What-Why-How: Virtualization of an OpenEdge system

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SKYWARD®

PUG Challenge Americas

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Worked at **Skyward** since **2005.**

Progress user since 1996. Version 8

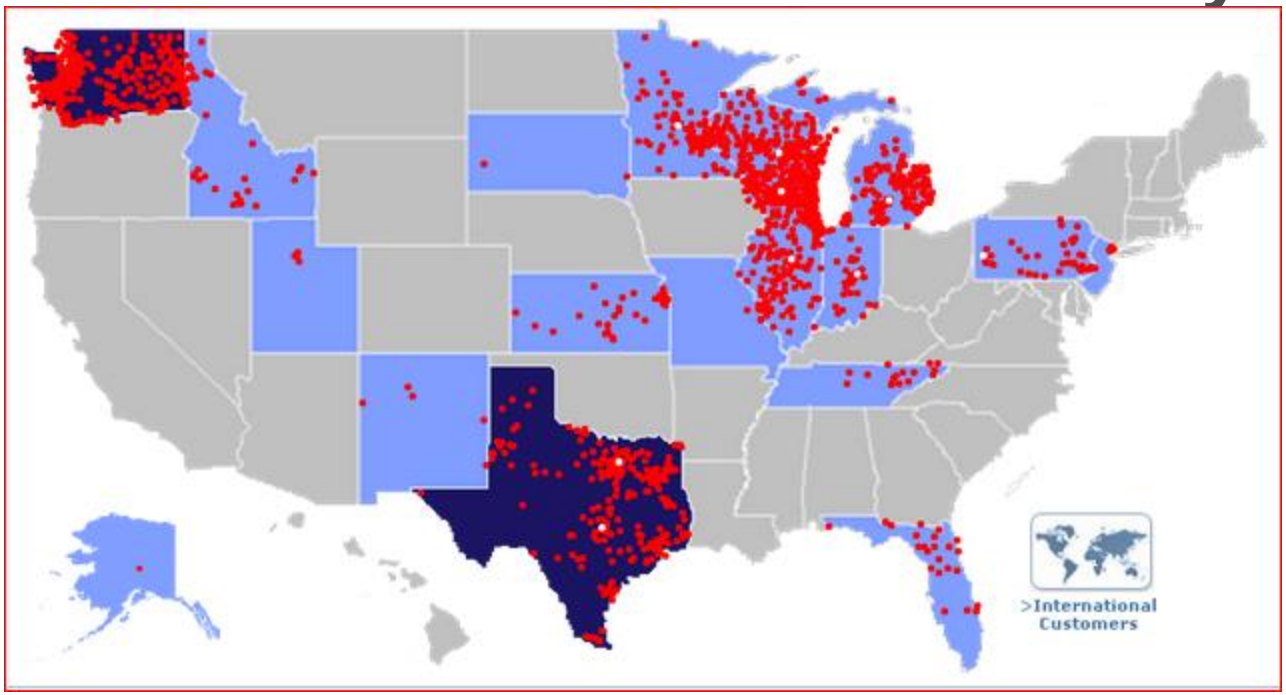
24 Years of Experience in **Information Technology**

Range of **Technology Expertise**

- Cisco & HP Networking
- Microsoft Systems
- Novell – Netware & SLES
- VMware

Skyward

- Student Management Suite
- School Business Suite
- **1665 districts across the world use Skyward.**



Skyward

- **1665 districts across the world use Skyward.**
- Student database
- Business database
- Training database
- = Well that be many OpenEdge databases.

Trivia Question.

- Name the first video played on MTV?

Trivia Question.

- Name the first Video on MTV?
  - "Video Killed the Radio Star"
  - August 1, 1981

Physical = Radio

Virtualization = Video

Agenda

Can OpenEdge Run Virtual?

- What is Virtualization
- Why Virtualize?
- How Virtualization Works
- Benefits of Virtualizing OpenEdge
- Challenges of Virtualizing OpenEdge
- Best Practices of Virtualizing OpenEdge
- Common Mistakes/Issues

What is Virtualization

In computing, virtualization means to create a virtual version of a device or resource, such as a server, storage device, network or even an operating system where the framework divides the resource into one or more execution environments.

Why Virtualize?

Consolidation of hardware resources and $$

Reduced hardware replacement/Migration costs

Reliable and high performing

Ease of remote management/Increased visibility

Increased utilization of hardware

Reduced and centralized power demands

And …

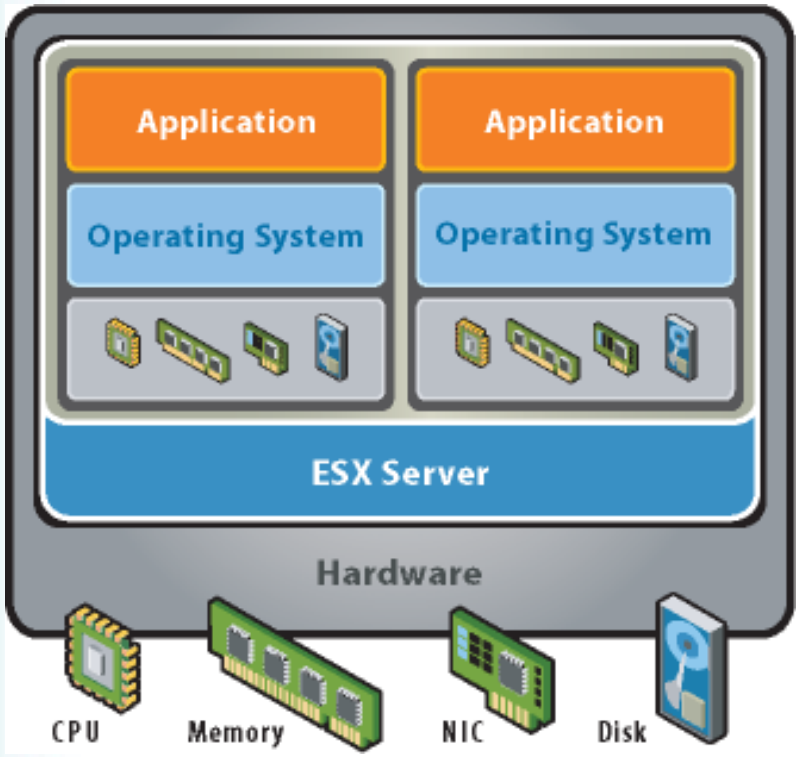
From This…

To This…

VMWare : Hyper-V : KVM : XEN

How Does It Work?

Physical Servers Are Resources



Processor Cycles

Memory

Network Connections

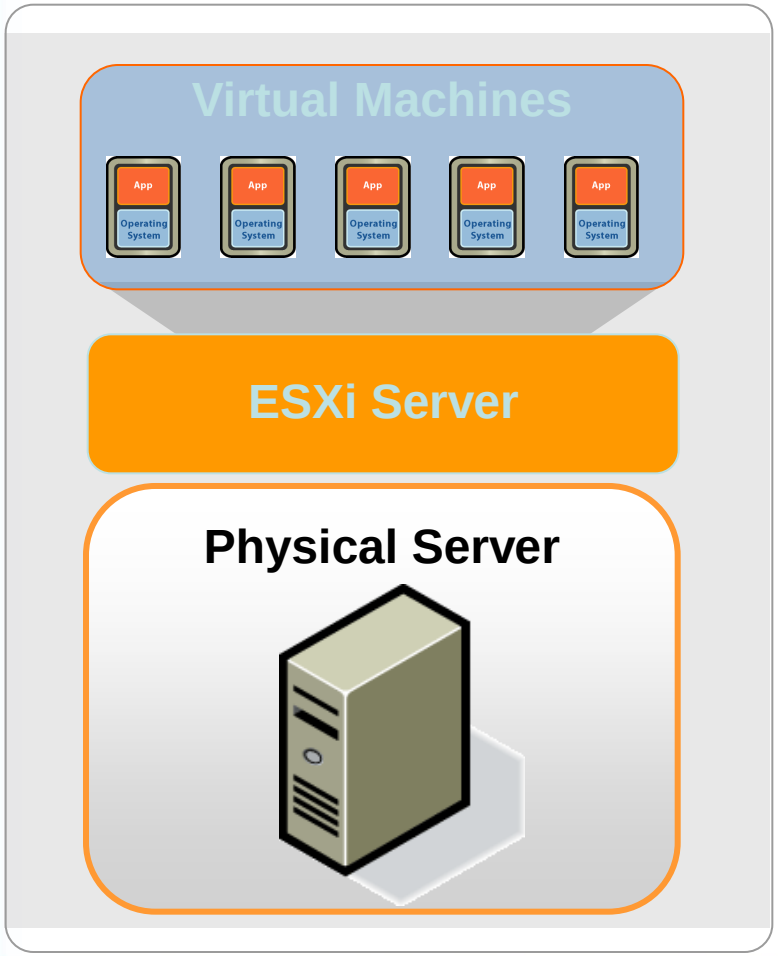
Disk Space

How Does It Work?

Virtual Servers Are Just Files

Name	Size	Provisioned Size	Type
Demo Skyward Cluster Node B.nvram	8.48 KB		Non-volatile memory file
Demo Skyward Cluster Node B.vmdk	17,395,710.00 K	20,971,520.00 KB	Virtual Disk
Demo Skyward Cluster Node B.vmsd	0.00 KB		File
Demo Skyward Cluster Node B.vmx	2.94 KB		Virtual Machine
Demo Skyward Cluster Node B.vmxf	0.28 KB		File
vmware.log	62.53 KB		Virtual Machine log file
vmware-22.log	92.84 KB		Virtual Machine log file
vmware-23.log	95.36 KB		Virtual Machine log file
vmware-24.log	73.43 KB		Virtual Machine log file
vmware-25.log	83.33 KB		Virtual Machine log file
vmware-26.log	68.51 KB		Virtual Machine log file
vmware-27.log	58.26 KB		Virtual Machine log file

How Does It Work?

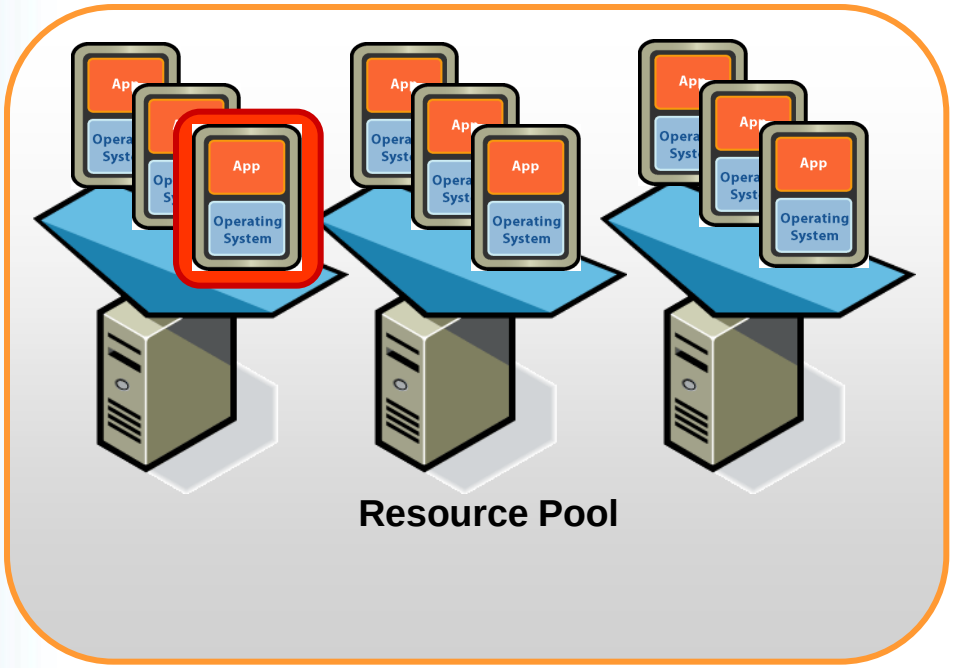


VMware vSphere ESXi

- Deploy multiple virtual machines on a single physical server
- Market leading:
  - Performance
  - Stability
  - Scalability
  - Cross-platform support

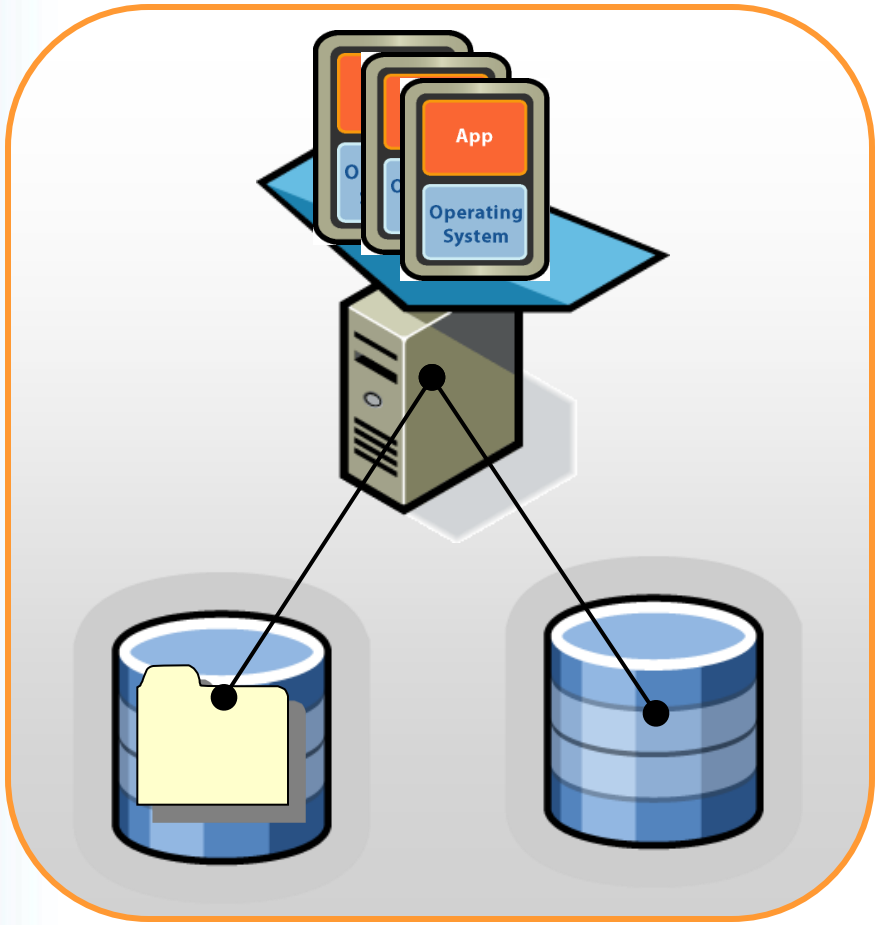
How Does It Work?

VMware DRS
(Dynamic Resource Scheduling)



- Dynamic and intelligent allocation of hardware resources
- Ensure optimal alignment between business and IT

How Does It Work?

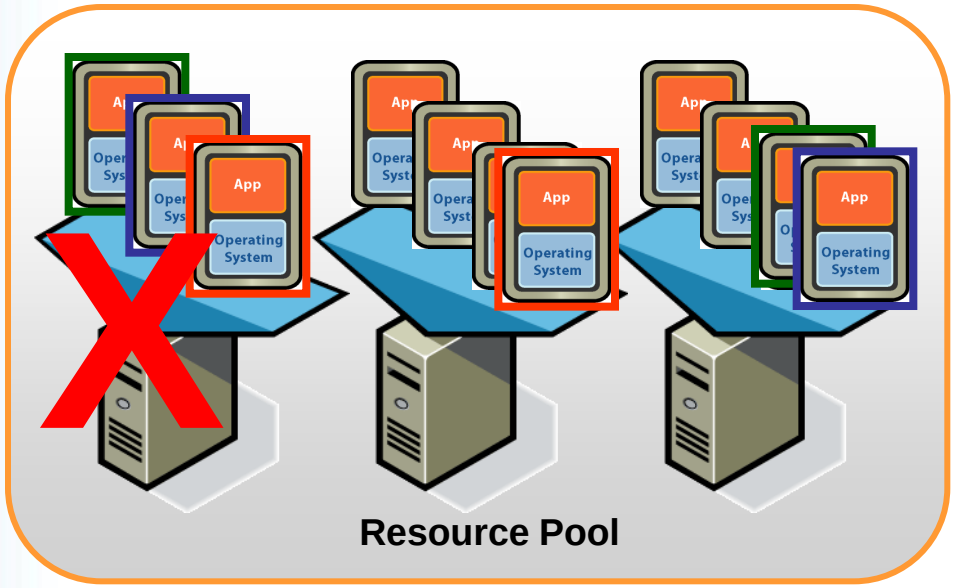


Storage vMotion

Storage independent live migration of virtual machine disks

- Zero downtime to virtual machines
- LUN independent
- Supported for Fiber channel SANs
- Perfect solution for migrating from one storage device to another

How Does It Work?

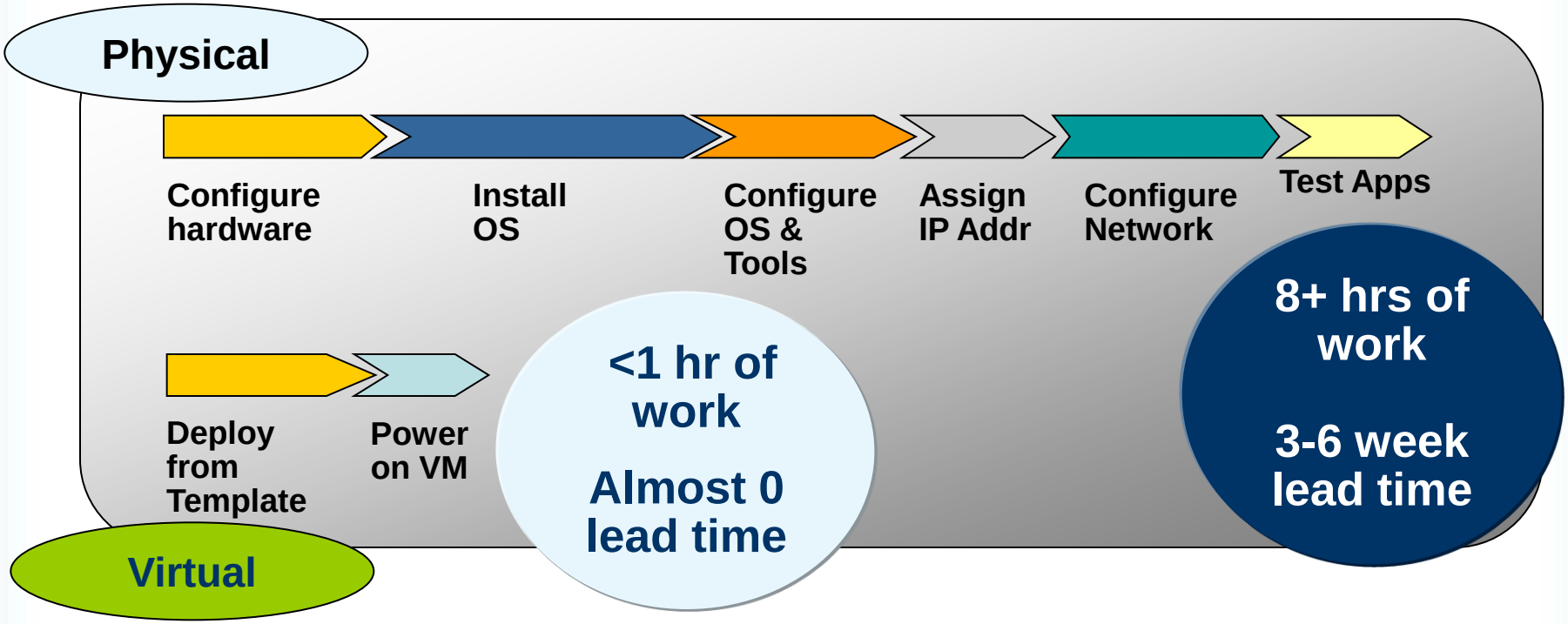


VMware HA
(High Availability)

- VMware HA automatically restarts virtual machines when a physical server fails

How Does It Work?

Quick Provisioning with VMware Templates



- Provisioning time reduced to minutes, not days to weeks!

Benefits of Virtualizing

- Additional Management and Performance Troubleshooting Tools
- Reduced Migration Complexity
- Share Hardware Resources with other Low Priority Applications – Reduce Hardware Purchasing and Replacement Costs

Challenges of Virtualizing

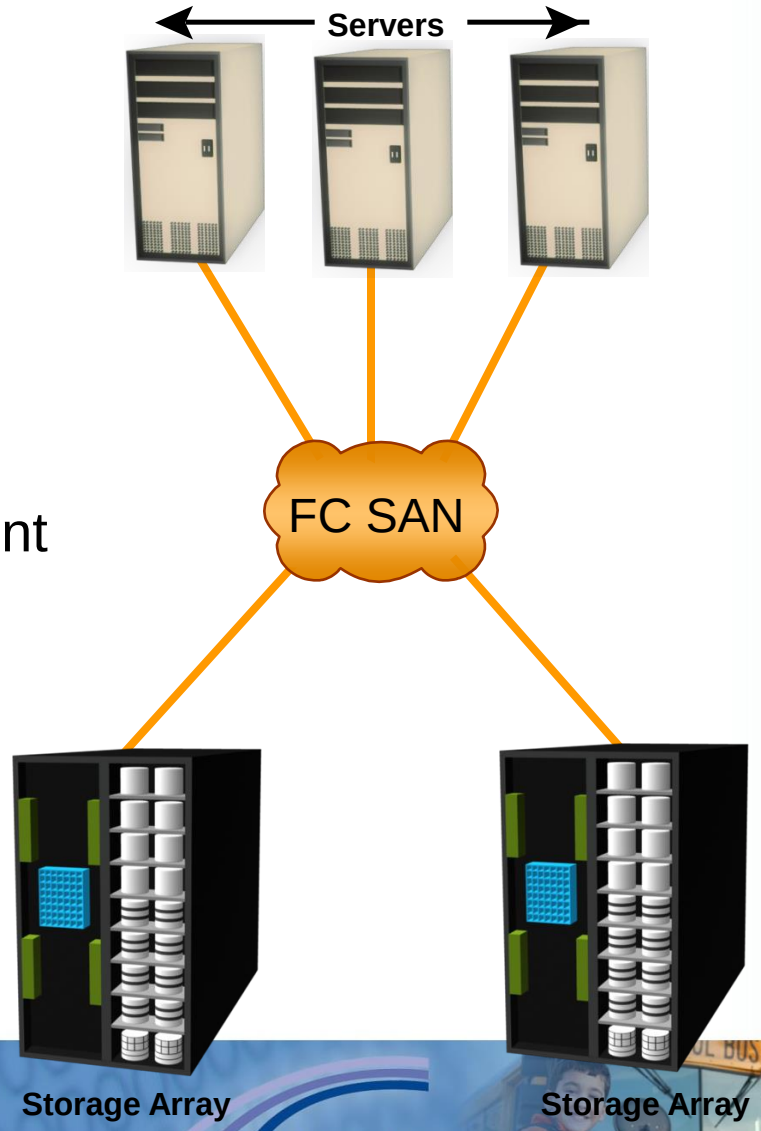
- Storage I/O Becomes Shared Amongst All Virtual Servers
- Provisioned CPUs vs. Available CPU Cores
- Memory Oversubscription = Bad Paging and Disk Thrashing
- Each Implementation is Unique in its Challenges

Best Practices for Virtualizing

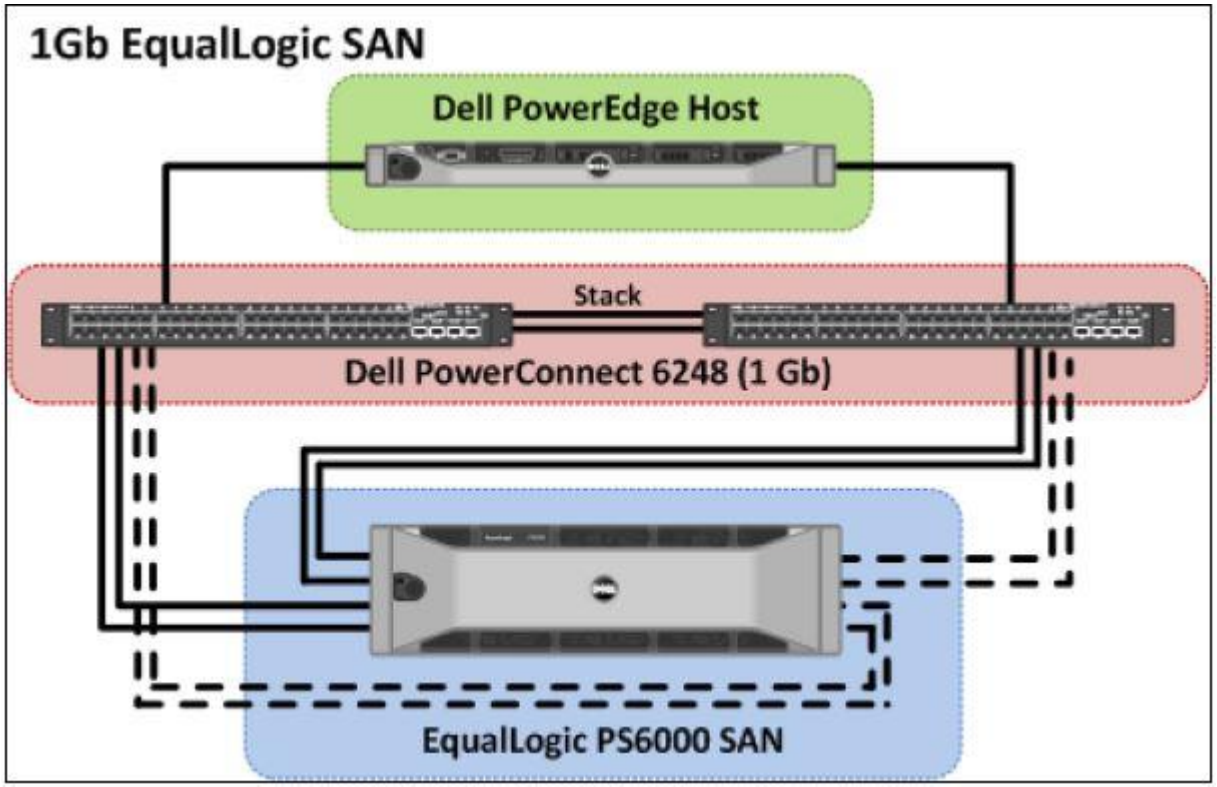
- Storage for OpenEdge VM's should be on SAS or SSD disks.
- If possible, reserve a separate Raid 1 or Raid 1+0 set for OpenEdge Databases.
- Give –B (Big B) the memory it requires without oversubscribing the physical RAM.
- (Optional) multiple OpenEdge servers (web servers, appserves, etc.) on the same ESXi server.
- Large MTU – Jumbo Frames.

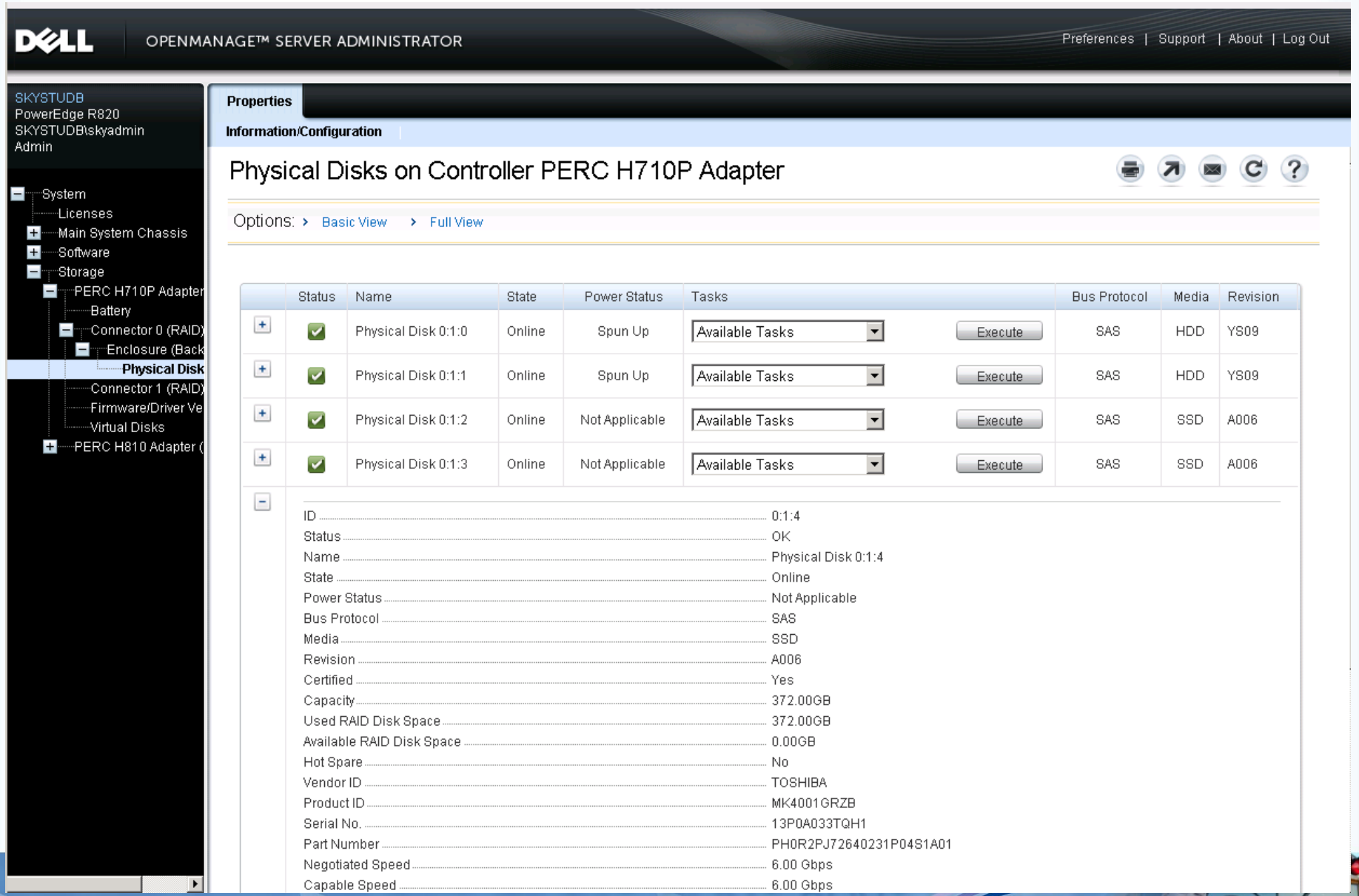
Storage Area Network - FC

- Dedicated high speed network of servers and shared storage devices
- Provide block level data access
- Resource Consolidation
  - Centralized storage and management
- Scalability
  - Theoretical limit: Appx. 15 million devices
- Secure Access



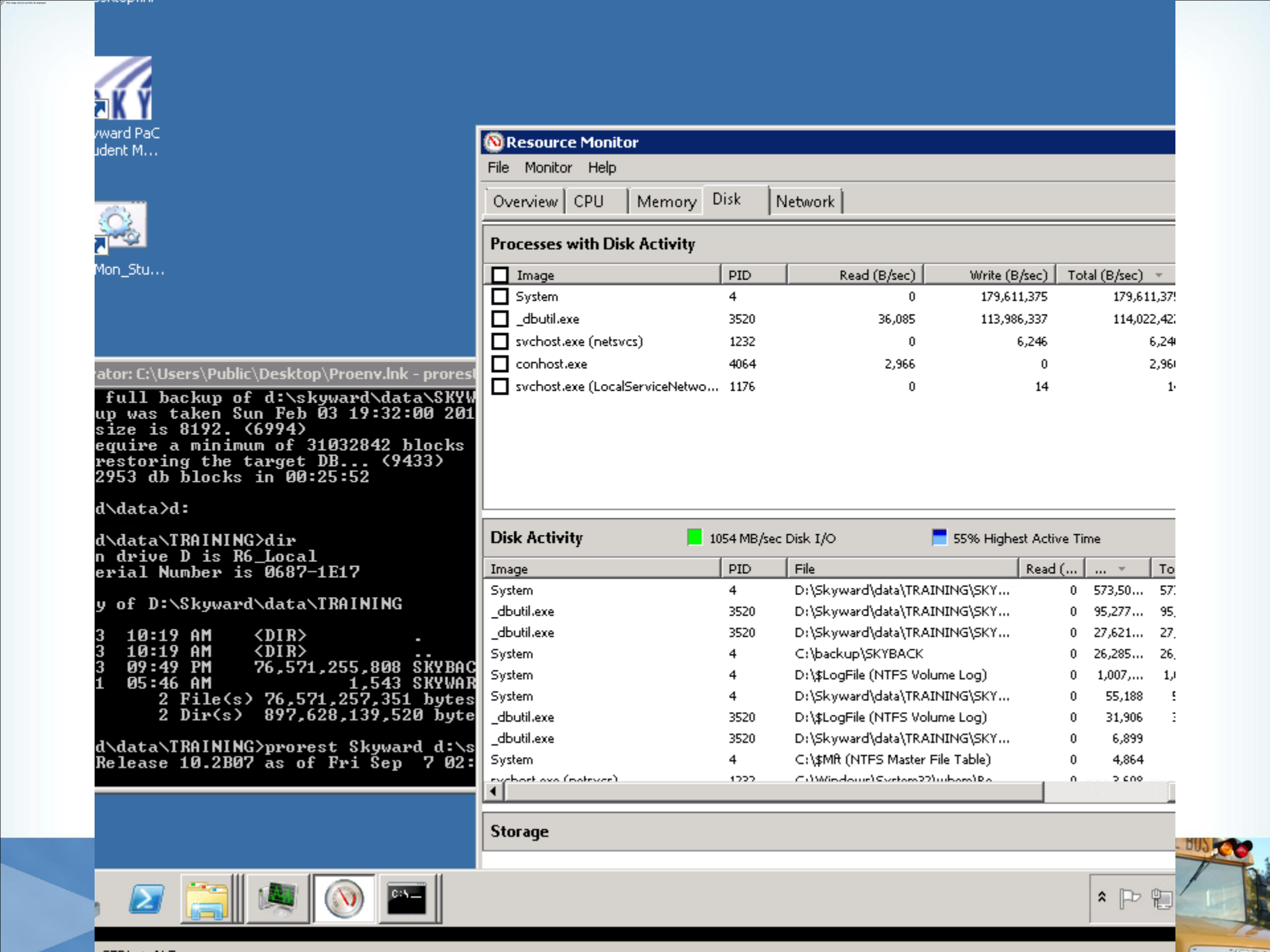
iSCSI SAN

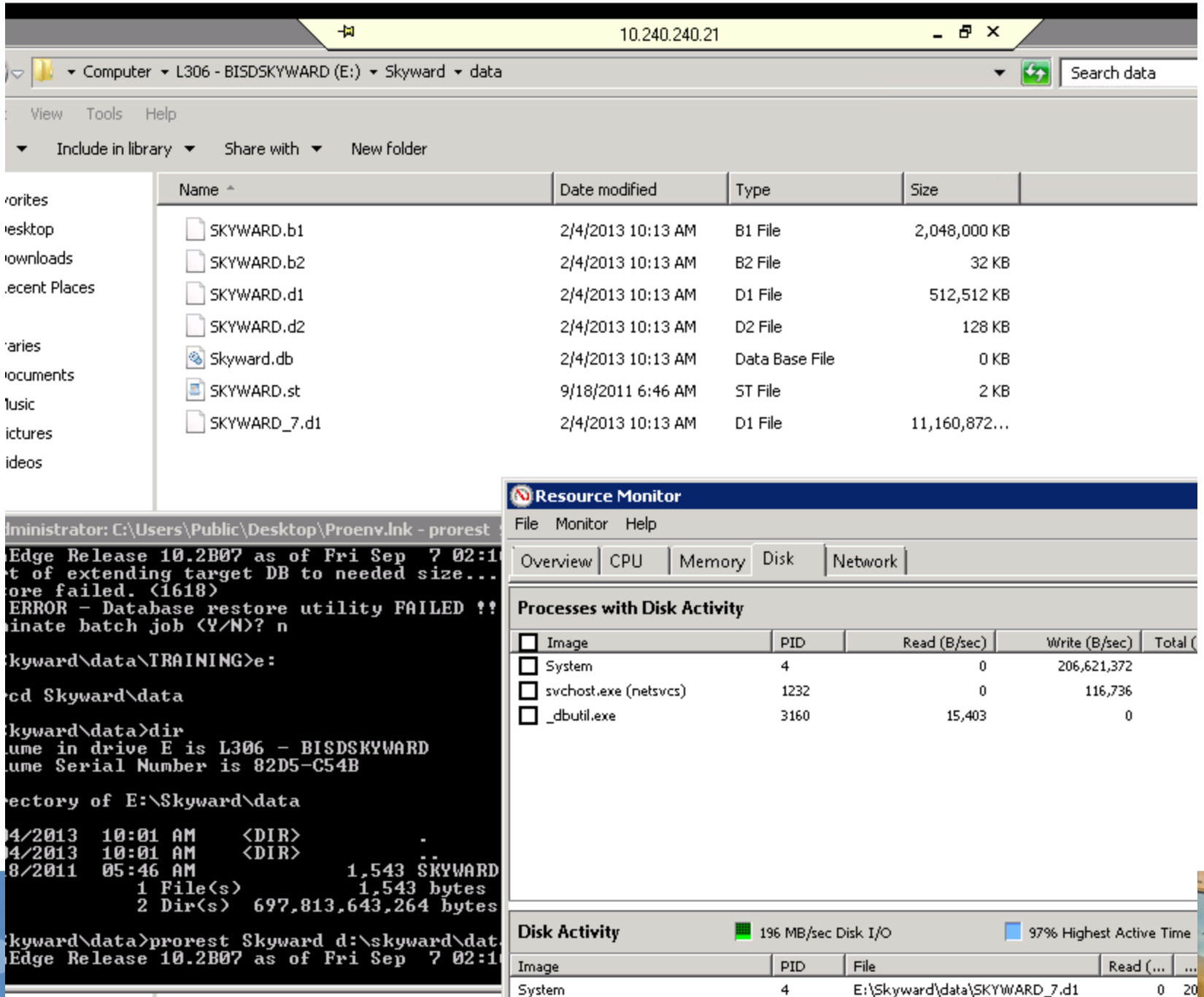

1Gb EqualLogic SAN
Dell PowerEdge Host
Stack
Dell PowerConnect 6248 (1 Gb)
EqualLogic PS6000 SAN



Best Practices for Virtualizing

- Do not Thin Provision
- Do not Thin Provision
- Do not Thin Provision
- Do not Dynamic Capacity
- Do not what ever they call it.
- Tier Storage : What can – will go wrong.


Resource Monitor
File Monitor Help
Overview CPU Memory Disk Network
Processes with Disk Activity
Image PID Read (B/sec) Write (B/sec) Total (B/sec)
System 4 0 179,611,375 179,611,375
_dbutil.exe 3520 36,085 113,986,337 114,022,42
svchost.exe (netsvcs) 1232 0 6,246 6,24
conhost.exe 4064 2,966 0 2,96
svchost.exe (LocalServiceNetwo... 1176 0 14 1
Disk Activity
1054 MB/sec Disk I/O
55% Highest Active Time
Image PID File Read (... ... To
System 4 D:\Skyward\data\TRAINING\SKY... 0 573,50... 57
_dbutil.exe 3520 D:\Skyward\data\TRAINING\SKY... 0 95,277... 95
_dbutil.exe 3520 D:\Skyward\data\TRAINING\SKY... 0 27,621... 27
System 4 C:\backup\SKYBACK 0 26,285... 26
System 4 D:\$LogFile (NTFS Volume Log) 0 1,007,... 1,
System 4 D:\Skyward\data\TRAINING\SKY... 0 55,188
_dbutil.exe 3520 D:\$LogFile (NTFS Volume Log) 0 31,906
_dbutil.exe 3520 D:\Skyward\data\TRAINING\SKY... 0 6,899
System 4 C:\$Mft (NTFS Master File Table) 0 4,864
Storage
full backup of d:\skyward\data\SKYW
up was taken Sun Feb 03 19:32:00 201
size is 8192. (6994)
equire a minimum of 31032842 blocks
restoring the target DB... (9433)
2953 db blocks in 00:25:52
d\data>d:
d\data\TRAINING>dir
n drive D is R6_Local
erial Number is 0687-1E17
y of D:\Skyward\data\TRAINING
3 10:19 AM <DIR> .
3 10:19 AM <DIR> ..
3 09:49 PM 76,571,255,808 SKYBAC
1 05:46 AM 1,543 SKYWAR
2 File(s) 76,571,257,351 bytes
2 Dir(s) 897,628,139,520 byte
d\data\TRAINING>prorest Skyward d:\s
Release 10.2B07 as of Fri Sep 7 02:

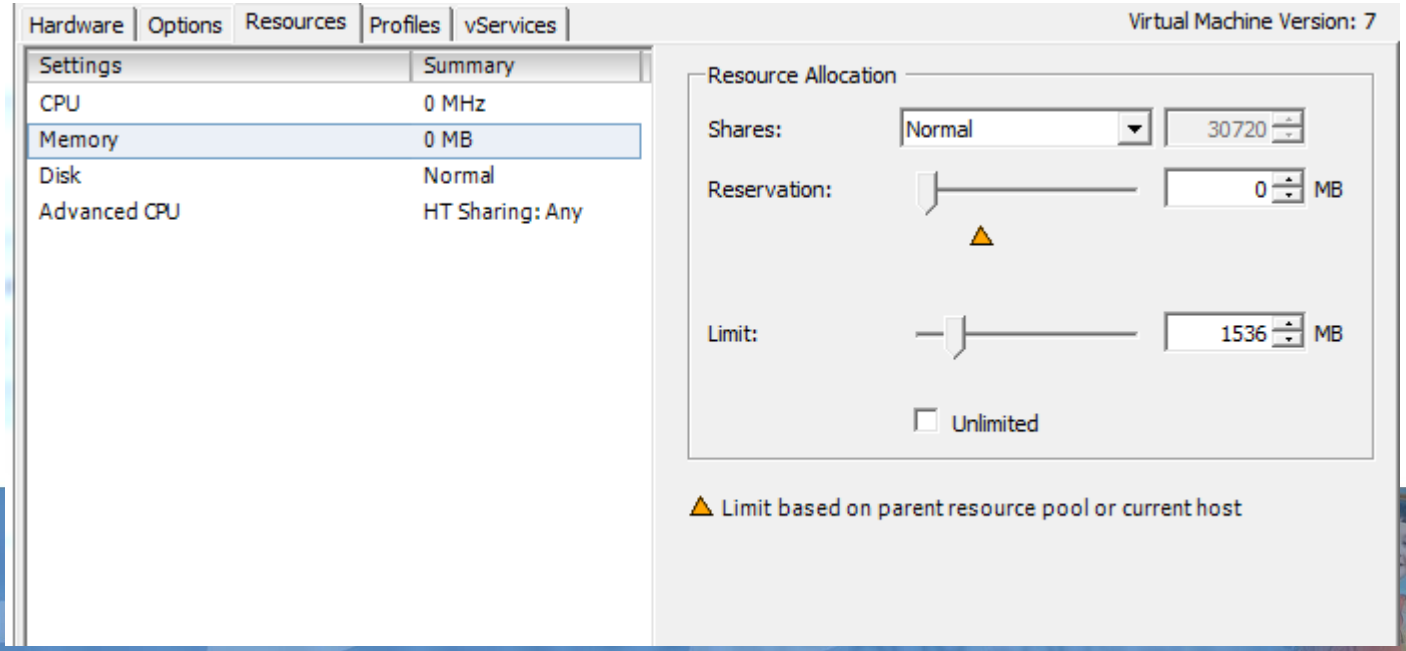

10.240.240.21
Computer ▸ L306 - BISDSKYWARD (E:) ▸ Skyward ▸ data
Search data
View Tools Help
Include in library Share with New folder
Name Date modified Type Size
SKYWARD.b1 2/4/2013 10:13 AM B1 File 2,048,000 KB
SKYWARD.b2 2/4/2013 10:13 AM B2 File 32 KB
SKYWARD.d1 2/4/2013 10:13 AM D1 File 512,512 KB
SKYWARD.d2 2/4/2013 10:13 AM D2 File 128 KB
Skyward.db 2/4/2013 10:13 AM Data Base File 0 KB
SKYWARD.st 9/18/2011 6:46 AM ST File 2 KB
SKYWARD_7.d1 2/4/2013 10:13 AM D1 File 11,160,872...
Resource Monitor
File Monitor Help
Overview CPU Memory Disk Network
Processes with Disk Activity
Image PID Read (B/sec) Write (B/sec)
System 4 0 206,621,372
svchost.exe (netsvcs) 1232 0 116,736
_dbutil.exe 3160 15,403 0
Disk Activity
196 MB/sec Disk I/O
97% Highest Active Time
Image PID File Read (...
System 4 E:\Skyward\data\SKYWARD_7.d1 0
Edge Release 10.2B07 as of Fri Sep 7 02:1
of extending target DB to needed size...
ore failed. (1618)
ERROR - Database restore utility FAILED !!
inate batch job (Y/N)? n
kyward\data\TRAINING>e:
cd Skyward\data
kyward\data>dir
ume in drive E is L306 - BISDSKYWARD
ume Serial Number is 82D5-C54B
ectory of E:\Skyward\data
4/2013 10:01 AM <DIR> .
4/2013 10:01 AM <DIR> ..
8/2011 05:46 AM 1,543 SKYWARD
1 File(s) 1,543 bytes
2 Dir(s) 697,813,643,264 bytes
kyward\data>prorest Skyward d:\skyward\dat
Edge Release 10.2B07 as of Fri Sep 7 02:1

Common Mistakes/Issues

- Resource Limits Causing Constraints

Many sites that have run VMware for a while will find that their VM's have limits applied. If additional Memory was been added to the server after it was created you may be hitting an artificial resource limit.

Check the Resources tab of the VM and make sure the Limits for CPU and Memory are set to Unlimited:

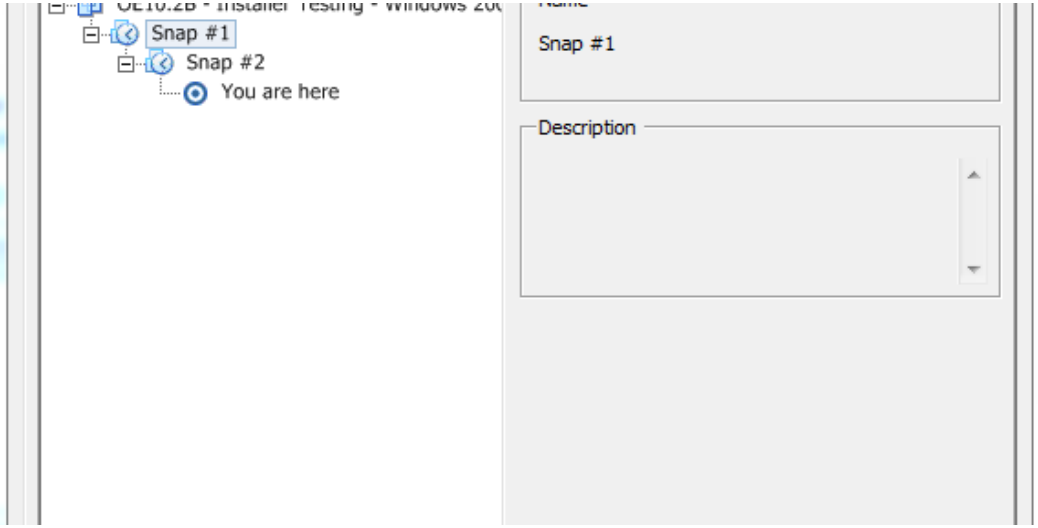


Common Mistakes/Issues

- Snapshots Causing Disk Performance Issues

Snapshots should never be kept for any period of time.

Snapshots are a great tool – but they should be used during a limited period and removed as quickly as possible to reduce the possibility of disk I/O performance issues.



Show all Datastores

Datastore	Datastore Cluster	File system type	Connectivity Status	Multipathing Status	Capacity	Space Used	Snapshot Space
md3200i-mdl-vdis...	MD3200i SATA Storage	VMFS	Up	Partial/No Redundancy	1.98 TB	267.27 GB	97.27 GB

What's New in vSphere 5?

Biggest change – vRam licensing

- Free Hypervisor — 32GB / no CPU limit
- Essentials — 32GB / CPU Socket
- Standard — 32GB / CPU Socket
- Advanced — 32GB / CPU Socket
- Enterprise — 48GB / CPU Socket
- Enterprise Plus — 64GB / CPU Socket

What's New in Hyper-V 2012?

- P - 320 logical processors
- P - 4 terabytes of RAM
- V - 64 virtual processors
- V - Terabyte of RAM
- Live migration non-shared storage
- Hyper-V Replica
- NUMA spanning - can be turned off

Conclusion

- Virtualization can be a good fit.
- Sometimes physical is better.
- Results will very.
- There are limits.

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Thank you for attending.