

Virtualization: Benefits & Pitfalls

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Who are we?

Matt Liebowitz

- High level virtualization benefits/pitfalls
- Experiences from the field

Kraft Kennedy

Tim Garner

- Experiences from the field
- SQL Server virtualization

ADERANT

Mike Lombardi

- Experiences from the field with Microsoft virtualization solutions

VERTICAL INTEGRATION
VERTIGRATE
FROM A TO Z

Sergey Polak

- Experiences with virtualization at Ropes & Gray

**ROPES
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Virtualization: Benefits & Pitfalls

Matt Liebowitz

Kraft Kennedy

What can you expect from this presentation?

- No vendor slants or sales pitches
- Real world examples of both benefits and pitfalls of virtualization implementations
- Recommendations, guidance, and suggestions for implementing successfully or improving current infrastructures

Industry Insight

Gartner's names virtualization #1 in its list of
“Top 10 Strategic Technologies for 2009”

“Virtualization helps organizations to cut costs, better utilize assets and reduce implementation and management time and complexity, all of which are crucial in this economic environment”

– Alan Dayley, Gartner

Virtualization Landscape

Three major vendors in the virtualization space:



vmware®


Microsoft

CITRIX®

Large third party ecosystem:

vizioncore

VEEAM

 symantec.

QUEST
SOFTWARE®

 PLATESPIN®

 VKERNEL.

Common pitfall: Look before you leap

- Capacity planning is a crucial first step in any virtualization project
- Over/under sizing the environment can lead to:
 - Significantly reduced ROI
 - Poor performance
 - Failed virtualization projects
- Remember: Don't guess – plan, then execute!

Potential Pitfall: Manage Lifecycle Carefully

- Easy to deploy new virtual machines quickly
- With ease of deployment comes challenges in management
- Management of physical server lifecycle is different than virtual server lifecycle
 - Needs physical management
 - Defined warranty periods
 - Hardware lifespan

Potential Pitfall: Manage Lifecycle Carefully

- Virtual machines can “live forever” by moving from host to host
- VMs are often deployed quickly to address specific needs, but their lifecycle may not be properly managed
 - OS patching/versions
 - Antivirus definitions
 - Security best practices
 - Application/OS licensing
 - Backup

Size virtual machines properly

- Using sizing practices from the physical world can lead to oversized virtual machines
- Typical physical server configuration:
 - Four to eight CPU cores
 - 4-8GB RAM
 - Ample disk space
- Virtual machines share resources, so sizing is important
- “Does my server really need that much?”
 - Capacity planning will tell you

Virtual Machine Backups

- There is **no** “one size fits all” backup solution for virtual environments
- Backup solutions in the physical world not automatically applicable to virtual machines
- Most often a blended approach is necessary
 - VM disk backup
 - File level backup (backup agent in guest)
 - SAN snapshots

Virtual Machine Backups

- **Benefits:**
 - Encapsulation makes backing up entire servers easy
 - Multiple backup options for different scenarios
 - Many tools allow for backing up entire VM while allowing file-level restore
 - Easy facilitator for disaster recovery

Big Benefit: Microsoft Licensing

- Microsoft has **very** attractive licensing for Windows Server in virtual environments
- Windows Server in a virtual machine:
 - Standard: 1 license per VM
 - Enterprise: 1 license per 4 VMs
 - Datacenter: 1 license for **unlimited** VMs (licensed per CPU)

Big Benefit: Microsoft Licensing

- Example cost savings: Standard vs. Datacenter
 - 2 physical servers with 2 x Quad Core CPUs
 - 30 total virtual machines

Windows OS	Cost*	Total
Standard Edition	\$700 per VM	\$21,000
Datacenter Edition	\$2,700 per CPU	\$10,800

Savings of over \$10,000

* - Estimated retail prices

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Virtualization: Benefits & Pitfalls

Tim Garner



Virtualization in the field

- Many Aderant customers have implemented virtualization
- Most have been successful. However, a number have encountered problems

Virtualization problems

- Upgrade to Aderant Expert 7.0 on a new virtualized SQL 2005 server
 - Server became unstable after applying OS patches and VM was reinstalled
 - Server was stable and a snapshot was done prior to applying OS patches
 - After snapshot the data drives for SQL databases could not be mounted
 - After 6 hours VMware support was able to recover the drives
 - The combination of unstable VM and lost data drives added 25 hours to the upgrade

Virtualization problems

- New Firm using virtualization for training environment
 - Initially the environment performed well
 - Users started heavy training and the training environment was made available to a desktops
 - SQL, File Server, and auxiliary services all on a single low end physical VM server
 - No VMotion capability
 - Combination of increased load and inability to increase resources resulted in very poor user experience

Virtualization Success

- Large firm with complex configuration
 - SQL Servers in cluster
 - Other systems on VMware ESX servers
 - 16 physical servers each with 4-way quad core CPUs and 64GB of memory
 - 3 dedicated to Aderant environment
 - Web servers (3)
 - File server
 - Auxiliary servers (4)
 - Installation and setup went smoothly and VM systems performed well
 - VMotion used to load balance

Virtualization and SQL Server

- Aderant does not recommend virtualization of large SQL Server systems
 - Large SQL Server systems require a lot of memory and CPU resources to perform well. This can take a significant percentage of the physical VM server resources.
 - Most Aderant firms on Expert 7.5 are running the 64-bit version of SQL 2005. This tends to increase the amount of memory. Medium to large firms will allocate 32GB+ to SQL Server
 - Virtualization adds another level of complexity to an already complex system
 - A production Aderant SQL Server is normally considered a mission critical system where reliability and performance is considered paramount
- Clustering and multiple SQL instances can duplicate many advantages of virtualization
- Production SQL Servers with databases smaller than 30GB and development / test SQL Servers can be considered for virtualization

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Virtualization: Benefits & Pitfalls

Mike Lombardi



Vertigrate, Inc.

About the company

- **Technology Services Firm**
 - Provide project based consulting services to complete remote management
- **Established in 2004**
 - Serving small to mid-sized law firms in Western United States
 - Started using MS Virtual Server in 2006
- **Mike Lombardi – President/Owner**
 - University of California, Davis, B.A. 1996
 - University of Arizona, MBA 2004

Why bother... to virtualize?

- **Know your business reasons**
 - Reduced cost?
 - Increased efficiency?
 - Existing hardware?
 - Deployment?
 - Disaster recovery?
 - Because everyone else is doing it??
- **Get stakeholder support**
 - They are critical to your success
- **Know your infrastructure**
 - Which servers are good candidates?

Microsoft Virtualization Tools

Tools	Notes
Virtual Server 2005 R2	<ul style="list-style-type: none"> • First viable Microsoft server virtualization platform • Compatible with Windows Server 2003
Hyper-V Manager	<ul style="list-style-type: none"> • Built-in MMC for Windows Server 2008 • Provides all the basics necessary to create and manage VM's • Fine for new server builds • No built-in P2V tools
Virtual Machine Manager 2008	<ul style="list-style-type: none"> • Microsoft's Workgroup or Enterprise Management Suite • Six components (3 optional) • P2V and V2V tools

How do we use vhd's?



Learning the Hard Way

- **HP Network Configuration Utility**
 - Hyper-V update prevented parent from starting
 - MS KB950792

- **Snapshot Control**
 - Make sure you have enough storage
 - Not all VM's are good candidates for checkpoints
 - i.e.; domain controllers, replicated databases

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Virtualization: Benefits & Pitfalls

Sergey Polak

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Virtualization at Ropes & Gray

About the Firm

- **8 Offices**
 - USA and Asia
- **Over 1000 attorneys**
- **Sergey Polak – Manager of Enterprise Systems**
 - Responsible for multi-tier, database-based systems
 - Document Management, Finance, Records, HRIS, Marketing, Litigation Imaging, Etc.

Virtualization at Ropes & Gray

Infrastructure

- **Hardware**
 - 65 Production Physical Servers
 - SQL, Exchange, Fax
- **Software**
 - 400 Production VMs
 - 230 in primary data center
 - 75 Test/Dev VMs
- **VMware ESX Infrastructure**
 - 9 host servers in primary data center
 - HP DL 585 G2, 4 quad-core CPUs, 128G RAM
 - 24 host servers in the 8 offices
 - Mostly DL 385 servers
 - 6 host servers in DR data center
- **Started using VMware in 2005**

Virtualization at Ropes & Gray

Benefits

- **Quick Turnaround**
 - New server can be on-line in about an hour
- **Server Portability**
 - Servers are easy to migrate between data centers
- **Redundancy**
 - Get rid of troublesome clusters or at least make them behave
- **Recoverability**
 - Server snapshots for maintenance
- **Disaster Recovery**
 - VMware SRM

Virtualization at Ropes & Gray Pitfalls

- **Server Sprawl**
 - Watch out. It is too easy to add new servers.
- **Performance Limitations**
 - Multi-CPU machines
 - Disk I/O
 - Network bandwidth
- **Insufficient Expertise**
 - Proper resource balancing
 - System performance & usage monitoring

Virtualization at Ropes & Gray Pitfalls

What's wrong with this picture?

State	Status	Hardware Health		% CPU	% Memory
Connected	○○●	○●○ Warning		83 	29 
Connected	○○●	○●○ Warning		82 	37 
Connected	○○●	○●○ Warning		85 	21 
Connected	○○●	○●○ Warning		94 	31 
Connected	○○●	○●○ Warning		81 	26 
Connected	○○●	○●○ Warning		77 	39 

Questions?

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