Philippe Ceyssens
philippe_ceyssens@be.ibm.com

IBM Systems Software update

PowerVM
AIX & PowerHA

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Power Systems Software

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PowerVM: Foundation of the Power Systems Software Stack

Workload-Optimizing Systems

+

AIX - The Future of UNIX

Total Integration with i

Scalable Linux ready for x86 Consolidation

PowerVM™

Virtualization without Limits

- ✓ Drive over 90% utilization
- ✓ Dynamically scale per demand

POWER7™ BUILT ON Power™

Dynamic Energy Optimization

- ✓ 70-90% energy cost reduction
- ✓ EnergyScale™ technologies

PowerHA™

Resiliency without Downtime

- ✓ Roadmap to continuous availability
- ✓ High availability systems and scaling

IBM® Systems Director

Management with Automation

- ✓ VMControl to manage virtualization
- ✓ Automation to reduce task time

Smarter Systems for a Smarter Planet.

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Power Systems Software Editions

Power Systems Software Editions	Express	Standard	Enterprise
Systems Director VMControl	✓ ✓	✓ ✓	✓ ✓
PowerHA[2]	Cluster Feature of OS*	✓	✓
IBM i	✓	✓	✓
AIX	✓[1]	✓	✓
PowerVM	✓	✓	✓

[1] AIX Express Edition 04/10
[2] PowerHA SystemMirror Editions for IBM i 04/10
* Clustering feature for IBM i, included with AIX 7 10/10

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Agenda

- **PowerVM 2.2**
  - PowerVM features
  - PowerVM vs the others
- **AIX V7**
- **PowerHA for AIX V7**

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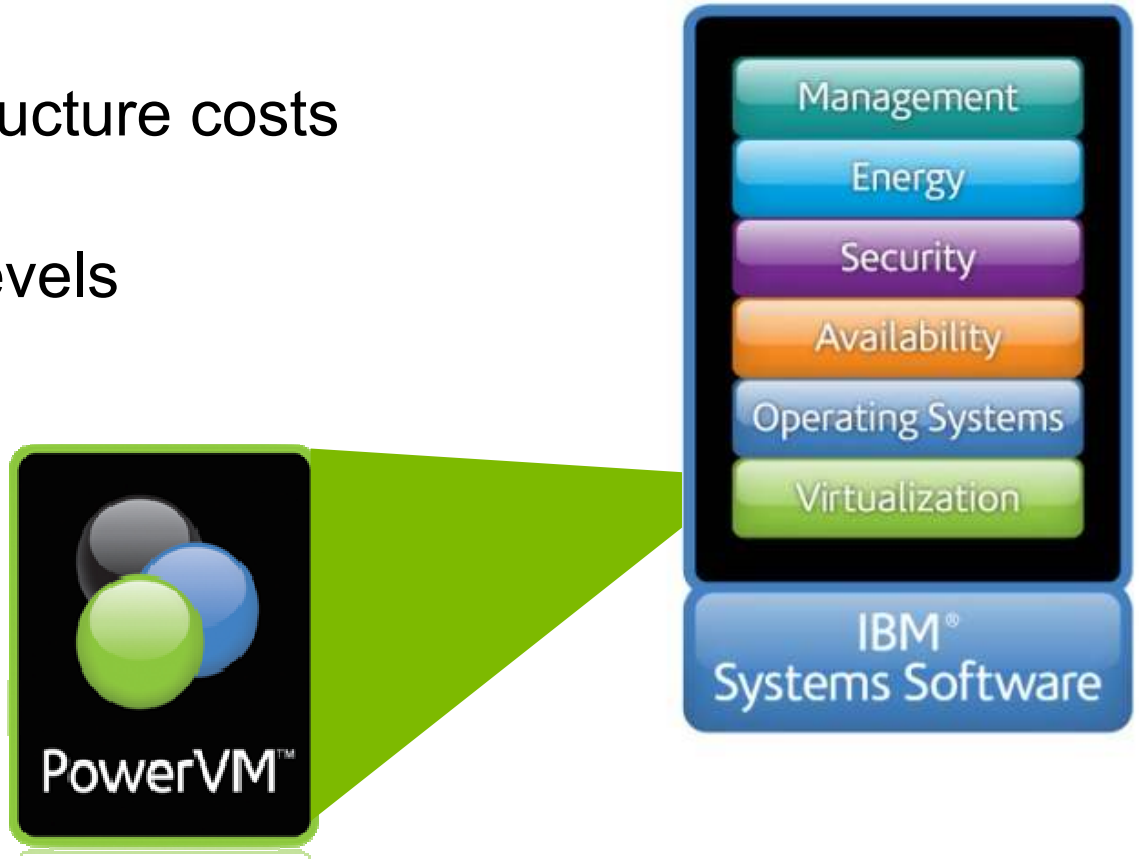
PowerVM: Virtualization Without Limits

- Reduces IT infrastructure costs
- Improves service levels
- Manages risk



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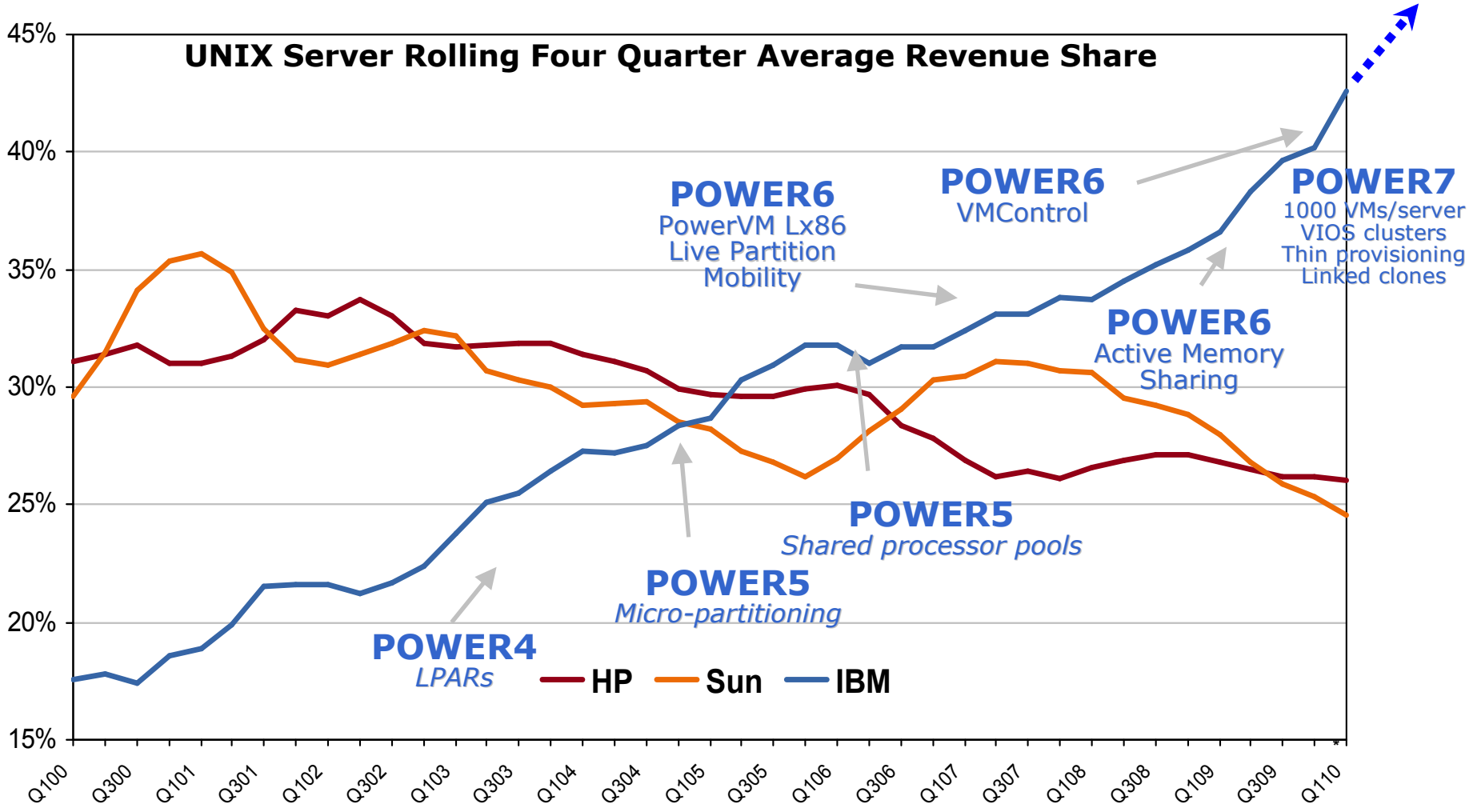
PowerVM helps drive Power Systems success



Source: IDC Quarterly Server Tracker, May 2010

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PowerVM Functions and Capabilities

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PowerVM Editions are tailored to client needs

PowerVM Editions offer a unified virtualization solution for all Power workloads

PowerVM Editions	Express	Standard	Enterprise
Concurrent VMs	2 per server	10 per core (up to 1000)	10 per core (up to 1000)
Virtual I/O Server	✓	✓ ✓	✓ ✓
PowerVM Lx86	✓	✓	✓
Suspend/Resume		✓	✓
Shared Processor Pools		✓	✓
Shared Storage Pools		✓	✓
Thin Provisioning		✓	✓
Live Partition Mobility			✓
Active Memory Sharing			✓

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New PowerVM™ release delivers the next generation of virtualized storage

- **Shared storage pools**
  - Enables Virtual Machines on multiple servers to access shared storage
- **Thin provisioning**
  - Dynamically optimizes utilization for cost-efficient use of storage
- **Enhanced virtualized networking**
  - Tighter integration, optimized performance and granular security
- **Suspend/resume**
  - Simplifies system administration and diagnostics

PowerVM Editions	Express	Standard	Enterprise
Maximum VMs	2 per server + VIOS	10 per core (up to 1000)	10 per core (up to 1000)
Virtual I/O Server	✓	✓✓ (Linked)	✓✓ (Linked)
PowerVM Lx86	✓	✓	✓
Suspend/Resume		✓	✓
Shared Processor Pools		✓	✓
Shared Storage Pools		✓	✓
Thin Provisioning		✓	✓
Live Partition Mobility			✓
Active Memory™ Sharing			✓

PowerVM beats VMware in criteria that clients value most:
performance, scalability, flexibility and integration

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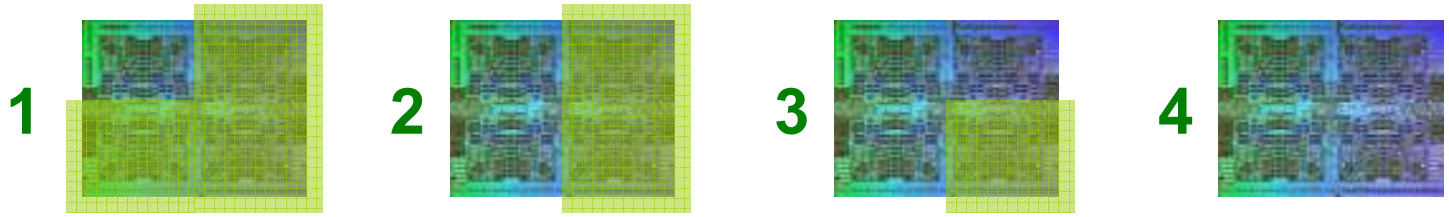
New: PowerVM entry-level licensing



- Intended audience: Clients seeking entry-level Power Systems virtualization on fewer cores than are built into a POWER7 chip
- Solution: PowerVM can be licensed for less than four cores
  - For example, a client can license PowerVM on a single-socket server (with a four-core POWER7 chip) for just one, two or three cores
  - Does not force clients to pay for more than they need
- Note: PowerVM *must still be licensed for all active cores on a system*
- Business benefits
  - Creates more affordable entry point for new PowerVM prospects
  - Encourages broader deployment of virtualization on Power Systems

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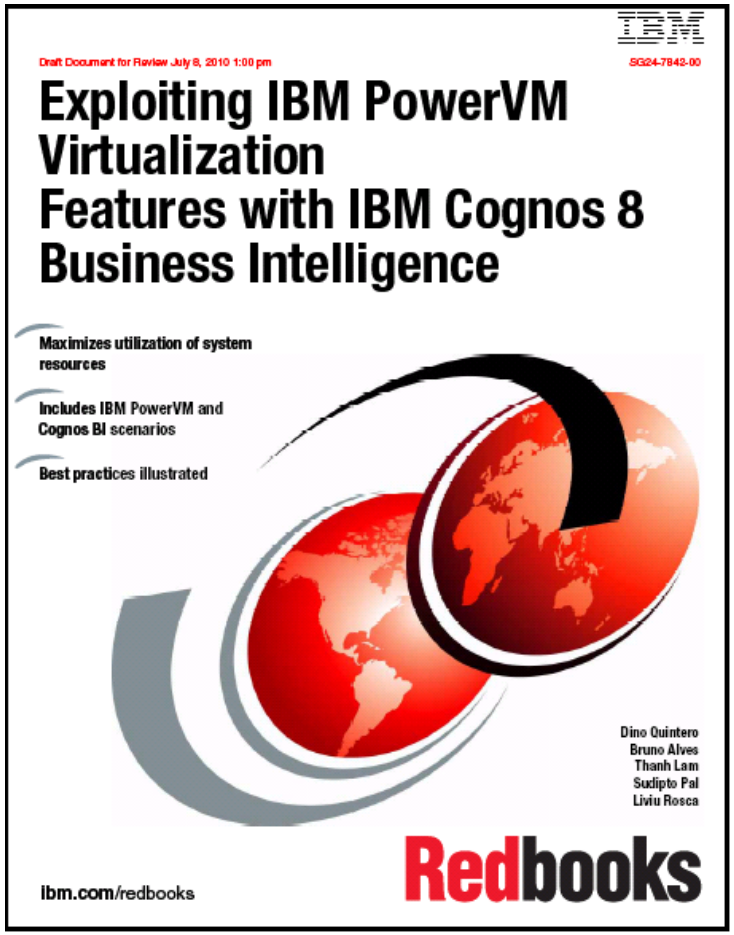
New PowerVM resources

- New IBM Redbook:
  - ***Exploiting IBM PowerVM Virtualization Features with IBM Cognos 8 Business Intelligence***
- Updated white paper:
  - ***A Comparison of PowerVM and VMware Virtualization Performance***
- New white paper:
  - ***Best Practices in Migrating Linux/x86 Workloads to Power Systems with PowerVM***
- PowerVM Flash Videos:
  - ***Live Partition Mobility***
  - ***Active Memory Sharing***
  - ***PowerVM Lx86***



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IBM Systems Director with VMControl: Management with Automation

Integrated service management for simplified IT operations

Automated management, provisioning and optimization of physical/virtual servers and system pools ensure that your cloud resources are automatically provisioned for optimal utilization

✓ Combines management functions into a **single virtualization management tool**

✓ Automated provisioning of standardized virtual images enable you to **reduce deployment times from days to hours** and **reduces deployment errors**

✓ **Improved manageability** by combining multiple virtual resources into one manageable entity

✓**Automated virtual image mobility** within the system pool for optimal utilization and resilience

✓ **Optimizes virtual assets** within a system pool for performance, availability and energy use

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VMControl Editions: Adds value to PowerVM

VMControl	VMControl Express Edition	VMControl Standard Edition	VMControl Enterprise Edition
Virtualization Capabilities	**Manage** resources	**Automate** virtual images	**Optimize** system pools
PowerVM	AIX, i for Business, Linux	AIX, Linux	AIX, Linux
Create/manage virtual machines (x86, PowerVM and z/VM)	✓	✓	✓
Virtual machine relocation	*✓	✓	✓
Capture/import, create/remove standardized virtual images		✓	✓
Deploy standard virtual images		✓	✓
Maintain virtual images in a centralized library		✓	✓
Create/remove system pools and manage system pool resources			✓
Add/remove physical servers within system pools			✓

**** VM relocation is not supported for IBM i workloads***

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Agenda

- PowerVM
- **PowerVM vs the others**
- PowerVM features

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PowerVM: More scalable and flexible than VMware or any x86 virtualization product

Virtualization Capabilities	VMware ESX 3.5 *(in VMware Infrastructure 3)*	VMware ESX 4.0 *(in VMware vSphere 4.1)*	PowerVM
Virtual CPUs per VM	4	8	256
Memory per VM	64 GB	255 GB	8192 GB
Live VMs per server	192	320	1000
CPU threads per server	32	64	1024
Memory per server	256 GB	1024 GB	8192 GB
Dynamic CPU/memory	No	Add (but not Remove)	Yes
Direct I/O access	No	Some (with Nehalem)	Yes
Implementation	Third-party software	Third-party software	Built-in firmware
Hypervisor I/O isolation	No	No	Yes (using VIOS)
Cross-platform virtualization	No	No	Yes (using Lx86)
Mobility across generations	No	Some (with Nehalem)	Yes (POWER6-7)

Source: http://www.vmware.com/pdf/vsphere4/r40/vsp_40_config_max.pdf

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PowerVM Leads Oracle /Sun Virtualization

Virtualization capability	Sun Logical Domains 1.1	PowerVM Editions	PowerVM Business Benefit
Support across entire product line	Sun UltraSPARC T1/T2 servers only	All Power Systems servers	**Standardize on one virtualization solution across an entire line of servers**
Maximum Partitions	32(T1) 128(T2+)	1000	**Consolidate more server workloads**
Dynamic logical partitioning	Add/remove CPU Add-only virtual I/O	Yes	**Adapt to changes without downtime**
Support for live partition mobility	'Warm' migration with many constraints	Yes	**Decrease downtime in your enterprise**
Support for dedicated I/O	No	Yes	**Superior performance for I/O intensive workloads**
Cross-platform virtualization	No	Yes (Lx86)	**PowerVM can consolidate workloads from four different platforms**

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PowerVM Leads HP Virtualization

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

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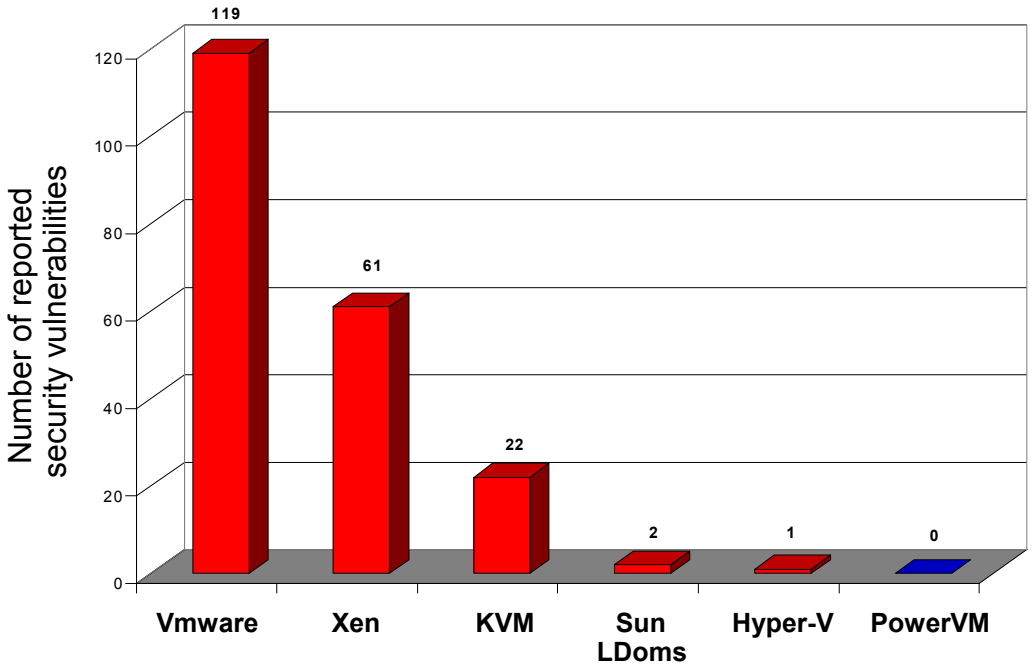
PowerVM provides the security customers demand for their mission-critical workloads

PowerVM has never had a single reported security vulnerability



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

australian open
The Grand Slam of Asia/Pacific

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

— Dr. Chris Yates, CIO Tennis Australia

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Agenda

- PowerVM
- PowerVM vs the others
- **PowerVM features**

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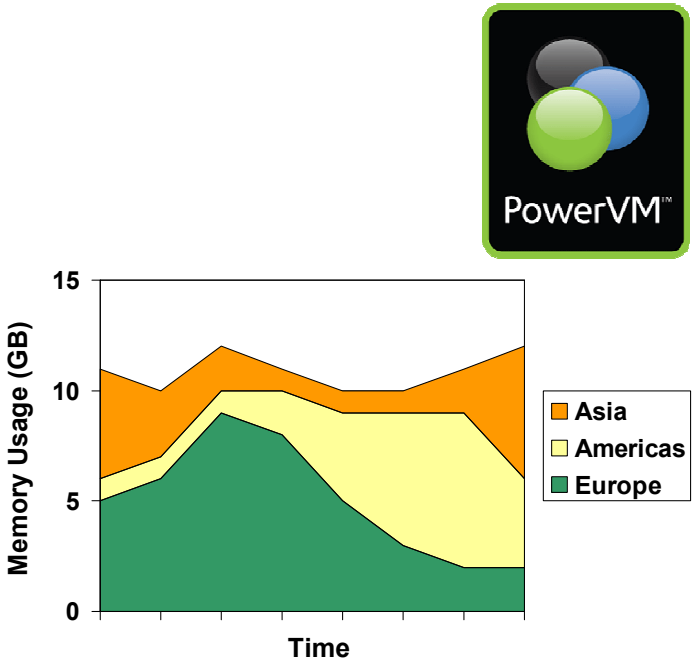
PowerVM Active Memory Sharing Optimizes Resource Use

- Dynamically adjusts memory available on a physical system for multiple virtual images based on their workload activity levels:
  - Different workload peaks due to time zones
  - Mixed workloads with different time of day peaks (e.g. CRM by day, batch at night)
  - Ideal for highly-consolidated workloads with low or sporadic memory requirements
- Available with PowerVM Enterprise Edition
  - Supports AIX, IBM i and Linux workloads
- Blends Power Systems hardware, firmware and software enhancements to optimize resources
  - Supports over-commitment of logical memory
  - Overflow managed by VIOS paging device
  - Two VIOS partitions can be used for redundancy
  - Compatible with Live Partition Mobility



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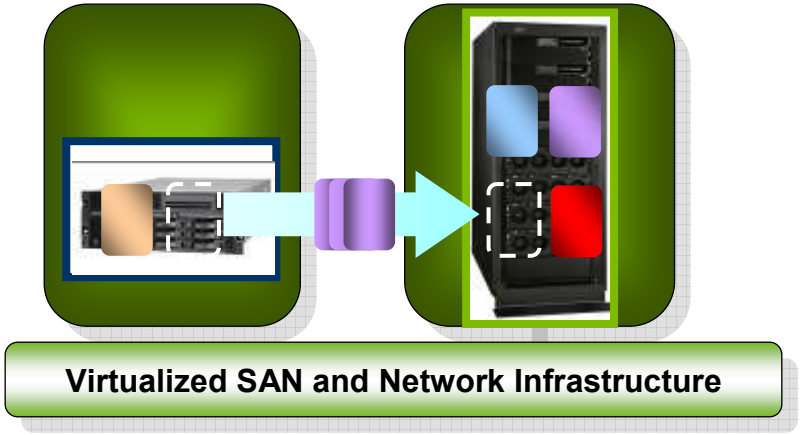
PowerVM Live Partition Mobility Improves Service Levels

Business and IT security and resiliency are as critical as ever, and must be dynamic and intelligent in order to match the speed of business change

- PowerVM Live Partition Mobility
  - Move running AIX and Linux partitions between systems



- Eliminate planned outages and balance workloads across systems

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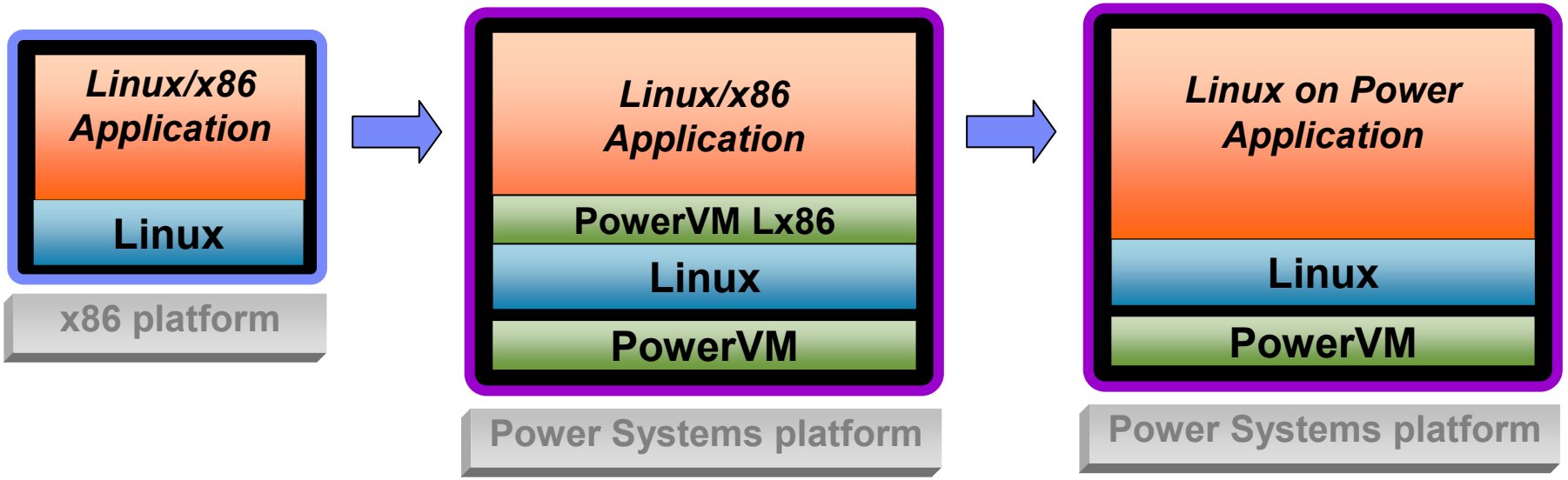
PowerVM Lx86 Accelerates Linux Workload Migration

- PowerVM Lx86 cross-platform virtualization runs unmodified Linux/x86 applications within VMs using Linux on Power
  - Copy x86 application binaries and run them – no rewriting necessary
  - Run Linux/x86 workloads with AIX, IBM i and Linux on Power workloads
- Simplifies migration and virtualization of workloads from x86-based platforms to higher-performance Power Systems servers running Linux
- Provides a convenient 'bridge' to native compilation of Linux workloads
- Included with all PowerVM Editions



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PowerVM: Virtualization without Limits

A key decision point for your cloud environment

Enterprise QOS virtualization capability with **higher performance**, **more scalability**, and **enterprise security** provides the best foundation for your cloud

- ✓ Drive systems to over **90% utilization**
- ✓ **Live Partition Mobility** with VM's of any size up to the entire system that can easily move between your POWER6 and POWER7 systems
- ✓ **Scales seamlessly from 1/10 of a core to 256 cores** and can use all resources of the host server
- ✓ **Dynamic changes** to any IT resource without reboot
- ✓ **Integrated storage virtualization** for simplified provisioning and management of virtual servers
- ✓ **Secure by design** with Zero common vulnerabilities exposures (CVEs) reported against PowerVM by US CERT or by MITRE Corporation.

*All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only. Some features require the purchase of additional software components.

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… align needs to manage both virtual and physical systems

PowerVM™ Express Edition	PowerVM Standard Edition	PowerVM Enterprise Edition
Evaluation	**Production**	**Consolidation**
VMControl Express Edition	VMControl Standard Edition	VMControl Enterprise Edition
Manage	**Automate**	**Optimize**
Systems Director Express Edition	Systems Director Standard Edition	Systems Director Enterprise Edition
Manage ▪ System resource relationships ▪ Server health alerts ▪ System updates	**Automate** ▪ Energy alerts and trend analysis ▪ Network system health alerts	**Optimize** ▪ Data warehouse and reporting ▪ Performance/capacity trend analysis

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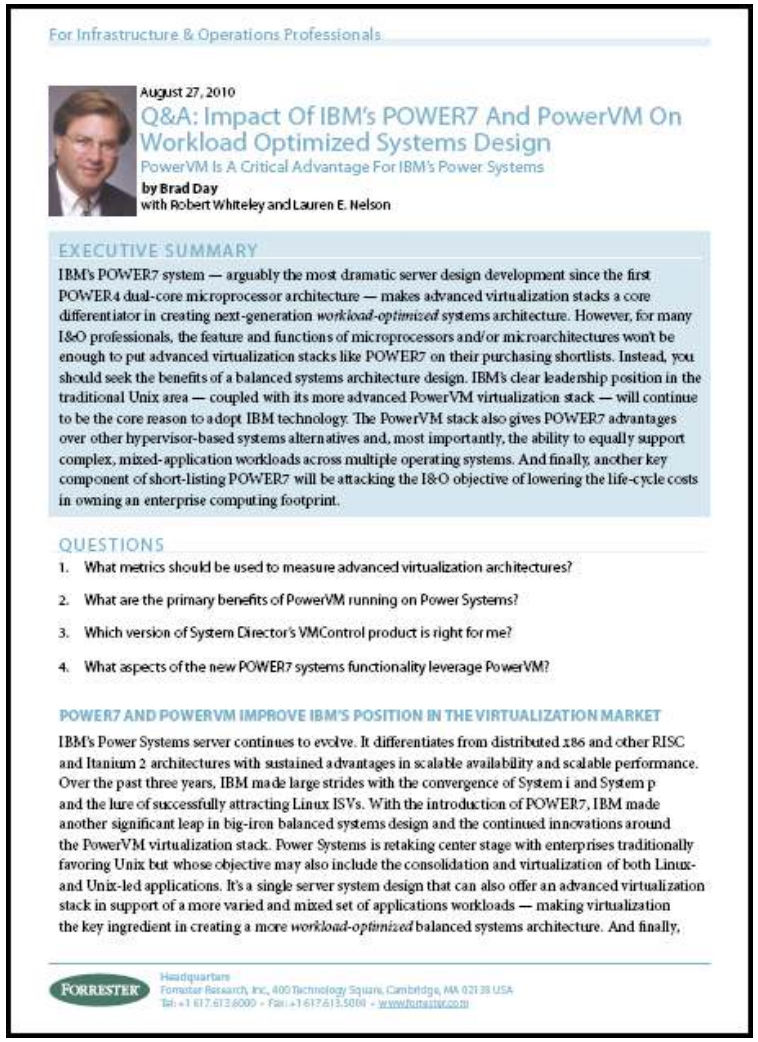
Positive Feedback: Analyst commentary on PowerVM



For Infrastructure & Operations Professionals

August 27, 2010

Q&A: Impact Of IBM's POWER7 And PowerVM On Workload Optimized Systems Design

PowerVM Is A Critical Advantage For IBM's Power Systems

by Brad Day
with Robert Whiteley and Lauren E. Nelson

EXECUTIVE SUMMARY

IBM's POWER7 system — arguably the most dramatic server design development since the first POWER4 dual-core microprocessor architecture — makes advanced virtualization stacks a core differentiator in creating next-generation *workload-optimized* systems architecture. However, for many I&O professionals, the feature and functions of microprocessors and/or microarchitectures won't be enough to put advanced virtualization stacks like POWER7 on their purchasing shortlists. Instead, you should seek the benefits of a balanced systems architecture design. IBM's clear leadership position in the traditional Unix area — coupled with its more advanced PowerVM virtualization stack — will continue to be the core reason to adopt IBM technology. The PowerVM stack also gives POWER7 advantages over other hypervisor-based systems alternatives and, most importantly, the ability to equally support complex, mixed-application workloads across multiple operating systems. And finally, another key component of short-listing POWER7 will be attacking the I&O objective of lowering the life-cycle costs in owning an enterprise computing footprint.

QUESTIONS

1. What metrics should be used to measure advanced virtualization architectures?
2. What are the primary benefits of PowerVM running on Power Systems?
3. Which version of System Director's VMControl product is right for me?
4. What aspects of the new POWER7 systems functionality leverage PowerVM?

POWER7 AND POWERVM IMPROVE IBM'S POSITION IN THE VIRTUALIZATION MARKET

IBM's Power Systems server continues to evolve. It differentiates from distributed x86 and other RISC and Itanium 2 architectures with sustained advantages in scalable availability and scalable performance. Over the past three years, IBM made large strides with the convergence of System i and System p and the lure of successfully attracting Linux ISVs. With the introduction of POWER7, IBM made another significant leap in big-iron balanced systems design and the continued innovations around the PowerVM virtualization stack. Power Systems is retaking center stage with enterprises traditionally favoring Unix but whose objective may also include the consolidation and virtualization of both Linux- and Unix-led applications. It's a single server system design that can also offer an advanced virtualization stack in support of a more varied and mixed set of applications workloads — making virtualization the key ingredient in creating a more *workload-optimized* balanced systems architecture. And finally,

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Headquarters
Forrester Research, Inc., 400 Technology Square, Cambridge, MA 02139 USA
Tel: +1 617 613 6000 • Fax: +1 617 613 5000 • www.forrester.com

- *"IBM's clear leadership position in the traditional Unix area — coupled with its more advanced PowerVM virtualization stack — will continue to be the core reason to adopt IBM technology. The PowerVM stack also gives POWER7 advantages over other hypervisor-based systems alternatives and, most importantly, the ability to equally support complex, mixed-application workloads across multiple operating systems."*
  - *Brad Day, Forrester Research*
  - *(August 2010)*

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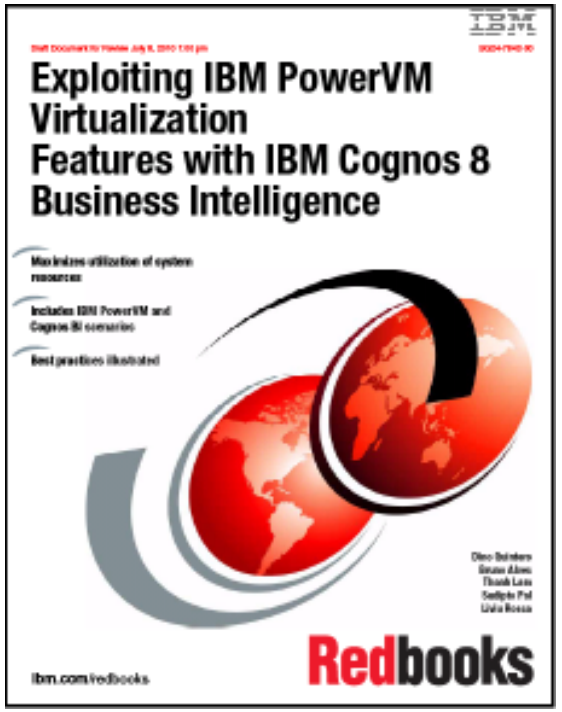
Learn more about PowerVM on the Web

http://www.ibm.com/systems/power/software/virtualization

(… or Google 'PowerVM' and click I'm Feeling Lucky)



PowerVM resources include white papers, demos, client references and Redbooks

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AIX V7 and PowerHA V7

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Power System Software highlights

AIX 7: The most scalable UNIX, new runtime management and compliance features

PowerHA: Integrated with cluster aware AIX; New Director management and Smart Assist application agents

i Solution Editions: Save on configurations for leading ERP apps

Linux: Easy installation or preload, boost Linux application performance 20% with IBM Advanced Toolchain, and simplify image management with Linux containers

Systems Director 6.2: new availability and security features including Linux support for automated virtual image management, provisioning and relocation

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Power Systems with AIX deliver 99.997% uptime

AIX & Power Systems delivers the best reliability of UNIX, Linux, and Windows

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

Reliability: ***The fewest unscheduled outages***

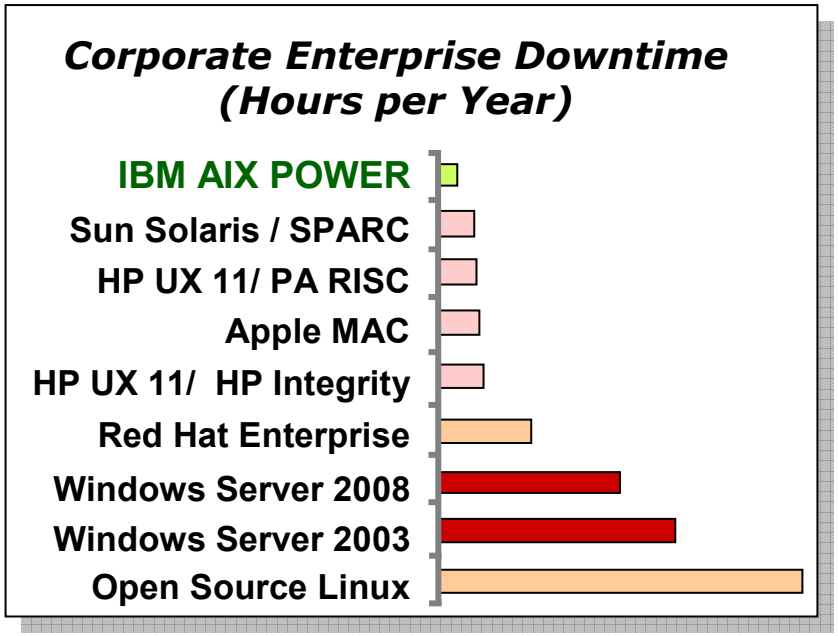
- Less than one outage per year

Availability: ***The least amount of downtime***

- 15 minutes a year (99.997% uptime)
- 2.3 times better than the closest UNIX competitor
- More than 10X better than Windows

Serviceability: ***The fastest patch time***

- 11 minutes to apply a patch



Source: ITIC 2009 Global Server Hardware & Server OS Reliability Survey Results, July 7, 2009 Fully paper is available at ibm.com/aix

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What we are announcing

- AIX 7
  - *The Future of UNIX*
- AIX 5.2 Workload Partitions for AIX 7
  - *A new way to consolidate older workloads on POWER7*

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AIX 7 – the future of UNIX

- **Virtualization without limits**
  - Run AIX 5.2 WPARs[1] to consolidate & lower cost of critical business applications on POWER7
- **Resiliency without downtime**
  - Built in clustering simplifies configuration and management, plus provides a foundation for PowerHA solutions
- **Data protection and compliance**
  - Extended administrator options for role based access control
  - Designed for deployments requiring CAPP/EAL4+ certification
- **Management with automation**
  - Simplified profile based configuration management[2]

[1]Requires "AIX 5.2 WPAR for AIX 7" product
[2]Requires IBM Systems Director

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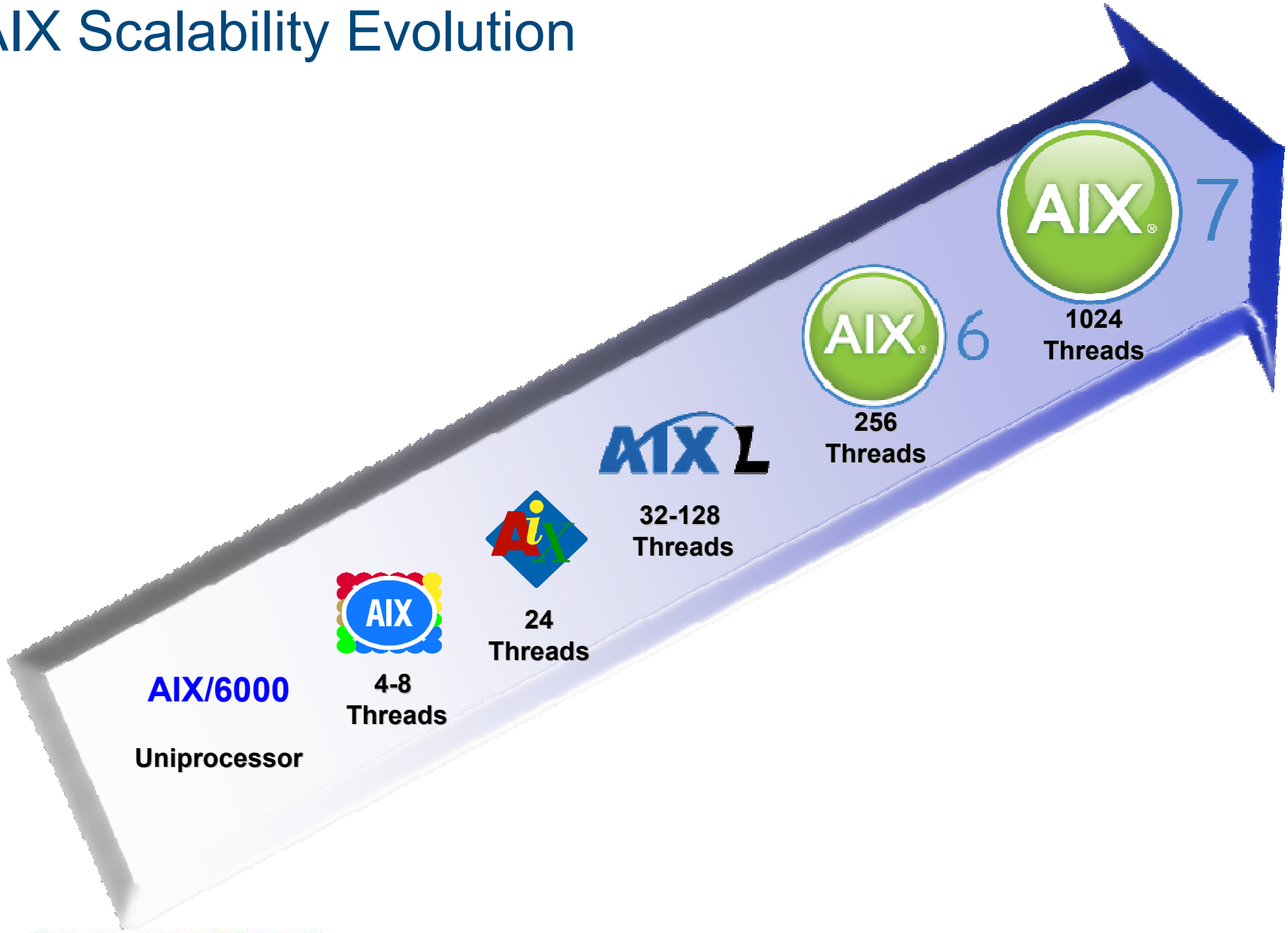
AIX Scalability Evolution



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AIX 7 Hardware Enablement and Support

- Terabyte Segment support
  - *Designed to improve performance for workloads that use large amounts of memory*
- AIX kernel memory pinning
  - *AIX 7 memory pinned by default to enhance performance*
- Hardware acceleration for Encrypting Filesystems, IPSec and Trusted Execution
  - *Reduce processor workload for encryption*
- LVM Solid State Disk Support
  - *SSD only VGs, enhancements to filemon to identify SSD candiates*
- Shared Memory interface to Barrier Synchronous Register
  - *Reduce need for kernel extensions for BSR access*

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WPAR Enhancements

- Export of Fibre channel adapters to WPARs
  - *NPIV-like, but can work on any Fibre Channel adapter*
  - *Adds support for Fibre Channel tape*
- Kernel Extensions for WPARs
  - *Trusted kernel extensions may be loaded by the WPAR administrator*
  - *Extensions can be only for one WPAR or for entire system*
- Support for VIOS disks in WPARs (also in AIX 6.1 TL6)
  - *Long requested feature*

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AIX 5.2 Workload Partitions for AIX 7

- **Reduce business risk with ongoing support for AIX 5.2**
  - Phone support, plus patches for critical security and data integrity problems
- **Lower infrastructure costs for critical business applications**
  - Consolidate AIX 5.2 workloads on latest POWER7 servers and blades
- **Set the right technology upgrade strategy for your business**
  - Exploit the lower costs of POWER7 now, and plan for AIX 7 when ready
- **Simplify application consolidation and management**
  - Back up existing AIX 5.2 partitions and restore them into a WPAR on AIX 7

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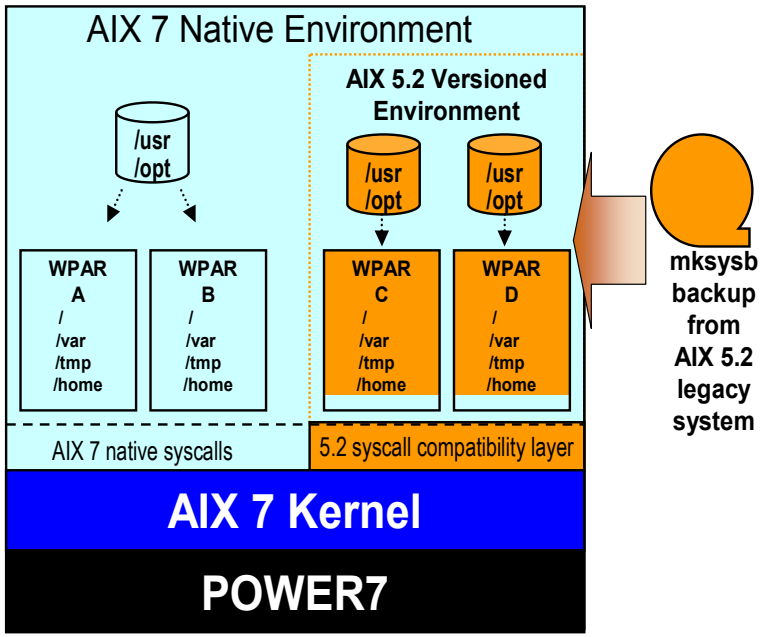
AIX 5.2 WPARs for AIX 7

How does it work?

- *Client simply backs up existing legacy AIX 5.2 environment and restores into an AIX 7 WPAR*
- *The AIX 5.2 environment including rootvg filesystems are preserved and restored*
- *Client applications continue to run in AIX 5.2 environment with AIX 5.2 libraries*
- *The kernel environment will be AIX 7*
  - *SMT4, MicroPartitioning and VIOS are supported!*
- *The SWMA for this offering will also provide how-to and limited defect support for the AIX 5.2 operating system*
- Managed via IBM Systems Director Workload Partitions Manager or command line



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Some features require the purchase of additional software components.

AIX 5.2 WPARs for AIX 7 is a separately charged product built on AIX 7

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Cluster Aware AIX

Designed to simplify construction and management of clusters of AIX systems for scale-out computing and high availability

- Easily create clusters of AIX instances for scale-out computing or high availability
- Designed to:
  - Significantly simplify cluster configuration, construction, and maintenance
  - Designed to improve availability by reducing the time to discover failures
  - Capabilities such as common device naming help simplify administration
  - Built in event management and monitoring
- A foundation for future AIX capabilities and the next generation of PowerHA SystemMirror

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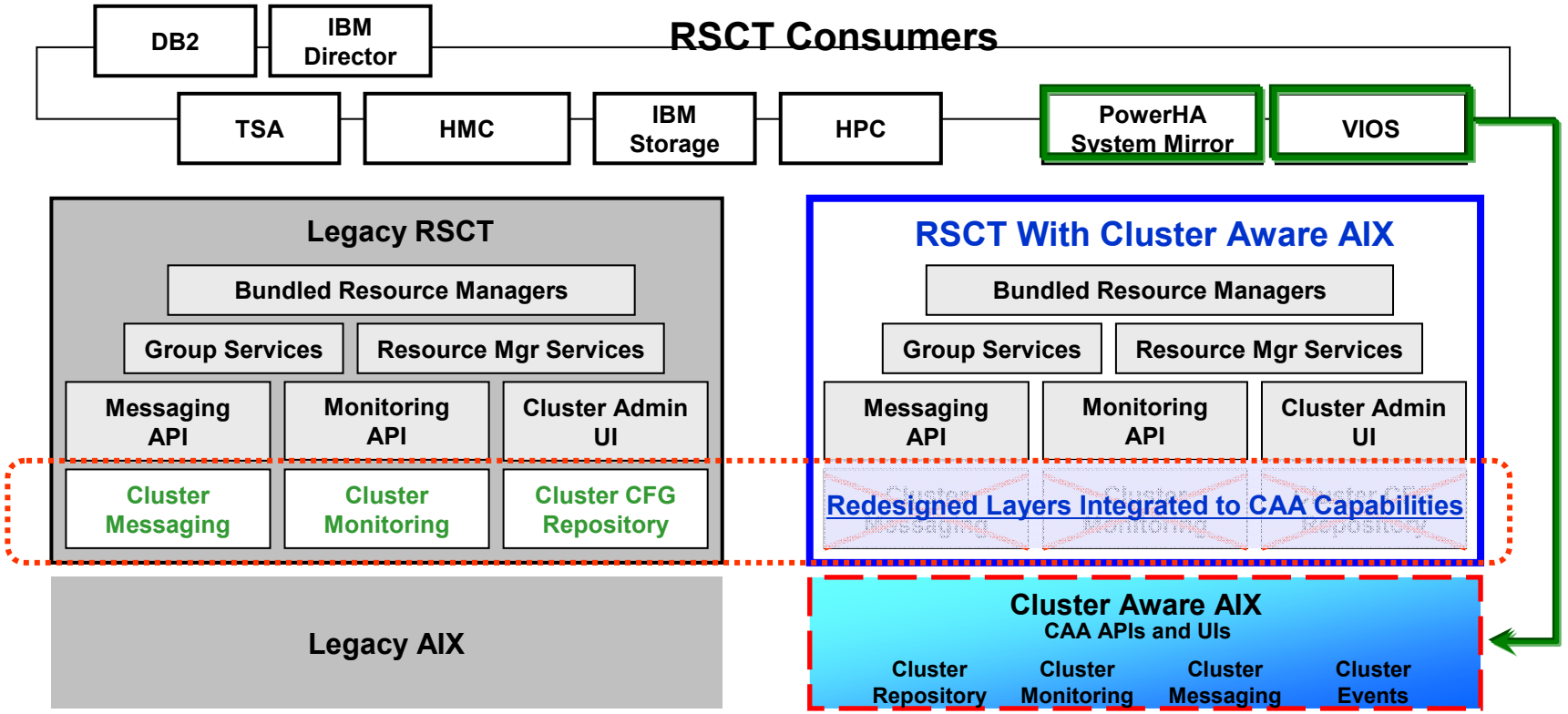
Cluster Aware AIX Exploiters



- RSCT and Cluster Aware AIX together provide the foundation of strategic Power Systems SW
- RSCT-CAA integration enables compatibility with a diverse set of dependent IBM products
- RSCT integration with CAA extends simplified cluster management along with optimized and robust cluster monitoring, failure detection, and recovery to RSCT exploiters on Power / AIX

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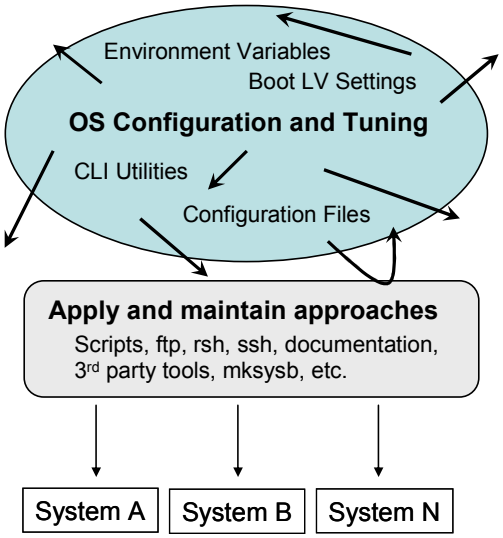
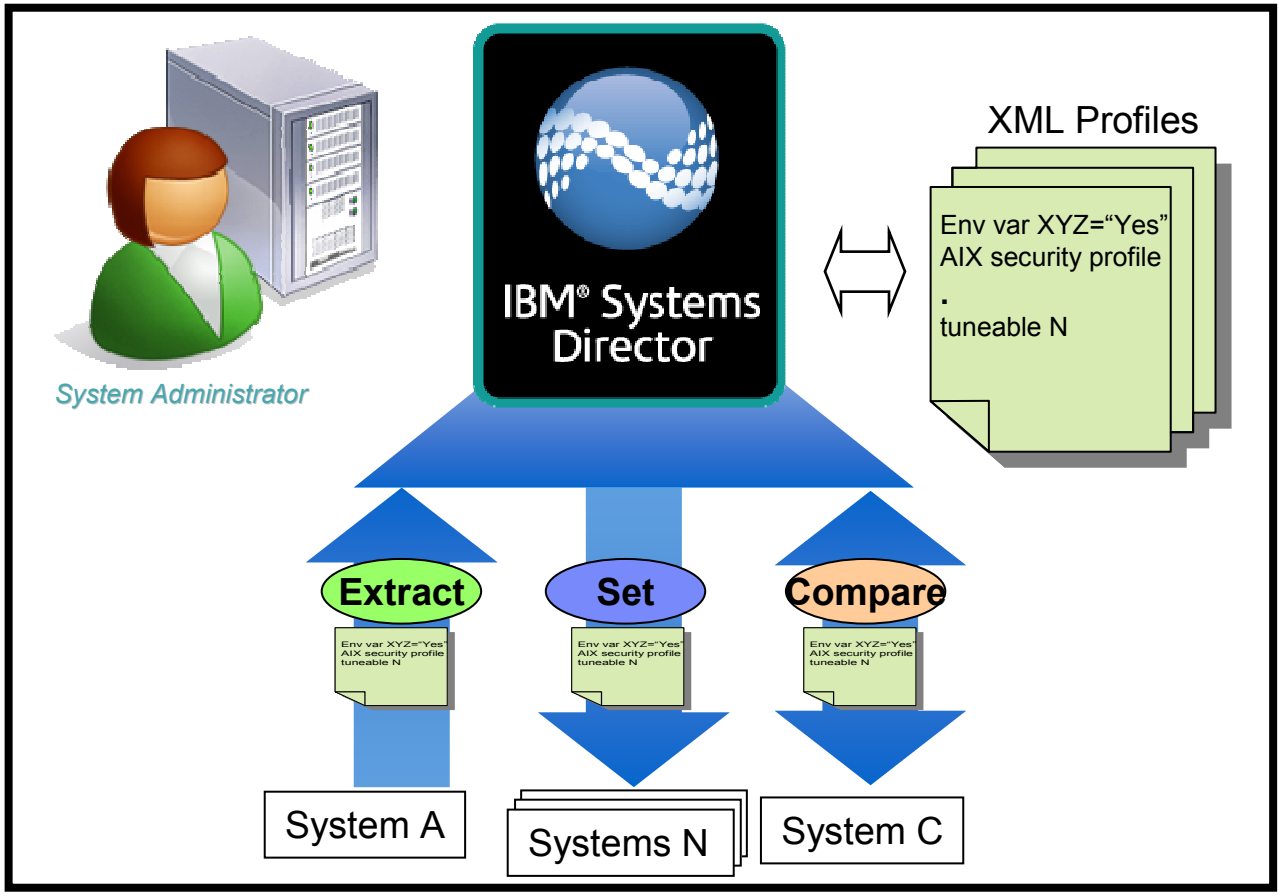
AIX 7 Profile Manager (Formerly AIX Runtime Expert)

Systems Director plug-in that is designed to simplify consistent AIX configuration across multiple systems

Traditional server configuration



Simplified configuration using the AIX Profile Manager



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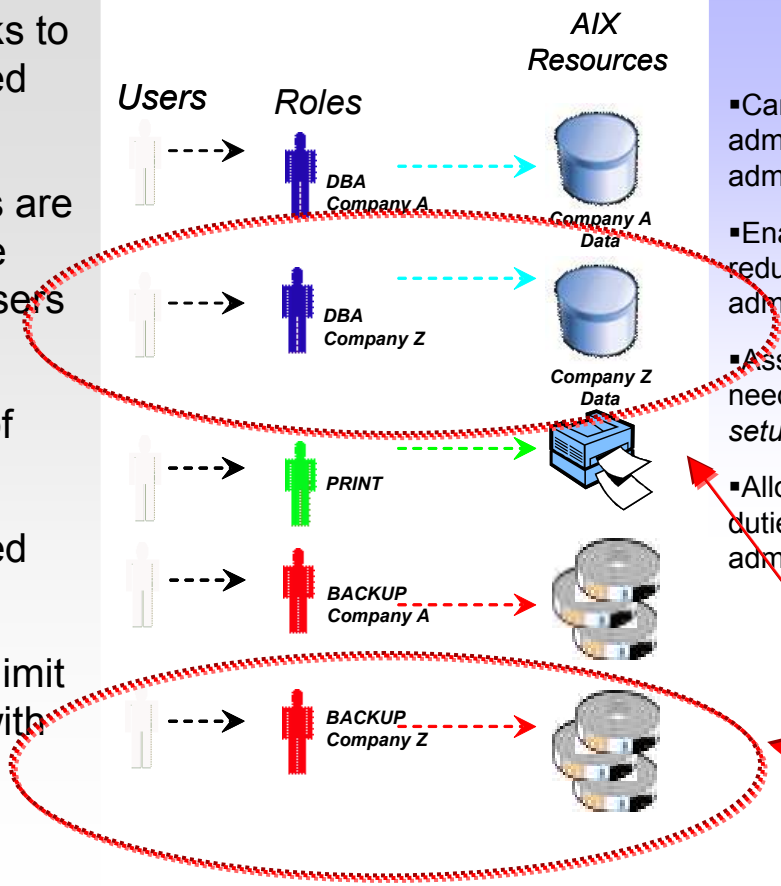
AIX Role Based Access Control (RBAC) with Domains

What is it?

- A capability of AIX that allows privileged administration tasks to be delegated to non-privileged users
- Access to system resources are associated with roles that are assigned to non-privileged users
- Many roles are predefined which can reduce the effort of implementing RBAC
- Roles can also be associated with programs
- Domain access can further limit administrators to only work with resources for a particular organization (AIX 7)



How it can help?

- Can reduce the cost and complexity of security administration by allowing secure delegation of administrative tasks to non-privileged users
- Enables a more secure IT infrastructure by reducing the need for so many privileged administrators
- Assigning roles to programs can reduce the need for security exposures such as the use of *setuid* for programs
- Allows for new ways to delegate administration duties between system administrators and non-administrative users

Domain support Provides more granularity for multi-tenant IT shops

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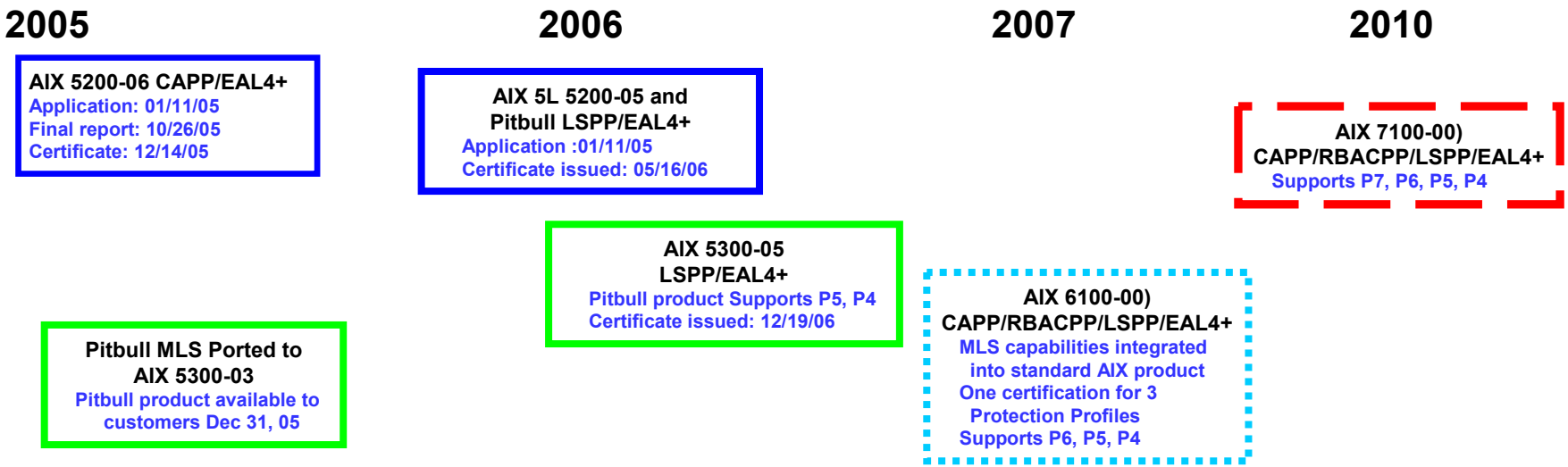
AIX & Power Systems Security Certifications



Certification History

AIX 4.2 C2: Apr 24, 1997
AIX 4.3 C2: May 6, 19987
AIX 5.2 CAPP/EAL4+ : Nov 4, 2002
POWER4 HW CAPP/EAL4+ : Apr 2003
AIX 5.2 ML1 CAPP/EAL4+ : Sept 8, 2003
AIX 5.2 ML6 CAPP/EAL4+ : Dec 14, 2005
AIX 5.2 ML5 and Pitbull LSPP: May 16, 2006
AIX 5.3 TL5 and Pitbull LSPP: May 16, 2006
AIX 5.2 TL4 & VIOS CAPP/EAL4+: Dec 16, 2006
POWER6: Dec, 2007
AIX 6: May 26, 2008

AIX 5300-04 CAPP/EAL4+
Supports P5, P4
Certificate issued: 12/19/06

VIOS EAL4+
Included with AIX 53.00-04
CAPP/EAL4+

POWER6 Hardware
EAL4+
Dynamic LPAR with
MicroPartitioning

Legend
- AIX V5.2
- AIX V5.3
- AIX 6
- AIX 7 (Planned)
- VIOS
- POWER6

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Flexible AIX Editions match the needs of mid-sized companies and large enterprises

Express Edition

- ✓ For blades, entry servers, small workload consolidation
- ✓ Scales up to 4 cores per VM, 8GB of memory per core

Standard Edition

- ✓ Industry leading UNIX for the most demanding workloads
- ✓ Scales up to 256 cores, unlimited memory per core
- ✓ AIX 7 includes Cluster Aware AIX and AIX Profile Manager

Enterprise Edition

- ✓ Industry leading UNIX with integrated management tools
- ✓ Enterprise management tools with IBM Systems Director
- ✓ Virtualization with Workload Partitions Manager™ for AIX

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Why should you move up to AIX 7 or AIX 6?

- More performance on POWER7
  - AIX 7 and AIX 6 can provide substantially more performance on POWER7 than AIX V5.3
  - AIX 7 supports massive workloads with up to 256 cores / 1024 threads
- Access to new features
  - Capabilities like WPARs, Role Based Access Control, AIX Profile Manager are designed to improve security and administrative efficiency
- AIX V5.3 is nearing End of Life
  - End of Marketing announced effective April 2011
- AIX 7 will support running AIX 5.2 in a WPAR
  - Excellent way to consolidate old workloads running on less efficient hardware
- It's FREE!
  - Customers with software maintenance agreements (SWMA) can upgrade for no additional charge within an Edition:

    AIX 5.3 to AIX 7 Standard edition

    AIX 6 Express Edition to AIX 7 Express Edition, etc,

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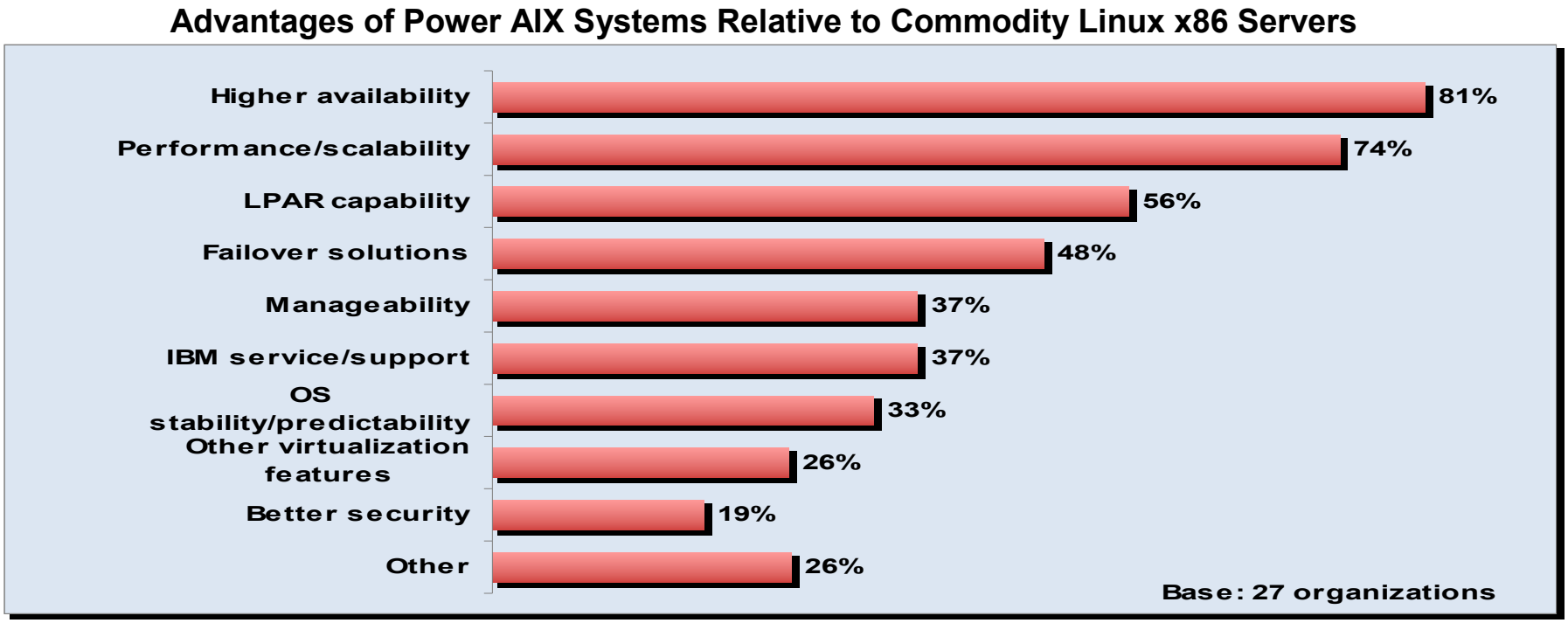
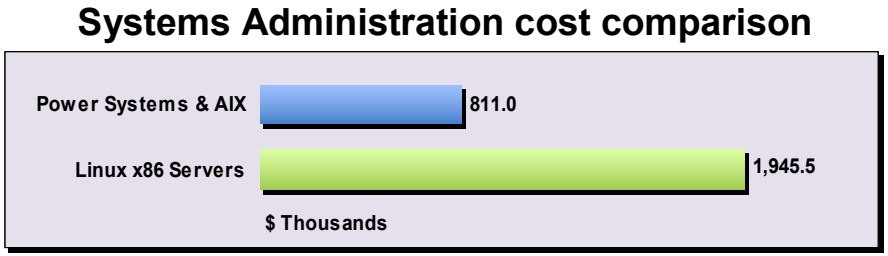
AIX/POWER versus Linux/Commodity x86





From "VALUE PROPOSITION FOR AIX ON IBM POWER SYSTEMS : OWNERSHIP EXPERIENCES COMPARED WITH LINUX ON COMMODITY X86-BASED SERVERS" *International Technology Group ©2010*

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AIX 7: *"The Future of UNIX"*

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PowerHA SystemMirror for AIX Highlights

PowerHA SystemMirror 7.1 Standard Edition

- **Integrated with cluster aware AIX**
  - HA solution for administrative simplicity
- **New director based management interface**
  - For simple centralized multi-cluster management
- **New Smart Assists – application agents**
  - Out of the box deployment for SAP and other popular applications

PowerHA SystemMirror 6.1 Enterprise Edition

- IBM DS8000® Metro Mirror, SVC Metro Mirror & Global Mirror, E*MC SRDF*
- Adding support: for Hitachi Truecopy and IBM DS8700® Global Mirror

IBM intends to enhance PowerHA SystemMirror Enterprise Edition to exploit AIX cluster aware technologies.

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PowerHA SystemMirror 7.1 Standard Edition

Simpler to deploy and easier to manage with IBM Systems Director, intuitive interfaces, cluster and resource group wizards, management dashboards and Smart Assists for SAP and other popular applications

Out of the box support for, DB2, WebSphere, Oracle, SAP, and TSM, Enterprise Content Manager, LDAP, IBM HTTP

Minimize IT operations with cluster aware AIX; cluster wide AIX commands, kernel based event management, device naming, central repository and multi-channel communications

Robust cluster integrity with disk fencing and multi-channel heart beat which automatically uses available I/O including SAN.

Complete end to end failover automation with policy driven resource group relationship sequencing

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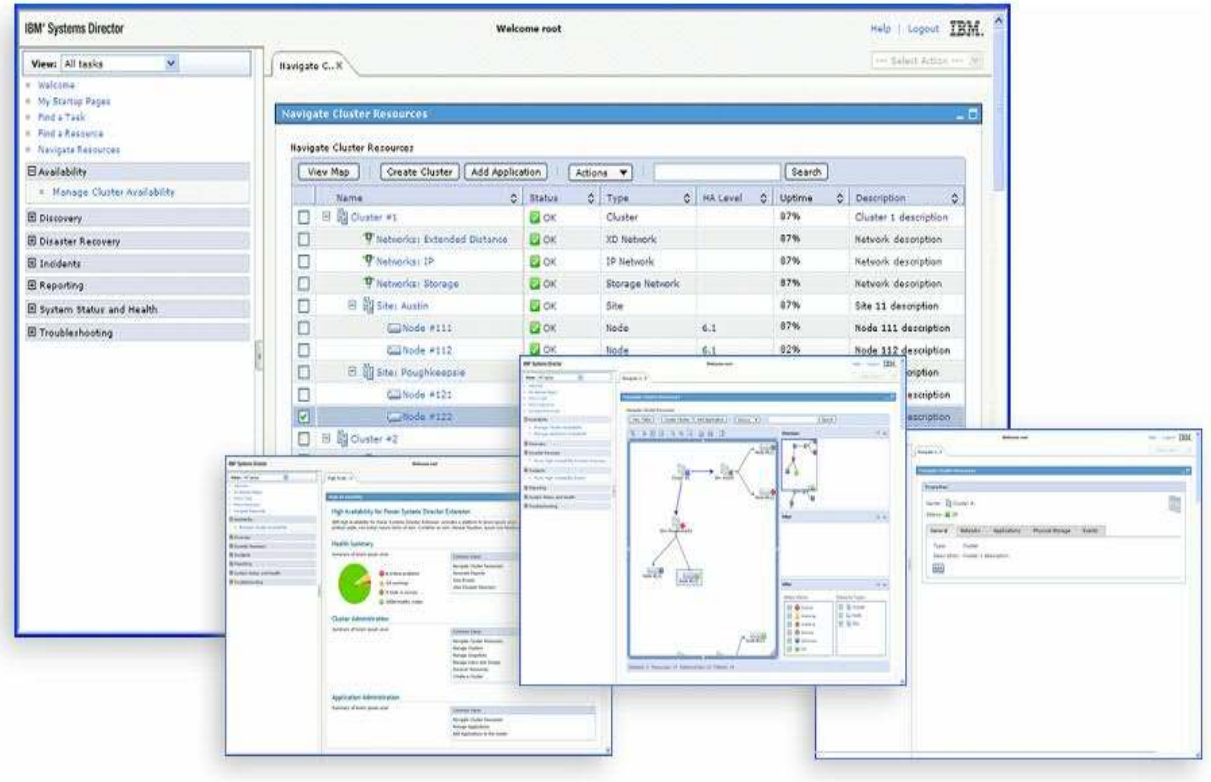
IBM Director: PowerHA Management Interface

State-of-the-art interface

- No charge plug-in
- Masks complexity
- Central management
- Real-time status
- Smart Assist integration
- Deployment wizards



IBM® Systems Director

PowerHA™

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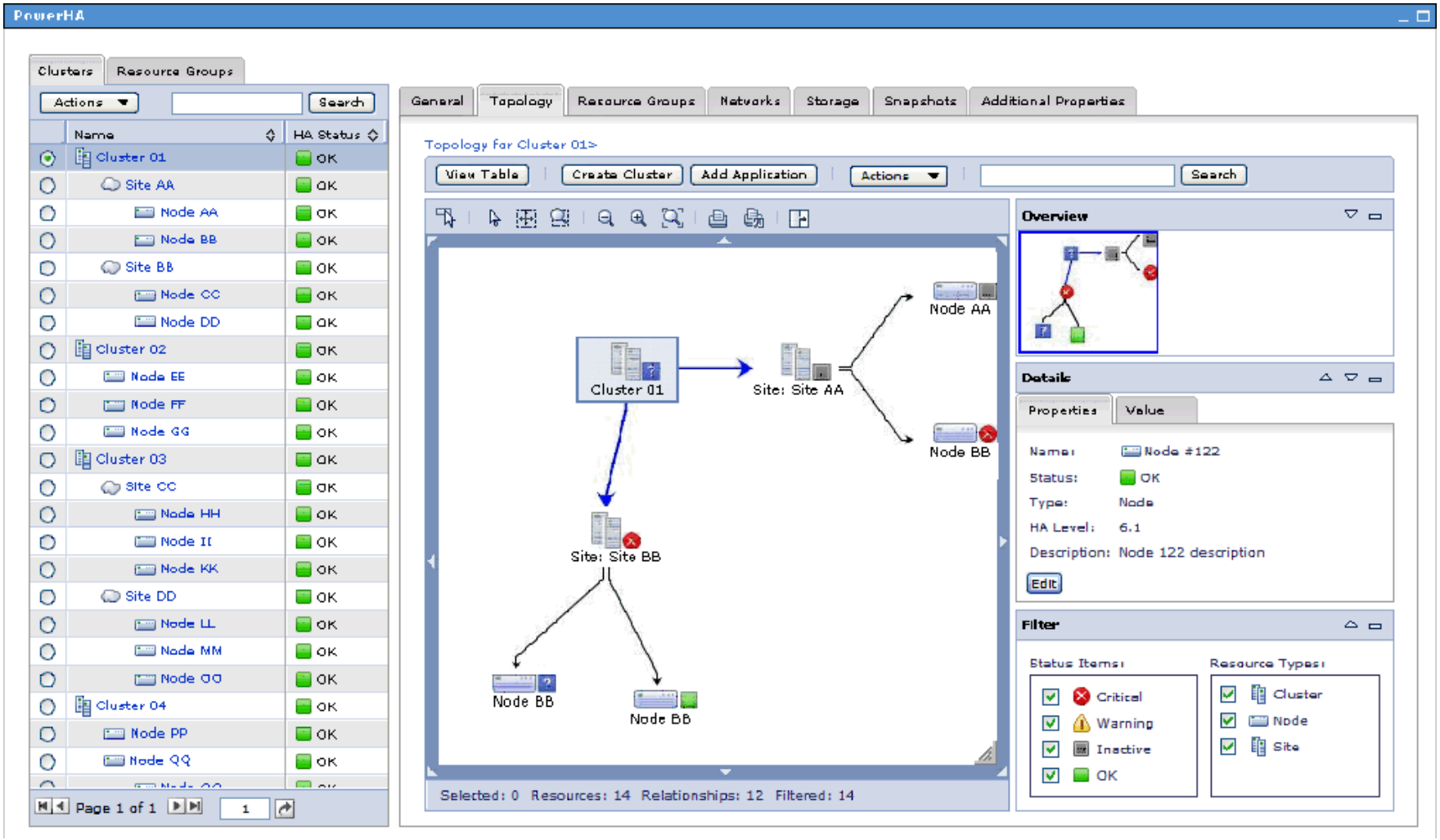
Sample Topology View



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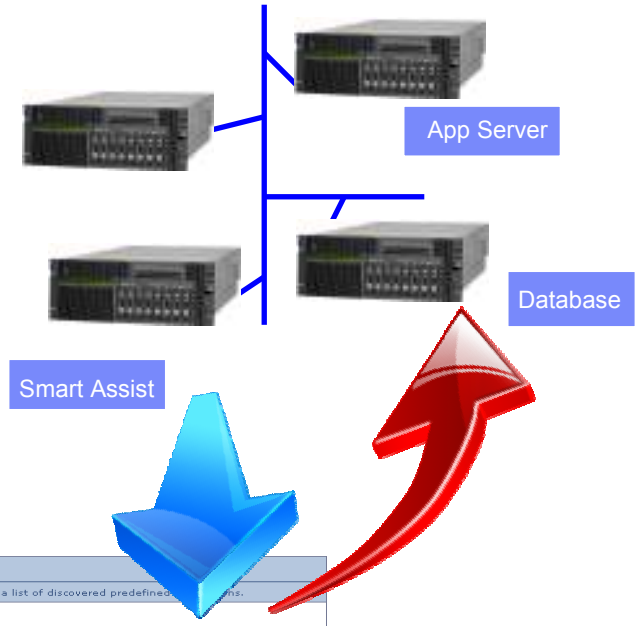
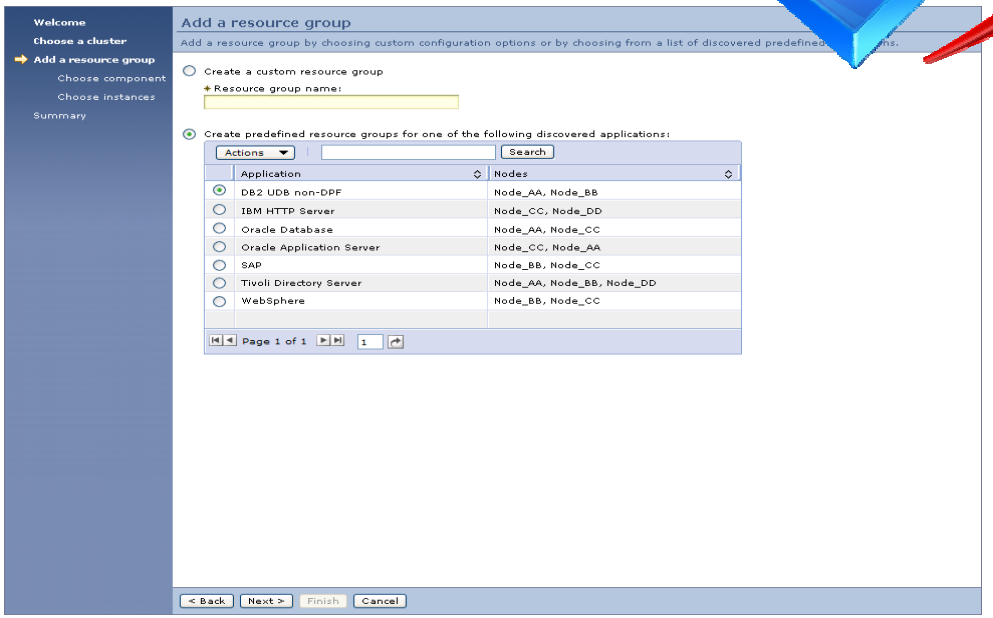
Smart Assists

- **HA agent Support**
  - Discover, Configure, and Manage
- **Resource Group Management**
  - Advanced Relationships
  - Support for Custom Resource Management
- **Out of the box support for**
  - DB2, WebSphere, Oracle, SAP, and TSM
  - Enterprise Content Manager, LDAP, IBM HTTP





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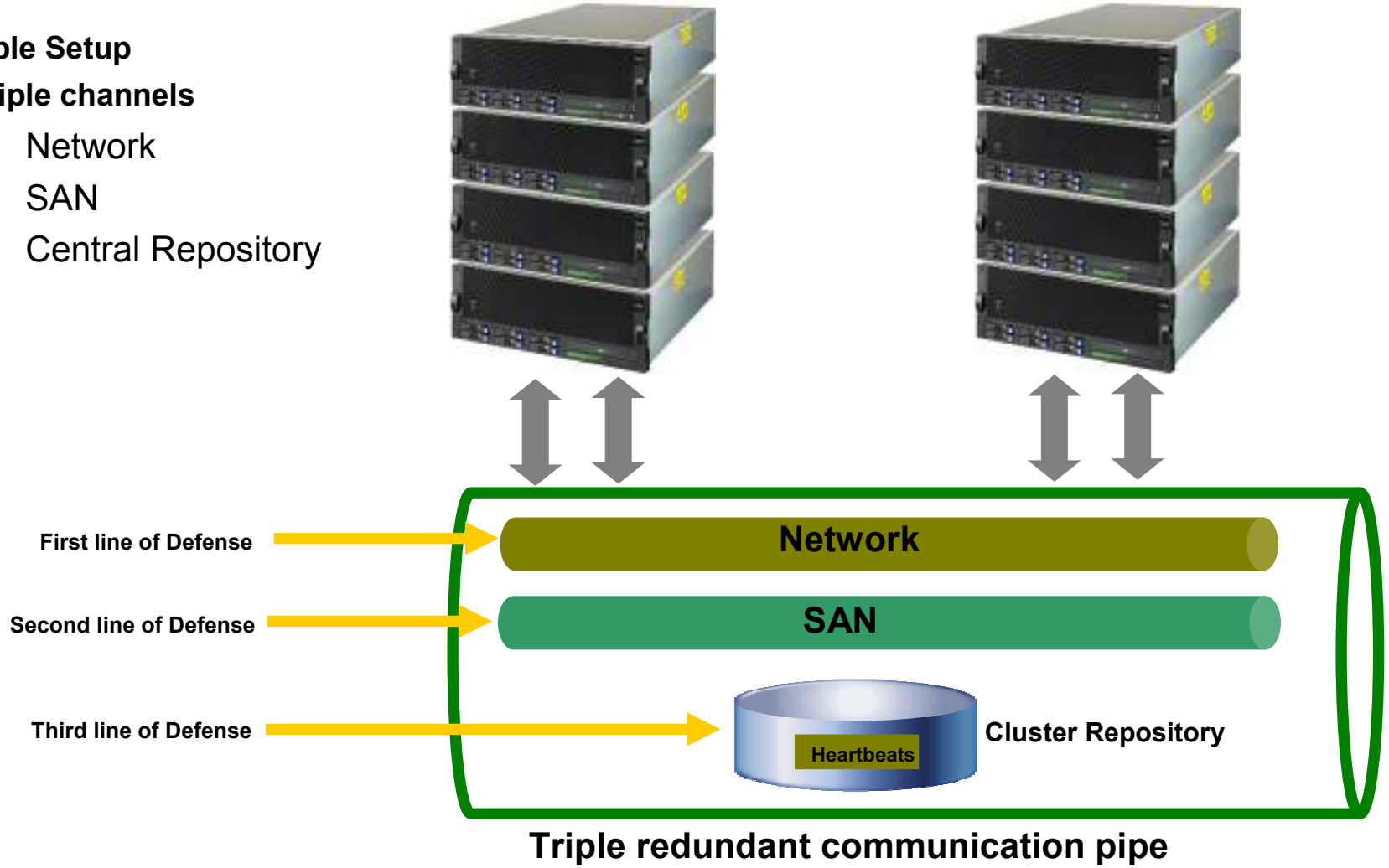
Default Multi Channel Health Management:

- **Simple Setup**
- **Multiple channels**
  - Network
  - SAN
  - Central Repository



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PowerHA SystemMirror 7.1 for AIX

- PowerHA SystemMirror is differentiated by integration with AIX *Cluster Aware*
- Kernel based event management
- PowerHA skills are an extension AIX skills
- WW IBM and BP community support PowerHA

	PowerHA
AIX IT operations skill base	✓
AIX Technical skill support base	✓
AIX Shared Storage management	✓
AIX Volume manager/Mirroring	✓
AIX File System	✓
AIX SMIT Management Tools	✓
AIX Event/error management	✓
AIX DLPAR HA/DR management	✓
Application agents	✓
Director based user interface	✓
AIX Cluster Aware	✓
Kernel based event management	✓
Centralized cluster repository	✓
Triple redundant multi-cast heartbeat	✓
SAN based communications	✓
HA coverage for root Vg storage	✓

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PowerHA SystemMirror 6.1 for AIX Editions

- Standard Edition targeted at datacenter HA
- Enterprise Edition targeted at multi-site HA/DR
- Tiered pricing structure Small/Med/Large
- Expanded storage support with August 2010 announce

	Standard Edition	EnterpriseEdition
Centralized Management CSPOC	✓	✓
Cluster resource management	✓	✓
Shared Storage management	✓	✓
Cluster verification framework	✓	✓
Integrated disk heartbeat	✓	✓
SMIT management interfaces	✓	✓
AIX event/error management	✓	✓
Integrated heartbeat	✓	✓
PowerHA DLPAR HA management	✓	✓
Smart Assists	✓	✓
Multi Site HA Management		✓
PowerHA GLVM async mode		✓
IBM Metro Mirror support		✓
IBM Global Mirror support DS8700		✓
EMC SRDF sync/async		✓
Hitachi Truecopy		✓

http://www.redbooks.ibm.com/Redbooks.nsf/RedpieceAbstracts/sg247841.html?Open

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PowerHA SystemMirror

PowerHA SystemMirror 7.1 Standard Edition represents the next generation of solutions for High Availability.

- ✓ **Cluster Aware AIX** for kernel based HA technology
- ✓ **Director based management** for simple, centralized cluster administration
- ✓ **Smart Assists** for out the box HA deployment of SAP and other popular applications
- ✓ **Multiple redundant heartbeat** with SAN communications for robust cluster integrity
- ✓ **Advanced resource group policies** for automated recovery sequencing

PowerHA SystemMirror 6.1 Enterprise Edition expands storage options for multi-site HA/DR

- ✓ IBM DS8000® Metro Mirror, SVC Metro Mirror & Global Mirror
- ✓ IBM DS8700® Global Mirror
- ✓ EMC SRDF
- ✓ Hitachi Truecopy

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Additional Resources PowerHA for AIX

- PowerHA Website
  - www.ibm.com/systems/power/software/availability/
- PowerHA SystemMirror 7.1 Beta Program….underway
- Availability Factory
  - Contact your IBM representative or an IBM Business Partner and they will contact us via e-mail (hacoc@us.ibm.com) to learn more.
- IBM Technology Service Offering for PowerHA SystemMirror XD deployment
  - http://www-935.ibm.com/services/us/index.wss/offering/its/a1000032
- Redbooks
  - PowerHA on AIX (SG24-7739-00)
  - SG24-7841 IBM PowerHA Enterprise Edition Implementation Guide
  - SG24- 7845 IBM PowerHA v.71 (COMING SOON !)
  - Education: PowerHA for AIX Implementation, Config and Administration AN410
  - Go to IBM.com/services/learning (search for AN410 or PowerHA)
- Education: Lab Services AN44 Extended Distance and Disaster Recovery
  - http://www-304.ibm.com/jct03001c/services/learning/ites.wss/us/en?pageType=course_list&subChapter=194&subChapterInd=S&region=us&subChapterName=AIX+high+availability&country=us
  - http://lpar.co.uk/HA/home.html
- GLVM white paper
  - www.ibm.com/systems/resources/systems_p_os_aix_whitepapers_pdf_aix_glvm.pdf
- IBM storage virtualization offerings
  - www.ibm.com/systems/storage/virtualization
- SAP consulting services for POWERHA and POWERVM
  - gehenni@us.ibm.com
  - sbranden@us.ibm.com
- Wiki
  - http://www.ibm.com/developerworks/wikis/display/WikiPtype/High%20Availability

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PowerHA SystemMirror 7.1 Standard Edition

Feature	*Function*	*Benefit*
Director Based Graphical User Interface	Wizards for cluster deployment and application health management Graphical Topology Management Resource change notification Report generation	Simple centralized multi-cluster management
PowerHA SystemMirror Cluster Aware AIX	Kernel based: Multi cast heat beat Centralized cluster repository Real time event notification Last gasp broadcasting	Early warning of pending failure Near real time failover Not prone to OS scheduling issues
Heartbeat	Triple redundant heart beat: SAN based communication Discovery based deployment	Easy set up Not prone to OS scheduling issues Minimize split brain scenarios
New Storage Framework	Host and device level fencing Strict control of shared disk access Kernel based event management	Prevents data corruption due to unauthorized access Real-time I/O driver monitoring
Resource group relationships	Start after Stop after	Insures proper sequence for starting and stopping dependent resource groups in cluster

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PowerHA SystemMirror 7.1 Standard Edition

Feature	*Function*	*Benefit*
Adaptive resource group policies	Start up (1st, home, all active) Fail over (prioritization policy) Fall back	User defined failover policies
Root Vg monitoring/event processing	HA coverage for root Vg storage	Automated failover includes all volume groups in cluster
Custom resource management	Custom resource can be plugged into resource group	Customer can monitor and define sequencing of custom resource
Smart Assists	Discovery	Out of the box deployment
	HA Management	Scripts for start, stop and monitoring
	Environment verification	Application health checks in addition to cluster health monitoring
New Smart Assists	SAP, Enterprise content manager, Oracle, DB2,Websphere, TSM, IBM HTTP, printers, IBM LDAP	Popular middle ware applications
Smart Assist for SAP	Support for: ABAP and J2EE environments DB2, Oracle or MAXDB databases LiveCache (MAXDB) based fast failover	Supports popular SAP configurations Allows for customization

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Thank you !

Philippe Ceyssens
philippe_ceyssens@be.ibm.com
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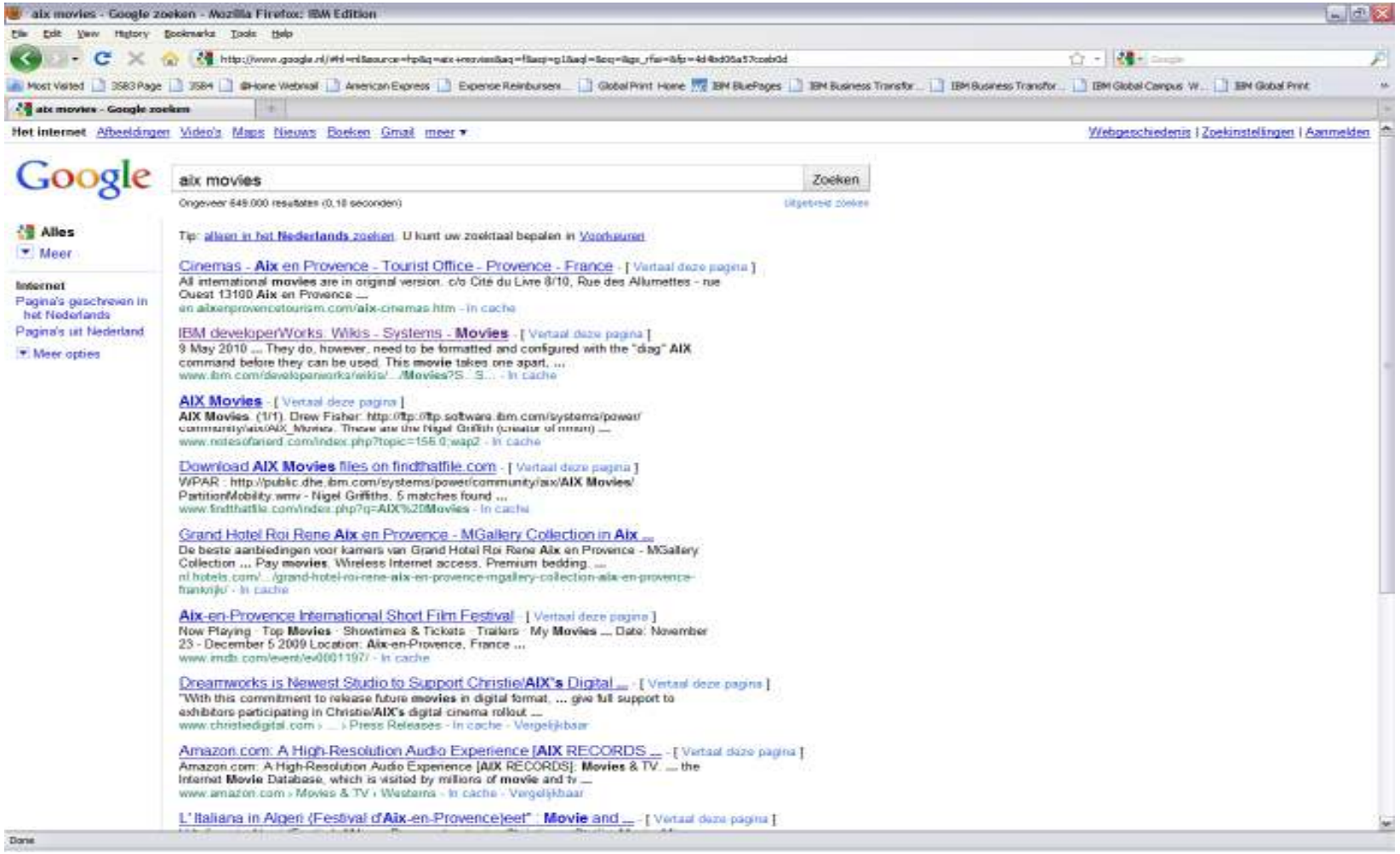
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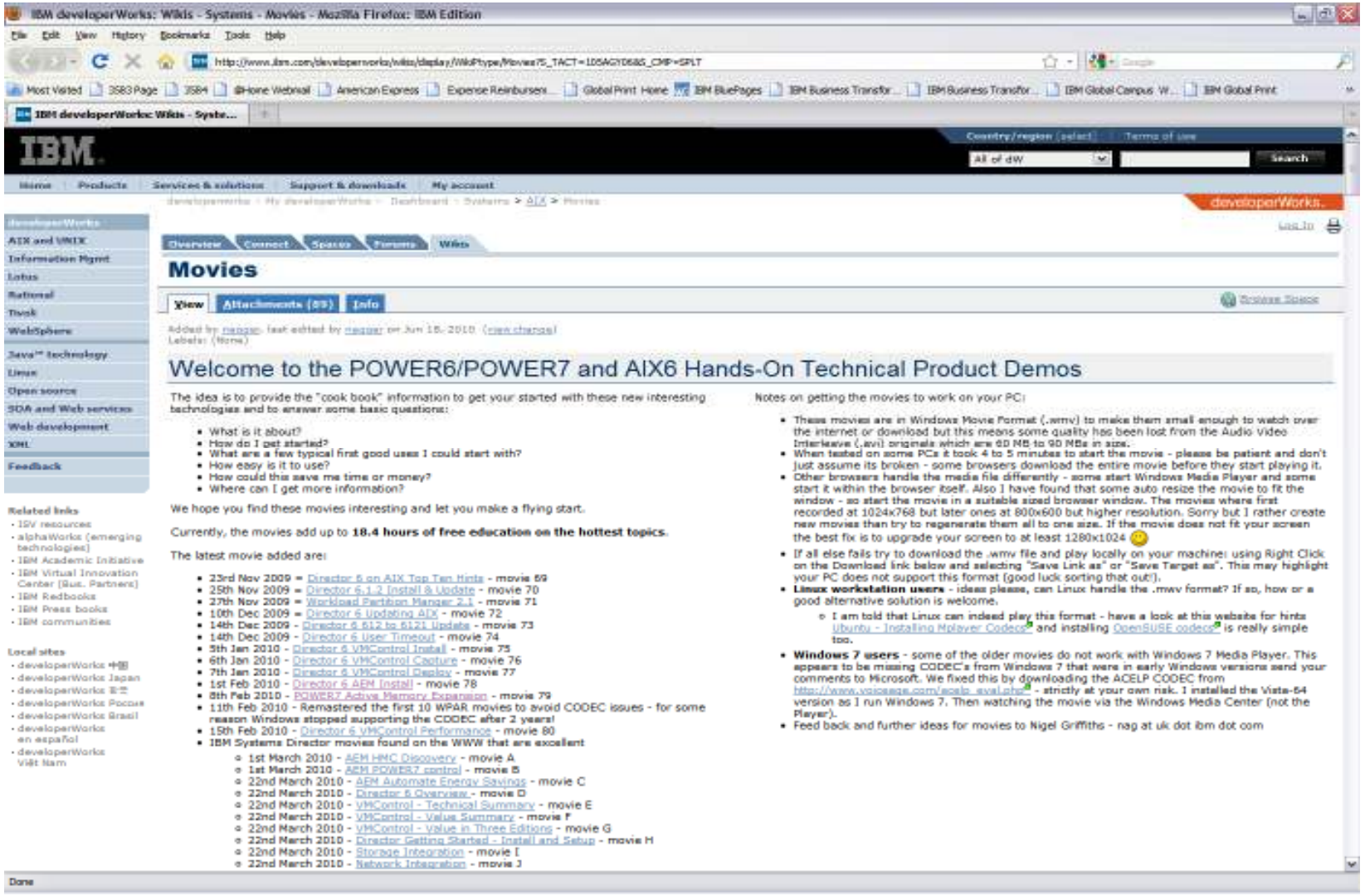
IBM developerWorks: Wikis - Systems - Movies - Mozilla Firefox: IBM Edition
Movies
Welcome to the POWER6/POWER7 and AIX6 Hands-On Technical Product Demos
The idea is to provide the "cook book" information to get your started with these new interesting technologies and to answer some basic questions:
What is it about?
How do I get started?
What are a few typical first good uses I could start with?
How easy is it to use?
How could this save me time or money?
Where can I get more information?
We hope you find these movies interesting and let you make a flying start.
Currently, the movies add up to 18.4 hours of free education on the hottest topics.
The latest movie added are:
23rd Nov 2009 = Director 6 on AIX Top Ten Hints - movie 69
25th Nov 2009 = Director 6.1.2 Install & Update - movie 70
27th Nov 2009 = Workload Partition Manager 2.1 - movie 71
10th Dec 2009 = Director 6 Updating AIX - movie 72
14th Dec 2009 - Director 6 612 to 6121 Update - movie 73
14th Dec 2009 - Director 6 User Timeout - movie 74
5th Jan 2010 - Director 6 VMControl Install - movie 75
6th Jan 2010 - Director 6 VMControl Capture - movie 76
7th Jan 2010 - Director 6 VMControl Deploy - movie 77
1st Feb 2010 - Director 6 AEM Install - movie 78
8th Feb 2010 - POWER7 Active Memory Expansion - movie 79
11th Feb 2010 - Remastered the first 10 WPAR movies to avoid CODEC issues - for some reason Windows stopped supporting the CODEC after 2 years!
15th Feb 2010 - Director 6 VMControl Performance - movie 80
IBM Systems Director movies found on the WWW that are excellent
1st March 2010 - AEM HMC Discovery - movie A
1st March 2010 - AEM POWER7 control - movie B
22nd March 2010 - AEM Automate Energy Savings - movie C
22nd March 2010 - Director 6 Overview - movie D
22nd March 2010 - VMControl - Technical Summary - movie E
22nd March 2010 - VMControl - Value Summary - movie F
22nd March 2010 - VMControl - Value in Three Editions - movie G
22nd March 2010 - Director Getting Started - Install and Setup - movie H
22nd March 2010 - Storage Integration - movie I
22nd March 2010 - Network Integration - movie J
Notes on getting the movies to work on your PC:
These movies are in Windows Movie Format (.wmv) to make them small enough to watch over the internet or download but this means some quality has been lost from the Audio Video Interleave (.avi) originals which are 60 MB to 90 MBs in size.
When tested on some PCs it took 4 to 5 minutes to start the movie - please be patient and don't just assume its broken - some browsers download the entire movie before they start playing it.
Other browsers handle the media file differently - some start Windows Media Player and some start it within the browser itself. Also I have found that some auto resize the movie to fit the window - so start the movie in a suitable sized browser window. The movies where first recorded at 1024x768 but later ones at 800x600 but higher resolution. Sorry but I rather create new movies than try to regenerate them all to one size. If the movie does not fit your screen the best fix is to upgrade your screen to at least 1280x1024
If all else fails try to download the .wmv file and play locally on your machine: using Right Click on the Download link below and selecting "Save Link as" or "Save Target as". This may highlight your PC does not support this format (good luck sorting that out!).
Linux workstation users - ideas please, can Linux handle the .mwv format? If so, how or a good alternative solution is welcome.
I am told that Linux can indeed play this format - have a look at this website for hints Ubuntu - Installing Mplayer Codecs and installing OpenSUSE codecs is really simple too.
Windows 7 users - some of the older movies do not work with Windows 7 Media Player. This appears to be missing CODEC's from Windows 7 that were in early Windows versions send your comments to Microsoft. We fixed this by downloading the ACELP CODEC from http://www.voiceage.com/acelp_eval.php - strictly at your own risk. I installed the Vista-64 version as I run Windows 7. Then watching the movie via the Windows Media Center (not the Player).
Feed back and further ideas for movies to Nigel Griffiths - nag at uk dot ibm dot com

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Revised September 26, 2006

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