
 - Complete, pre-assembled & tested infrastructure with big data & analytics software preloaded
 - On-site services for fast configuration & data center integration
 - Intelligent cluster management & automation for effective deployment
- **Flexibility**
 - Easily set-up & manage workloads for multiple tenants (**1 Hour or Less***)
 - Adjustable resource allocation to meet diverse LOB demands
 - Scalable & extendable as needs change and as the enterprise grows
- **Efficiency (3x less storage*)**
 - Reliability without data duplication
 - Tailored Big Data & Analytics optimizations
 - Lays the foundation for consolidating traditional data analytics with new workloads such as Hadoop



*** Big Data & Analytics Software:**
Primary SW stack includes BigInsights
+ Streams for High Velocity Data
Ingest and BigInsights + DataStage for
Data Warehouse Modernization

***Not Final, unverified**

Elastic Storage Server



Key component and differentiator for IBM Data Engine for Analytics

Deploy High Performance Server Based Storage

Building Block approach grows from fifty Terabytes to hundreds of Petabytes – and Scales in Capacity, Performance, and Single Namespace!

Benefits

High Performance and Density

- Today's workloads demand Fast Access to *Petabytes* of Data
- Accelerates current data workloads while creating future-proof infrastructure
- Complete Petascale storage in a single rack, including servers, disks, and middleware
- Optimized for multi-workload access including Cloud, Analytics, Media, and HPC

Flexibility

- Scalable Growth – start small and grow easily in a building block approach
- Encryption available for highly secure data and multi-tenant access
- Optimize around performance and capacity with SSD, SAS, and NL-SAS drives
- Scalable & extendable as needs change and the enterprise grows

Data Protection and Availability

- Declustered RAID technology to reduce disk rebuild times up to 7 times
- Complete Path Data Integrity Protection all the way from Disk Surface to Client
- Hierarchical Storage Management to move unused data to lower cost storage devices
- Active File Management for off-site data replication for local access and disaster recovery



Elastic Storage Server: Power 8247, System Storage 1818-80e JBODS, GPFS, GPFS Native RAID

IBM Solution for Flash Optimized NoSQL- Power Systems Edition

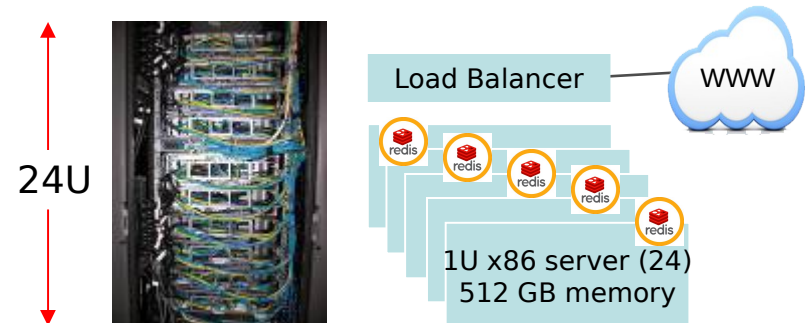
Significant Cost Savings for In-Memory NoSQL Data Stores

The Market: Explosive growth of new mobile, social apps requiring lightening fast response at high volume

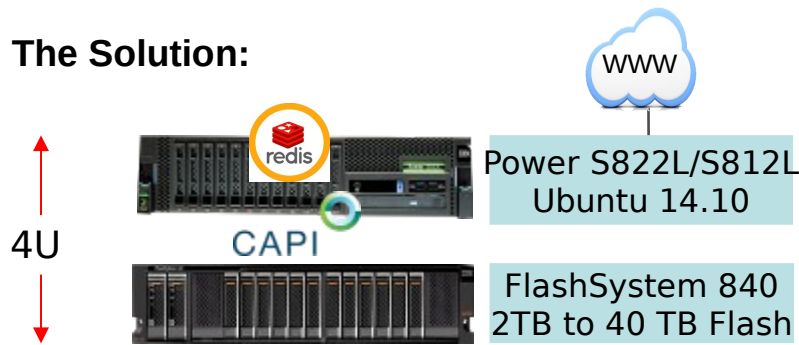
- Plays an important role in many large websites
GitHub, Amazon, Facebook, Twitter & more...
- Enabled by in-memory NoSQL, Key Value Stores like Redis
- Ordered (key, value) pairs provide type of in-memory, lightening fast distributed hash table

The Issue:

- Scale-out x86 servers limited memory size
- Results in costly, complex infrastructure



The Solution:



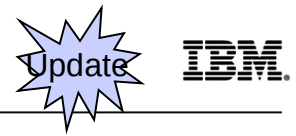
The POWER8 + CAPI Flash Advantage:

- Provides means for large FLASH exploitation
- New FLASH as RAM for Redis in-memory apps
- Lower cost memory, greater workload density
- Dramatically reduce costs to deliver services
- Can be offered as a cloud-based service or as an on-premise solution for enterprises

**24:1 server
consolidation³**

**Up to 3x
lower TCA**

Worklight on Power for Mobile



47% lower TCA with WebSphere deployments at 2X throughput *

2X better core performance in enterprise Java-based environments *

Price / performance leadership - 2.25X better performance/\$ * on scale-out systems



A Mobile application platform to speed development and ongoing management of mobile apps.

* Update with final proof points for Power Enterprise servers for October when available

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October Announcement and 2H2014 Highlights

- Worklight/WAS on Power Enterprise IFLs provide a superior environment for mobile infrastructure with comparable pricing to Intel x86 (70 PVUs per core)
- Power offers 2x or better performance and virtualized throughput *
- A single integrated platform which includes a comprehensive development environment, mobile-optimized runtime middleware, a private enterprise application store and an integrated management and analytics console



Systems of Engagement



- Agile, Faster, more Scalable DevOps Platform to Engage Customers via Mobile Apps with Social Insights



Mobile Apps



Systems of Record

The Integration point for Social, Mobile & Business Data and Transactions

Manage, Transact and Securely Provide the Data that Mobile Apps Need

Infrastructure Matters

IBM Confidential - All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice and are not goals and objectives only.

#powersystems

Virtualization and Cloud Management



PowerKVM v2.1.1

Open Virtualization Choice for Linux-only Scale-out Servers

- ü *Optimize **Linux Workload Consolidation** and **scale out** of workloads at a lower cost of ownership*
- ü *Maintain flexibility and agility by exploiting **Open Source** Community*
- ü ***Leverage** traditional **Linux admin skills** on Power Systems to administer virtualization*
- ü *Use **open source tools like OpenStack** to manage virtualization*



- ü *Reduces IT Infrastructure costs*
- ü *Optimize Linux workload consolidation at a lower cost*
- ü *Simplify your virtualization management using open source tools*

Announce – 10/6 GA – 10/28

- Kernel-Based Virtual Machine(KVM) Linux based virtualization For Scale Out POWER8 Linux Servers
- PCI Pass through I/O Support allows more options for performance
- Mixed Endian VM support on a single PowerKVM host provides increased flexibility
- PCI Hot Plug support provides expanded availability by allowing new devices to be added dynamically
- Support for SLES 12, RHEL 6.6 and Ubuntu 14.10 provides a larger choice of Linux versions
- Energy Star Improvements provides new policies for energy control

PowerVM v2.2.3.4

Virtualization without Limits



- ü **Reduces IT infrastructure costs**

Consolidate diverse workloads save operational costs

- ü **Improves service levels**

Virtualized resources can be applied dynamically to workloads as needed

- ü **Manages risk**

Unrivalled flexibility enables rapid response to business change minimizing risk

Announce – 10/6 GA – 10/28

- ü *Improved User Experience for PowerVM*
- ü *Industrial Strength Server Virtualization*
- ü *POWER8 Enterprise Systems Support*

- **Improved Virtualization User Experience – HMC 8.20**

- Enhanced, simplified HMC Virtualization UI lowers cost of operation
- No Touch VIOS Management simplifies administration
- One Touch VIOS Deployment from the HMC accelerates virtualization deployment
- System and Partition Templates reduces risk by providing repeatable deployments and best practices enforcement
- *Tech Preview for new UI capabilities* like Quick search, gallery views, graphical topologies, improved resource views

- **Simplified VM Remote Restart** CLI accelerates recovery
- **POWER8 Enterprise Systems Support** enables improved Power capabilities

PowerVC v1.2.2

Virtualization Center



"I have a certain set of skills. For me to do these tasks without any background of the product shows it's intuitive."
Spencer Siu



"PowerVC is so easy I could have an intern do this for me."



- ü *Improve resource utilization to **reduce capital expense and power consumption***
- ü ***Increase agility** and execution to quickly respond to changing business requirements*
- ü ***Increase IT productivity** and responsiveness*
- ü ***Manage scalability** without adding complexity*
- ü ***Dynamically adjusts** workloads to ease burden on systems management*

Announce – 10/6 GA – 12/12

- Improved Switch Storage Support – EMC, IBM xiv, Cisco
- Support for managing IBM i LPARs
- Support for importing existing PowerKVM VMs
- Support for importing PowerVM LUN images
- 3rd Party Supported OpenStack drivers increases device support
- Scaling Improvements allowing larger configurations to be managed
- Support for managing SLES v12 and Ubuntu v14 VMs
- IP Pooling support which automates assignment of Addresses
- One click evacuation of a server for scheduled maintenance

IBM Cloud Manager with OpenStack v.Next 4Q14

Announce: 10/06/14
Release to manufacturing: 11/21/14
GA: 12/12/14

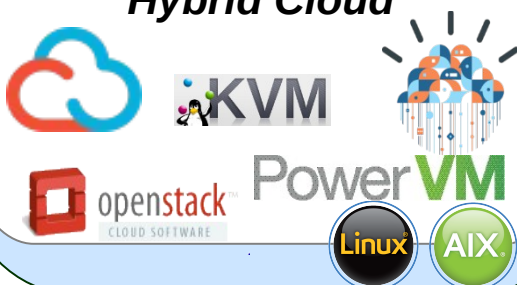
IBM Cloud Manager with OpenStack

NEW

Next Generation of SmartCloud Entry with OpenAPIs

- ü Complete OpenStack distribution with simplified installation, config and support
- ü Cross-platform support for x86, Power and System z
- ü Single pane of glass for hybrid

Hybrid Cloud



- Hybrid (OpenStack multi-region management)
 - Best practices for creating secure connection for on premise to off premise clouds
 - Ability to configure and connect to Cloud Manager-based off-premise cloud as a region
 - Placement and optimization policies for both on premise and off premise clouds**
- Service Management Connect Client Interaction
 - Support up to 20 participants in 'Inner Circle'
- Support for all "core" packages in OpenStack Juno release
 - Database (Trove)
 - Data Processing Hadoop (Sahara)
 - Queue service (Marconi)*
 - Bare metal (Ironic)*
- Take advantage of new PowerVC functions
 - Provisioning of IBM i workloads
 - Additional storage support (vSCSI, XIV, CISCO SAN, EMC)
 - New networking capabilities for PowerVC (vNIC, IP Pools)
 - Host Maintenance mode
 - Support cloud_init metadata fields in deploy UI
 - Support multiple storage connectivity groups in deploy UI
 - Support multiple storage templates in boot volume deploy UI

Note:

* Not yet Core in Juno; will only be included if become Core

* Not applicable to PowerVM, PowerKVM only

Promotions



Market Growth Program for IBM Power Systems Solution Providers (valid until Dec 2014)

* The rebates are offered for :

- Power Systems sold to First In Enterprise Accounts for Power Systems
- Power Systems sold to replace an eligible non-IBM server listed in the PLET

Not combinable with SBO!!!

* Rebate:

§ Power System S814	\$ 1000
§ Power System S822	\$ 1500
§ Power System S824	\$ 3000
§ Power System S812L	\$ 1000
§ Power System S822L	\$ 2000

* PLET : ZW14-1193

IBM 2013 Power Trade In Program (valid until Dec 2014)

* The offer :

End user clients can claim up to 3k€ rebate & Resellers can claim up to 2k€ when trading in their eligible power system to a new P7+ or P8

CAN be combined with SBO!!!

* Rebate :	Customer	BP
Power 720 4 core P7+	\$1000	\$750
Power 720 6/8 core P7+	\$1500	\$1000
Power 740 P7+	\$2500	\$1500
Power 750 P7+	\$3000	\$2000
Power S814	\$1000	\$750
Power S822	\$1500	\$1200
Power S824	\$2000	\$1750

* PLET T2 : ZW14-0206

* Condition :

Confirm at the time of the order, that the replaced system will be removed and disposed of within 120 days from the acquisition of the new Power system by completing and signing the **Appendix 1** and send it to their BP with the required documentation for claim processing.

(based on the invoice date by the IBM Business Partner Solution Provider to the end user customer)

* PLET : ZW14-0206