Virtualization

Beyond the Hype

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Agenda

What is Virtualization?

Why Virtualization from Novell?

Optimization = Virtualization + Automation

Novell and Dell Partnership

Resources

Questions

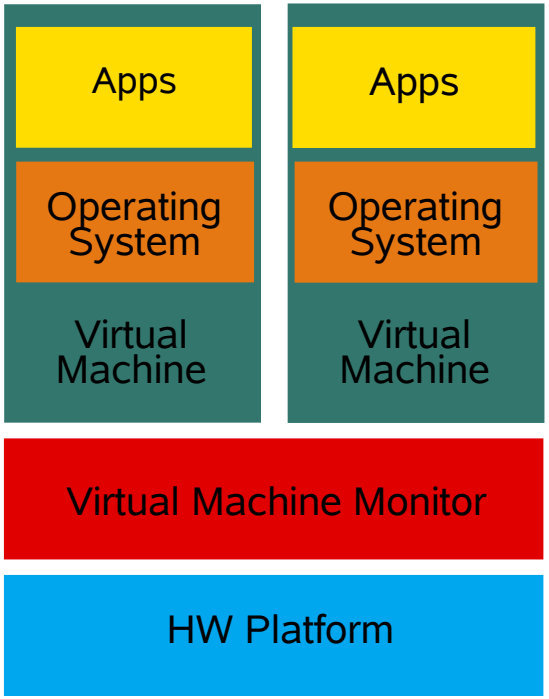
What is Virtualization?

What is Virtualization?

- Virtualization is the ability to run multiple workloads or applications discretely on the same machine at the same time – more effectively utilizing a system's resources
  - For example: if you have multiple physical servers in various locations that typically host a single application service and run at low utilization
  - Virtualizing these servers and their workloads can help decrease costs for floorspace, power, cooling, management and relocation

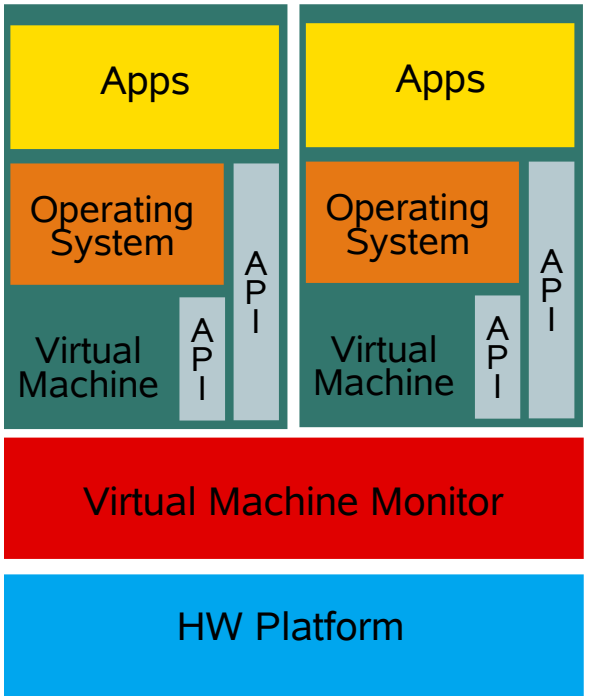
Virtualization Modes
Full and Paravirtualization Overview

Full Virtualization



Runtime modification of Guest OS: VMM manages the conflict, then returns to OS

Paravirtualization



Static modification of Guest OS prior to runtime: Privileged instruction calls are exchanged with API functions provided by the VMM

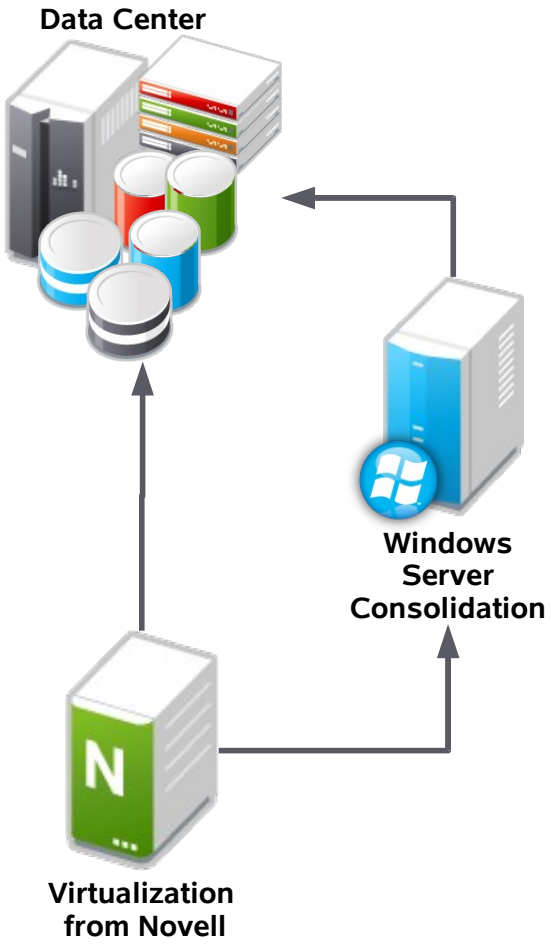
Why Virtualize?
The Top Reasons

- Server Consolidation and Infrastructure Optimization
  - Achieve significantly higher resource utilization by pooling common infrastructure resources
  - Breaking the legacy “one application to one server” model.
- Physical Infrastructure Cost Reduction
  - Green IT; reduce the number of servers, reductions in real estate, power and cooling requirements
- Improved Operational Flexibility
  - Spend less time on repetitive tasks such as provisioning, configuration, monitoring and maintenance.
- Increased Application Availability & Business Continuity
  - Eliminate planned downtime
  - Recover quickly from unplanned outages
  - Backup and migrate entire virtual environments

Why Virtualization from Novell?

Virtualization from Novell®

A Unique Value Proposition



- ONLY vendor that offers the ability to virtualize Linux, Windows and NetWare® on one common platform with complete support for all three operating systems
- Most robust and best supported open source virtualization solution for Windows server consolidation
- Full interoperability with existing IT infrastructures
- Integrated suite of tools for virtualization management and automation.

Virtual Machine Guest OS
The Forgotten Story

Virtualization Host

Key Criteria:

OS support

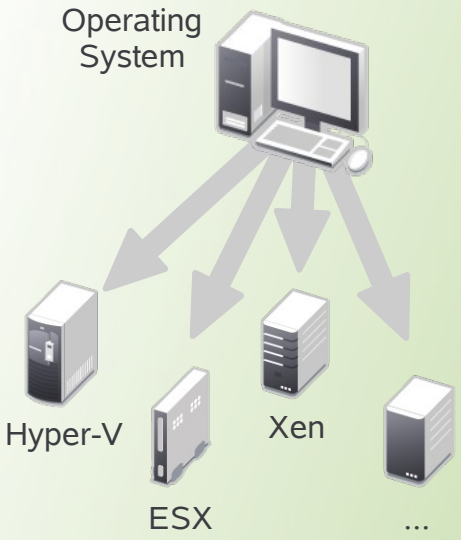
Management

Performance

Automation

HA, BC/DR, etc.

VM Guest



Key Criteria:

Performance

Manageability & Support

Interoperability

SUSE Linux Enterprise Server
The Perfect Guest

The ideal guest completes your virtualization strategy

- Optimized for VMware ESX
- Optimized for Hyper-V
- Optimized for Xen

Most attractive VM guest pricing

Close partnerships with VMware, Microsoft and the Xen community

What are Paravirtualization and VMI?

Paravirtualization involves modifying the guest OS so it is aware of the hypervisor and can communicate certain instructions differently to the hypervisor

- Reduces amount of work performed by hypervisor
- Increases performance of VM guests

Virtual Machine Interface (VMI) is an open standard interface for paravirtualization, originated by VMware

- Supported by ESX Server and other VMware products
- Allows same OS kernel to be run on a hypervisor or bare metal, without modification

SUSE Linux Enterprise Server
on VMware

Only enterprise OS to support VMI-based paravirtualization

- Greater performance than with traditional full virtualization
- Based on significant joint engineering work with VMware

Proven to deliver better CPU performance than Windows Server 2008 on ESX Server

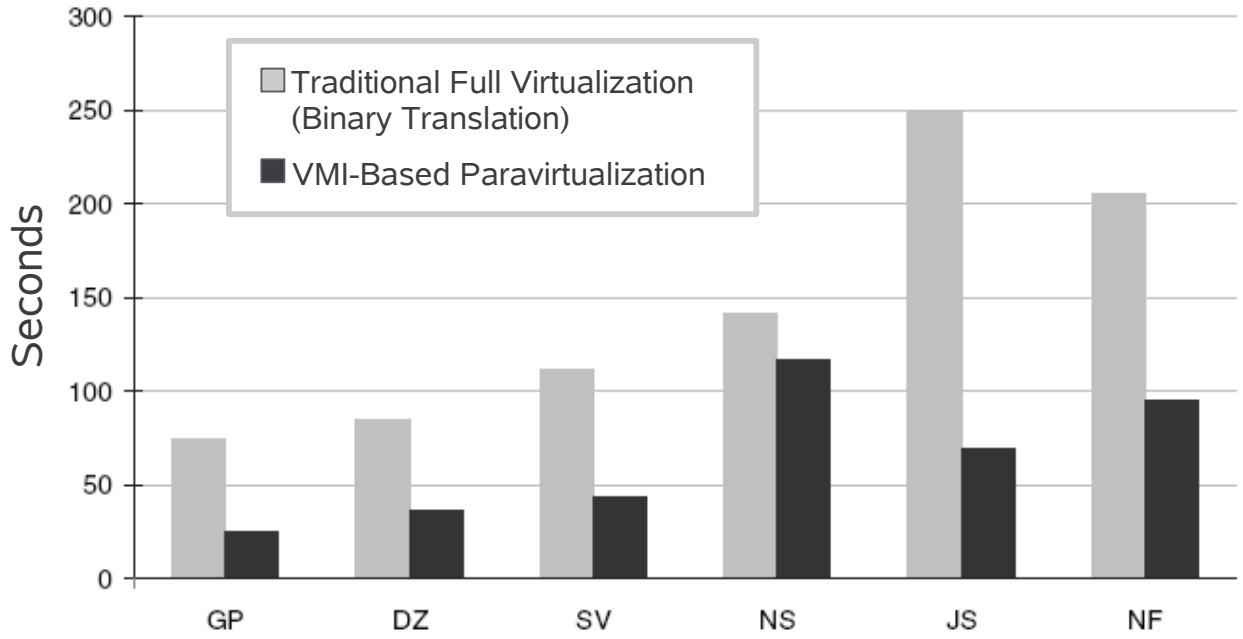
- Recent Network World lab test confirms leadership of SUSE Linux Enterprise Server

Better VM Performance on ESX Server

Kernel Microbenchmarks

SUSE Linux Enterprise Server 10 SP1 on ESX Server 3.5

(Lower is Better)



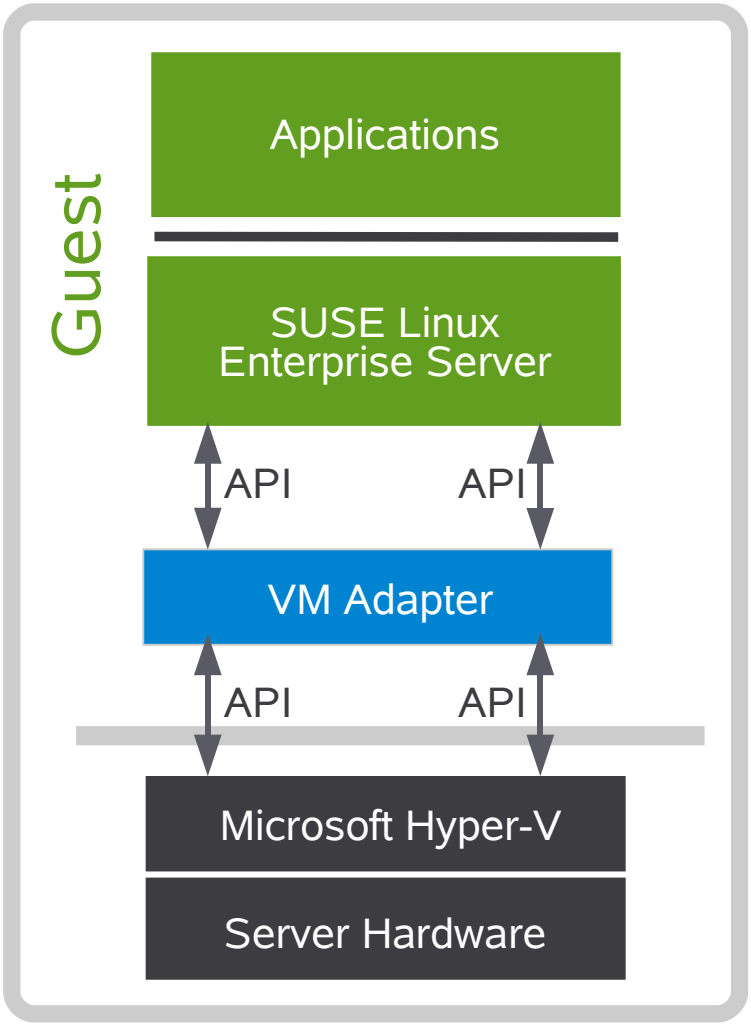
VMI Performance Improvement:

8% to 72%

These benchmarks were run in SUSE Linux Enterprise Server 10 SP1 with a VMI-patched 2.6.16 kernel on a virtual machine with 1 vCPU and 1GB of RAM.

Source: VMware: http://www.vmware.com/pdf/VMware_VMI_performance.pdf

Optimizing VM Guest Performance
Novell / Microsoft Partnership



Microsoft and Novell are performing mutual collaboration on software adapters that translate APIs between respective technologies

- Microsoft has delivered an adapter enabling SUSE® Linux Enterprise Server to interface with Hyper-V
- Provides greater performance through "enlightenment" (para-virtualization) of guest OS

SUSE Linux Enterprise Server
On Hyper-V

Cross-platform virtualization solution developed by Microsoft and Novell®, in joint Interoperability Lab

SUSE Linux Enterprise Server configured and tested as an optimized guest operating system on Windows Server 2008 Hyper-V

Supported by Microsoft and Novell channel partners, including Dell

"This offering is a net win for the channel partners who now can offer their customers a fully supported and optimized virtualization solution for mixed Windows and Linux environments."

– Janet Waxman, vice president, IDC

SUSE® Linux Enterprise Server
Virtual Machine Driver Pack for Xen

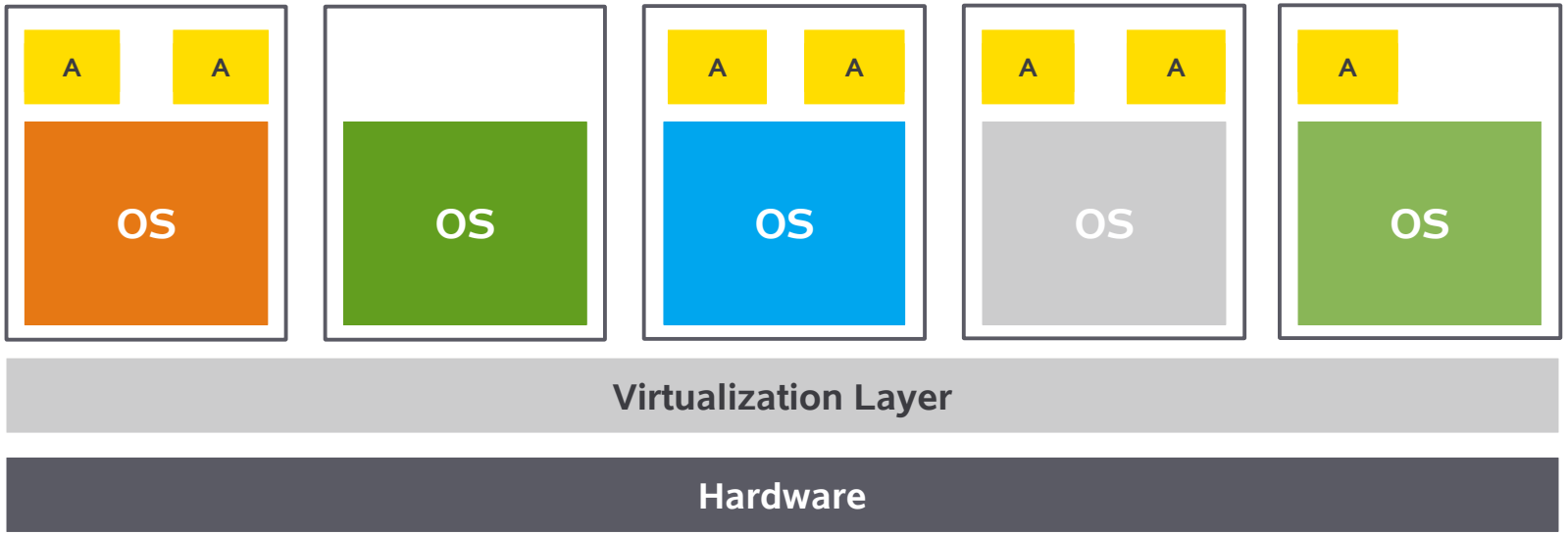
- Run your virtual services on unmodified Windows and Linux operating systems with near native performance
  - Run them on a wide variety of operating systems
  - Extend the useful life of your custom and legacy applications
  - Run them with the assurance of enterprise support from Novell®
- Device drivers improve communication between the Xen hypervisor and guest operating system, accelerating network and storage I/O
  - Drivers for Windows Server 2008, 2003, 2000, and XP on Xen
  - Drivers for Red Hat Enterprise Linux 4 and 5 on Xen

Virtualization from Novell
...as an Agnostic Data Center Solution

- Heterogeneous data center automation
  - Novell ZENworks Virtual Machine Management and ZENworks Orchestrator
    - Policy-based automation for virtual and physical resources
    - Support for Xen, VMware and Hyper-V
    - Intelligently manage your resources from one place
  - PlateSpin product set
    - PlateSpin PowerRecon to assesses readiness and monitor environment
    - PlateSpin PowerConvert for seamless P2V, V2P, V2V conversion
    - PlateSpin Forge for disaster recovery

Optimization = Virtualization + Automation

Virtualization is a Promising Technology...



What	Why
Abstraction	Increase server and space utilization
Partitioning	Increase service availability
Division and simultaneous sharing	Respond more rapidly
Hypervisor	Extend investments

But Virtualization Alone is NOT the Answer – Automation is the Key

*"**Virtualization** in and of itself is interesting, and it gives you server efficiency, but without some of the automated tools, it **may actually increase your management burden**. **For virtualization to truly work** in real-world applications, users must also focus strongly on **automation**, the policy-based administrative **tools used to deploy virtualized instances and manage them**."*

- John Enck, Gartner

Challenges

- Still have to manage the same amount of operating systems (if not more)
- Potential conflict between virtual machines
- Keeping pace with disruptive changes
- Tracking usage and licensing
- Staying in compliance

Automated Virtualization
Data Center Optimization from Novell®

	How does it fit together?	How should you use it?
 **SUSE® Linux Enterprise Server**	Foundation, platform Management server OS Managed node OS	Create Virtual Machines
 **SUSE® Linux Enterprise Virtual Machine Driver Pack**	Device drivers for guest operating systems	Extend Virtual Machines
 **ZENworks® Virtual Machine Management**	Predefined jobs and tasks for the creation and management of virtual machines	Manage Virtual Machines
 **ZENworks® Orchestrator**	Java-based management server and agent	Automate Management

Novell® ZENworks® Virtual Machine Management

A collection of jobs that snap into ZENworks Orchestrator and uses it to run them in the most efficient manner

- Heterogeneous virtual machine management (SUSE Linux Enterprise, VMware, Microsoft and Xen)
- Automated deployment and management of virtual data center assets
- Dynamically provisioned workloads that ensure business continuity

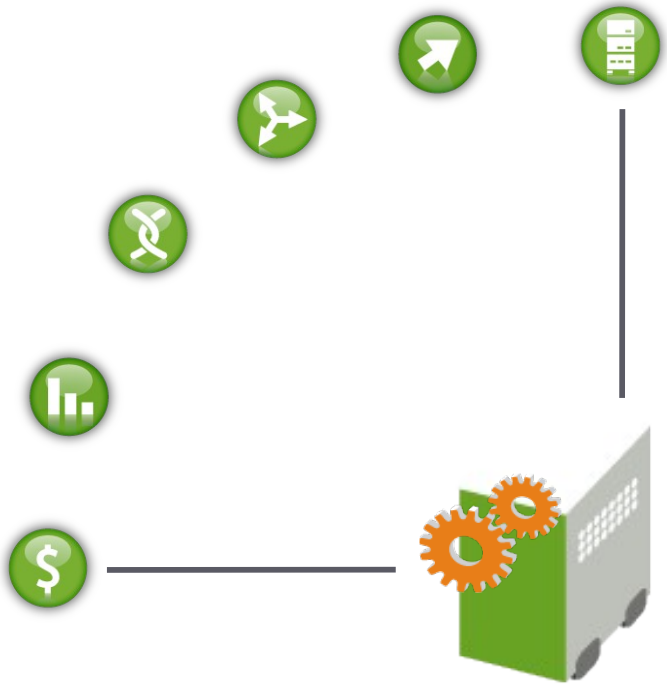
Novell® ZENworks® Orchestrator

Third generation orchestration engine that uses intelligent automation to manage heterogeneous virtual machines, enabling you to align IT to business requirements, control costs, and minimize risks

- Resource Discovery
- Workload Management
- Dynamic Scheduling
- VM Lifecycle management
- Policy Management
- Auditing and Accounting
- Software Compliance

Benefits of Automated Virtualization

- Increased server and space utilization
- Increased service availability
- Increased business agility
- Greater flexibility
- Reduced power consumption
- Reduced costs



Novell and Dell Partnership

Dell and Novell®
Partnership Overview

- Dell and Novell have been partners for over 15 years
- Dell is the first major systems provider to join the Novell-Microsoft collaboration for enhanced interoperability
- Dell has promoted SUSE® Linux Enterprise Server to “Tier 1” OS status
  - Includes Dell/EMC certification, OpenManage integration, and pre-install on Dell's new server line
  - Dell has invested many engineering resources to enable this
- ZENworks® Linux Management was chosen by Dell as its recommended Linux management platform
  - Joint engineering/testing/marketing effort
  - Systems management is one of Dell's key components of their “scalable enterprise” strategy
- Dell values the Novell ability to penetrate enterprise customers

Dell and Novell®
Partnership Facts

- In 2007, over 1,000,000 PowerRecon server/days
- In 2007, over 25,000 PowerConvert migrations
- Dell Professional Services utilizes PowerRecon for the planning and assessment of customer virtualization projects as part of their VRA (Virtual Readiness Assessment)
- Largest Dell/PlateSpin project – 5000 server migration
- Fastest Dell/PlateSpin migration – 250 servers a day

Dell and Novell®

New OEM Agreement (announced September 2008)

- Dell will bundle a limited V2P capability of the PlateSpin PowerConvert product with every Dell server sold
- Dell will utilize PlateSpin PowerRecon for the planning and assessment of customer virtualization projects as part of its Virtual Readiness Assessment (VRA)
- Dell will sell and support PlateSpin's broader solutions, which provide customers with a unified suite to help them adopt, manage and extend their use of server virtualization in the data center

Dell and Novell®
Common Dell Solutions

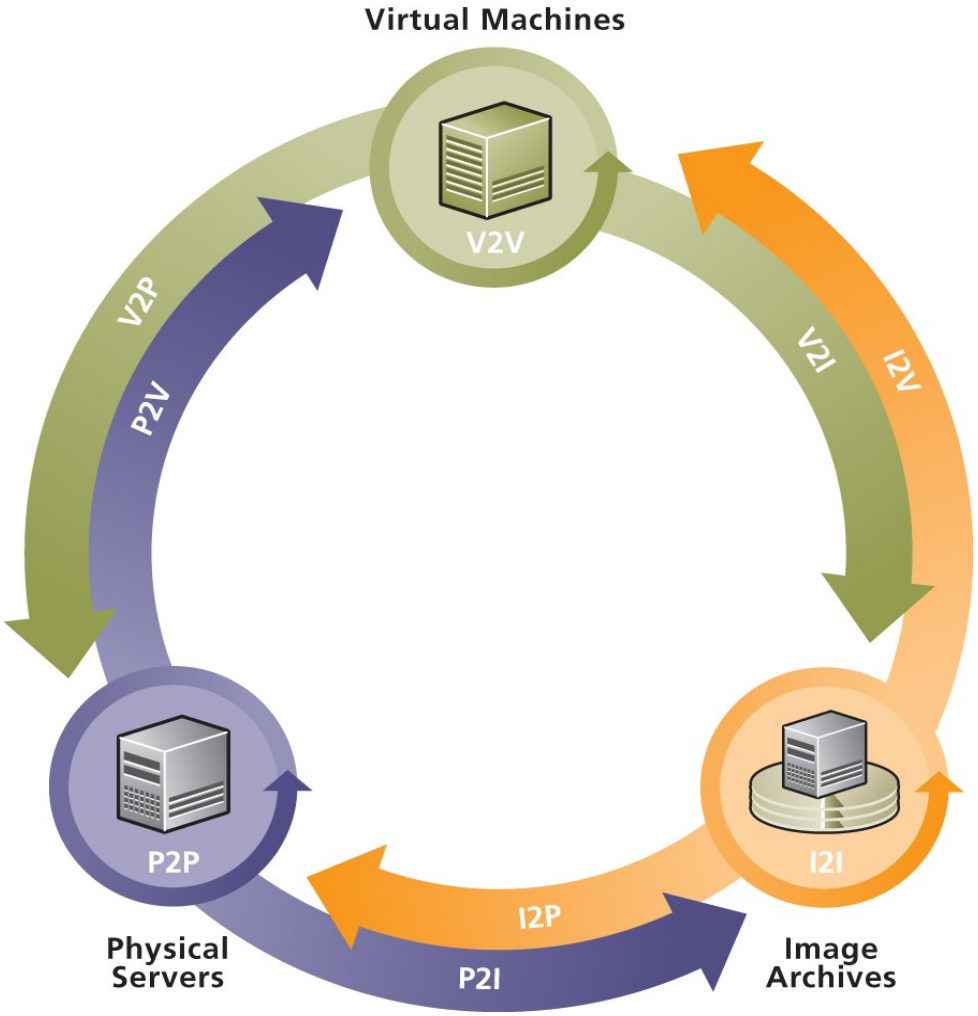
P2V
VMware, Citrix Xen
VI, MS Virtual Server

V2P
For OS/App support
Disaster Recovery

V2V
Tiered-Virtualization
Competitive / DR

P2P
Hardware Upgrades
Competitive Upgrades
End-of-Lease

Desktop
Provisioning/Protection
WinXP/2000



Resources

Resources

- OPS Americas blog
  - http://opsamericas.com
- SUSE Linux Enterprise home page
  - http://www.novell.com/linux
- Novell Virtualization home page
  - http://www.novell.com/linux/virtualization/
  - Virtualization Technical Library, Whitepapers
- Novell's pricing for virtualization and available support offerings
  - http://www.novell.com/products/server/virtualization.html
  - http://support.novell.com/linux/

Additional Resources

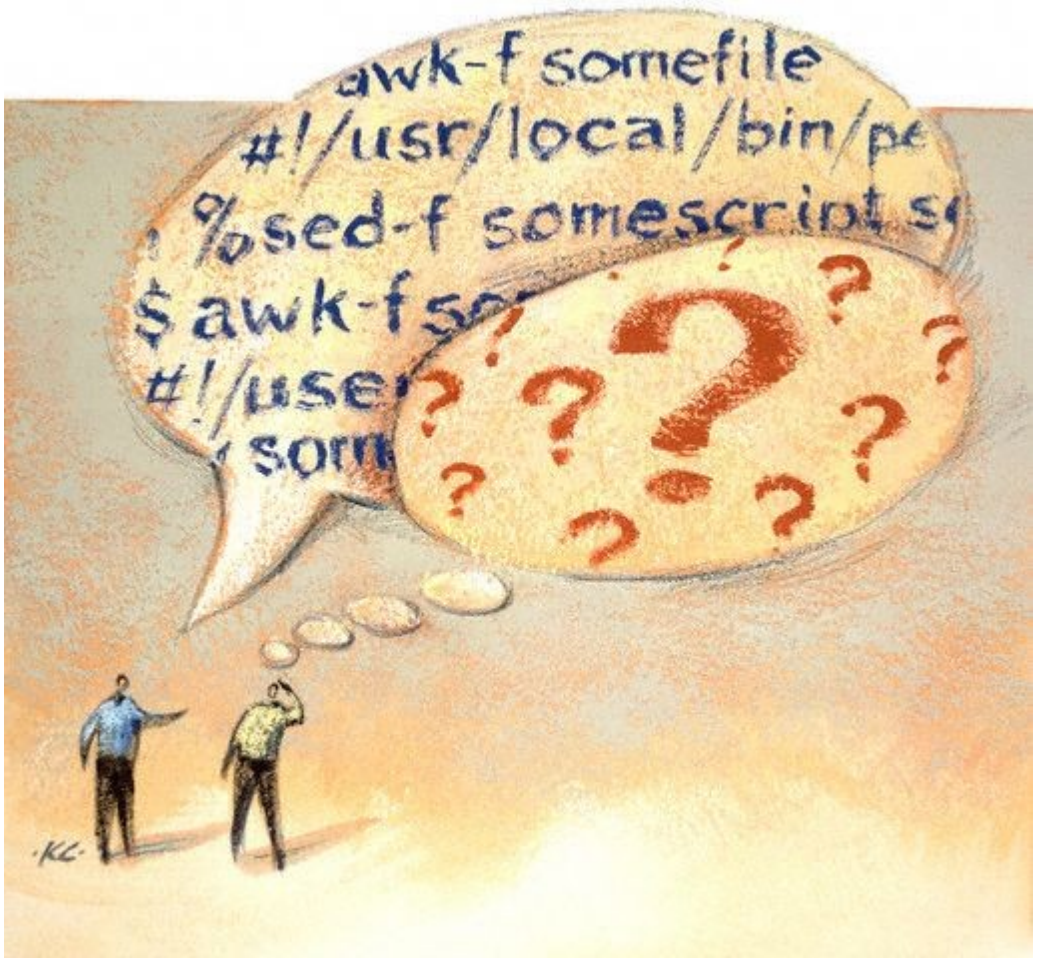
See it

Try it

Buy it

- http://www.novell.com/products/server
- http://www.novell.com/documentation/sles10/index.html
- http://www.novell.com/documentation/vmserver/index.html
- http://www.novell.com/products/vmdriverpack
- http://www.novell.com/products/zenworks/orchestrator
- http://www.novell.com/products/zenworks/virtualmachinemanagement

Questions?

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