

IBM System p

# **POWER5 Virtualization Technology**

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## IBM POWER technology roadmap for pSeries



#### Autonomic Computing Enhancements & Binary Compatibility

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# The TCO Problem...

- Workloads fluctuate significantly over time
- Servers are often purchased to handle individual unknown peaks
- Unused resources cannot be used by other servers
- Non-production servers often have very low utilization rates
- Total unused capacity can exceed used capacity



"Tying specific pieces of server and storage hardware to applications was very limiting, because it locked us into buying new and larger pieces of equipment, driving up costs. Working with IBM, Colgate has already **improved IT asset utilization, efficiency and productivity**, with flexible IT services that meet customers' needs and **reducing costs by 60** to 70%."

Source: http://www.ibm.com/software/success/cssdb.nsf/CS/CSTE-6PUJ9U?OpenDocument&Site=eserverpseries



## IBM Partitions: a technology developer's solution

- Define the solution to provide
- Develop needed technology
- Design the system to provide solution

## 2001: POWER4

Hide internal structure Small allocation units

- 1 CPU
- 256 MB

1 slot PCI-X
 Dynamic reconfiguration

## **2004: POWER5**

#### Virtualization

- MicroPartitioning
- Virtual Ethernet
- Virtual SCSI





## **Micro-Partitioning**

#### **Entitled capacity**

- In units of 1/100 of a CPU
- Minimum 1/10 of a CPU

## **Capped Partition**

#### **Uncapped Partition**

- Variable weight
- -% share (priority) of surplus capacity



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## Real production environment





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## Virtual Ethernet



- Configured like a standard Ethernet
- One partition may have multiple virtual ethernet
- A virtual ethernet supports up to 20 VLAN
- I/O server partition provides Layer 2 bridging using shared ethernet
- Each shared adapter can support 16 virtual Ethernet LANs

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# Virtual SCSI



- One physical drive can appear to be multiple logical drives
  - LUNs appear as individual logical drives
- Minimizes the number of adapters
- Can have mixed configuration (virtual and real adapters)
- SCSI and Fibre supported
- Supports AIX 5L V5.3 and Linux partitions

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## Before virtualization



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## With virtualization



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### Scale up. Scale out. Scale within. *With more than 70 leadership performance benchmarks!*



3. Uses PowerPC 970 processor

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## Simplified Management: Integrated Virtualization Manager

- Very simple and quick LPAR management
  - Few clicks to create/modify an LPAR
  - Limited skills required
  - Remote access to LPAR management
- Available for all Express systems
- Wizard-driven, browser-based interface

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Integrated Virtualization Manager							11	11000	12	IBN
Welcome padmin								Edit	my profile   H	elp i Log o
Partition Management	View/M	lodify I	Partitio	15						
<u>View/Modify Partitions</u> <u>Create Partitions</u> <u>view/Modify System</u> Properties	To perfo System	rm an i 9 Over	action on view	a partition	n, first se	ect the pa	rtition or part	titions, and t	hen select the	task.
/irtual Ethernet Management	Total sy	stem m	nemory:		4 G	в то	tal processin	g units:	2	
<u>View/Modify Virtual Ethernet</u>	Nemory	/ availal	ble:		1.3	IGB Pr	ocessing unit	s available:	1.3	(1.6%)
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View/Modify Virtual Storage <u>Create Virtual Storage</u>	Partitio	on Deta	nils							
VM Management		6	8							
<u>View/Modify User Accounts</u> Create User Accounts <u>View/Modify TCP/IP Settings</u>	Select	ID ^	Name	State	Uptime	Memory	Processors	Entitled Processing Units	Utilized Processing Units	Reference Code
Service Management		1	65- 084CA	Running	18.9 Days	512 MB	2	0.2	0.01	
Service Focal Point     Manage Serviceable Events     Service Utilities		2	ivm1	Running	17.17 Days	528 MB	1	0.1	0.00	
Create Serviceable Event     Manage Dumps		3	ivm2	Running	17.17 Days	512 MB	2	0.2	0.00	
Collect VPD Information     Updates     Backup/Restore		4	<u>ivm3</u>	Running	17.17 Days	512 MB	1	0.1	0.00	
Application Logs     Monitor Tasks     Hardware Inventory		5	ivm4	Running	16.88 Days	512 MB	1	0.1	0.01	
	Tasks									
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Included in System p "Advanced POWER Virtualization"

## It is so easy that we can try it now!