

# Power Systems 2011

Common Europe Tour November 2011

Danny Vandaele



**Power is performance redefined**

Deliver IT services faster,  
with higher quality,  
and with superior economics

[www.ibm.com/power](http://www.ibm.com/power)

IBM Power Systems 2011 advertisement featuring various server models and logos for IBM, AIX, i for Business, and Linux.



A technology-friendly architecture supporting continuous innovation without disruption

Follow-on to the System/3, System/32, System/34, System/36 and System/38 architectures from the 1970's and 1980's

Recent Names include:  
AS/400, iSeries, System i, IBM i

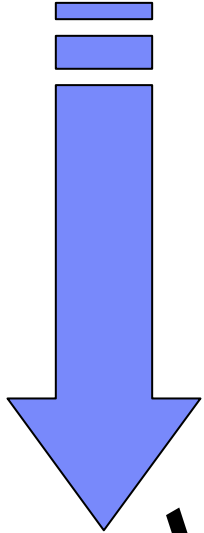


1988

Present

## What's Next ?

- More performance, less Floorspace
- More performance per Rack
- More performance per Unit
- Performance on Demand



**Private Cloud ?**  
**Public Cloud ?**

## Starter Kit for Cloud Capabilities



### Create Images

- **Easily create** new golden master images and software “appliances” using corporate standard OS
- **Convert images** from physical systems or between various x86 hypervisors to use cheaper tooling
- **Reliably track** images to ensure compliance and minimize security risks
- **Conserve resources**, reducing both the number of images and the storage required for them

*Simplify storage of thousands of images*

### Deploy VMs

- **Deployment** of application images across compute and storage resources
- **End user self service** for improved responsiveness
- **Ensure security** through resource and VM isolation, project-level user access controls
- **Easy to use** - no need to know all the details of the infrastructure
- **Protect your investment** through full support of your current virtualization environment
- **Optimize performance** on IBM systems with dynamic scaling, expansive capacity and continuous operation

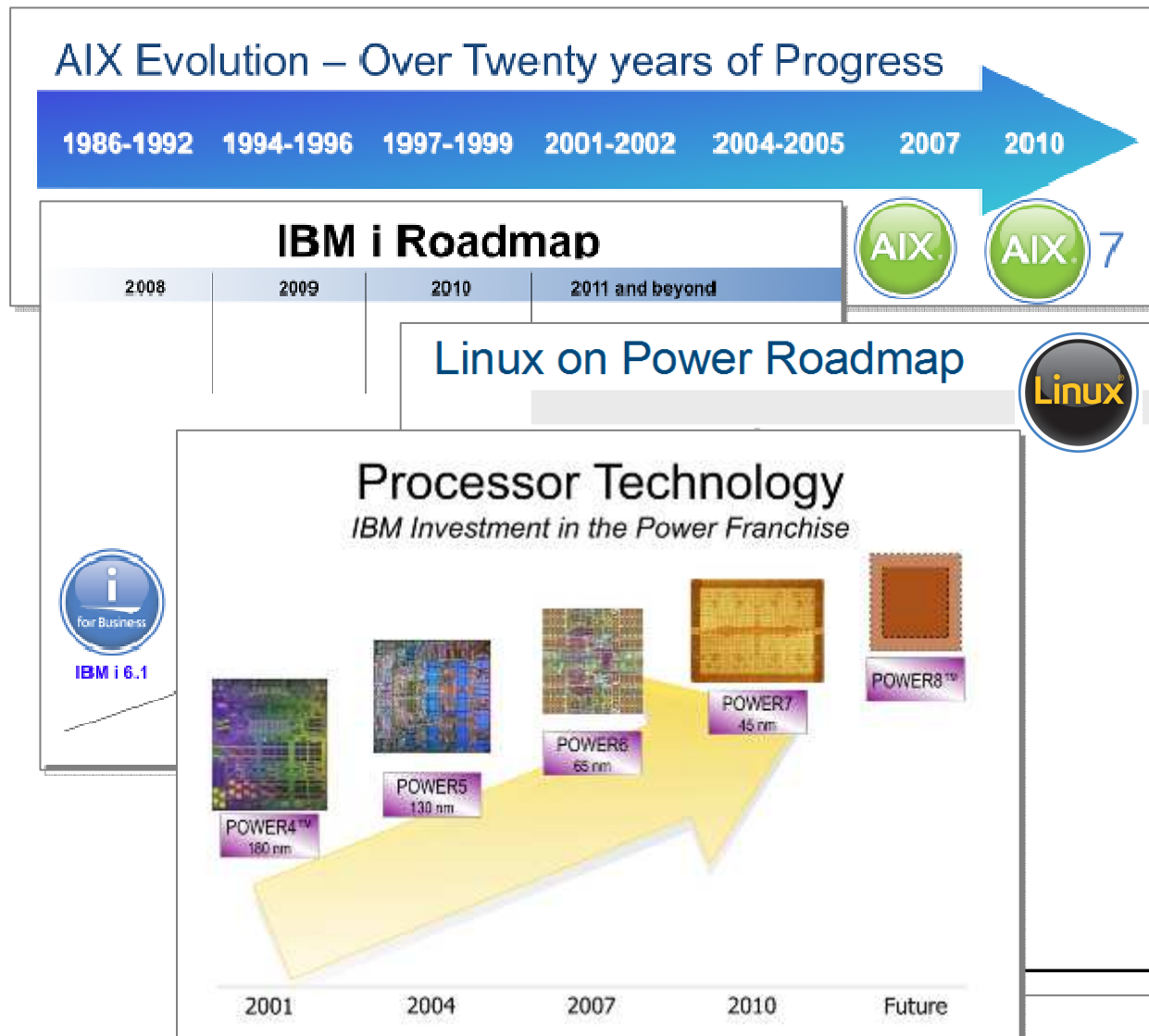
**35:1** *Slash time to market for new apps from four months to just two or three days*

### Operate Your Cloud

- **Delegate provisioning** to authorized ‘users’ to improve productivity
- **Maintain full oversight** to ensure an optimally running and safe Cloud through automated approval / rejection
- **Standardize deployment** and configuration to improve compliance and reduce errors by setting policies, defaults and templates
- **Simplify administration** with an intuitive interface for managing projects, users, workloads, resources, billing, approvals & metering

*Cut costs with efficient operation*

## POWER is delivering quality products on time



- Power Systems delivers on commitments
- Clear and detailed technology roadmaps
- R&D for continued leadership in server market

## POWER7 is Workload Optimization

*Power Systems™ Express servers offers balanced systems designs that automatically optimize workload performance and capacity at either a system or VM level*



- **Intelligent Threads** utilize more threads when workloads benefit
- **Intelligent Cache** technology optimizes cache utilization flowing it from core to core
- **Intelligent Energy Optimization** maximizes performance when thermal conditions allow
- **Active Memory™ Expansion** provides more memory for SAP
- **Solid State Drives** optimize high I/O access applications
- **Built-in Hypervisor** optimized and scalable to run both OLTP and BATCH workload

*Workload-Optimizing Features make POWER7 #1 in Transaction and Throughput Computing*



## ***POWER7 is performance redefined***

October announcements is NOT POWER7+  
SAME product structure as “B” models



“C” models



**Power 795**  
24 to 265  
cores



**Power 780**

**Power 770**



**Power 750**  
4 sockets : 4, 6, 8 –core  
max 32 - cores



**Power 720/740**  
1/2 socket : 4, 6, 8-core



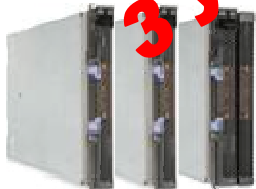
**Power 775**



**Power 710/730**  
1/2 socket : 4, 6, 8-core



**PS BladeCenter** : up to 32-cores



**HMC & SDMC**



**Power 755**






**3 year warranty !!**



## New Power Express At a Glance

Blue is new   Red is a change

	<b>Power 710</b> <b>8231-E1C</b>  <p>High-performance, energy efficient, reliable and secure infrastructure and application server in a compact 2U package. This is the lowest priced entry offering.</p>	<b>Power 720</b> <b>8202-E4C</b>  <p>Reliable, secure and flexible server for UNIX, IBM i and Linux workloads. This model is particularly well suited for the IBM i customer base.</p>	<b>Power 730</b> <b>8231-E2C</b>  <p>High-performance, dense and energy-efficient server ideal for running multiple application and infrastructure workloads in a virtualized environment.</p>	<b>Power 740</b> <b>8205-E6C</b>  <p>High-performance, flexible and reliable midsize database and consolidation server. High core counts and expansion capabilities make this a particularly attractive offering for growing customers.</p>
Form Factor	2U rack	4U rack or tower	2U rack	4U rack (no tower)
# cores	4, 6, 8 one socket	4, 6, 8 one socket	8, 12, 16 two socket	4, 6, 8 one socket 8, 12, 16 two socket
Memory min/max	4/128 GB Active Memory Expansion	4/256 GB Active Memory Expansion	8/256 GB Active Memory Expansion	8/512 GB Active Memory Expansion
PCIe slots	5 PCIe Gen2 LP	5 PCIe Gen2 + 4 PCIe Gen2 (opt)	5 PCIe Gen2 LP	5 PCIe Gen2 + 4 PCIe Gen2 (opt)
Capacities with expansion	Up to 102 disk bays Up to 5 PCIe slots	Up to 380 disk bays Up to 25 PCIe slots	Up to 378 disk bays Up to 25 PCIe slots	Up to 416 disk bays Up to 45 PCIe slots
Integrated SAS support	RAID 10 RAID 5/6 (opt.)	RAID 10 RAID 5/6 (opt.)	RAID 10 RAID 5/6 (opt.)	RAID 10 RAID 5/6 (opt.)
Standard Ethernet <u>not Host Ethernet Adapter</u>	2-port 1GB Ethernet	2-port 1GB Ethernet	2-port 1GB Ethernet	2-port 1GB Ethernet

Performance  
Availability  
Capacity

## Power 770 Same Structure for B and C models

- 1 to 4 processor enclosures

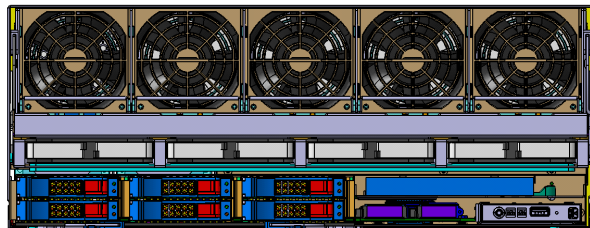


MMC/MHC and MMB/MHB have

- Same multi-block structure
- Same inter-drawer cables
- Same service processor structure
  - But different feat code #EU05

MMC/MHC and MMB/MHB have

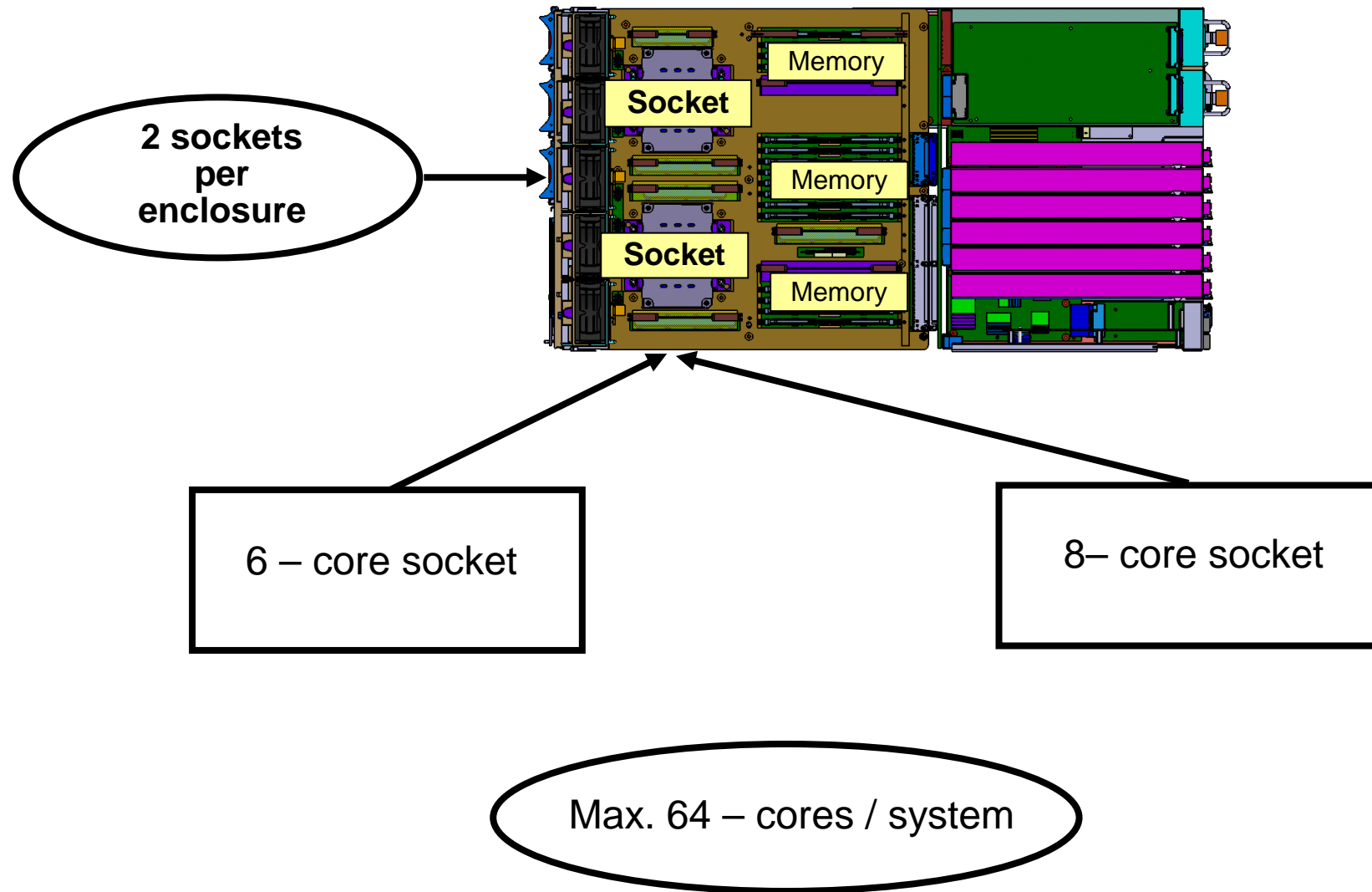
- Same need of an HMC
- SOD for SDMC



MMC/MHC and MMB/MHB have

- Same DASD backplane
- Same base 3/3 split backplane or triple split option or no-split option
- Same console option/rules
- Same PCI blind swap cassettes

## Power 770 (9117-MMB/C) Processor Options

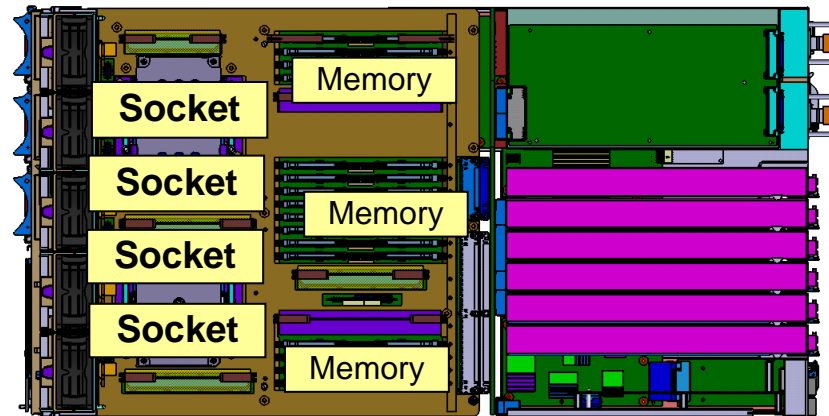


## Power 780 (9179-MHC) Processor Option

**New**

FOUR  
6 – core sockets

TWO  
6 / 8 - core sockets

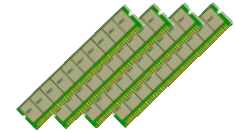


24 – core / enclosure  
Max: 96 cores / system

Turbo core provided Power 780 with 8-cores per chip

**9179-MHB only has  
two sockets per  
enclosure**

## New 64 GB DIMM *doubles memory capacity*



DIMM size	Feature code	F/C size	Node maximum	System maximum
8 GB	5600	32 GB	128 GB	512 GB
16 GB	5601	64 GB	256 GB	1024 GB
32 GB	5602	128 GB	512 GB	2 TB
<b>New!</b> 64 GB	5564	256 GB	1024 GB	<b>New!</b> 4 TB

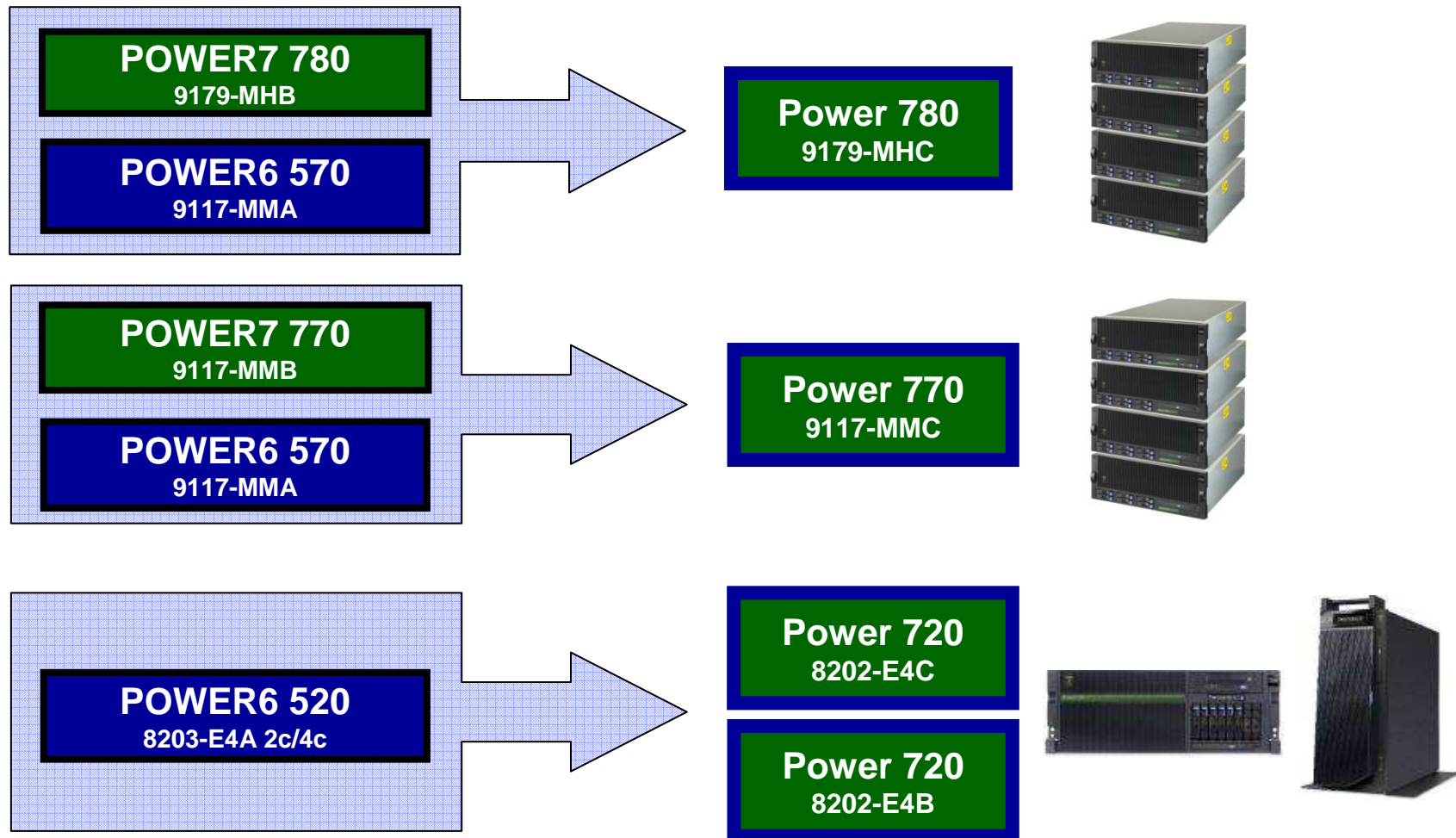

**4X**

**4X**

**4X**

- Notes:
- 16 DIMM slots per node/enclosure
  - 4 feature codes per node/enclosure
  - 2 feature codes required per node/enclosure
  - 64 GB DIMM available for both Power 770 & 780

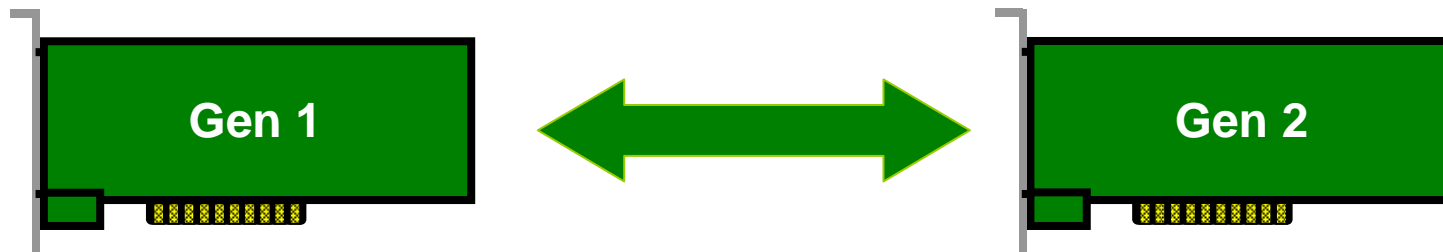
## Power 570 & 520 systems can upgrade to POWER7





## Introducing PCIe Gen 2

Flexibility, Performance, Price Performance

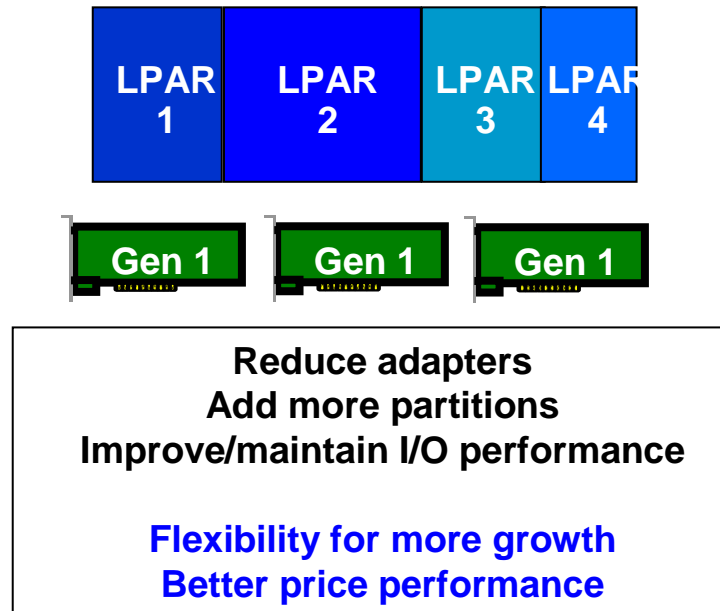


- Gen 2 slots up to 2X more **bandwidth** than Gen 1 slots allowing
  - More ports per adapter ... saving PCI adapters/slots and I/O drawers
  - More I/O virtualization ... saving PCI adapters/slots and I/O drawers
  - More I/O consolidation ... saving PCI adapters/slots and I/O drawers
  - Future higher speed adapters such as 16 Gb Fibre Channel
  - Better support for high performance adapters

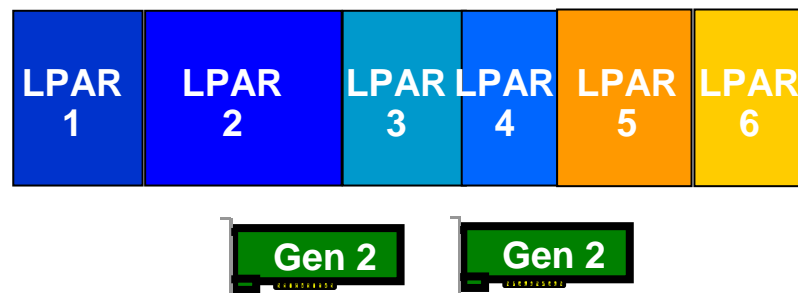
▪ **Note – most individual device/connection performance not changed, BUT more devices/connections per adapter with good performance**

## PCIe Gen2 : Do More With Less

- With Gen 1, you might today have

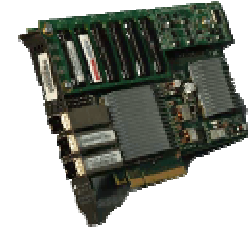


- And with Gen2, you might tomorrow have



## Oct 2011: New Gen2 Adapter Features

- Large cache PCIe SAS adapter 3-port 6 Gb (#5913) → IBM i
- Save PCI slots --- 3X more SSD or 2X more HDD per PCI slot
- NO battery maintenance



- 4-port 8Gb Fibre Channel Adapter (#5729)
- Save PCI slots --- 2X more ports per PCI slot
- 14% lower cost per adapter port + slot savings

- 10Gb Ethernet adapters - 2-port .... 2x more ports than with Gen1
- 2-port 10Gb Ethernet Adapters – full high (#5287/5288)
- 4-port Ethernet Adapters for Linux – 10Gb+1Gb (#5279/5280/5744/5745)

- 2-port QDR Adapter - full high 4x Infiniband 40Gb (#5285)  
– High speed connection for AIX/Linux clustering

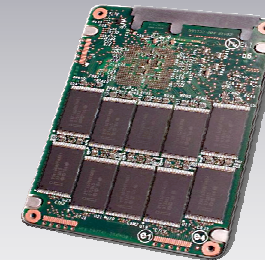
## Move the right data to the right storage technology



Tape



Hard Disk



Solid-state storage

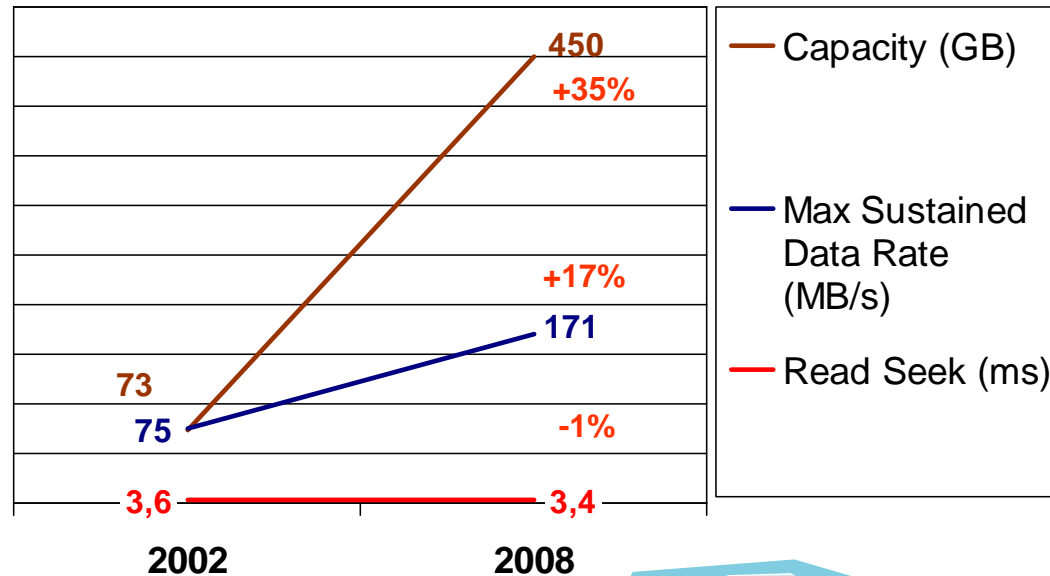


*Tape is the greenest*

*Solid-state is the fastest*

## SSD (Solid State Drives)

### Seagate 15k RPM/3.5" Drive Specifications



### HDD (Hard Disk Drives)

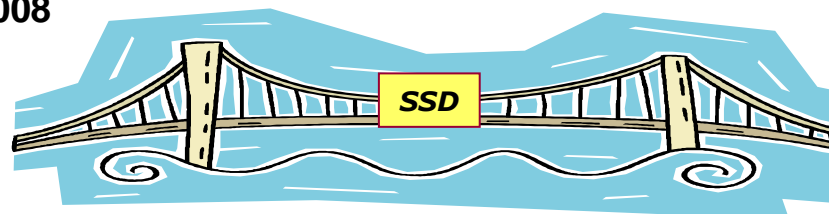
Continue to provide value on a \$ per GB metric .... **but are getting worse on an I/O per GB metric**

**Processors**

Very, very, very, very, very fast

**Memory**

Very, very, very fast



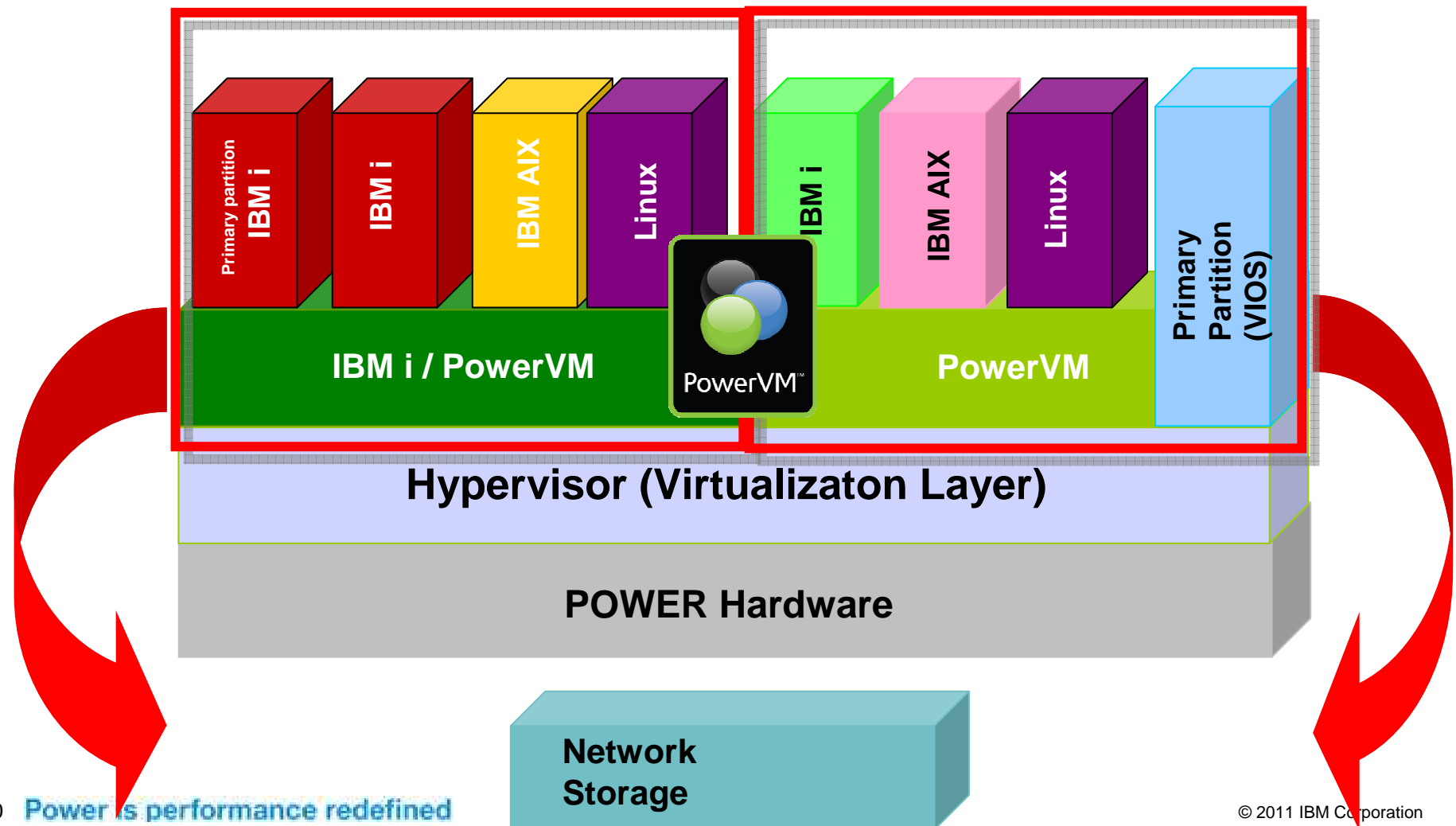
Fast

**Disk**

Very, very slow comparatively

≤ 10's ns	~100 ns	~200,000 ns	1,000,000 - 8,000,000 ns
Access Speed			

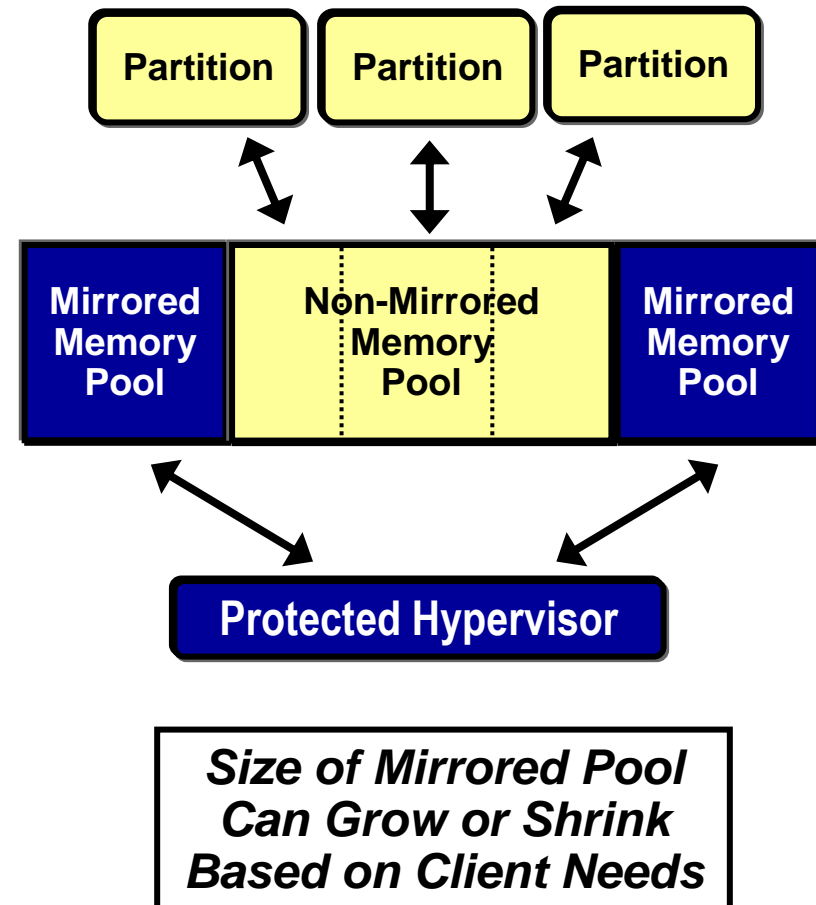
## ***POWER = Built In Virtual Machine***





## Higher Level of Availability : Active Memory Mirroring for Hypervisor

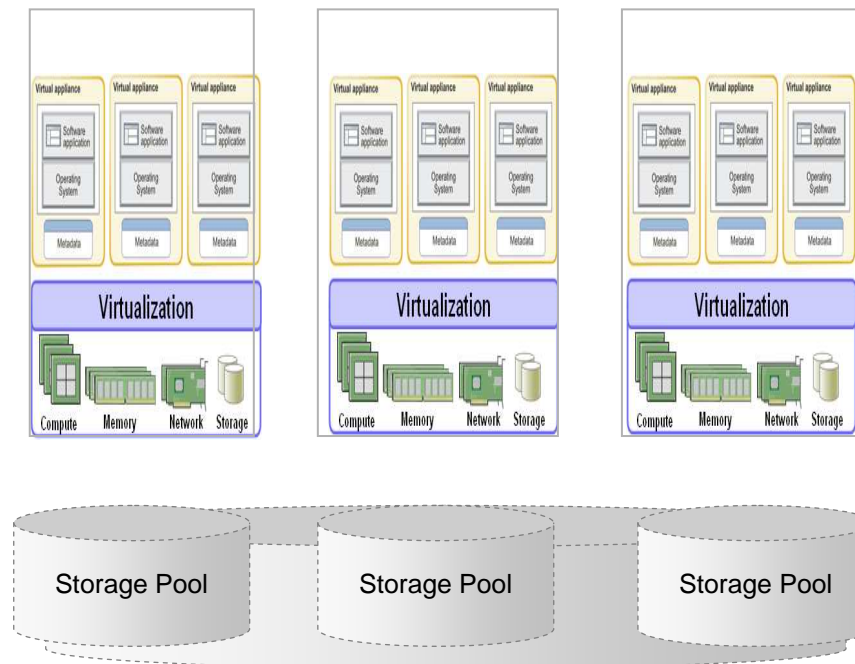
- Improve LPAR availability
- Eliminate Platform outages due to uncorrectable errors in memory
- Maintains two identical copies of the system hypervisor in memory at all times
- Both copies are simultaneously updated with any changes
- In the event of a memory failure on the primary copy, the second copy will be automatically invoked and a notification sent to IBM via the Electronic Service Agent (ESA)
- Active Memory Mirroring for Power 770 and Power 780 systems will require MMC or MHC systems ... **Not MMB/MHB**



**New capability for Power 770 and 780 (C-Model)**

# PowerVM – Storage Pools

*Extending Storage Virtualization Beyond a Single System*



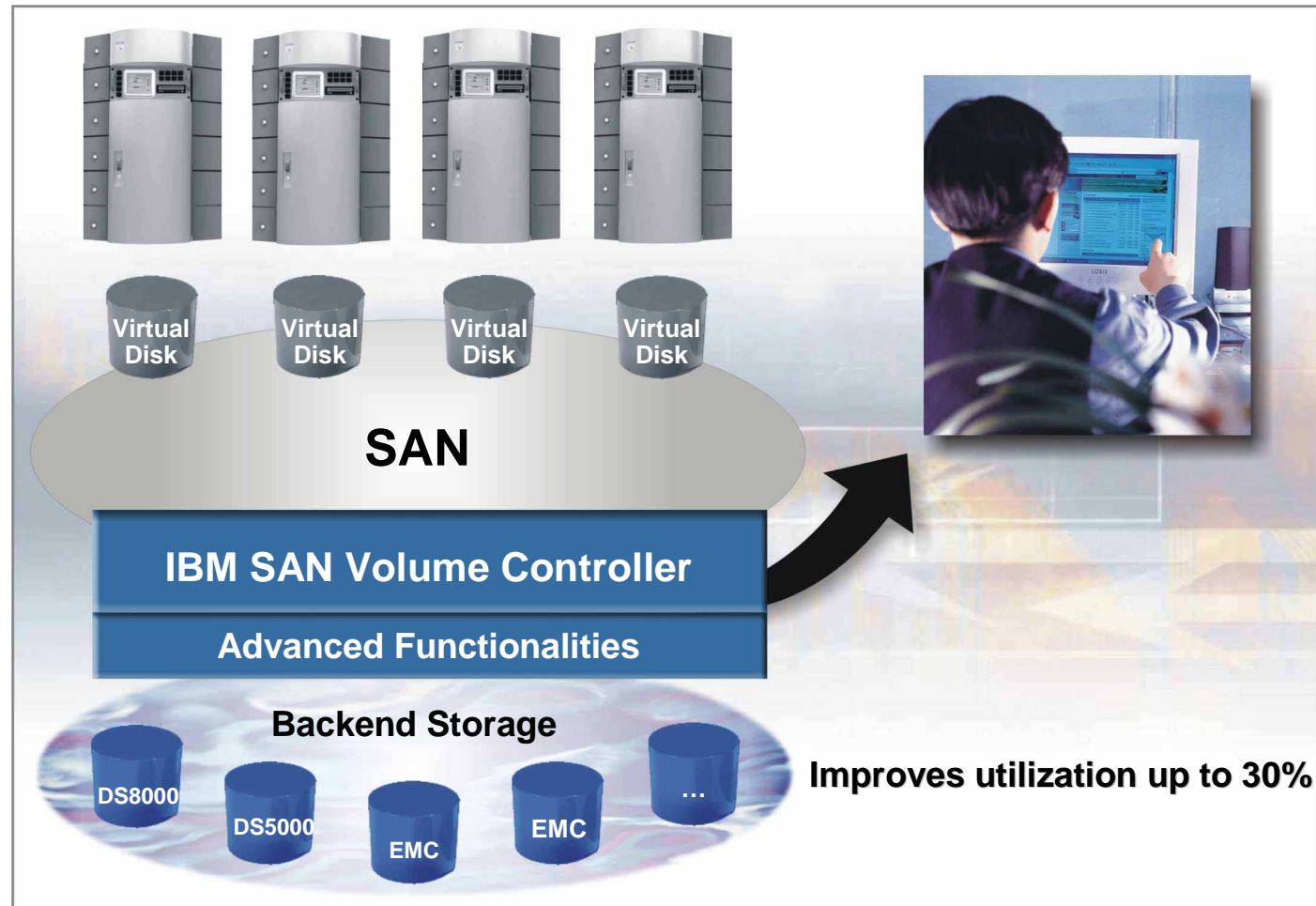
## vSCSI Classic – Storage pool virtualization

- Storage pooled at VIOS for a single system
- Enables dynamic storage allocation
- Supports Local and SAN Storage, IBM and non-IBM Storage

## SSP – Shared Storage Pool

- Storage pool spans multiple VIOS's and servers
- Enabler for federated management
- Location transparency - Base capabilities
- Supports SAN , IBM and non-IBM Storage

## IBM SAN Volume Controller - concept



### Brings advanced capabilities to existing storage:

- High performance Thin Provisioning
- Remote Mirroring
- Online data migration, without disrupting users.

## PowerVM Storage Virtualization

- **vSCSI** (Virtual Scsi)  
Resources owned by VIOS
- **NPIV** (N\_port Virtualization)  
Resources owned by LPAR
- **SSP** (Shared Storage Pool Virtualization)  
Resources owned by VIOS
- **SVC** (SAN Volume Controller)  
Virtualized SAN architecture  
Storage resources owned by SVC

**Power Systems Only**

**Cross Platform Support**



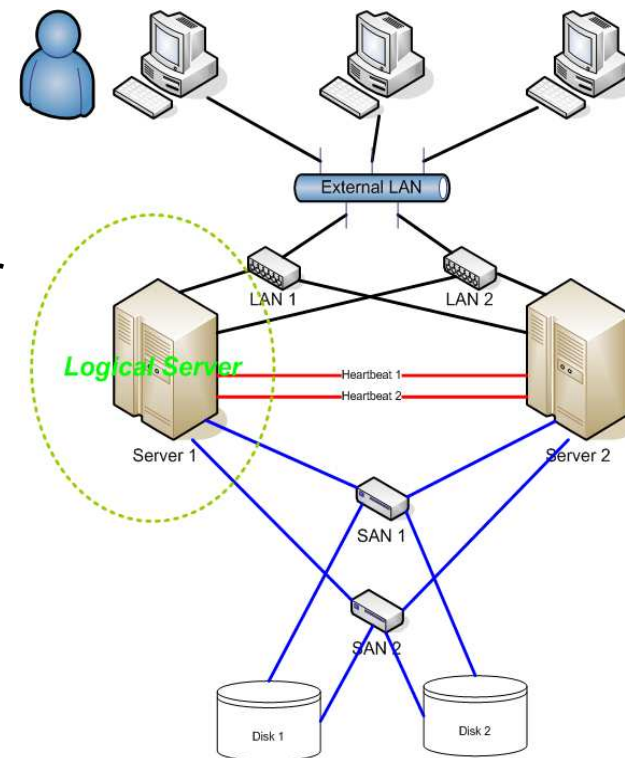


## Q4 2011 Features

<b><u>PowerVM Editions</u></b>	<b>Express</b>	<b>Standard</b>	<b>Enterprise</b>
<b>Concurrent VMs</b>	<b>2 per server</b>	<b>10 per core (up to 1000)</b>	<b>10 per core (up to 1000)</b>
<b>Virtual I/O Server</b>	✓	✓ ✓	✓ ✓
<b>NPIV</b>	✓	✓	✓
<b>Suspend/Resume</b>		✓	✓
<b>Shared Processor Pools</b>		✓	✓
<b>Thin Provisioning</b>		✓	✓
<b>Live Partition Mobility</b>			✓
<b>Active Memory Sharing</b>			✓
<b>Shared Storage Pools+</b>		✓	✓
<b>Active Memory Deduplication**</b>			✓
<b>Network Balancing</b>		✓	✓
<b>Live Partition Mobility Performance Improvements</b>			✓

## Modern HA Solutions Are Based on Clustering

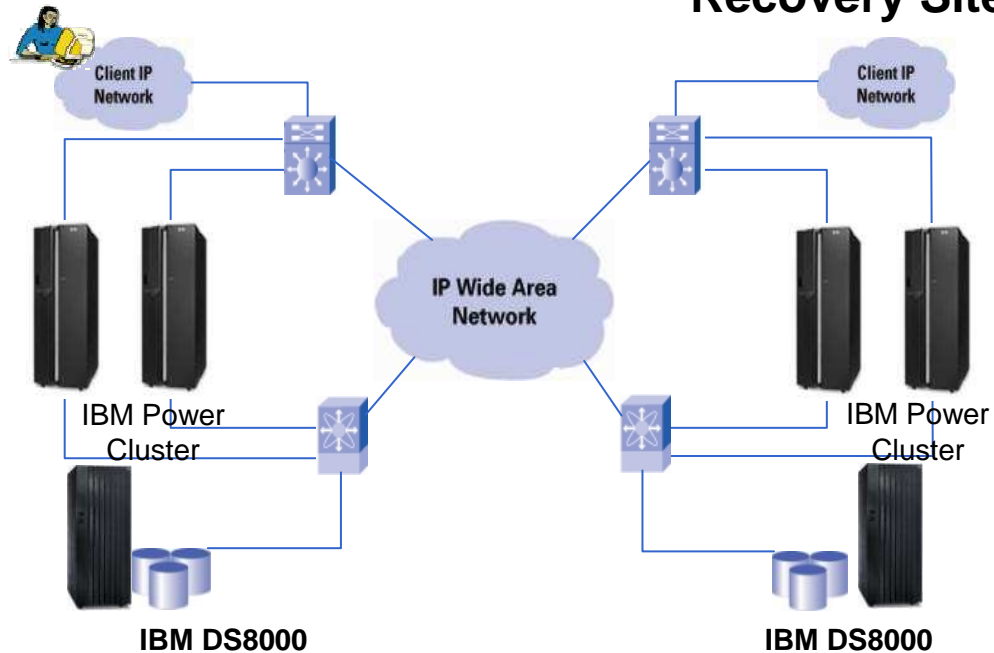
- Clustering is the default deployment for HA/DR in the mainframe and Unix marketplace
- With PowerHA SystemMirror, clustering is available to our IBM i customers
- Provides complete redundancy
- Provides for automated failover – minimal IT operations involvement
- Planned and unplanned outage management





## PowerHA + IBM DS8000 Solution Fit

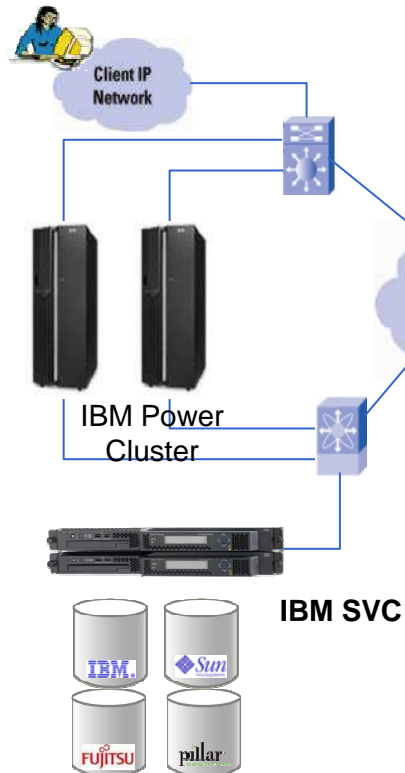
### Production Site



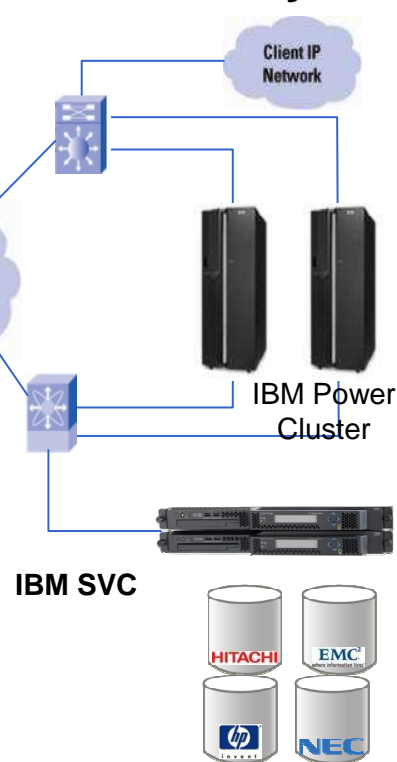
	DS8000
Tight integration with PowerHA	✓
3 site mirroring	✓
Metro Mirror up to 300 KM	✓
Global Mirror lower potential for data loss (3-5 seconds data loss vs 20-30 sec or more)	✓
Efficient bandwidth utilization	✓
Native IBM i and AIX (and system z) support	✓
Integration with IBM TPC for Replication (IBM i)	✓
Easy Tier - High performance with SSDs	✓
Integrated Server and Storage Management (Director + TPC)	✓

## PowerHA + IBM SVC Solution Fit

### Production Site

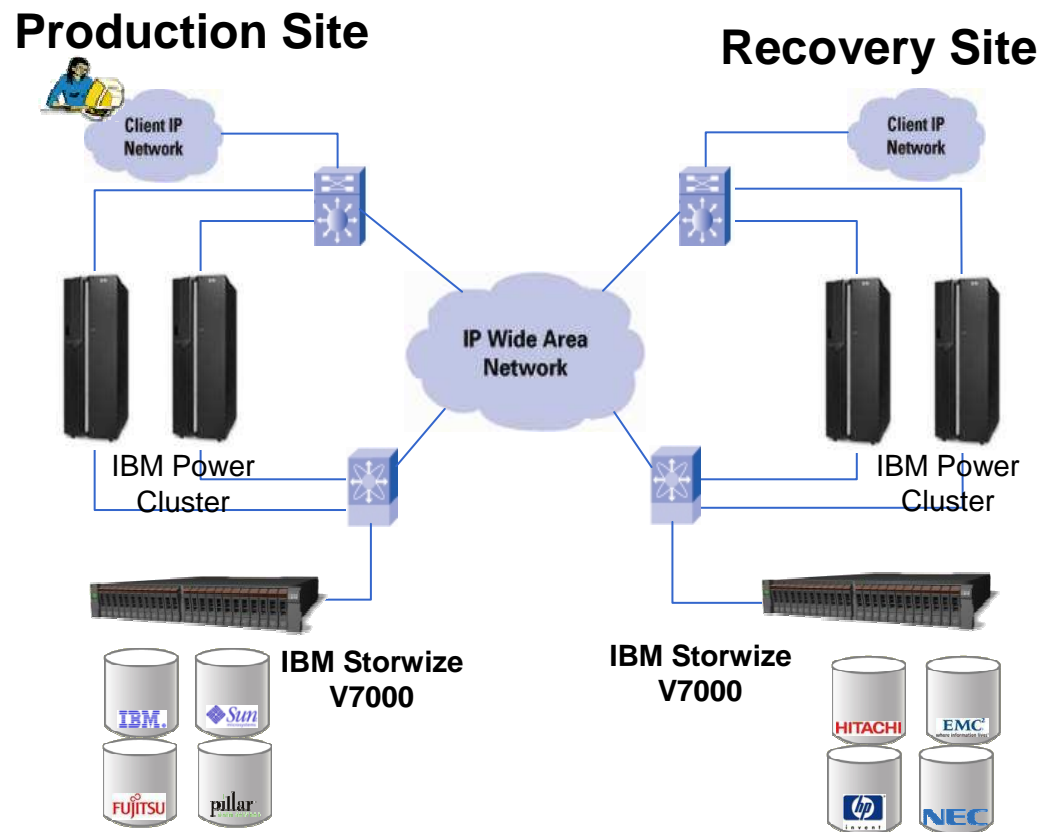


### Recovery Site



	SVC
Tight integration with PowerHA	✓
Integrates (virtualizes) with over 100 storage systems	✓
Metro Mirror up to 300 KM	✓
Metro and Global Mirror across mixed storage types	✓
AIX and IBM i (with VIOS) support	✓
Virtualizes storage to improve utilization	✓
Simplifies management across storage types	✓
Easy Tier - High performance with SSDs	✓
Integrated Server and Storage Management (Director + TPC)	✓

## PowerHA + IBM Storwize V7000 Solution Fit



	Storwize V7000
Tight integration with PowerHA	✓
Mid-range storage	✓
Integrates (virtualizes) with over 100 storage systems	✓
Metro Mirror up to 300 KM	✓
Metro and Global Mirror across mixed storage types	✓
AIX and IBM i (with VIOS) support	✓
Virtualizes storage to improve utilization	✓
Simplifies management across storage types	✓
Easy Tier - High performance with SSDs	✓
Integrated Server and Storage Management (Director + TPC)	✓

## PRPQ 5799 - HAS

- Subset for 5770-HAS (PowerHA)
- You need to order 5799-HAS Program Request Pricing Quotation (PRPQ) for IBM PowerHA SystemMirror for i to obtain the following enhancement in PowerHA:
  - PowerHA GUI.
  - SVC/V7000 remote Copy Service support Metro Mirror, Global Mirror, and FlashCopy.
  - New CL commands CFGDEVASP to create an iASP and CFGGEOMIR to configure geographic mirroring
- This PRPQ (5799-HAS) is available in English language (2924) only but can be installed on other language system. So you have to install the PRPQ with LNG parameter as 2924 when you install PRPQ with the RSTLICPGM command. PTF SI44148 for LPP 5770-HAS is a pre-requirement for the PRPQ.

## IBM i CBU for PowerHA

- CBU + PowerHA SystemMirror 7.1 for IBM i
  - Three days of services included
  - Fast start to better business continuity



## PowerHA Lab Services and Training

### Key Offerings - High Availability Services on IBM i

- **Availability Workshop for IBM Power Systems**
- **IBM PowerHA SystemMirror for i**
- **Copy Services for IBM i**
  - Utilizing Copy Services Toolkit (CST)
  - Advanced Copy Services for IBM PowerHA on IBM i
  - The DS Storage Management for IBM i Toolkit
- **Independent ASP (IASP) Migration Workshop for IBM i**
- **Full System Flash Copy for IBM i**
- **Attaching and integrating IBM i to IBM external storage**
  - Consulting services associated with the planning, design, and implementation of best practices when attaching IBM i to IBM external storage.
  - Logical configuration to ensure optimal performance and redundancy.
  - Exploitation of Copy Services functions such as FlashCopy, Metro Mirror, and Global Mirror.
- **IBM HA Assist for IBM i**

### Americas, WW Contacts

**Frank Kriss**

[kriss@us.ibm.com](mailto:kriss@us.ibm.com), 507-253-1354

IBM i, High Availability

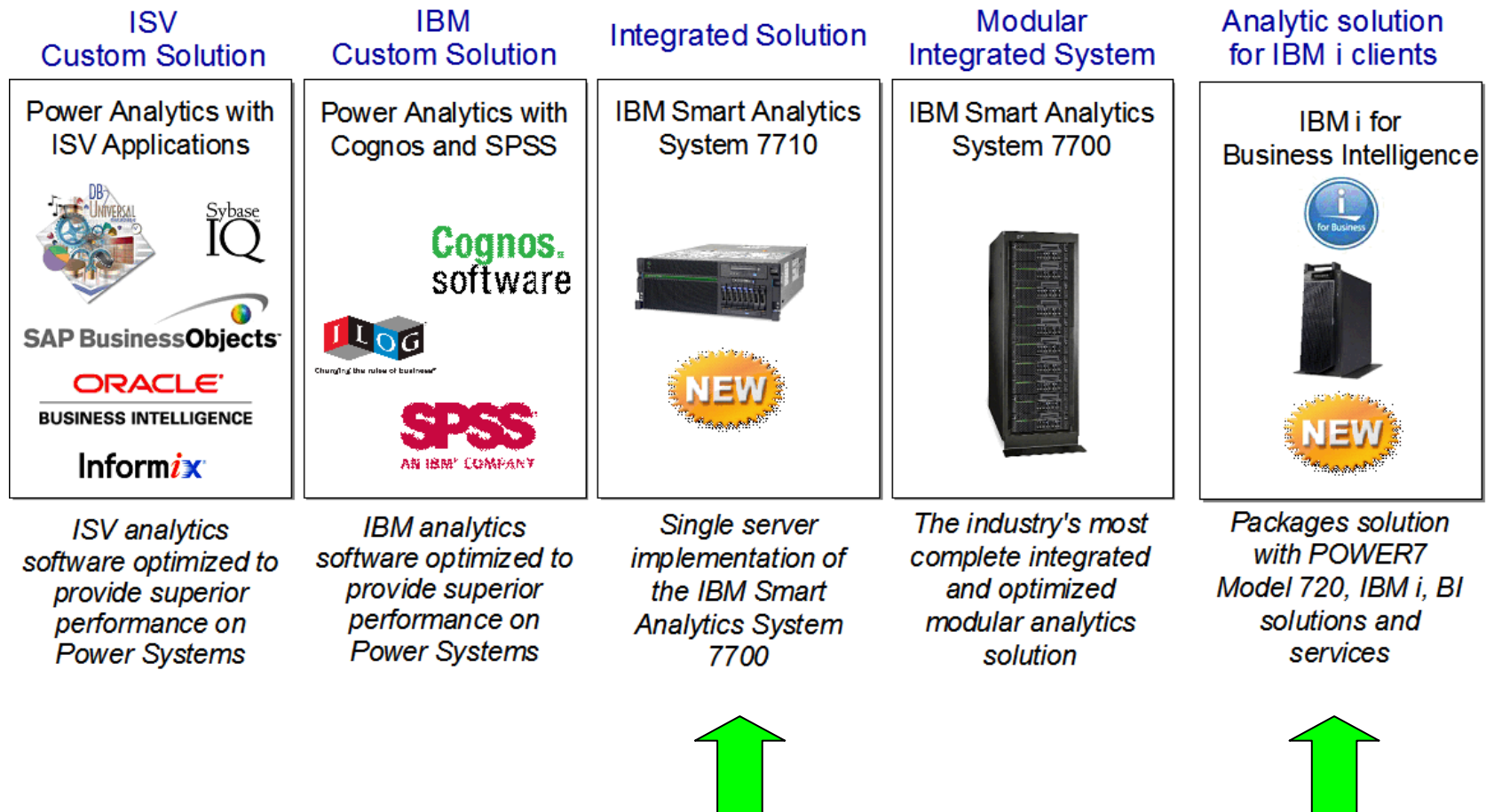
#### Why IBM®?

- ⑩ Deep skills in IBM storage, clustering and IBM i planning, implementation and integration.
- ⑩ Experience in application architecture and design gained from thousands of engagements across many industries.
- ⑩ Ability to deliver skills transfer as part of service engagement.

[http://www-03.ibm.com/systems/services/labservices/platforms/labservices\\_power.html#show-hide](http://www-03.ibm.com/systems/services/labservices/platforms/labservices_power.html#show-hide)





## Power Systems Analytics Solutions – entry points at any level



## October Announcements for Power Systems Analytics

Power Systems can accelerate analytics projects to deliver services faster with superior economics

-  **IBM Smart Analytics System 7710 (AIX)**
  - Single server implementation of IBM Smart Analytics System 7700 **at half the cost**
  - Target Warehouses under 10TB (**60% of Market**)
  - Designed for test and development environments...as well as clients that are looking for a fully integrated and optimized analytics solution but don't need the full capacity of the Smart Analytics System 7700
  - Announce October 11th, General Availability November 4th
-  **IBM i for Business Intelligence**
  - A packaged solution that is easy to order and easy to implement -- combining the strengths of Power Systems, IBM i, DB/2, DB2 Web Query, and InfoSphere Change Data Capture software
  - Announce October 11th, General Availability November 18th

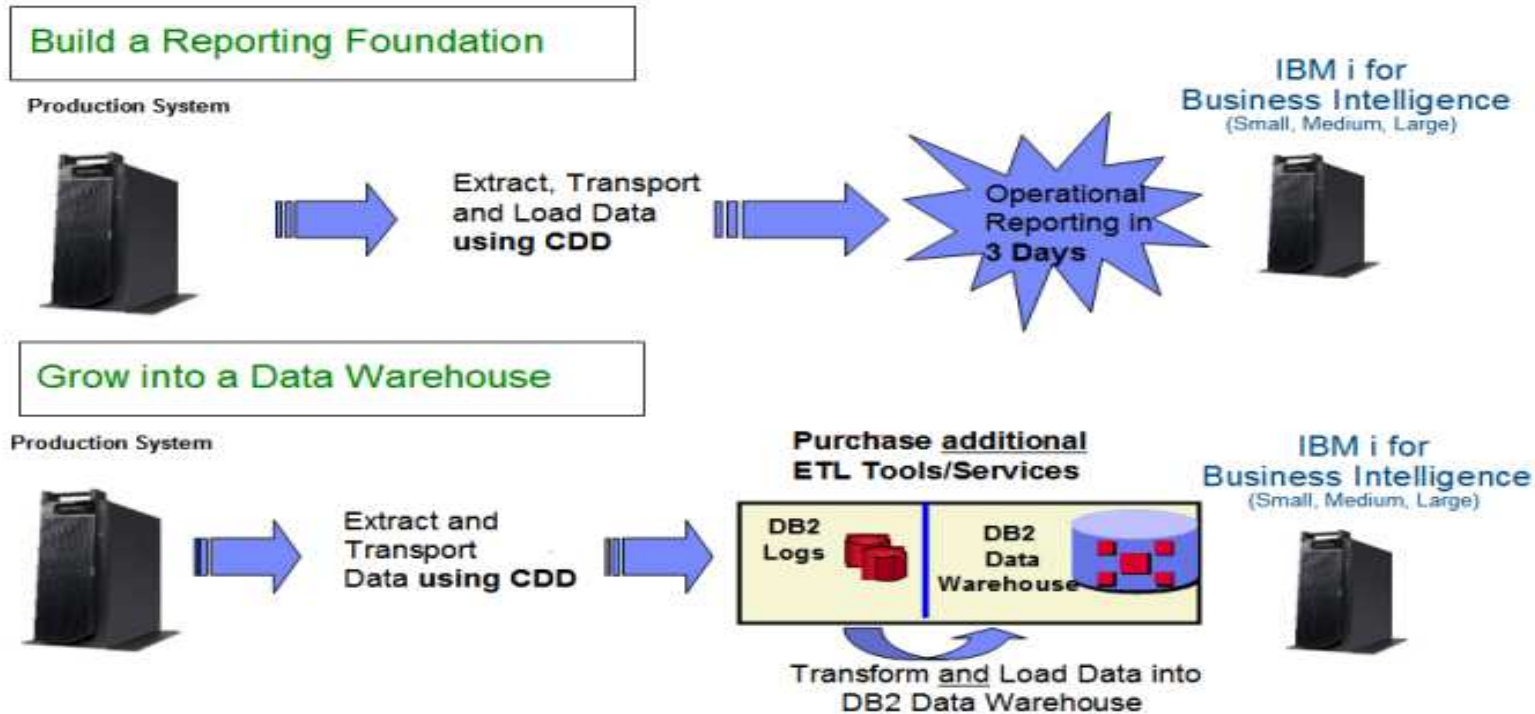


***Power Systems can accelerate analytics projects to deliver services faster with superior economics***



A packaged solution that is easy to order and easy to implement -- combining the strengths of Power Systems, IBM i, DB/2, DB2 Web Query, and InfoSphere Change Data Capture software

- Based on POWER7 Model 720 : Small, medium, large packaging
- Comes with a 3-day service voucher
- DB2 / DB2 Web Query Center of Excellence availability



***Reduce cost, complexity, and implementation time***

# IBM Smart Analytics System 7700

Integrated and optimized system for Analytics



## Analytics Software Options

- ☑ Business Intelligence Module (Cognos)
- ☑ InfoSphere Warehouse Cubing Services
- ☑ InfoSphere Warehouse Text Analytics & Data Mining

## Data Warehouse Software

- ☑ InfoSphere Warehouse
- ☑ InfoSphere Information Integration Module (New May 2011)
- ☑ InfoSphere Warehouse Advanced Workload Management
- ☑ Tivoli System Automation

## Hardware/OS

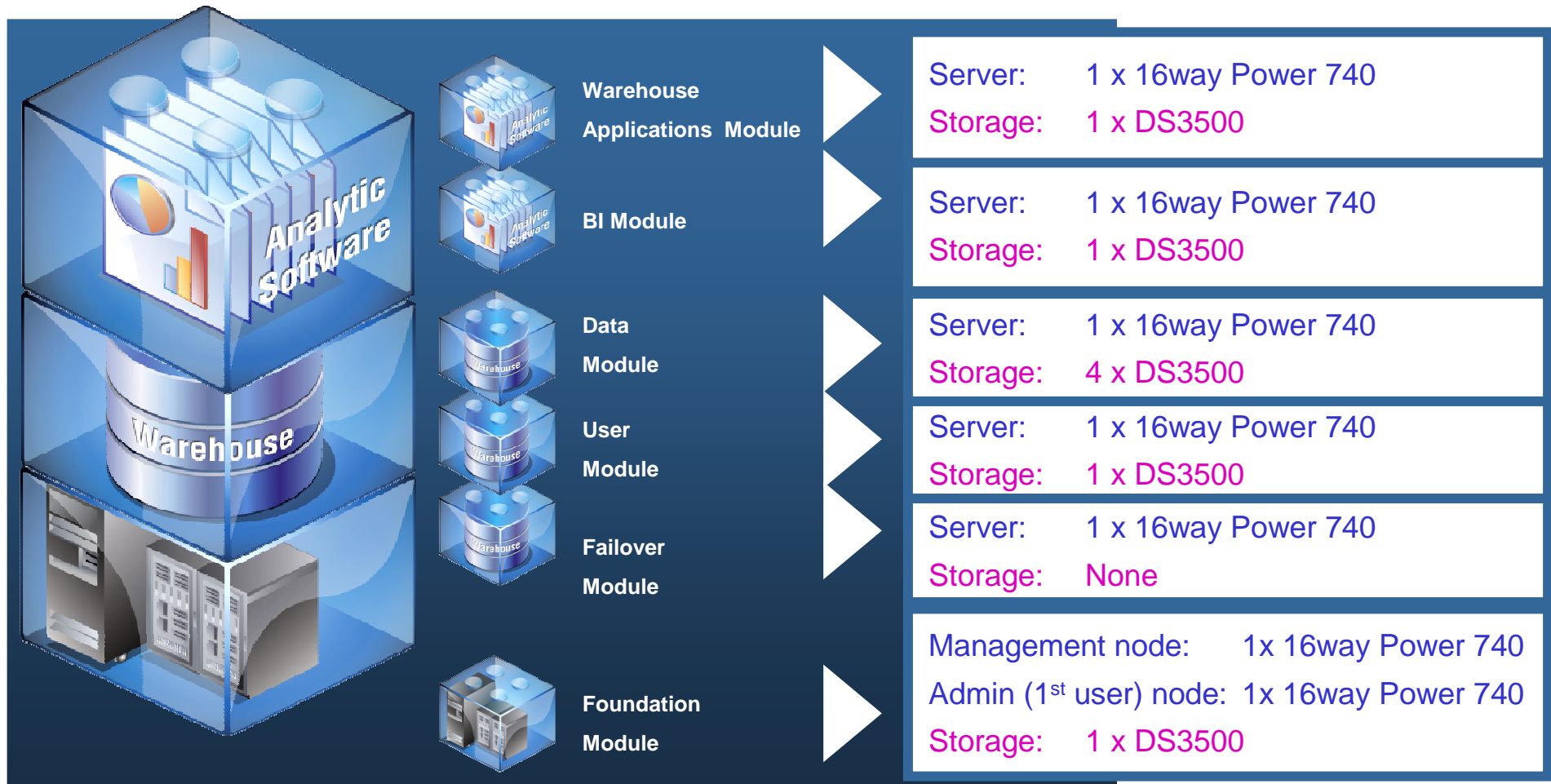
- ☑ IBM Power 740 Servers (16 core modules)
- ☑ IBM System Storage Designed for the IBM Smart Analytics System including SSD acceleration
- ☑ AIX 6.1



<http://www.ibm.com/software/data/infosphere/smart-analytics-system/>

## IBM Smart Analytics System 7700 R1. What's Inside?

*Fully integrated and optimized analytics, with a broad range of capabilities, on an enterprise-class platform, cost-effectively meeting user analytics needs*



## IBM Smart Analytics System 7710

Integrated and optimized system for Analytics



### Analytics Software Options

- ☑ InfoSphere Warehouse Cubing Services
- ☑ InfoSphere Warehouse Text Analytics & Data Mining

### Data Warehouse Software

- ☑ InfoSphere Warehouse
- ☑ InfoSphere Warehouse Advanced Workload Management
- ☑ Tivoli System Automation

### Hardware/OS

- ☑ IBM Power 740 Servers (16 cores)
- ☑ IBM System Storage Designed for the IBM Smart Analytics System including SSD acceleration
- ☑ AIX 6.1



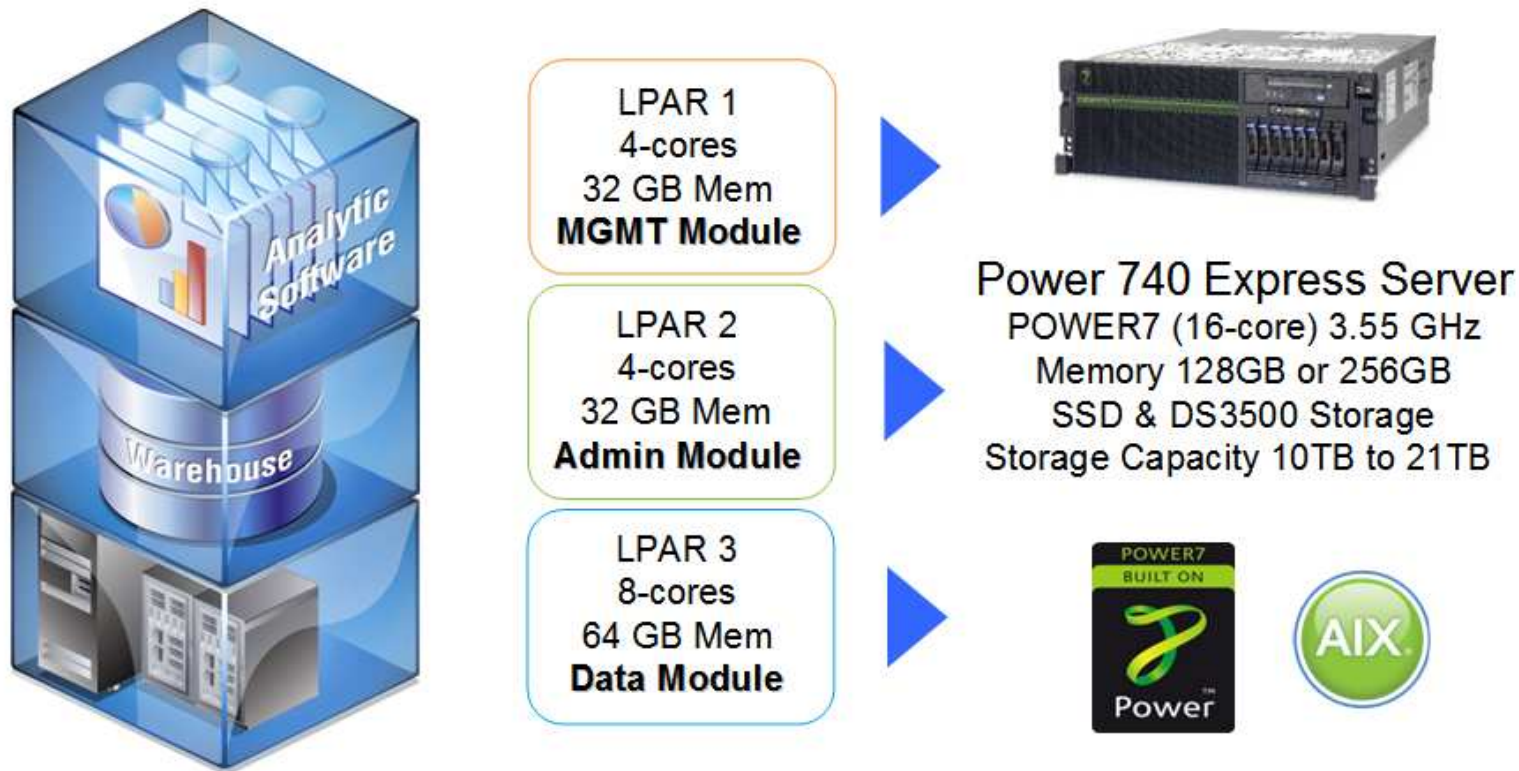
<http://www.ibm.com/software/data/infosphere/smart-analytics-system/7710/>



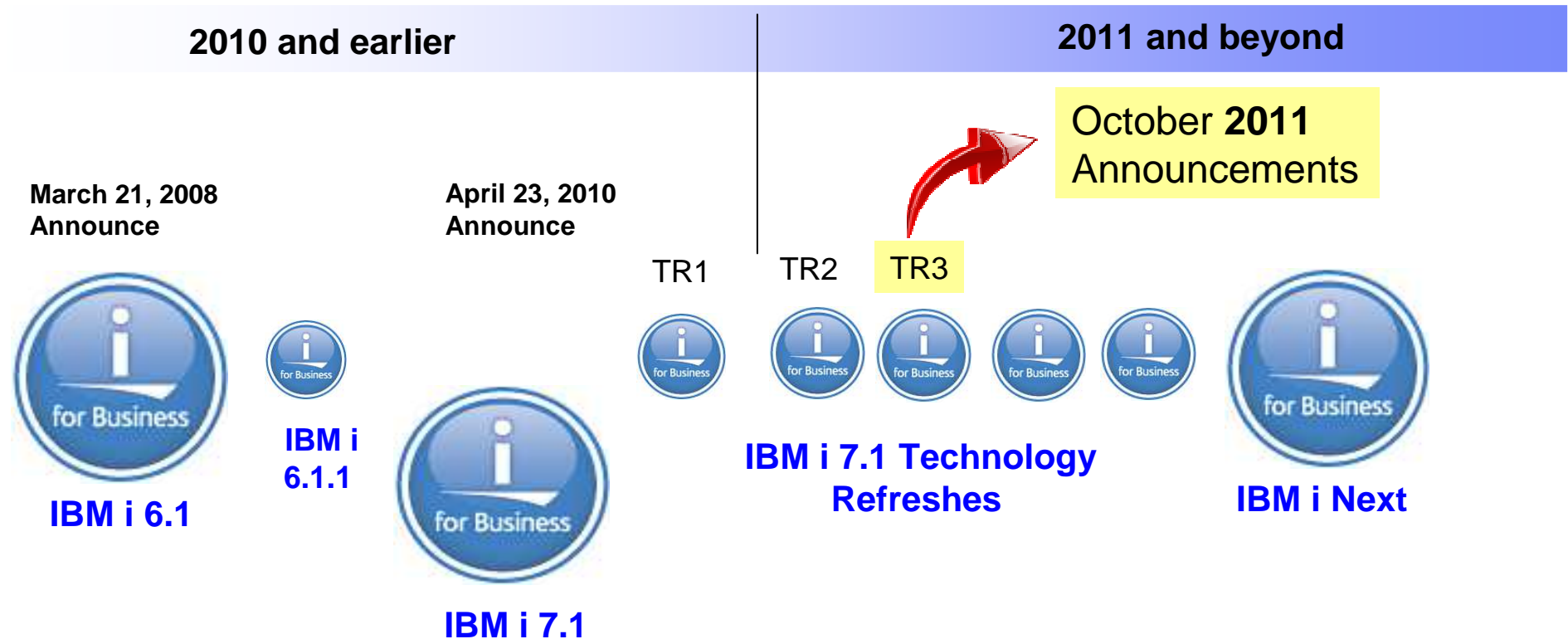
## IBM Smart Analytics System 7710

*Fully integrated and optimized analytics, with a broad range of capabilities, on an enterprise-class platform, cost-effectively meeting user analytics needs*

- Price range : HW + SW solution prices are Small = \$530K / \$910K Large = \$825K / \$1500K
- Ordering : similar to all Analytics solution, via Sales Transaction Hub
- additional details : [IBM 7710 proposal & ordering process](#)



## IBM i Version.Release with Technology Refresh



Interim Technology Refreshes provide new functions and I/O support  
Simpler to install on a current release and less disruptive



## IBM i Technology Refresh 2



### IBM i suspend / resume

- Ability to suspend a partition and resume it from the suspend point through PowerVM (Enterprise or Standard Edition)
- Customer Value: Saves IPLs. Suspend before CEC maintenance, do the repair or CEC IPL and then resume.
- One of the underlying technologies required prior to future potential Live Partition Mobility

### I/O performance – enhanced multi-path

- Smarter load balancing multi-path algorithm that tries to push more I/O faster
- Example: When using NPIV, running both disk and tape traffic on the same port more feasible since the disk traffic will move off the port if the tape traffic starts slowing down the disk performance.

### Support of new hardware

- 571GB disk, EXP24S I/O drawer, Power 795 177GB SSD, and more

## IBM i Technology Refresh 2



### IBM i to IBM i virtual tape

- In an environment where an IBM i partition is hosting other partitions
- Allow multiple IBM i partitions to share the tape drive owned by a another IBM i partition
- No longer need to reassign the tape drive (actually assign its connecting adapter) to a different partition
- Alternative to VIOS/NPIV sharing

Note: no tape library robotics controls. That needs VIOS/NPIV

### Enhanced support of existing hardware

- 6.1 support of existing PCIe-based 177GB SSD
- 7.1 support of PCIe Gen2 Riser Card

### DS5000 NPIV support

- Allow better utilization of FC adapter/switch resources by using NPIV with the DS5300/DS5100
- For POWER6/POWER7 servers (excepting Blades)

## IBM i Enhancements TR3



### Virtualization

**Virtual Partition Manager** is enhanced to create IBM i partitions

POWER6 and POWER7 Express Servers that do not have an external management console.

IBM i 7.1, the ability to create [up to four](#) IBM i partitions will be enabled in VPM.

Note ... this may be attractive for smaller-shop clients who wish to use IBM i to virtualize an Ethernet port using IBM i instead of VIOS and who wish to avoid adding an HMC to their configuration

Thin Provisioning for DS8700 and DS8800 storage servers, and for VIOS Shared Storage Pools allows configurations set up with a smaller amount of real disk storage

IBM i mirroring algorithms are enhanced to take into consideration any N\_Port ID Virtualization (NPIV) attached disks.

### System and I/O Support

- Additional bus level statistics for 12x loops with 7.1
- Ethernet link aggregation improves throughput and reliability for up to 8 links
- Share physical Ethernet connections across partitions with Ethernet layer-2 bridging

## IBM i Enhancements TR3



### DB2

- SSD Asynchronous Table & Index Movement  
Can speed up implementing SSD placement
- Security – Simplify Authentication with new keyword
- DB2 Monitoring Tool Improvements – Filters  
Error Cases, Client IP Addresses, Group & User Profiles
- ISV and Advanced User requests  
Smaller SQL Statements in SQL Packages  
Improved ALTER TABLE Performance  
Administration Information available through SQL

### Application Development

Native archive / un-archive API supports creating and restoring archive files specifically .zip files

## Management Console Offering Highlights

*Multiple offerings for flexibility and ease of use for Power Systems  
virtualization and HW service*

### HMC

Hardware appliance

Legacy

7042- CR6

Rack mount



### Systems Director Management Console

Hardware appliance next-gen

7042- CR6 (7944-A2Y)

System x3550 M3 Commercial

2.53GHz Intel Xeon E5630,

Quad Core & Memory: 8 GB

HDD: 2x 500MB = 1 TB

Rack mount



### PowerVM IVM

Part of PowerVM

Focus on Blades &  
small servers



### Systems Director Management Console

Software appliance next-gen

Runs on VMware or KVM

Customer supplied IBM x86 HW

Part of Flex ITME

## SDMC Feature Adds Vs HMC

<b><u>Capability</u></b>	<b>SDMC</b>	<b>HMC</b>
Simplified Virtualization	✓	
Blades Management	✓	
Mobility between Blades and Servers	✓	
Dual VIOS for Blades	✓	
Active Memory Expansion for Blades	✓	
Virtual Appliance Option	✓	
Consistent Look and Feel	✓	
OS Management and Monitoring	✓	

- SDMC provides simplified Virtualization Management (vs HMC)
- SDMC can manage Blades (HMC can not)
- SDMC is offered in a virtual appliance (HMC is not)
- SDMC integrates Power hardware, service, and virtualization management into a common look and feel (Director)
- SDMC will add hierarchical management to seamlessly integrate with Director advanced managers (Oct 2011)



## October, 2011 Statements of Direction

### **Enhancement of SDMC to support new Power Servers**

IBM Power 710, 730, 720, 740, 770, 780 IBM intends to enhance the IBM Systems Director Management Console (SDMC) to support the new Power System Servers.

### **HMC upgrade option**

IBM intends for the current Hardware Management Console (HMC) 7042-CR6 to be upgradeable to an IBM SDMC when that support becomes available for the new Power Systems.

## Matching workloads to the right system can deliver superior performance and economics

### System z

Freedom by Design



Achieve up to 55% lower TCO per workload

### Power Systems

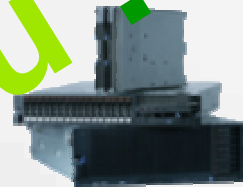
Performance Redefined



Power Systems running DB2 as low as 1/3 the cost of Oracle Database\*

### System x

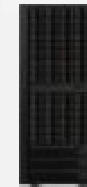
Defining the Next Generation of x86 Servers



Industry-leading Intel performance and lower management cost by 50%

### IBM Storage

Storage Reinvented



Reduce power, operating and cooling costs by up to 60%

Thank You!!!!

Source: Based on IBM internal studies

\*Pricing comparison based on US list prices of IBM DB2 Advanced Enterprise Edition and the Oracle software with analogous capabilities: Oracle Database Enterprise Edition, Advanced Compression, Active Data Guard, Label Security, Partitioning, Oracle Enterprise Manager, Internet Developer Suite, Diagnostics Pack, Oracle-to-Oracle Federation, Golden Gate. All list prices based on US and valid as of 01/26/2011.