

vSphere 4.1 Technical Overview

May 2010

Confidential until 7/13

vmware®

Agenda

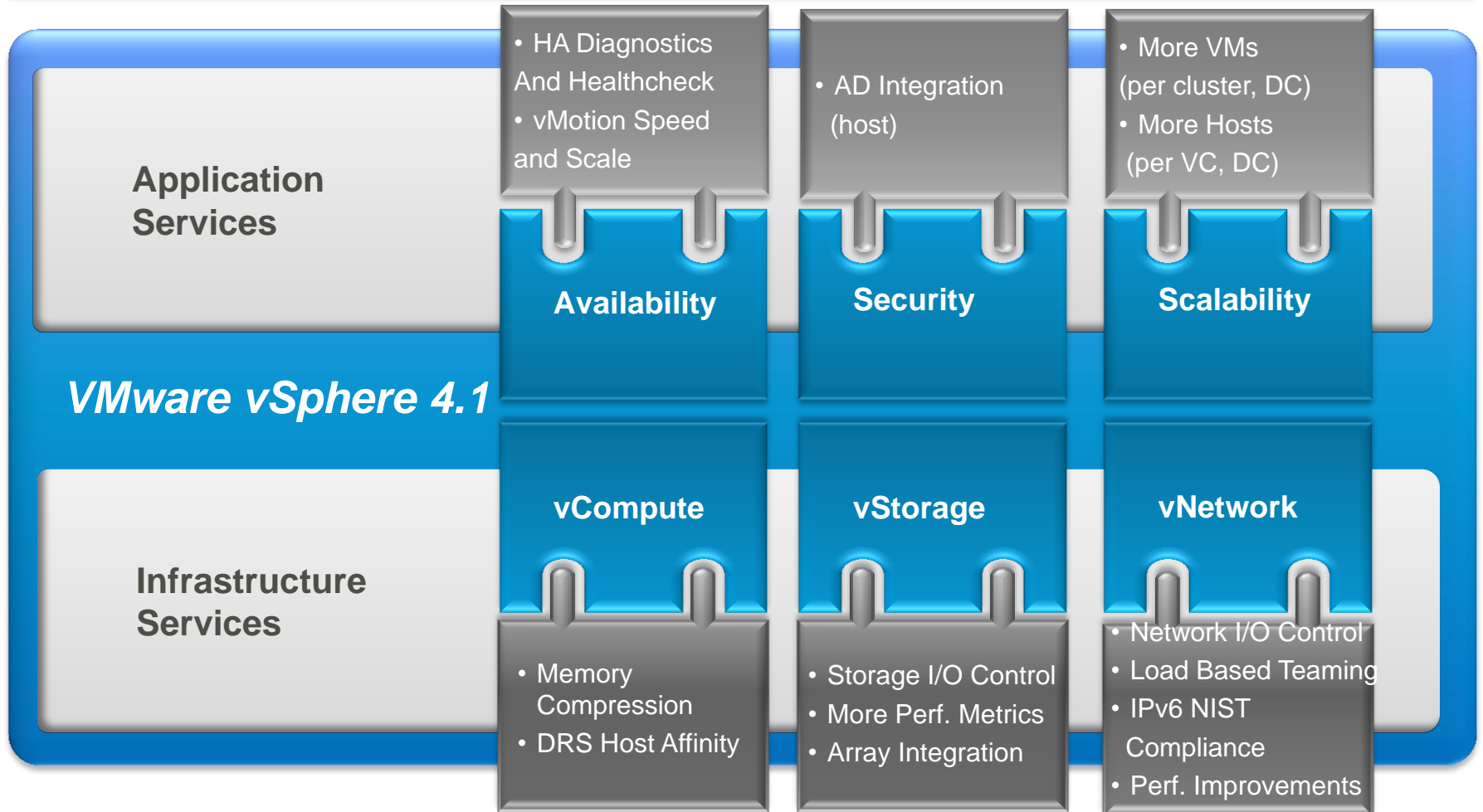
- Introduction – vSphere 4.1 Features and Themes
- Network – Network I/O Control, Load-Based Teaming, IPv6, Performance
- Storage – Storage I/O Control, VAAI, I/O Metrics, iSCSI Offload enhancements
- ESXi – Deployment Methods, Tech Support Mode enhancements
- HA & FT – HA Diagnostics & Reliability, FT enhancements, vMotion enhancements
- DRS & DPM – DRS Host Affinity, DPM enhancements
- Management – vCenter Server & vSphere Platform enhancements

VMware vSphere™ 4.1

*The Platform for Cloud
Infrastructure*

VMware vSphere 4.1: *What's New?*

vCenter Server (64-bit)



Network

vSphere 4.1—Network Feature Summary

Network Performance & Scale Improvements

- vmkernel TCP/IP stack—vMotion, NFS, FT logging performance gains
- UDP and intra-host VM to VM performance improvements
- vDS scaling to ~350 hosts/vDS (from current 64 hosts/vDS)—final number is TBD!

Traffic Management (*vDS only* features)

- NetIOC (Network I/O Control)
 - Software scheduler to guarantee service levels for specified traffic types
- LBT (Load Based Teaming)
 - Avoid congestion by dynamic adjustment to NIC team based upon pNIC load

IPv6—NIST Compliance

- Compliance with NIST “Host” Profile

Nexus 1000V Enhancements

- Additional Nexus 1000V features—Nexus 1000V V1.4 or 2.0

Network Performance Improvements

vMotion

- Throughput improved significantly for single vMotion
 - ESX 3.5 – ~1.0Gbps
 - ESX 4.0 – ~2.6Gbps
 - ESX 4.1 – max 8 Gbps
- Elapsed reduced by 50%+ on 10GigE tests.

Tx Worldlet

- VM – VM throughput improved by 2X, to up to 19 Gbps
- VM – Native throughput improved by 10%

LRO (Large Receive Offload)

- Receive tests indicate 5-30% improvement in throughput
- 40 - 60% decrease in CPU cost

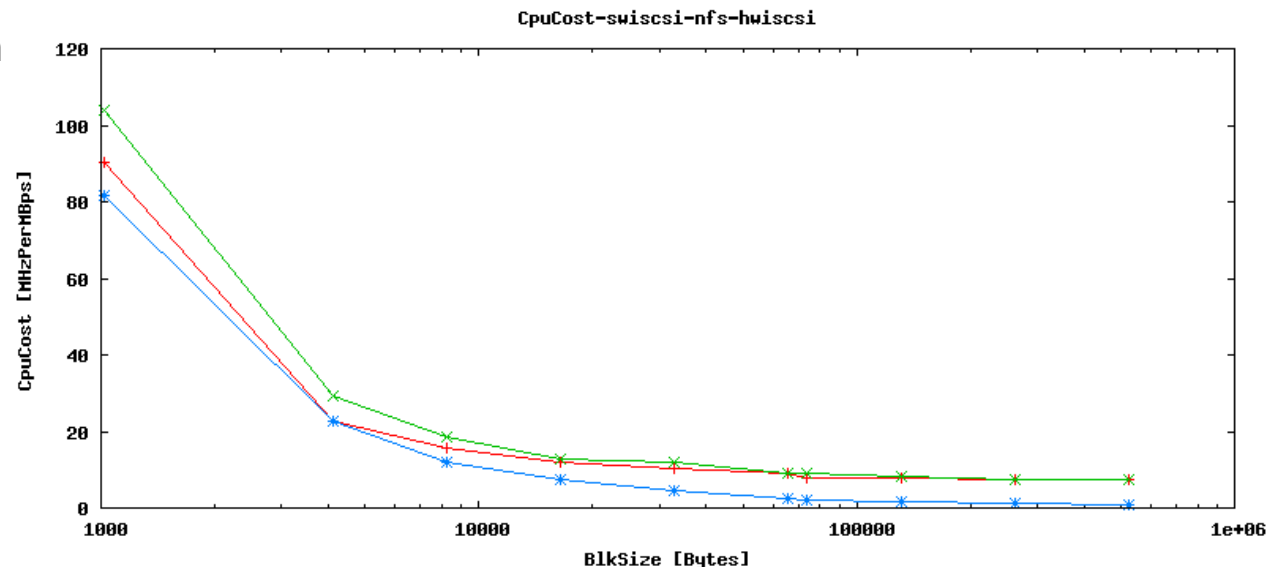
NFS & HW iSCSI Support (Storage) in vSphere 4.1

Improved NFS performance

- Up to 15% reduction in CPU cost for both read & write
- Up to 15% improvement in Throughput cost for both read & write

Broadcom iSCSI HW Offload Support

- 89% improvement in CPU read cost !
- 83% improvement in CPU write cost !

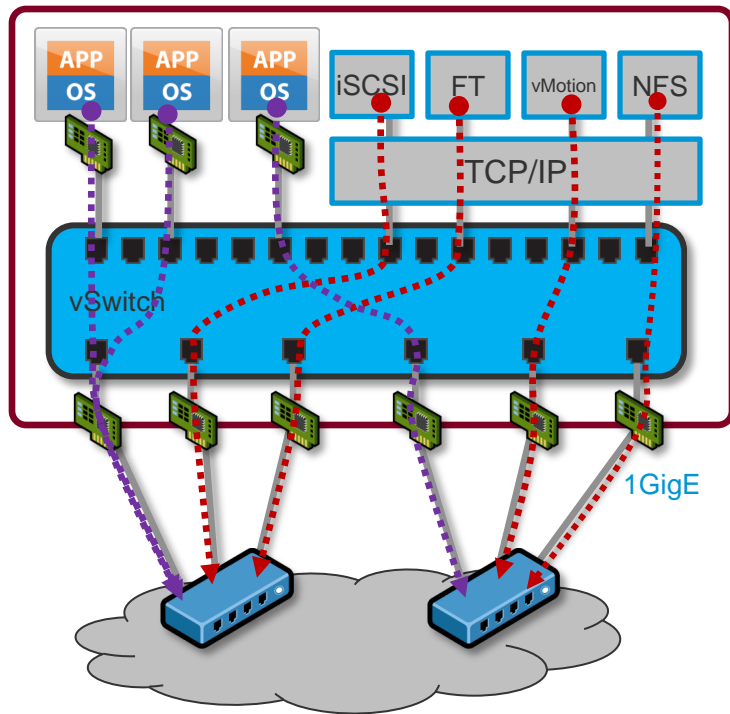


Plotted 18-Mar-2010 15:48:25 (Thu)

+ D=2010-03-09,T=0818,CS=993875,P=swiscsi,V=rdn,H=82598,M=1500,Gos=M2008EE,A=x64,PCpu=8,VM=1,Read%=100,Rand%= 0
* D=2010-03-08,T=1629,CS=993875,P=_____nfs,V=nfs,H=82598,M=1500,Gos=M2008EE,A=x64,PCpu=8,VM=1,Read%=100,Rand%= 0
* D=2010-03-02,T=1932,CS=993875,P=hwiscsi,V=rdn,H=57711,M=1500,Gos=M2008EE,A=x64,PCpu=8,VM=1,Read%=100,Rand%= 0

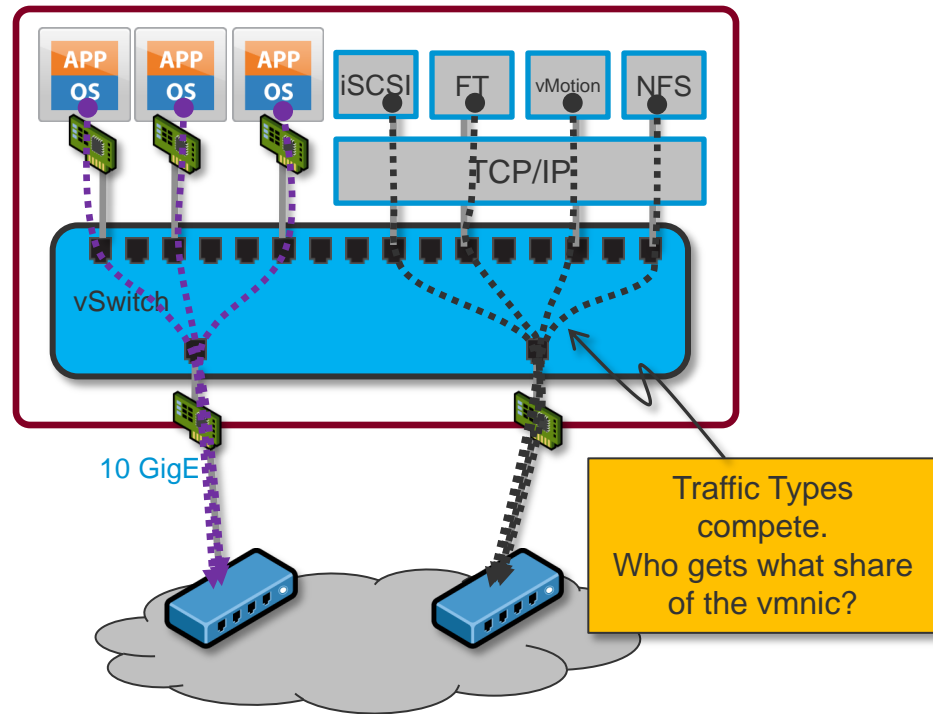
Network Traffic Management—Emergence of 10 GigE

1GigE pNICs



- NICs dedicated for some traffic types e.g. vMotion, IP Storage
 - Bandwidth assured by dedicated physical NICs

10 GigE pNICs



- Traffic typically converged to two 10 GigE NICs
- Some traffic types & flows could dominate others through oversubscription

Network I/O Control (NetIOC)

Network I/O Control Goals

- Isolation
 - One flow should not dominate others
- Flexible Partitioning
 - Allow isolation and over commitment
 - Guarantee Service Levels when flows compete

Note: NetIOC feature is only available with vDS (Enterprise Plus)

Network I/O Control—Parameters

Limits and Shares

- **Limits** specify the absolute maximum bandwidth for a flow over a Team
 - Specified in Mbps
 - Traffic from a given flow will never exceed its specified limit
 - Egress from ESX host
- **Shares** specify the relative importance of an egress flow on a vmnic i.e. guaranteed minimum
 - Specified in abstract units, from 1-100
 - Presets for *Low* (25 shares), *Normal* (50 shares), *High* (100 shares), plus *Custom*
 - Bandwidth divided between flows based on their relative shares
- Controls apply to output from ESX host
- Shares apply to a given vmnic
- Limits apply across the team

Network I/O Control—Configuration from vSphere Client

tm-vcenter01.vmworld.com - vSphere Client

File Edit View Inventory Administration Plug-ins Help

Home Inventory Networking

tm-vcenter01.vmworld.com

- Data Center 01
 - DHCP-VM02
 - DHCP-VM03
 - Production01
 - Static-VM01
 - dvSwitch
 - dvSwitch-DVUplinks-48
 - DHCP-VM02
 - DHCP-VM03
 - dvPortGroup
 - FT01
 - Management
 - Static-VM01
 - Storage01
 - VMotion01

vDS only feature!

Preconfigured Traffic Classes

Limits
Maximum bandwidth for traffic class/type

Shares
Guaranteed minimum service level

Network Resource Pool	Host Limit - Mbit/s	Physical Adapter Shares	Shares Value
FT Traffic	Unlimited	High	100
iSCSI Traffic	Unlimited	High	100
vMotion Traffic	Unlimited	Normal	50
Management Traffic	Unlimited	Normal	50
NFS Traffic	Unlimited	Normal	50
Virtual Machine Traffic	500	Normal	50

Network Resource Pool Settings

Network Resource Pool: Virtual Machine Traffic

Resource Allocation

Physical adapter shares: High

Host limit: 300 Mbit/s

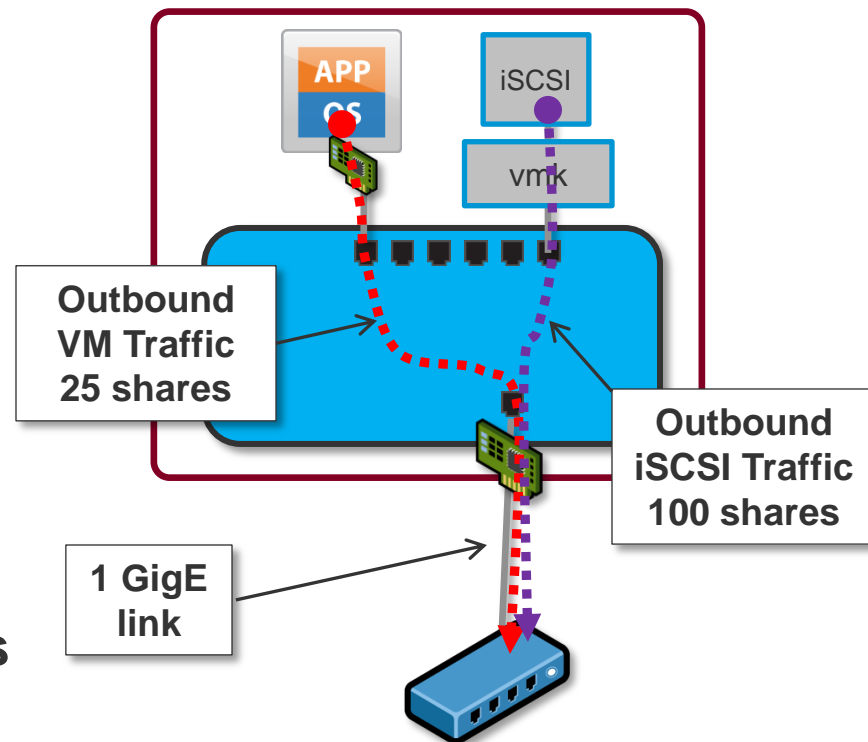
Unlimited

Help OK Cancel

- e.g. VM traffic in this example:
- limited to max of 500 Mbps (aggregate of all VMs)
 - with minimum of 50/400 of pNIC bandwidth (50/(100+100+50+50+50+50))

Demonstration Scenario

- 1GigE pnic (vmnics)
- Two traffic types competing for link (link oversubscribed)
 - iSCSI set with “100 shares” (generated by iometer)
 - VM traffic set with “25 shares” (generated by iperf)
- Link capable of ~890 Mbps
 - iSCSI gets 80% → ~710Mbps
 - VM gets 20% → ~180Mbps



- gagan-w2k8-vm.vmware.com
 - Datcenter_1
 - VM Network
 - vmnic0
 - vmnic1
 - vmnic4
 - vmnic5
 - vmnic6
 - vmnic7
 - vmnic9
 - vc-dvs-vmnic3
 - vc-dvs-vmnic3-DVU
 - dvPortGroup
 - vc-dvs-vmnic8
 - vc-dvs-vmnic8-DVU
 - dvPortGroup2

vc-dvs-vmnic3

Getting Started Summary Networks Ports Resource Allocation Configuration Virtual Machines

Network Resource Management defines how different network traffic types are propagated through each congested physical network adapter in the vNetwork Distributed Switch.

To exclude a physical network adapter from the network resource management, go to Software > Advanced Settings on the host Configuration tab.

Summary

Total number of physical adapters: **1**

Total network bandwidth capacity: **1000 Mbit/s**

Network resource management: **Enabled**

[Properties...](#)

Network Resource Pool	Host Limit - Mbit/s	Physical Ada..	Shares...
FT Traffic	Unlimited	Normal	50
iSCSI Traffic	Unlimited	High	100
vMotion Traffic	Unlimited	Normal	50
Management Traffic	Unlimited	Normal	50
NFS Traffic	Unlimited	Normal	50
Virtual Machine Traffic	Unlimited	Low	25

Network I/O Control Demonstration

What happens if we turn off IOMETER?

- VM traffic consumes the link up to capacity of ~890Mbps (no competing flows)

Network I/O Control – Demonstration

Now, flip the shares around

- Set iSCSI to 25 Shares → 20% of bandwidth (~180Mbps)
- Set VM Traffic to 100 shares → 80 % of bandwidth (~710 Mbps)

Network I/O Control – Demonstration

Now, Introduce a “Limit” on VM traffic of 500 Mbps

Network I/O Control – Demonstration

Now, disable Network I/O Control

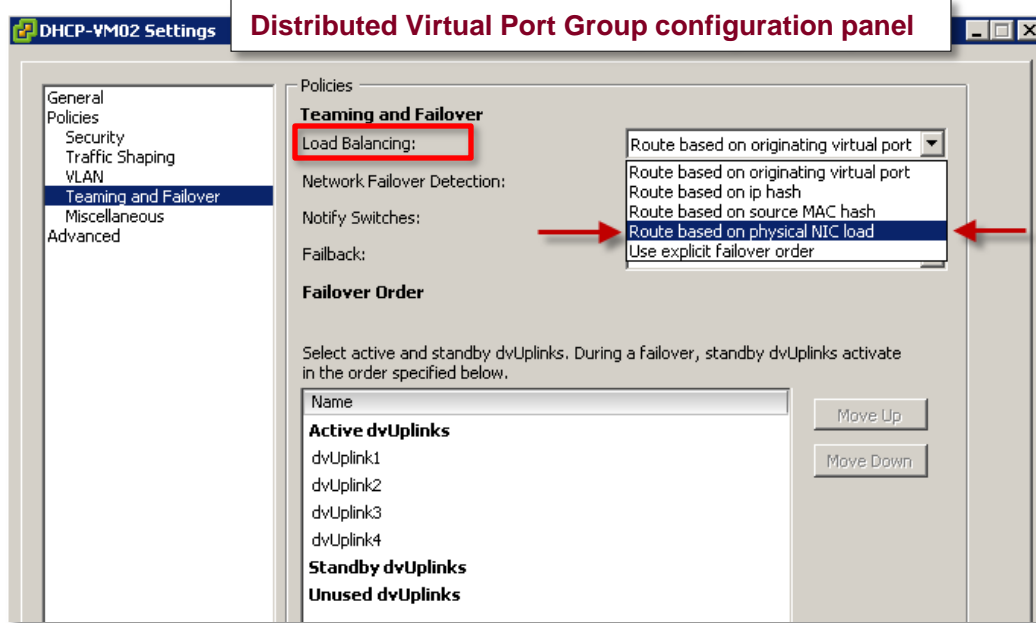
- iSCSI and VM traffic compete for link and become erratic.

Network I/O Control – Use Cases

Most applicable to 2x 10GigE link deployment—converged traffic types (vMotion, FT, VM, iSCSI, etc)

But, ... can be used with 1GigE links (per demonstration)

NIC Teaming Enhancements—Load Based Teaming (LBT)



Note: adjacent physical switch configuration is same as other teaming types (except IP-hash).
i.e. same L2 domain

Load Based Teaming (LBT) – only available with vDS

- Existing vSphere 4.0 teaming modes use static virtual port to pNIC allocation—teaming algorithms do not account for load
- LBT Goal: avoid congestion by balancing load on the team
- LBT invoked if saturation detected on Tx or Rx (>75% mean utilization over 30s period)
- 30 sec period—long period avoids mac address flapping issues with adjacent physical switches
- Note: Current implementation does not take NetIORM shares into account

IPv6—Progress towards full NIST “Host” Profile Compliance

VI 3 (ESX 3.5)

- IPv6 supported in guests

vSphere 4.0

- IPv6 support for
 - ESX 4
 - vSphere Client
 - vCenter Server
 - vMotion
 - **IP Storage (iSCSI, NFS) — EXPERIMENTAL**
- Not supported for vSphere vCLI, HA, FT, Auto Deploy

vSphere 4.1

- NIST compliance with “Host” Profile (<http://www.antd.nist.gov/usgv6/usgv6-v1.pdf>)
- Including IPSEC, IKEv2, etc.
- Not supported for vSphere vCLI, HA, FT

Cisco Nexus 1000V—Planned Enhancements

Easier software upgrade

- In Service Software Upgrade (ISSU) for VSM and VEM
- Binary compatibility

Weighted Fair Queuing (s/w scheduler)

Increased Scalability

SPAN to and from Port Profile

VLAN pinning to PNIC

Installer app for VSM HA and L3 VEM/VSM communication

Start of EAL4 Common Criteria certification

4094 active VLANs

Scale Port Profiles > 512

Storage

Storage Feature Summary

Storage I/O Control

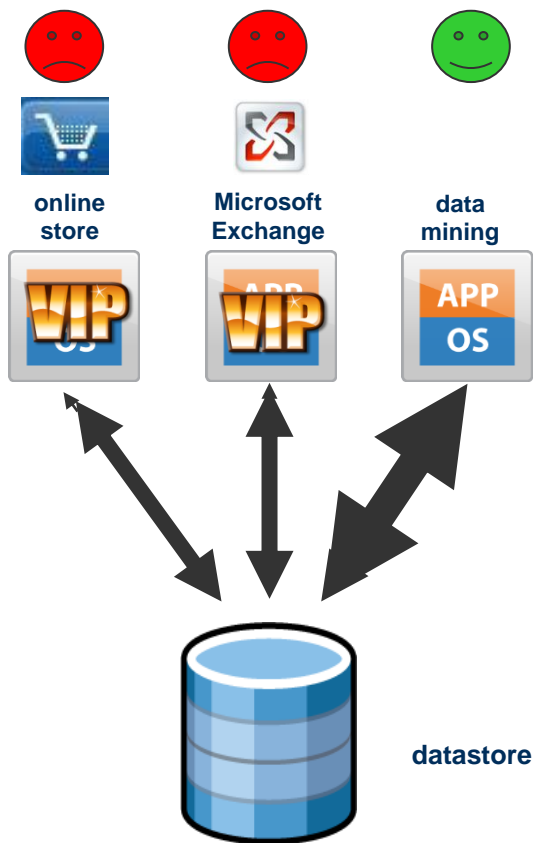
vStorage API for Array Integration (VAAI)

New Performance Monitoring Statistics

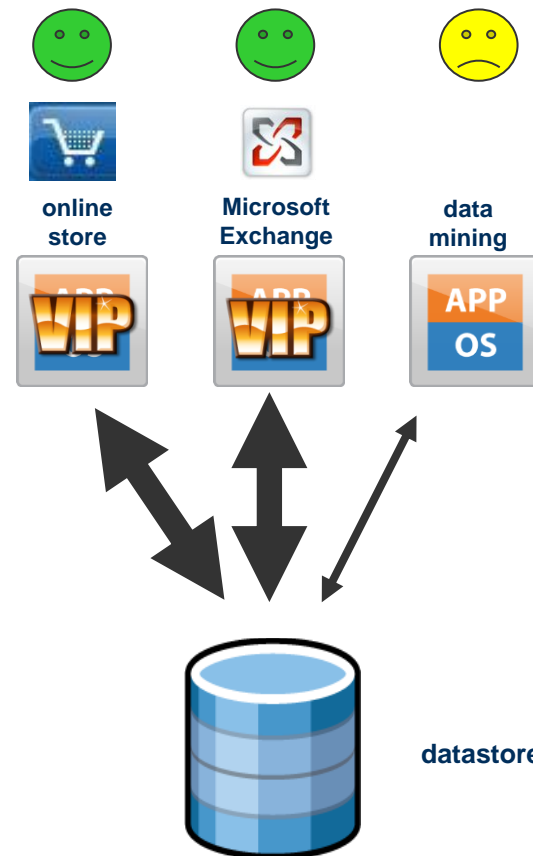
The I/O Sharing Problem

- Low priority VM can limit I/O bandwidth for high priority VMs
- Storage I/O allocation should be in line with VM priorities

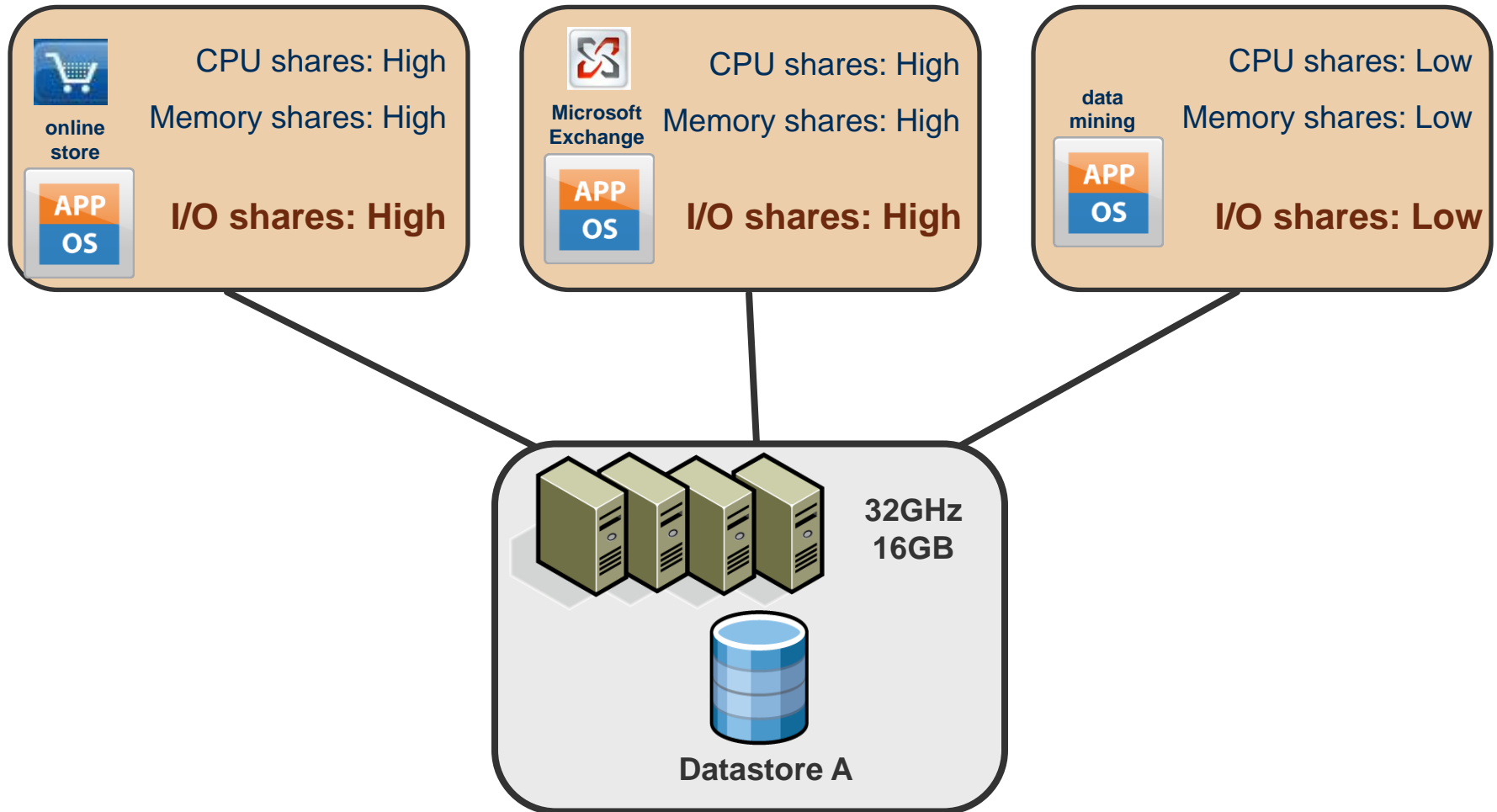
What you see



What you want to see



Solution: Storage I/O Control (SIOC)



Setting I/O Controls

Win5 - Virtual Machine Properties

Hardware | Options | Resources | Virtual Machine Version: 3

Settings Summary

CPU	0 MHz
Memory	0 MB
Disk	Normal
Advanced CPU	HT Sharing: Any

Resource Allocation

Select a virtual hard disk from the list below and click the Shares field to change its value.

Disk	Shares	Shares Value	Limit - IOPs
Hard disk 1	Normal	1000	Unlimited
Hard disk 2	High	2000	1500

Limit specifies an upper bound for storage resources that can be allocated to a virtual machine.
IOPs are number of I/O operations per second.

Help OK Cancel

Enabling Storage I/O Control

The screenshot shows the vSphere Client interface for the datastore **FC_LUN01_TMGO2**. The top navigation bar includes **Summary**, **Virtual Machines**, **Hosts**, **Performance**, **Configuration**, **Tasks & Events**, **Alarms**, and **Permissions**. The **Configuration** tab is active, showing a table of connected hosts and a detailed view of the datastore's storage configuration.

The host connection table lists the following hosts:

Name	State	Status	% CPU	% Memory	Uptime	Last Time Exited
esx17a.vmworl.c...	Connected	✓ Nor...	0	9		Never
esx17b.vmworl.c...	Connected	✓ Nor...	0	10		Never
esx18a.vmworl.c...	Connected	✓ Nor...	0	9	4	Never
esx18b.vmworl.c...	Connected	✓ Nor...	0	10	4	Never

The **Datastore Details** section for **FC_LUN01_TMGO2** shows:

- Location: /vmfs/volumes/4b0e8053-a...
- Hardware Acceleration: Unknown
- Capacity: 122.75 GB
- Used: 59.28 GB
- Free: 63.47 GB

The **Storage I/O Control** status is **Enabled**. The **Extents** table shows:

Volume Label	DGC Fibre Channel Disk (na ...)	Capacity
FC_LUN01_...	DGC Fibre Channel Disk (na ...)	123.00 GB

The **Formatting** section shows:

- File System: VMFS 3.46
- Block Size: 1 MB

The **Storage I/O Control Enabled** status is highlighted in a large blue oval. A mouse cursor is pointing at the **Properties...** link in the top right corner of the host table. Another blue oval highlights the **Properties...** link in the bottom right corner of the datastore details section.

Viewing Configuration Settings

YSITAUTO1 - vSphere Client

File Edit View Inventory Administration Plug-ins Help

Home Inventory Datastores Search Inventory

YSITAUTO1

- IO-DRS
 - datastore1 (1)
 - LocalDisk
 - pa-group-stautomation
 - pvt_jun250gb
 - SharedStorage
 - test

pvt_jun250gb

Getting Started Summary Virtual Machines Hosts Performance Configuration Tasks & Events Alarms Permissions Storage Views

Name, State, Host or Guest OS contains: Clear

Name	State	Status	Host	Shares Value	Limit - IOPs	Datastore % Shares
io-rm_vm1	Powered On	Normal	vcuiqa010.eng.vmware.com	1500	Unlimited	30
io-rm_vm2	Powered On	Normal	vcuiqa012.eng.vmware.com	3500	Unlimited	70

Recent Tasks

Name, Target or Status contains: Clear

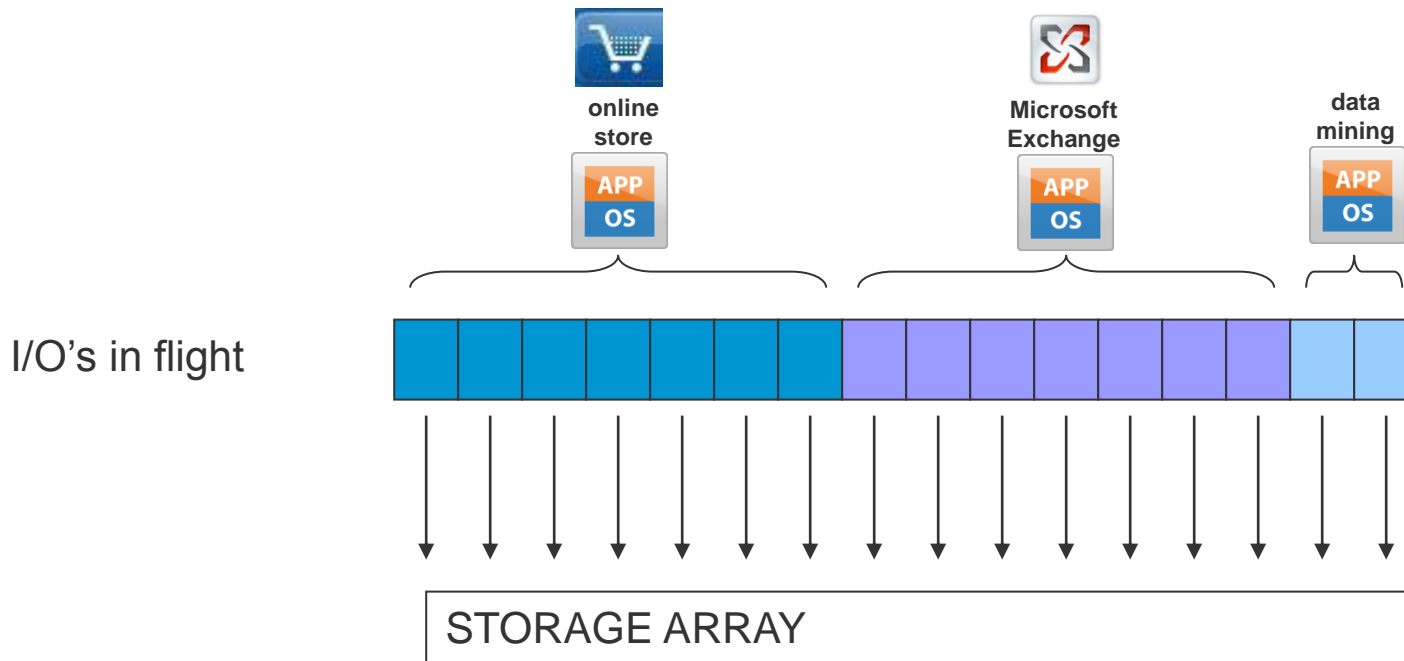
Name	Target	Status	Details	Requested Start Time	Start Time	Completed Time
Reconfigure virtual machine	io-rm_vm1	Completed		8/25/2009 6:52:20 PM	8/25/2009 6:52:20 PM	8/25/2009 6:52:22 PM
Reconfigure virtual machine	io-rm_vm2	Completed		8/25/2009 6:46:25 PM	8/25/2009 6:46:25 PM	8/25/2009 6:46:27 PM
Reconfigure virtual machine	io-rm_vm2	Completed		8/25/2009 6:46:15 PM	8/25/2009 6:46:15 PM	8/25/2009 6:46:18 PM

Tasks Alarms Administrator

Allocate I/O Resources

Shares translate into ESX I/O queue slots

- VMs with more shares are allowed to send more I/O's at a time
- Slot assignment is dynamic, based on VM shares and current load
- Total # of slots available is dynamic, based on level of congestion



Storage I/O Control in Action: Example #1

Two VMs running IOmeter* on two hosts

- 16 KB random reads

VM1 : 1000 shares

VM2 : 2000 shares

Result: VMs get IOPS in ratio 1:2

	Without Storage I/O Control		With Storage I/O Control	
	IOPS	IOmeter Latency (ms)	IOPS	IOmeter Latency (ms)
VM1	1500	20	1080	31
VM2	1500	21	1900	16

* <http://www.iometer.org>

Storage I/O Control in Action: Example #2

Two Windows VMs running SQL Server on two hosts

- 250 GB data disk, 50 GB log disk

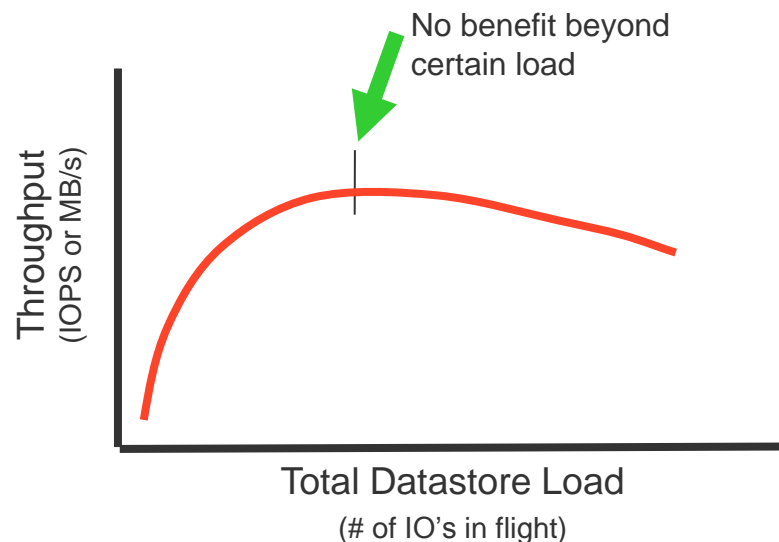
VM1: 500 shares

VM2: 2000 shares

Result: VM2 with higher shares gets more orders/min & lower latency!

	Without Storage I/O Control		With Storage I/O Control	
	Orders/ Minute	Processing Time (ms)	Orders/ Minute	Processing Time (ms)
VM1 (500 Shares)	8800	213	7000	275
VM2 (2000 Shares)	8500	220	12400	150
Aggregate	17300		19400	

Step 1: Detect Congestion



Congestion signal: ESX-array response time > threshold

- Default threshold: 35ms
- We will likely recommend different defaults for SSD and SATA
- **Automated tiered storage arrays are NOT SUPPORTED with 4.1**

Changing default threshold (not usually recommended)

- Low latency goal: set lower if latency is critical for some VMs
- High throughput goal: set close to IOPS maximization point

What are Automated Tiered Storage

LUNs/blocks migrated between tiers automatically & transparently

- Tiers: SSD, FC, SAS, SATA
- Examples: Compellent, EMC FAST, Dell Equallogic

Static latency threshold may not work well for such systems

- Threshold too low unnecessary throttling
- Threshold too high congestion not detected

Certification program to assess compatibility

- Targeted at automated tiered systems only – tell us who you are!
- Systems supporting only manual migration between tiers do not need certification
- Cert program to be launched on or after vSphere 4.1 GA
 - May initially be limited to a subset of automated tiered storage partners

Achieve compatibility by dynamically changing threshold via vSphere API

For more details on Storage I/O Control

vSphere 4.1 Documentation also describes use of this features in the Resource Management Guide Chapter 4 (pages 37-39)

Also check out the VMWorld 2009 presentation video:

<http://vmworld.com/docs/DOC-3855>

Additional Collateral planned for release at GA

- Technical White paper on Concepts and Deployment Considerations for SIOC
- Frequently Asked Questions
- Datasheet or webpage content

vStorage APIs for Array Integration (VAAI)

Improves performance by leveraging efficient array-based operations as an alternative to VMware host-based solutions

Three Primitives include :

1. Full Copy – Xcopy like function to offload work to the array
2. Write Same -Speeds up zeroing out of blocks or writing repeated content
3. Atomic Test and Set – Alternate means to locking the entire LUN

Helping function such as:

- Storage vMotion
 - Provisioning virtual machines from Template
 - Improves thin provisioning disk performance
 - VMFS share storage pool scalability
- Requires firmware from Storage Vendors (6 participating, see later slides)
 - Supports block based storage only in the 4.1 release

VM Provisioning from Template with Full Copy

Benefits

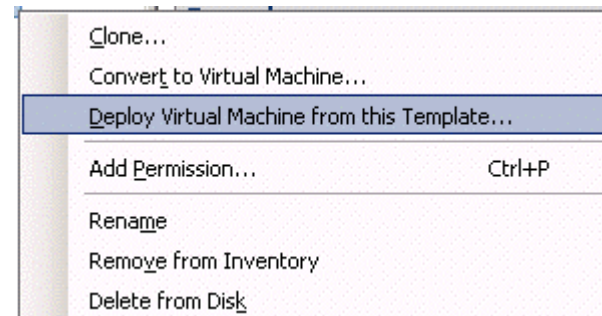
- Reduce installation time
- Standardize to ensure efficient management, protection & control

Challenges

- Requires a full data copy
- 100 GB template (10 GB to copy): 5-20 minutes
- FT requires additional zeroing of blocks

Improved Solution

- Use array's native copy/clone & zeroing functions
- Up to 10-20x speedup in provisioning time



Storage vMotion with Array Full Copy Function

Benefits

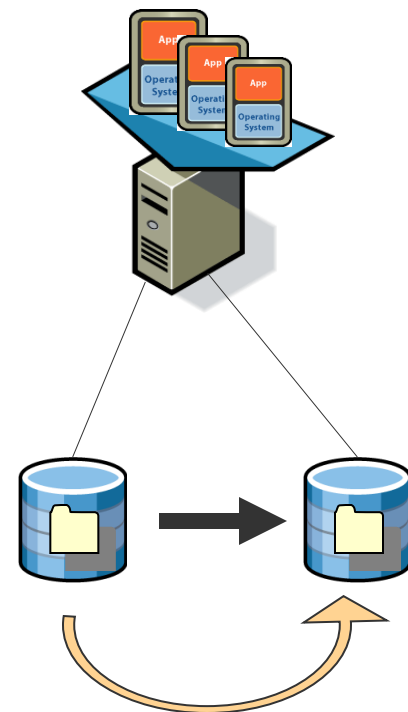
- Zero-downtime migration
- Eases array maintenance, tiering, load balancing, upgrades, space mgmt

Challenges

- Performance impact on host, array, network
- Long migration time (0.5 - 2.5 hrs for 100GB VM)
- Best practice: use infrequently

Improved solution

- Use array's native copy/clone functionality



VAAI Speeds Up Storage vMotion - Example

The screenshot shows the vSphere Client interface. The main area displays performance graphs for a VM named 'prme-iox137.eng.vmware.com'. The 'Disk Rate (KBps) (Top 10)' graph shows a significant spike in disk activity during the migration process. Below the graphs is a 'Recent Tasks' table with the following data:

Name	Target	Status	Details	Initiated by	vCenter S...	Requested Start Time	Start Time	Completed Time
Relocate virtual machine	win...	Completed		Administrator	djo...	3/12/2010 11:39:12 AM	3/12/2010 11:39:12 AM	3/12/2010 11:42:27 AM
Migrate virtual machine	win...	Completed		Administrator	djo...	3/12/2010 11:32:37 AM	3/12/2010 11:32:37 AM	3/12/2010 11:33:04 AM

The second row of the table is circled in red, indicating the migration that was completed in 27 seconds with VAAI.

42:27 - 39:12 =
2 Min 21 sec w/out
(141 seconds)

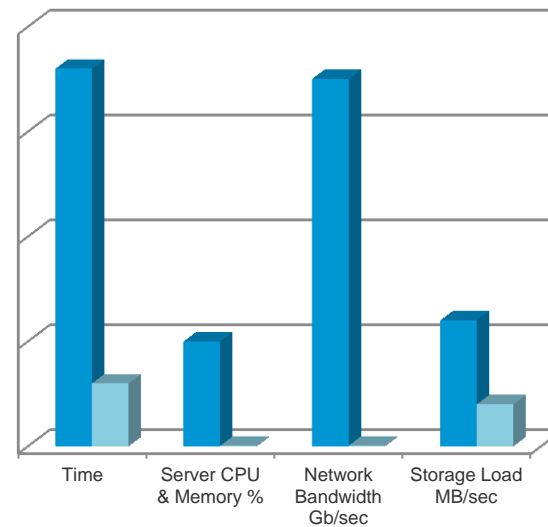
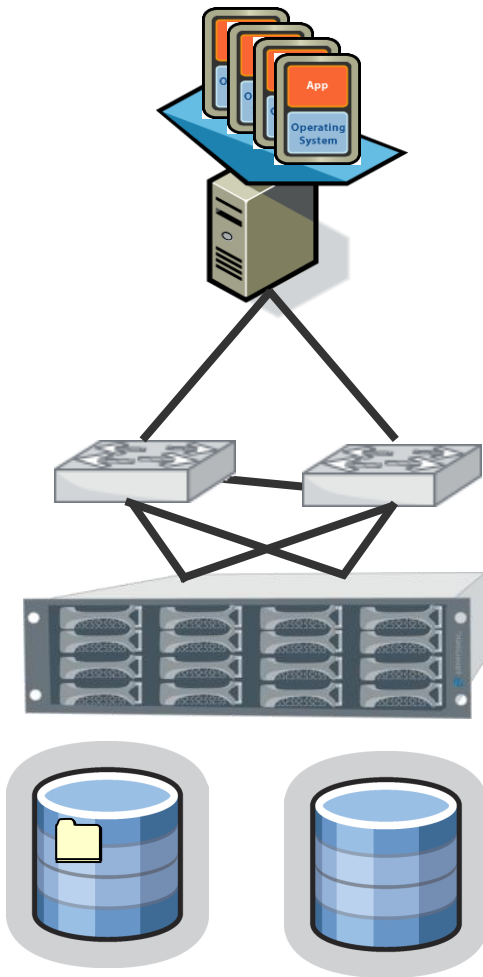
33:04 - 32:37 =
27 Sec with VAAI

141 sec vs. 27 sec

Copying Data – Optimized Cloning with VAAI

VMFS directs storage to move data directly

- Much less time!
 - Up to 95% reduction
- Dramatic reduction in load on:
 - Servers
 - Network
 - Storage



■ Before VAAI
■ With VAAI

Scalable Lock Management

- A number of VMFS operations cause the LUN to temporarily become locked for exclusive write use by one of the ESX nodes, including:
 - Moving a VM with vMotion
 - Creating a new VM or deploying a VM from a template
 - Powering a VM on or off
 - Creating a template
 - Creating or deleting a file, including snapshots
- A new VAAI feature, `atomic_test_and_set` allows the ESX Server to offload the management of the required locks to the storage and avoids locking the entire VMFS file system.

VMFS Scalability with Atomic Test and Set (ATS)

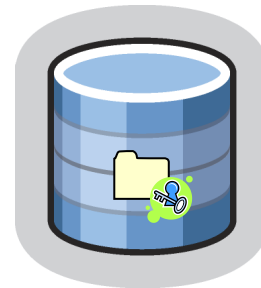
Makes VMFS more scalable overall, by offloading block locking mechanism

Using Atomic Test and Set (ATS) capability provides an alternate option to use of SCSI reservations to protect the VMFS metadata from being written to by two separate ESX Servers at one time.

Normal VMware
Locking (No ATS)



Enhanced VMware
Locking (With ATS)



For more details on VAAI

vSphere 4.1 Documentation also describes use of this features in the ESX Configuration Guide Chapter 9 (pages 124 - 125)

Listed in TOC as “Storage Hardware Acceleration”

Three setting under advanced settings:

- DataMover.HardwareAcceratedMove - Full Copy
- DataMover.HardwareAcceratedInit - Write Same
- VMFS3.HarwareAccerated Locking - Atomic Test Set

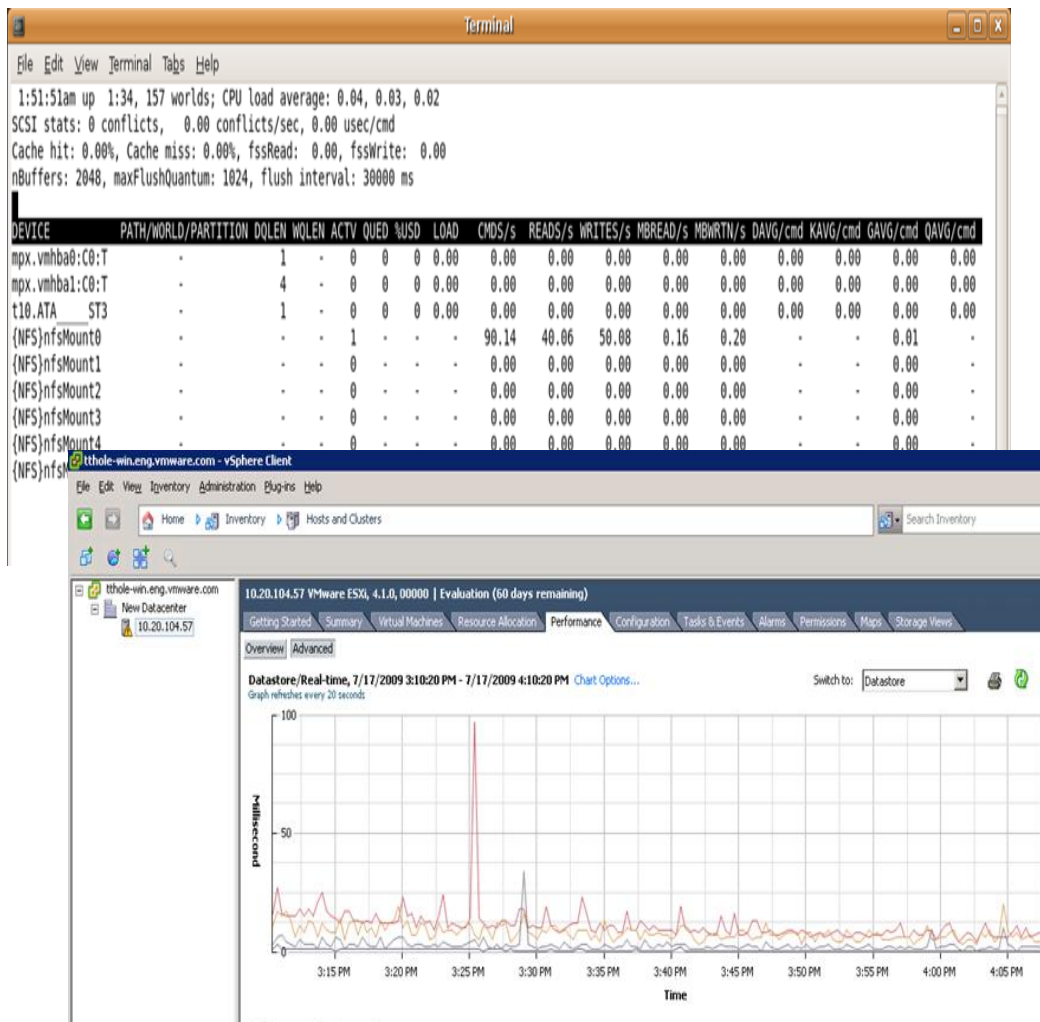
Additional Collateral planned for release at GA

- Frequently Asked Questions
- Datasheet or webpage content

Partners include : Dell/EQL, EMC, HDS, HP, IBM and NetApp

*** Will only support block based storage in 4.1**

New Performance Monitoring Statistics



- Comprehensive host & VM storage performance statistics enable proactive monitoring to simplify troubleshooting
- Heterogeneous customer storage environments supported (FC, iSCSI, NFS)
- Tools support varied usage scenarios
 - GUI for trending and user-friendly comparative analysis
 - Command-line for scripting/drill-down at host

Features:

- Throughput and latency statistics for:
 - Datastore per host
 - Storage adapter & path per Host
 - Datastore per VM
 - VMDK per VM
- Realtime and historical trending (vCenter)
- Esxtop (for ESX) and resxtop (for ESXi)

Statistics targeted in solution: vCenter & esxtop

Inventory object	Per Component	Statistic	FC/NFS/iSCSI	vCenter?	Esxtop?
Host	datastore	Throughput, latency	All		
	Storage adapter	Throughput, latency	FC*		Available today
	Storage path	Throughput, latency	FC*		Available today
	LUN	Throughput, latency	FC, iSCSI**	Available today	Available today
VM	Datastore	Throughput, latency	All		
	VMDK	Throughput, latency	All		

Not available in this timeframe: Aggregation at cluster level in vCenter (possible through APIs)

*Network-based storage (NFS, iSCSI) I/O breakdown still being researched

** Not applicable to NFS; datastore is the equivalent



ESXTOP publishes throughput and latency for LUN, if datastore has only one LUN then LUN will be equal datastore

Volume Stats for NFS Device

```
Terminal
File Edit View Terminal Tabs Help
1:51:51am up 1:34, 157 worlds; CPU load average: 0.04, 0.03, 0.02
SCSI stats: 0 conflicts, 0.00 conflicts/sec, 0.00 usec/cmd
Cache hit: 0.00%, Cache miss: 0.00%, fssRead: 0.00, fssWrite: 0.00
nBuffers: 2048, maxFlushQuantum: 1024, flush interval: 30000 ms
```

DEVICE	PATH/WORLD/PARTITION	DQLEN	WQLEN	ACTV	QUED	%USD	LOAD	CMDS/s	READS/s	WRITES/s	MBREAD/s	MBWRTN/s	DAVG/cmd	KAVG/cmd	GAVG/cmd	QAVG/cmd
mpx.vmhba0:C0:T	-	1	-	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
mpx.vmhba1:C0:T	-	4	-	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
t10.ATA ST3	-	1	-	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
{NFS}nfsMount0	-	-	-	1	-	-	-	90.14	40.06	50.08	0.16	0.20	-	-	0.01	-
{NFS}nfsMount1	-	-	-	0	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	-
{NFS}nfsMount2	-	-	-	0	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	-
{NFS}nfsMount3	-	-	-	0	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	-
{NFS}nfsMount4	-	-	-	0	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	-
{NFS}nfsMount5	-	-	-	0	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	-

Datastore Activity Per Host

tthole-win.eng.vmware.com - vSphere Client

File Edit View Inventory Administration Plug-ins Help

Home Inventory Hosts and Clusters Search Inventory

10.20.104.57 VMware ESXi, 4.1.0, 00000 | Evaluation (60 days remaining)

Getting Started Summary Virtual Machines Resource Allocation Performance Configuration Tasks & Events Alarms Permissions Maps Storage Views

Overview Advanced

Datastore/Real-time, 7/17/2009 3:10:20 PM - 7/17/2009 4:10:20 PM Chart Options... Switch to: Datastore

Graph refreshes every 20 seconds

Performance Chart Legend

Key	Object	Measurement	Rollup	Units	Latest	Maximum	Minimum	Average
■	4a0a00c7-15200178-76bd-0030487cc885	Write Latency	Average	Millisecond	0	3	0	0.333
■	4a0a00c7-15200178-76bd-0030487cc885	Read Latency	Average	Millisecond	5	97	4	11.006
■	47b60bab-a3435ca5-ea1f-0030487cc884	Read Latency	Average	Millisecond	5	20	3	7.789
■	47b60bab-a3435ca5-ea1f-0030487cc884	Write Latency	Average	Millisecond	1	34	0	2.522

Recent Tasks

Name, Target or Status contains: Clear

Name	Target	Status	Details	Initiated by	vCenter Server	Requested Start Ti...	Start Time	Completed Time

Tasks Alarms License Period: 167 days remaining Administrator

Other Host Stats

Customize Performance Chart

Saved Chart Settings: Default Always load these settings at startup

Chart Options

Chart Type

Line graph Stacked graph Stacked Graph (Per VM)

CPU

- CPU
- Datastore
 - Real-time
- Disk
- Memory
- Network
- Storage Adapter
- Storage Path
- System

All None

	Units	Internal Name	Collection Level
n	Number	numberRead	2
	Millisecond	totalReadLatency	2
	KBps	read	2
	KBps	write	2
n	Number	numberWrite	2
	Millisecond	totalWriteLatency	2

All None

Last: 1 Hour(s)

From: 7/17/2009 4:12 PM

To: 7/17/2009 4:12 PM

Counter Description

Rollup: Average

Rate of reading data from the datastore

Statistics Type: Rate

Manage Chart Settings... Save Chart Settings...

Help OK Cancel Apply

Datastore Activity per VM

tthole-win.eng.vmware.com - vSphere Client

File Edit View Inventory Administration Plug-ins Help

Home Inventory Hosts and Clusters Search Inventory

tthole-win.eng.vmware.com

- New Datacenter
 - 10.20.104.57
 - AshmiVM
 - vm_on_nfs
 - win-2k3-32-ent-sp2

AshmiVM

Getting Started Summary Resource Allocation Performance Tasks & Events Alarms Console Permissions Maps Storage Views

Overview Advanced

Datastore/Real-time, 7/17/2009 4:13:38 PM - 7/17/2009 5:13:38 PM [Chart Options...](#) Switch to: Datastore

Graph refreshes every 20 seconds

Performance Chart Legend

Key	Object	Measurement	Rollup	Units	Latest	Maximum	Minimum	Average
■	4a0a00c7-1520...	Write Latency	Average	Millisecond	0	0	0	0
■	4a0a00c7-1520...	Read Latency	Average	Millisecond	0	0	0	0

Recent Tasks Name, Target or Status contains: Clear

Name	Target	Status	Details	Initiated by	vCenter Server	Requested Start Time	Start Time	Completed Time
Unregister virtual mach...	dslvm	Completed		VMWAREM\...	tthole-win.eng...	7/17/2009 5:08:07 PM	7/17/2009 5:08:07 PM	7/17/2009 5:08:07 PM
Power On virtual mach...	win-2k3-32-ent...	Completed		VMWAREM\...	tthole-win.eng...	7/17/2009 5:07:51 PM	7/17/2009 5:07:51 PM	7/17/2009 5:07:55 PM
Initialize powering On	New Datacenter	Completed		VMWAREM\...	tthole-win.eng...	7/17/2009 5:07:51 PM	7/17/2009 5:07:51 PM	7/17/2009 5:07:51 PM
Power On virtual mach...	vm_on_nfs	Completed		VMWAREM\...	tthole-win.eng...	7/17/2009 5:07:51 PM	7/17/2009 5:07:51 PM	7/17/2009 5:07:51 PM

Tasks Alarms License Period: 166 days remaining Administrator

Virtual Disk Activity per VM

Screenshot of the vSphere Client interface showing Virtual Disk Activity per VM.

The interface displays the following information:

- Navigation:** Home > Inventory > Hosts and Clusters
- VM Selection:** tthole-win.eng.vsphere.com > New Datacenter > 10.20.104.57 > AshmiVM > vm_on_nfs
- Performance View:** Performance > Virtual Disk/Real-time, 7/17/2009 4:15:09 PM - 7/17/2009 5:15:09 PM
- Chart:** A line graph showing Virtual Disk activity in Milliseconds over Time (4:20 PM to 5:15 PM). The Y-axis is labeled "Millisecond" and the X-axis is labeled "Time". The graph shows a flat line at 0 milliseconds for most of the duration, with a small spike at the end.
- Performance Chart Legend:**

Key	Object	Measurement	Rollup	Units	Latest	Maximum	Minimum	Average
■	scsi0:0	Write Latency	Average	Millisecond	0	0	0	0
■	scsi0:0	Read Latency	Average	Millisecond	0	0	0	0
- Recent Tasks:**

Name	Target	Status	Details	Initiated by	vCenter Server	Requested Start Time	Start Time	Completed Time
Unregister virtual mach...	dslvm	Completed		VMWAREM\{t...	tthole-win.eng...	7/17/2009 5:08:07 PM	7/17/2009 5:08:07 PM	7/17/2009 5:08:07 PM
Power On virtual mach...	win-2k3-32-ent...	Completed		VMWAREM\{t...	tthole-win.eng...	7/17/2009 5:07:51 PM	7/17/2009 5:07:51 PM	7/17/2009 5:07:55 PM
Initialize powering On	New Datacenter	Completed		VMWAREM\{t...	tthole-win.eng...	7/17/2009 5:07:51 PM	7/17/2009 5:07:51 PM	7/17/2009 5:07:51 PM

ESXi

New Feature: Additional Deployment Option

Boot From SAN

- Fully supported in ESXi 4.1
- Was only experimentally supported in ESXi 4.0
- Boot from SAN supported for FC, iSCSI, and FCoE

New Feature: Additional Deployment Option

Scripted Installation

- Numerous choices for installation
 - Installer booted from
 - CD-ROM (default)
 - Preboot Execution Environment (PXE)
 - ESXi Installation image on
 - CD-ROM (default), HTTP / HTTPS, FTP, NFS
 - Script can be stored and accessed
 - Within the ESXi Installer ramdisk (default)
 - On the installation CD-ROM
 - HTTP / HTTPS, FTP, NFS
 - Configuration script (“ks.cfg”) can include other scripts
 - Preinstall
 - Postinstall
 - First boot

New Feature: Full Support of Tech Support Mode

The screenshot shows the vCenter DCUI interface. At the top, there is a 'Troubleshooting Mode Options' panel with a yellow background. It contains the following options: 'Enable Local Tech Support', 'Disable Remote Tech Support (SSH)', 'Modify Tech Support timeout' (highlighted with a dark bar), and 'Restart Management Agents'. To the right of this panel is a dark grey area with the text 'Modify Tech Support timeout' and a description: 'Modify the amount of time before Tech Support Mode logins are automatically disabled.' Below these panels is a navigation bar with tabs for 'Configuration', 'Tasks & Events', 'Alarms', 'Permissions', 'Maps', and 'Hardware Status'. The main content area is titled 'Security Profile' and includes a 'Services' section with a 'Refresh' and 'Properties...' link. The services listed are: 'I/O Redirector (Active Directory ...)', 'Network Login Server (Active Dir...', 'lbttd', 'Local Tech Support' (highlighted with a red box), 'Local Security Authentication Ser...', 'NTP Daemon', 'VMware vCenter Agent', 'Remote Tech Support (SSH)' (highlighted with a red box), and 'Direct Console UI'. Below the services is a 'Lockdown Mode' section with an 'Edit...' link. The text reads: 'When enabled, lockdown mode prevents remote users from logging directly into this host. The host will only be accessible through local console or an authorized centralized management application.' The 'Lockdown Mode:' is currently set to 'Disabled'.

Troubleshooting Mode Options

- Enable Local Tech Support
- Disable Remote Tech Support (SSH)
- Modify Tech Support timeout
- Restart Management Agents

Modify Tech Support timeout

Modify the amount of time before Tech Support Mode logins are automatically disabled.

Configuration | Tasks & Events | Alarms | Permissions | Maps | Hardware Status

Security Profile

Services [Refresh](#) [Properties...](#)

- I/O Redirector (Active Directory ...)
- Network Login Server (Active Dir...
- lbttd
- Local Tech Support
- Local Security Authentication Ser...
- NTP Daemon
- VMware vCenter Agent
- Remote Tech Support (SSH)
- Direct Console UI

Lockdown Mode [Edit...](#)

When enabled, lockdown mode prevents remote users from logging directly into this host. The host will only be accessible through local console or an authorized centralized management application.

Lockdown Mode: Disabled

Can enable in vCenter or DCUI

New Feature: Full Support of Tech Support Mode

(c) 2007-2010 VMware, Inc.

Tech Support Mode is not supported unless used in consultation with VMware Tech Support.

esx23b.vmworld.com login: _

Big Scary Warning will be removed...

...but admin will be notified when active

The screenshot shows the VMware vCenter console interface. On the left, a tree view shows the hierarchy: Data Center 01 > Cluster 01 > esx23a.vmworld.com, esx23b.vmworld.com, esx24a.vmworld.com, and esx24b.vmworld.com. The main window displays the configuration page for esx23b.vmworld.com VMware ESXi, 4.1.0, 235786. A yellow warning banner at the top of the configuration page reads: "Configuration Issues: The Local Tech Support Mode for the host esx23b.vmworld.com has been enabled". Below this, the "General" tab shows the manufacturer as IBM and the model as IBM eServer BladeCenter H... The "Resources" tab shows CPU usage at 161 MHz and capacity as 8 x 2.5 GHz.

New Feature: Full Support of Tech Support Mode

```
Set the timeout for Tech Support Mode
```

```
Set the timeout in minutes for Tech Support Mode. Zero disables  
the timeout; maximum value is 1440 minutes.
```

```
Timeout in minutes (0 to disable, 1440 maximum): [ 0 ]
```

```
<Enter> OK <Esc> Cancel
```

- Timeout automatically disables Tech Support Mode (local and remote)
- Running sessions are not terminated
- All commands issued in Tech Support Mode are sent to syslog

New Feature: Full Support of Tech Support Mode

Recommended uses

- Support, troubleshooting, and break-fix
- Scripted deployment preinstall, postinstall, and first boot scripts

Discouraged uses

- Any other scripts
- Running commands/scripts periodically (cron jobs)
- Leaving open for routine access or permanent SSH connection

New Feature: Active Directory Service

Provides authentication for all local services

- vSphere Client
- Other access based on vSphere API
- DCUI
- Tech Support Mode (local and remote)

Has nominal Active Directory groups functionality

- Members of “ESX Admins” AD group have Administrative privilege
- Administrative privilege includes:
 - Full Administrative role in vSphere Client and vSphere API clients
 - DCUI access
 - Tech Support Mode access (local and remote)

New Feature: Additional vCLI configuration commands

Storage

- `esxcli swiscsi session`: Manage iSCSI sessions
- `esxcli swiscsi nic`: Manage iSCSI NICs
- `esxcli swiscsi vmknic`: List VMkernel NICs available for binding to particular iSCSI adapter
- `esxcli swiscsi vmnic`: List available uplink adapters for use with a specified iSCSI adapter
- `esxcli vaai device`: Display information about devices claimed by the VMware VAAI (vStorage APIs for Array Integration) Filter Plugin.
- `esxcli corestorage device`: List devices or plugins. Used in conjunction with hardware acceleration.

New Feature: Additional vCLI troubleshooting commands

Network

- `esxcli network`: List active connections or list active ARP table entries.

Storage

- NFS statistics available in `resxtop`

Virtual Machine

- `esxcli vms`: Forcibly stop virtual machines that do not respond to normal stop operations, by using kill commands.
- NOTE: designed to kill VMs in a reliable way (not dependent upon well-behaving system)

New Feature: Additional commands in Tech Support Mode

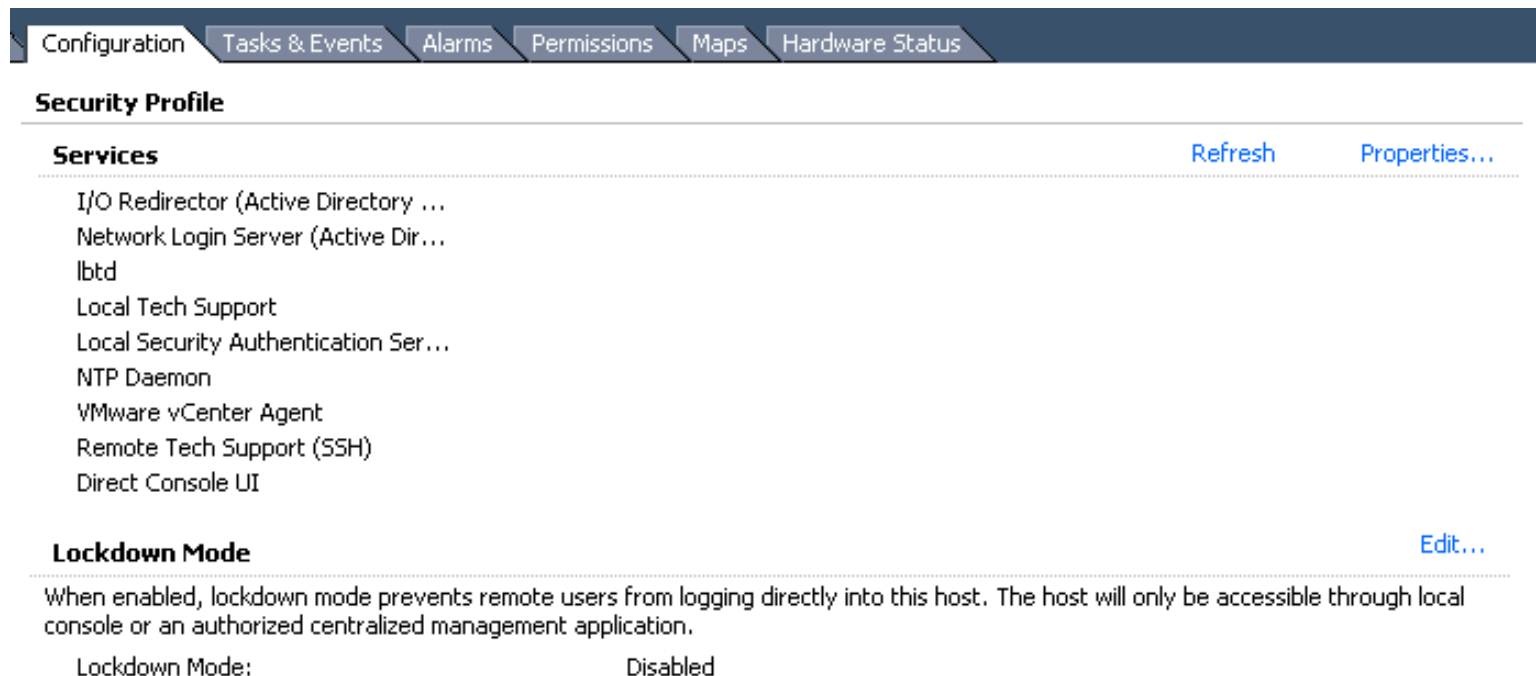
Additional commands for troubleshooting

- vscsiStats
- nc (netcat)
- tcpdump-uw

New Feature: Total Lockdown

Ability to totally control local access via vCenter Server

- DCUI
- Lockdown Mode (disallows all access except root on DCUI)
- Tech Support Mode (local and remote)
- If all configured, then **no local activity possible** (except pull the plugs)



The screenshot shows the vCenter Server configuration interface for a Security Profile. The navigation bar at the top includes tabs for Configuration, Tasks & Events, Alarms, Permissions, Maps, and Hardware Status. The main content area is titled "Security Profile" and is divided into two sections: "Services" and "Lockdown Mode".

Services [Refresh](#) [Properties...](#)

- I/O Redirector (Active Directory ...)
- Network Login Server (Active Dir...
- lbtid
- Local Tech Support
- Local Security Authentication Ser...
- NTP Daemon
- VMware vCenter Agent
- Remote Tech Support (SSH)
- Direct Console UI

Lockdown Mode [Edit...](#)

When enabled, lockdown mode prevents remote users from logging directly into this host. The host will only be accessible through local console or an authorized centralized management application.

Lockdown Mode: Disabled

Summary of new features in ESXi 4.1

Deployment Options

- Boot from SAN
- Scripted Installation (a la “Kickstart”)

Centralized updating of 3rd party code

- VMware Update Manager can deploy drivers, CIM providers, other modules

Improved Local Authentication

- Built-in Active Directory Service
- DCUI and Tech Support Mode access by any authorized user (not just root)

Easier CLI options for troubleshooting

- Full support of Tech Support Mode – both local and remote (via SSH)
- Additional commands in Tech Support Mode: vscsiStats, nc, tcpdump-uw, etc.
- Additional management options in vCLI: SCSI, VAAI, Network, VM

Better control over local activity

- DCUI and Tech Support Mode is configurable in vCenter Server
- Total host lockdown possible
- Activity in Tech Support Mode is sent to syslog

Summary of new features in ESXi 4.1

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Availability – HA & FT DRS & DPM

Availability Feature Summary

HA and DRS Cluster Limitations

High Availability (HA) Diagnostic and Reliability Improvements

Fault Tolerance (FT) Enhancements

vMotion Enhancements

- Performance
- Usability
- Enhanced Feature Compatibility

DRS Host Affinity

DPM Enhancements

Data Recovery Enhancements

HA and DRS Cluster Limitations

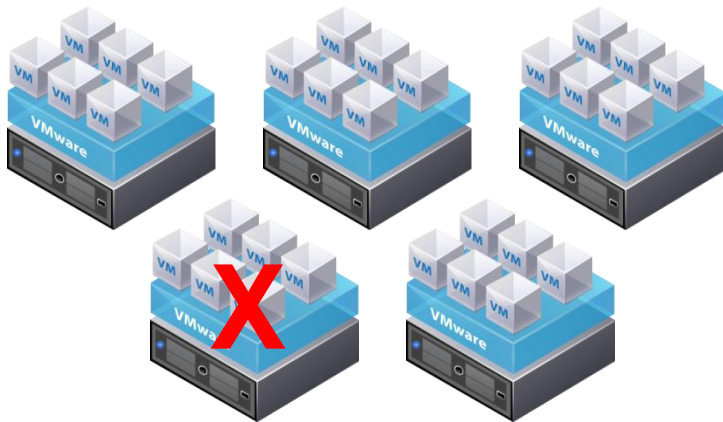
Increased cluster limitations

- Cluster limits are now unified for HA and DRS clusters
- Increased limits for VMs/host and VMs/cluster
- Cluster limits for HA and DRS:
 - 32 hosts/cluster
 - 320 VMs/host (regardless of # of hosts/cluster)
 - 3000 VMs/cluster
- Note that these limits also apply to post-failover scenarios. Please be sure that these limits will not be violated even after the maximum configured number of host failovers.

HA and DRS Cluster Limitations

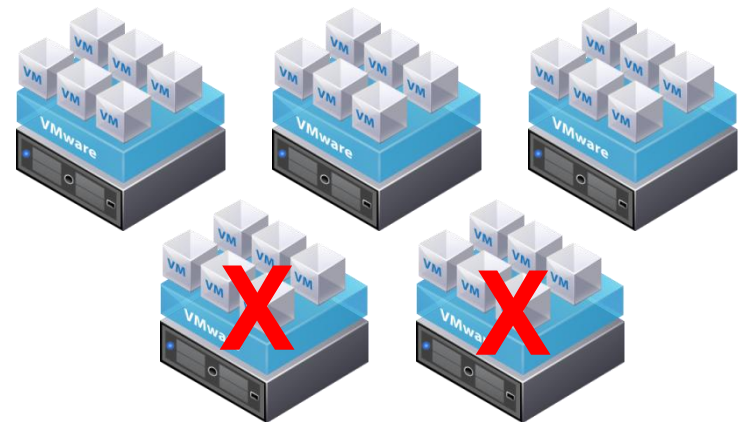
5-host cluster, tolerate 1 host failure

- vSphere 4.1 supports 320 VMs/host
- Supports 320x5 VMs/cluster? NO
- Cluster can only support 320x4 VMs



5-host cluster, tolerate 2 host failures

- Supports 320x5 VMs/cluster? NO
- Cluster can only support 320x3 VMs



HA Diagnostic and Reliability Improvements

HA Healthcheck Status

- HA provides an ongoing healthcheck facility to ensure that the required cluster configuration is met at all times. Deviations result in an event or alarm on the cluster.

HA Operational Status

- A new Cluster Operational Status window displays more information about the current HA operational status, including the specific status and errors for each host in the HA cluster.

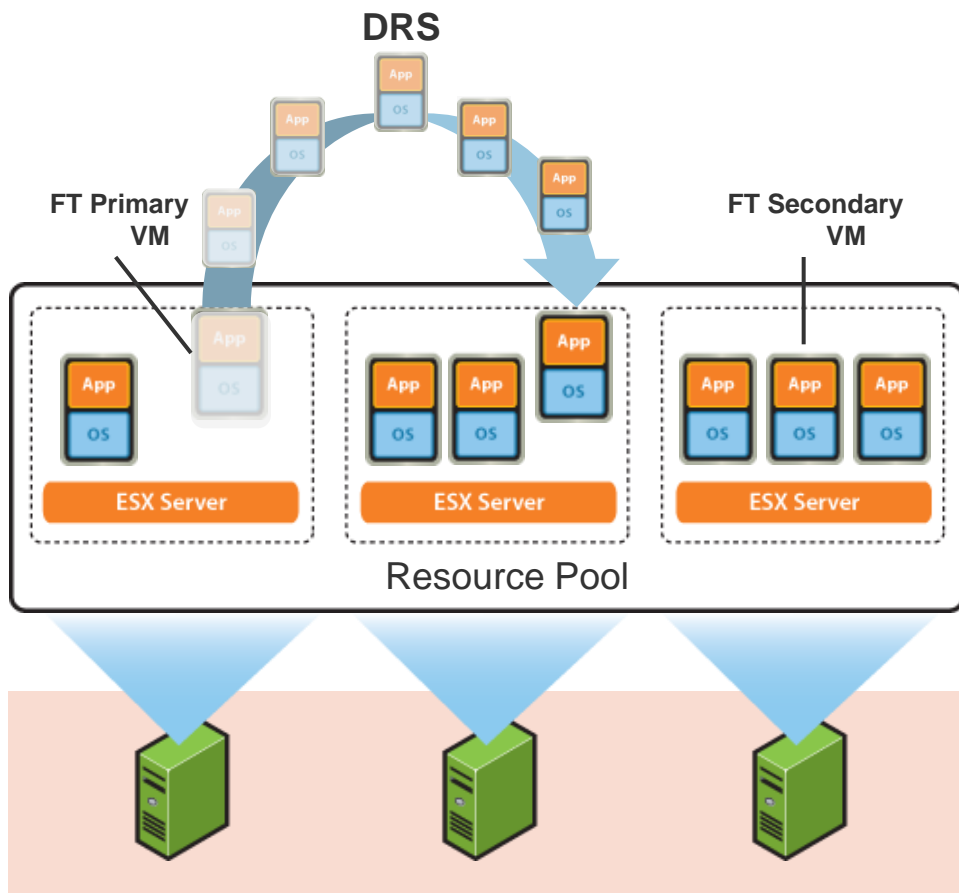
VMware HA	
Admission Control:	Enabled
Current Failover Capacity:	2 hosts
Configured Failover Capacity:	1 host
Host Monitoring:	Enabled
VM Monitoring:	Disabled
Application Monitoring:	Disabled
Advanced Runtime Info	
Cluster Operational Status	

Improved HA-DRS interoperability during HA failover

- DRS will perform vMotion to free up contiguous resources (i.e. on one host) so that HA can place a VM that needs to be restarted

HA app awareness – expose APIs for 3rd party app developers

Fault Tolerance (FT) Enhancements



FT fully integrated with DRS

- DRS load balances FT Primary and Secondary VMs. EVC required.

Versioning control lifts requirement on ESX build consistency



- Primary VM can run on host with a different build # as Secondary VM.

Events for Primary VM vs. Secondary VM differentiated

- Events logged/stored differently.

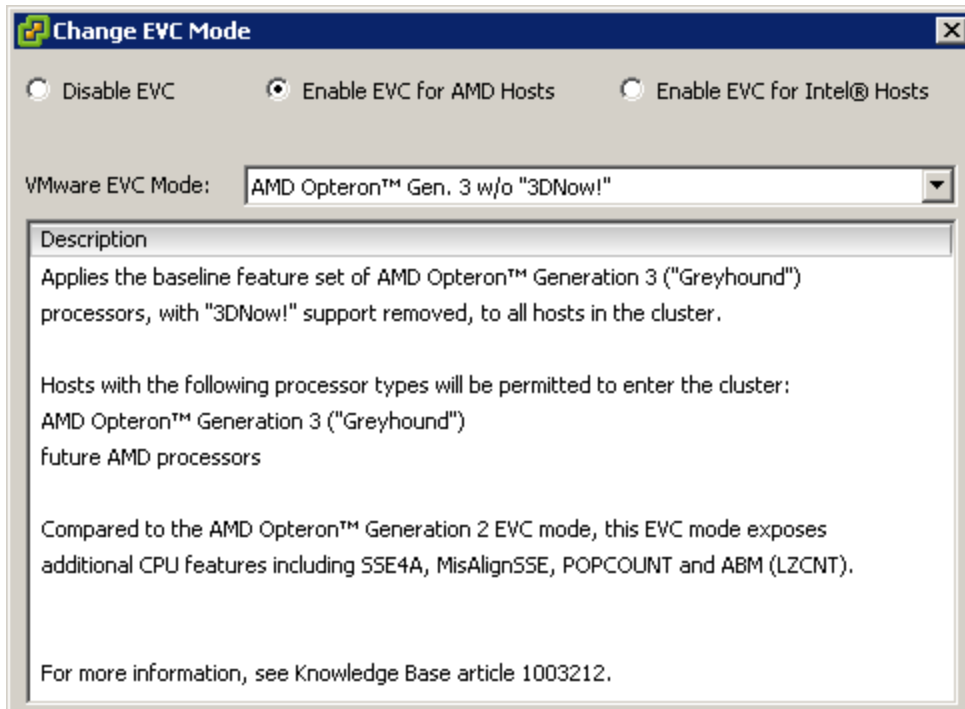
vMotion Enhancements

- Significantly decreased the overall migration time (time will vary depending on workload)
- Increased number of concurrent vMotions:
 - ESX host: **4** on a 1 Gbps network and **8** on a 10 Gbps network
 - Datastore: **128** (both VMFS and NFS)

Status	Details
 In Progress	
10%	Migrating the active state of Virtual Machine
12%	Migrating the active state of Virtual Machine
36%	Migrating the active state of Virtual Machine
35%	Migrating the active state of Virtual Machine
35%	Migrating the active state of Virtual Machine
37%	Migrating the active state of Virtual Machine
61%	Migrating the active state of Virtual Machine
61%	Migrating the active state of Virtual Machine
 Completed	

- Maintenance mode evacuation time is greatly decreased due to above improvements

Enhanced vMotion Compatibility Improvements



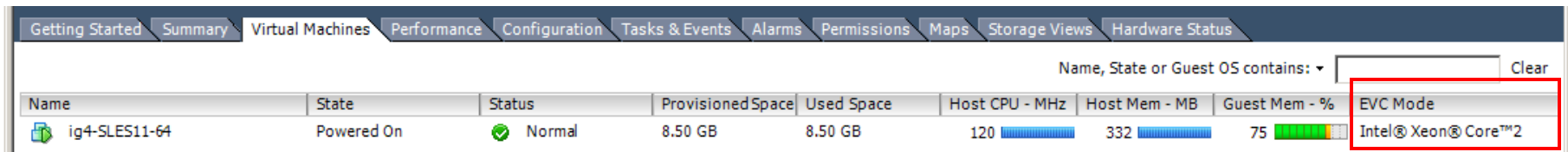
Usability Improvements

- **Preparation for AMD Next Generation w/o 3DNow!:** Future AMD CPUs may not support 3DNow!. To prevent vMotion incompatibilities, a new EVC mode is introduced.
- **Better handling of powered-on VMs:** vCenter Server now uses a live VM's CPU feature set (instead of host's CPU features) to determine migration into an EVC cluster. This will provide better granularity in error detection.

Enhanced vMotion Compatibility Improvements

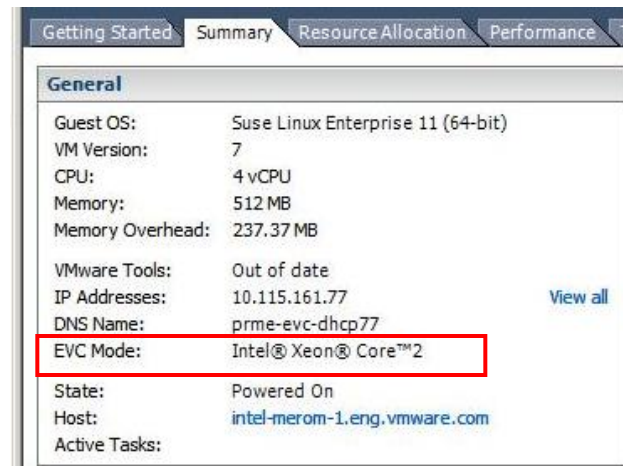
Usability Improvements

- **VM's EVC capability:** The Virtual Machines tab for hosts and clusters now displays the EVC mode corresponding to the features used by VMs.



Name	State	Status	Provisioned Space	Used Space	Host CPU - MHz	Host Mem - MB	Guest Mem - %	EVC Mode
ig4-SLES11-64	Powered On	Normal	8.50 GB	8.50 GB	120	332	75	Intel® Xeon® Core™2

- **VM Summary:** The Summary tab for a VM lists the EVC mode corresponding to the features used by the VM.



General

Guest OS: Suse Linux Enterprise 11 (64-bit)
VM Version: 7
CPU: 4 vCPU
Memory: 512 MB
Memory Overhead: 237.37 MB

VMware Tools: Out of date
IP Addresses: 10.115.161.77 [View all](#)
DNS Name: prme-evt-dhcp77
EVC Mode: Intel® Xeon® Core™2
State: Powered On
Host: intel-merom-1.eng.vmware.com
Active Tasks:

- **Earlier *Add-Host* Error detection:** Host-specific incompatibilities are now displayed prior to the Add-Host work-flow when adding a host into an EVC cluster.

DRS Host Affinity

Rule DRS Groups Manager

Give the new rule a name and choose its type from the menu below. Then, select the entities to which this rule will apply.

Name

Type
Virtual Machines to Hosts

DRS Groups

Cluster Vm Group:

Cluster Host Group:

Must run on hosts in group

Select Cluster Vm Group

OK Cancel

Required rules

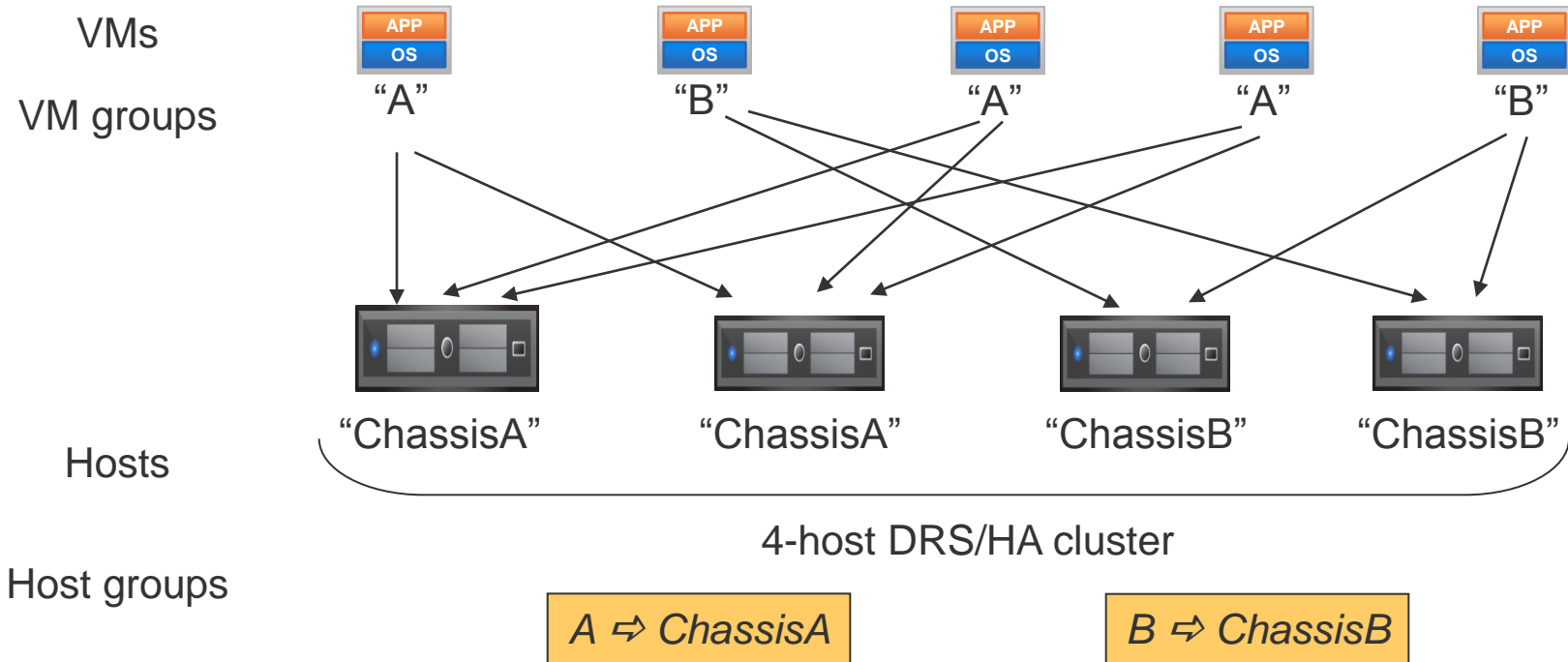
Must run on hosts in group
Should run on hosts in group
Must Not run on hosts in group
Should Not run on hosts in group

Preferential rules

Rule enforcement: 2 options

- Required: DRS/HA will never violate the rule; event generated if violated manually. Only advised for enforcing host-based licensing of ISV apps.
- Preferential: DRS/HA will violate the rule if necessary for failover or for maintaining availability

DRS Host Affinity



Rules

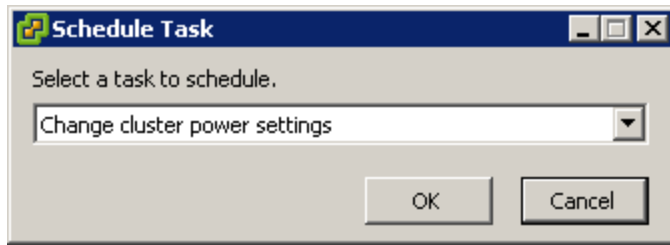
VM-VM anti-affinity rule enhancement

- VM-VM anti-affinity rules can now incorporate more than 2 VMs

DPM Enhancements

Scheduling Distributed Power Management

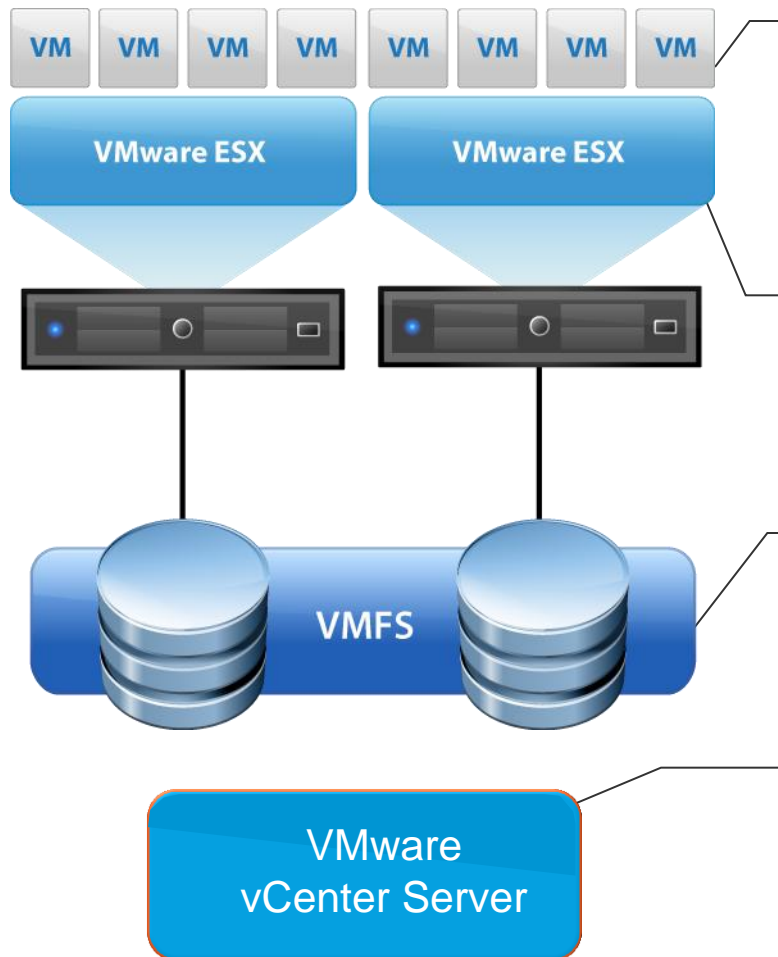
- Turning on/off DPM is now a scheduled task
- DPM can be turned off prior to business hours in anticipation for higher resource demands



Disabling DPM brings hosts out of standby

- Eliminates risk of ESX hosts being stuck in standby mode while DPM is disabled. Ensures that when DPM is disabled, all hosts are powered on and ready to accommodate load increases.

VMware Data Recovery: New Capabilities



Backup and Recovery Appliance

- Support for up to 10 appliances per vCenter Server instance to allow protection of up to 1000 virtual machines
- File Level Restore client for Linux VMs

VMware vSphere 4.1

- Improved VSS support for Windows 2008 and Windows 7: application level quiescing

Destination Storage

- Expanded support for DAS, NFS, iSCSI or Fibre Channel storage plus CIFS shares as destination
- Improved deduplication performance

vSphere Client Plug-In

- Ability for seamless switch between multiple backup appliances
- Improved usability and user experience

Management

Management – New Features Summary

vCenter Server

- 32-bit to 64-bit data migration
- Enhanced Scalability

Update Manager

Host Profile Enhancements

Orchestrator

Active Directory Support (Host and vMA)

Management Assistant (vMA)

- Scale and readiness

Converter

- Hyper-V Import

Virtual Serial Port Concentrator (VSPC)

vCenter Server – Migration to 64-bit

vCenter Server **MUST** be hosted on 64-bit Windows OS

- 32-bit OS NOT supported as a host OS with vCenter vSphere 4.1

Why the change?

- Scalability is restricted by the x86 32 bit virtual address space and moving to 64 bit will eliminate this problem
- Reduces dev and QA cycles and resources (faster time to market)

Two Options

1. vCenter Server in a virtual machine running 64-bit Windows OS
2. vCenter Server install on a 64-bit Windows OS

Best Practice – Use Option 1

Enhanced vCenter Scalability – “Cloud Scale”

	vSphere 4	vSphere 4.1	Ratio
VMs per host	320	320	1x
Hosts per cluster	32	32	1x
VMs per cluster	1280	3000	3x
Hosts per VC	300	1000	3x
Registered VMs per VC	4500	15000	3x+
Powered-On VMs per VC	3000	10000	3x
Concurrent VI Clients	30	120	4x
Hosts per DC	100	500	5x
VMs per DC	2500	5000	2x

Update Manager

The screenshot shows the VMware Update Manager interface. The top section displays 'Attached Baseline Groups' and 'Attached Baselines'. The 'Attached Baselines' list includes:

- All
- Critical Host Patches
- Non-Critical Host Patches
- Upgrade to 4.0 build 152112

The 'Host Compliance' section shows a pie chart indicating 0% compliance. The table below lists the status of various hosts:

Host Name	Patch Status	Upgrade Status	Attached Baselines	Last Patch Scan
uesteam-esx-05.eng.vmware.com	Unknown		(1) Critical Host Patches	
10.20.134.35	Non-compliant		(1) Critical Host Patches	3/11/2009 3:52:23 PM
uesteam-esx-02.eng.vmware.com	Unknown		(2) Critical Host Patches, Non-Critical H...	3/11/2009 3:52:23 PM
uesteam-esx-03.eng.vmware.com	Non-compliant		(2) Critical Host Patches, Non-Critical H...	3/11/2009 3:52:23 PM
erider-esx.eng.vmware.com	Non-compliant	Unknown	(2) Critical Host Patches, Non-Critical H...	3/11/2009 3:52:23 PM
cornwell-host.eng.vmware.com	Non-compliant	Compliant	(1) Critical Host Patches	3/11/2009 3:52:23 PM
uesteam-esx-04.eng.vmware.com	Unknown		(1) Critical Host Patches	
uesteam-esx-07.eng.vmware.com	Unknown		(1) Non-Critical Host Patches	

- Central automated, actionable VI patch compliance management solution
- Define, track, and enforce software update compliance for ESX hosts/clusters, 3rd party ESX extensions, Virtual Appliances, VMTools/VM Hardware, online*/offline VMs, templates

- Patch notification and recall
- Cluster level pre-remediation check analysis and report
- Framework to support 3rd party IHV/ISV updates, customizations: mass install, /update of EMC's PowerPath module
- Enhanced compatibility with DPM for cluster level patch operations
- Performance and scalability enhancements to match vCenter

The screenshot shows the 'Pre-remediation Check' summary. The summary indicates:

- Clusters to remediate: 2
- Hosts to remediate: 10

Other or different summary info?

Cluster	Host	VM	Problem	Resolution
VIM cluster	10.20.135.35	erider-www...	A removable device is attached.	Disconnect removable device.
VIM cluster	uesteam-esx...	Test VM	HA admission control policy will be violated.	Disable HA admission control.
My Cluster	---	---	DPM is enabled.	Disable DPM on the cluster.
My Cluster	---	---	EVC is disabled.	Enable EVC on the cluster.

Host Profiles and Orchestrator Enhancements

Host Profiles

- Cisco support
- PCI device ordering (support for selecting NICs)
- iSCSI support
- Admin password (setting root password)
- PSA configuration

Orchestrator

- provides a client and server for 64-bit installations, with an optional 32-bit client.
- performance enhancements due to 64-bit installation

Management - Other New Features (Continued)

Active Directory Support (Host and vMA)

- No need to manage user accounts on ESX or ESXi – “stateless”
- Match Hyper-V capability (it can do this today)

Management Assistant

- Improved authentication capability – Active Directory support
- Transition from RHEL to CentOS

Converter

- Allows import of VMs from Hyper-V host

Virtual Serial Port Concentrator

- Traditional low-bandwidth, secure remote console approach for managing servers

Thank You

Confidential until 7/13

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