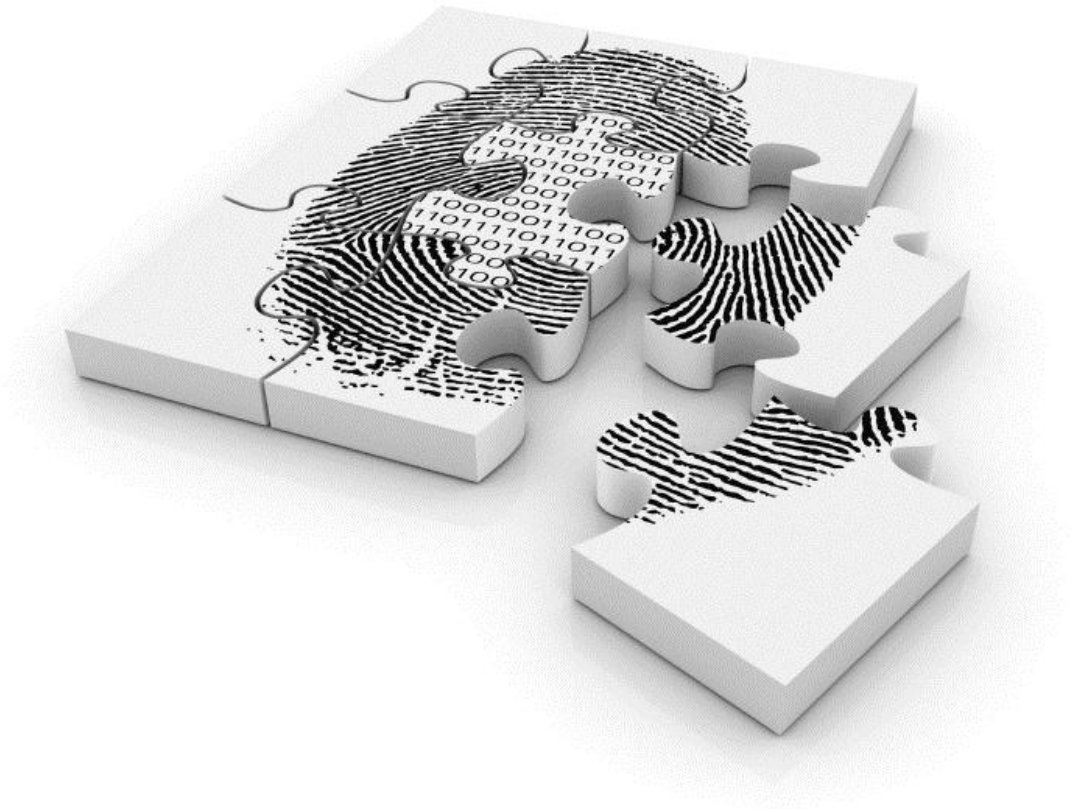
vSphere Performance Troubleshooting

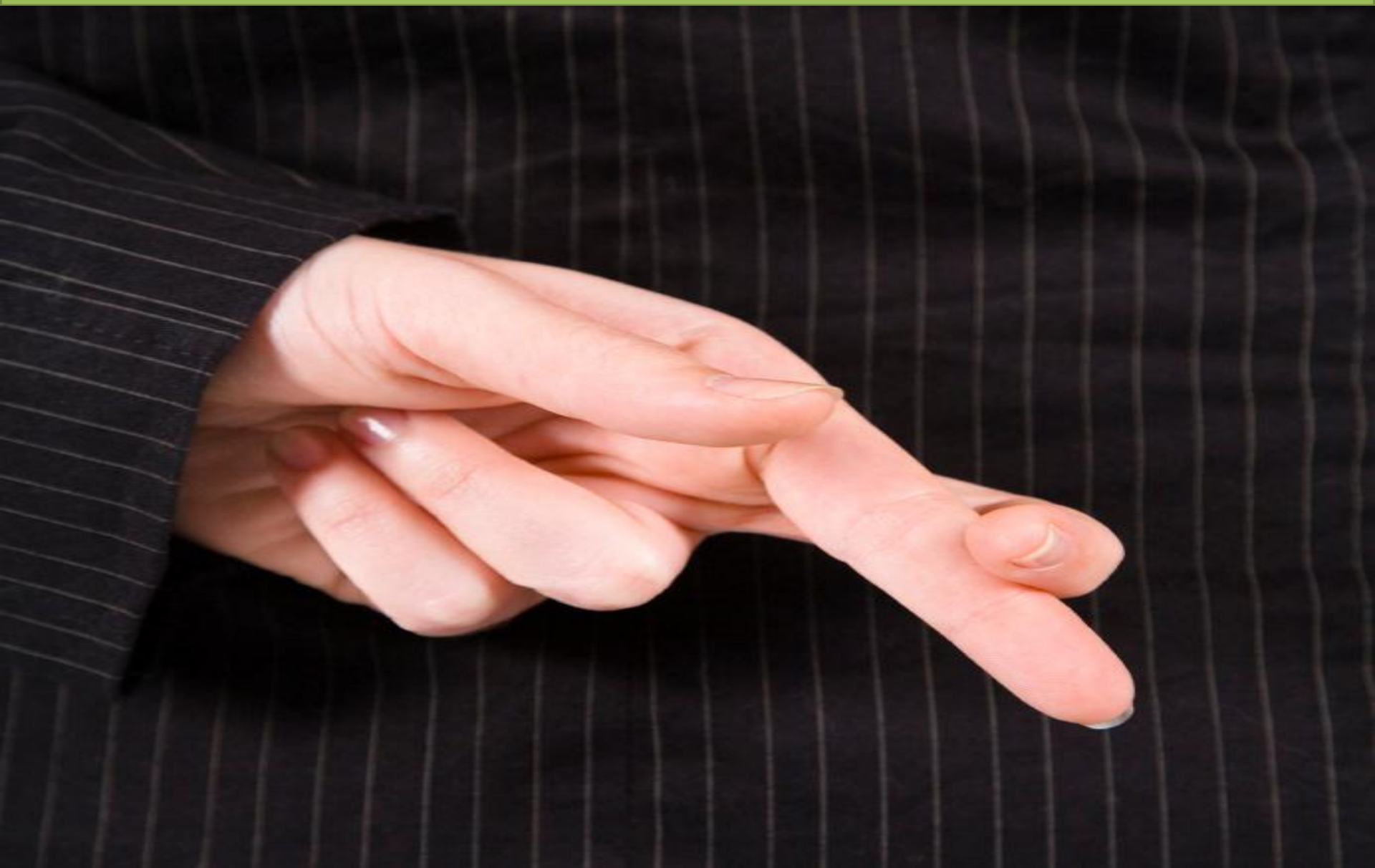


Rod Mach - rod@hiperlogic.com

vmware vEXPERT

Application Performance Problem

Application Owner: I Changed Nothing

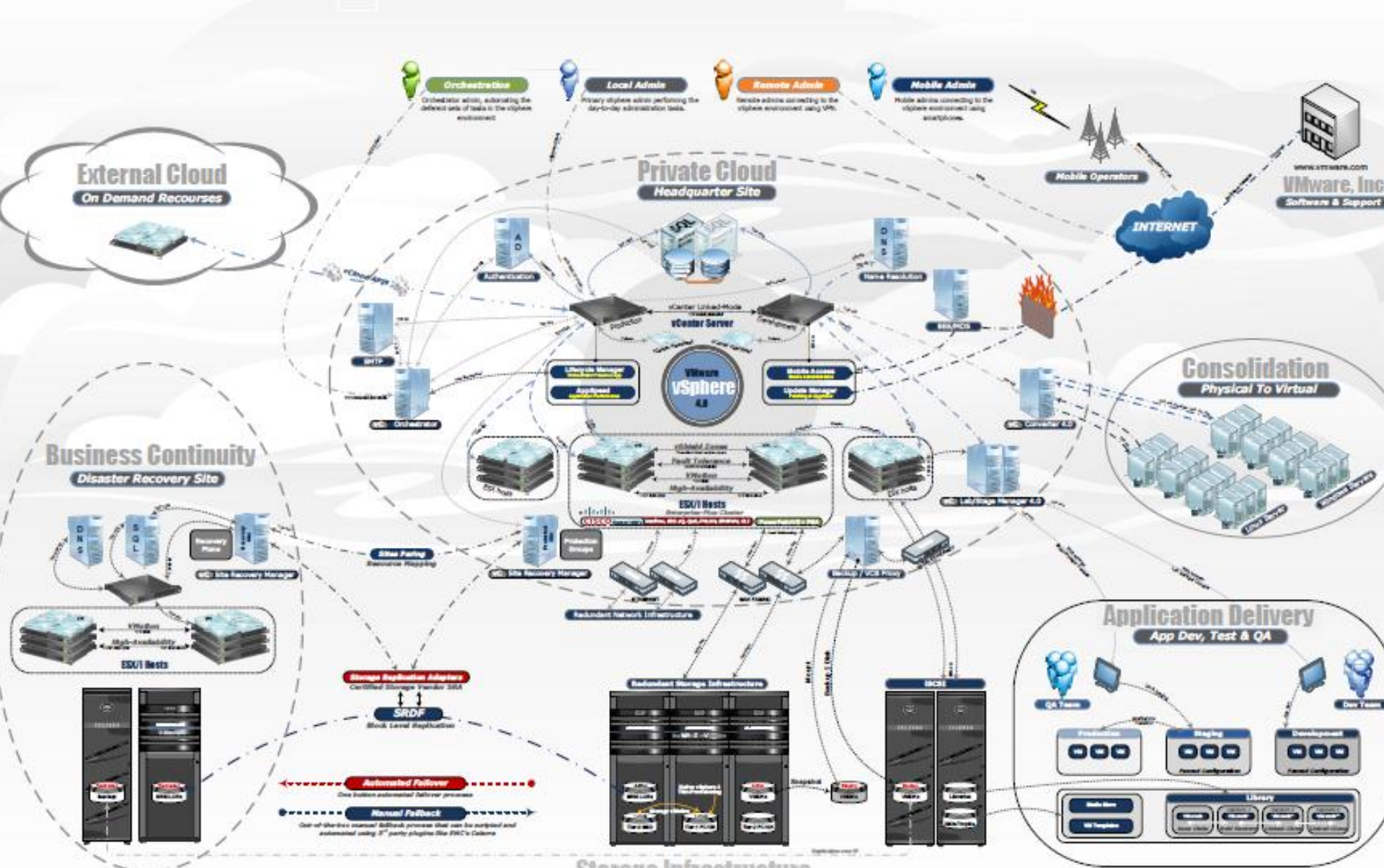


Storage Team: All Green Here

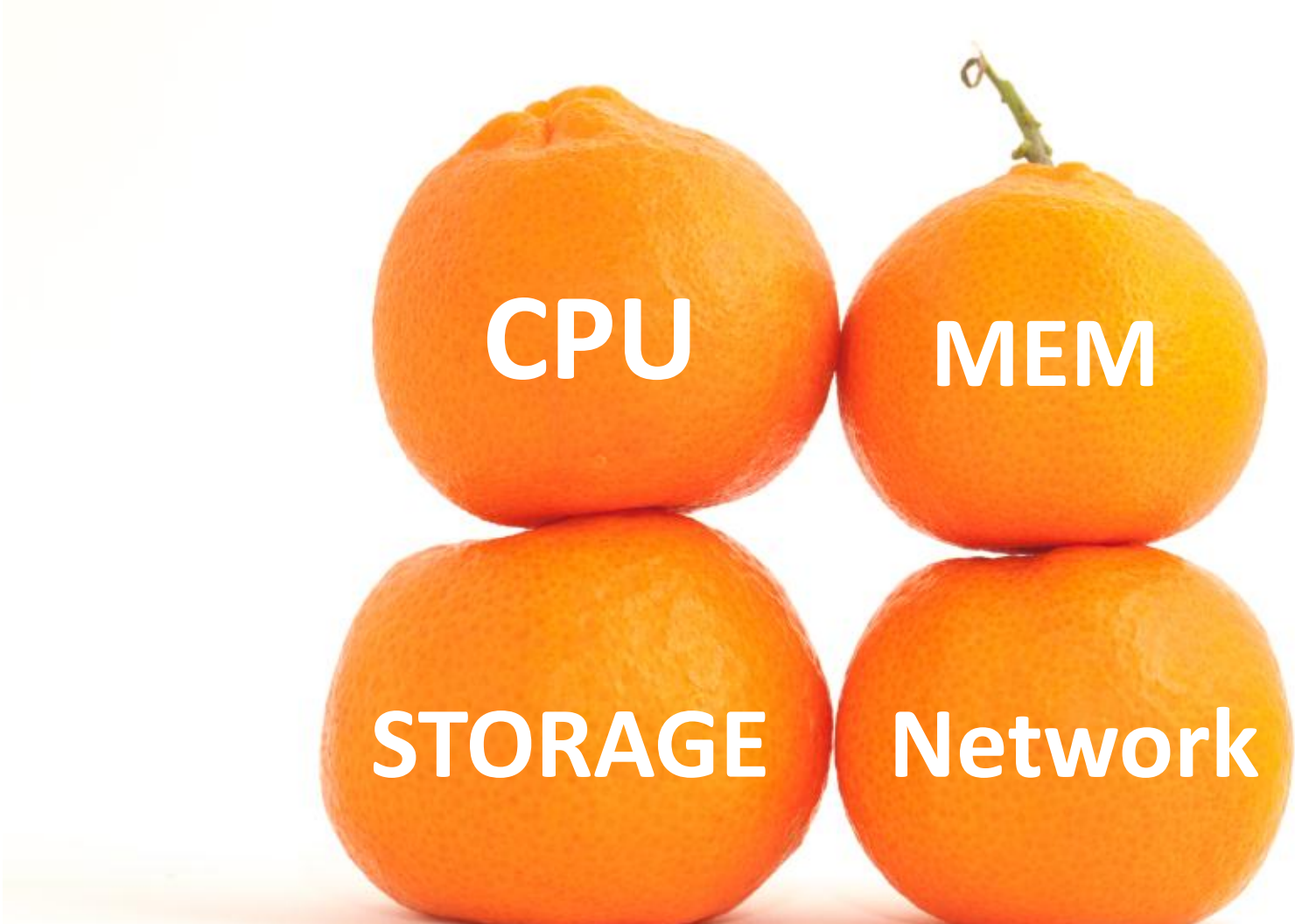
Storage Team: All Green Here

Network Team: No Problem on My End

VMware Team: Yeah I'll Get Back To You



Global or VM Specific Problem?



CPU Issues

Is the VM Guest CPU Utilization High at 100% ?

- Add a vCPU if App is Multi-Threaded
- Do NOT add vCPUs Without Data-Driven Cause

If CPU Utilization in the VM Guest is Unusually Low

- Check if App is waiting on an external dependency

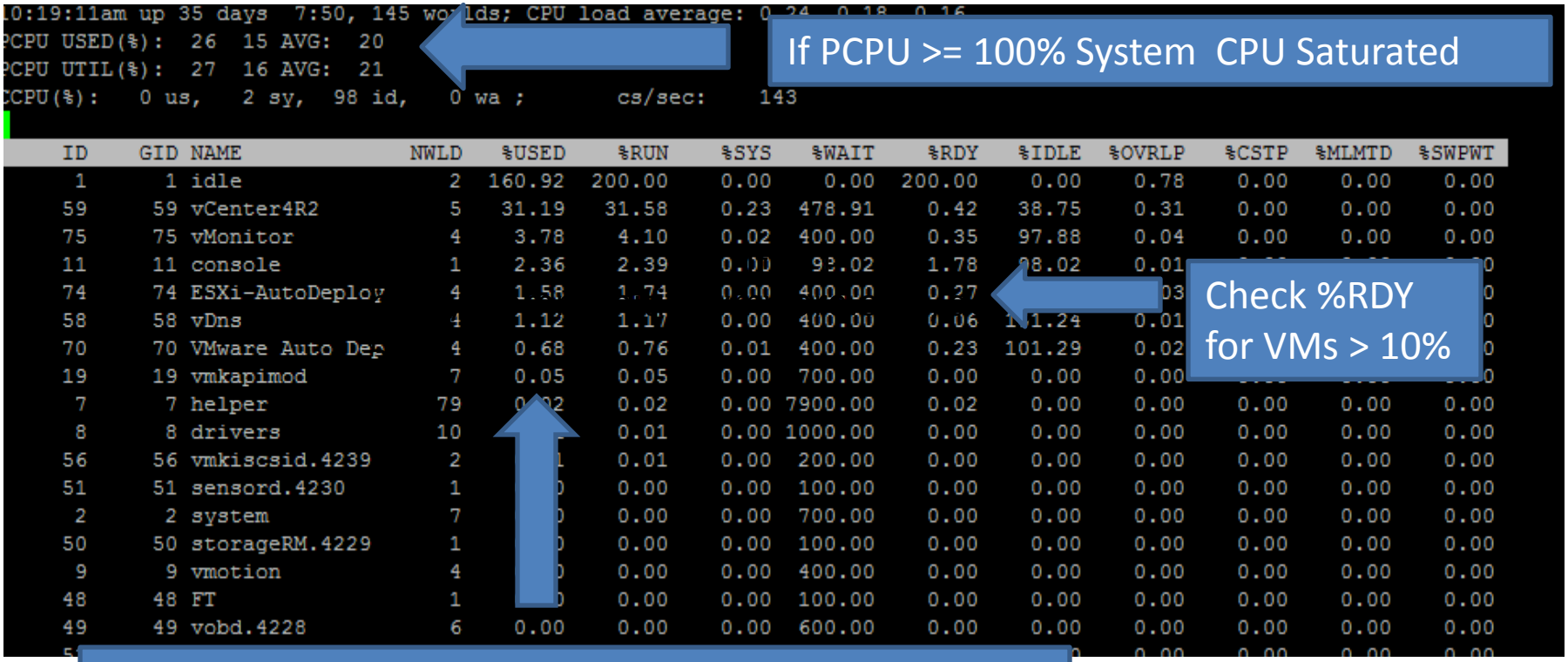
Is the VM CPU Ready > 2000 ms?

- ESX Host Saturated. Change Priority of VM or vMotion

Is the ESX Host CPU Utilization Peaks Above > 95%

- vMotion VM With Highest CPU to Less Utilized ESX Host

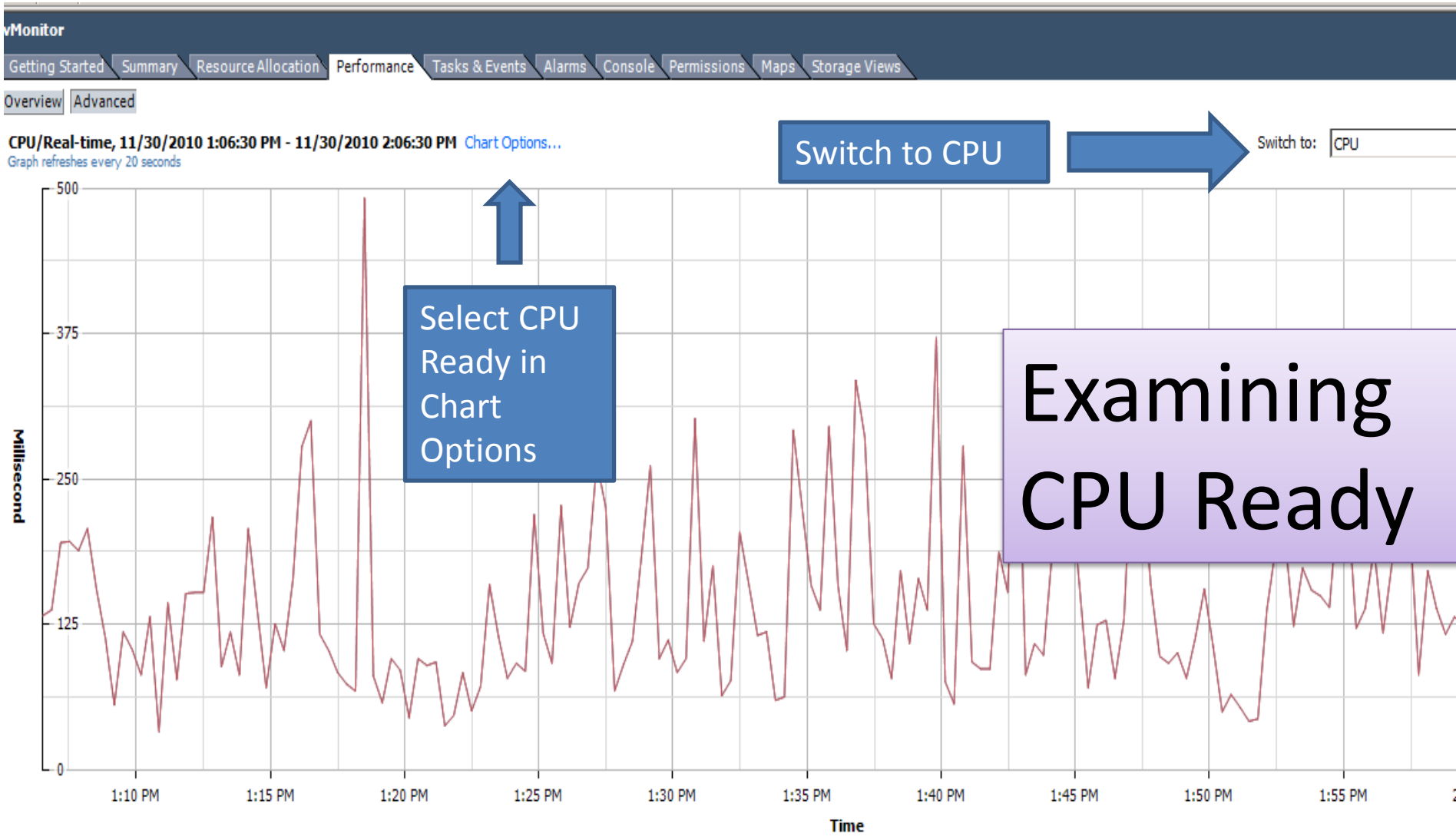
Debugging CPU with ESXTOP



ID	GID	NAME	NWLD	%USED	%RUN	%SYS	%WAIT	%RDY	%IDLE	%OVRLP	%CSTP	%MLMTD	%SWPWT
1	1	idle	2	160.92	200.00	0.00	0.00	200.00	0.00	0.78	0.00	0.00	0.00
59	59	vCenter4R2	5	31.19	31.58	0.23	478.91	0.42	38.75	0.31	0.00	0.00	0.00
75	75	vMonitor	4	3.78	4.10	0.02	400.00	0.35	97.88	0.04	0.00	0.00	0.00
11	11	console	1	2.36	2.39	0.00	98.02	1.78	98.02	0.01			
74	74	ESXi-AutoDeploy	4	1.58	1.74	0.00	400.00	0.27		03			
58	58	vDns	4	1.12	1.17	0.00	400.00	0.06	1.24	0.01			
70	70	VMware Auto Dep	4	0.68	0.76	0.01	400.00	0.23	101.29	0.02			
19	19	vmkapimod	7	0.05	0.05	0.00	700.00	0.00	0.00	0.00			
7	7	helper	79	0.02	0.02	0.00	7900.00	0.02	0.00	0.00	0.00	0.00	0.00
8	8	drivers	10		0.01	0.00	1000.00	0.00	0.00	0.00	0.00	0.00	0.00
56	56	vmkiscsid.4239	2		0.01	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
51	51	sensord.4230	1		0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2	system	7		0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
50	50	storageRM.4229	1		0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
9	9	vmotion	4		0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
48	48	FT	1		0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
49	49	vobd.4228	6	0.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00

http://communities.vmware.com/docs/DOC-5420

http://communities.vmware.com/docs/DOC-5240



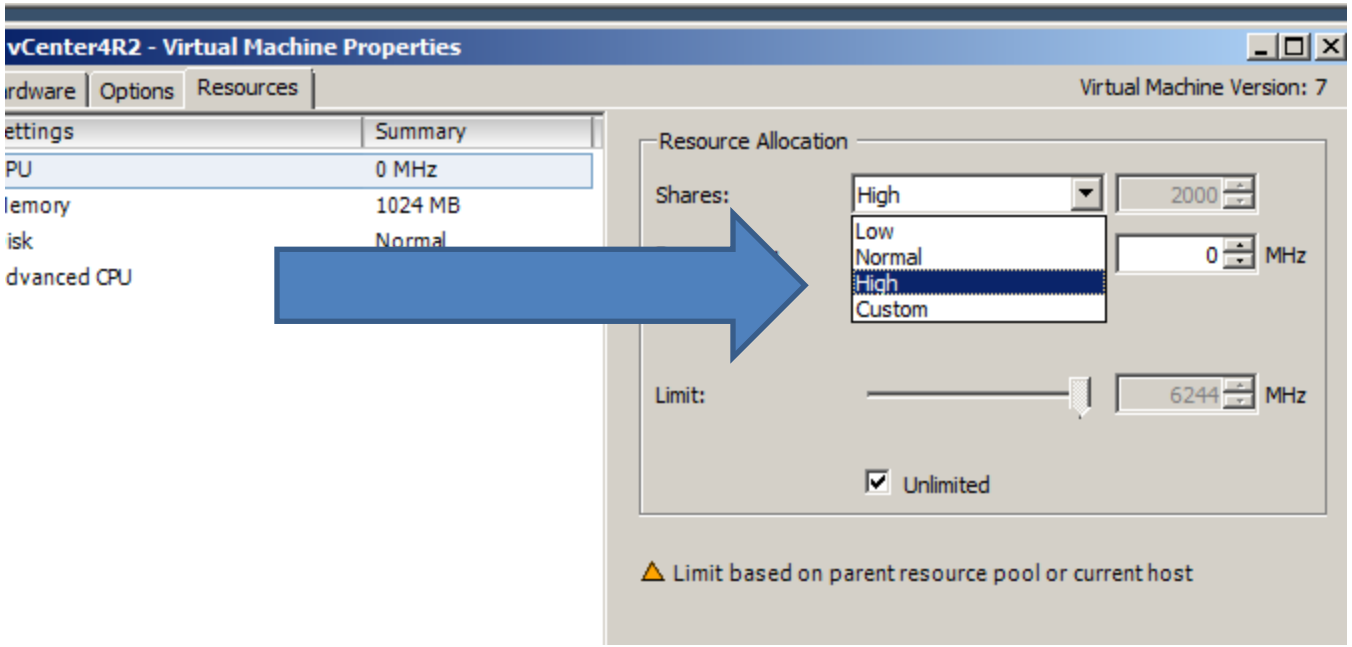
Performance Chart Legend

Key	Object	Measurement	Rollup	Units	Latest	Maximum	Minimum	Average
	vMonitor	Ready	Summation	Millisecond	67	492	32	143.917
	0	Ready	Summation	Millisecond	67	492	32	143.917

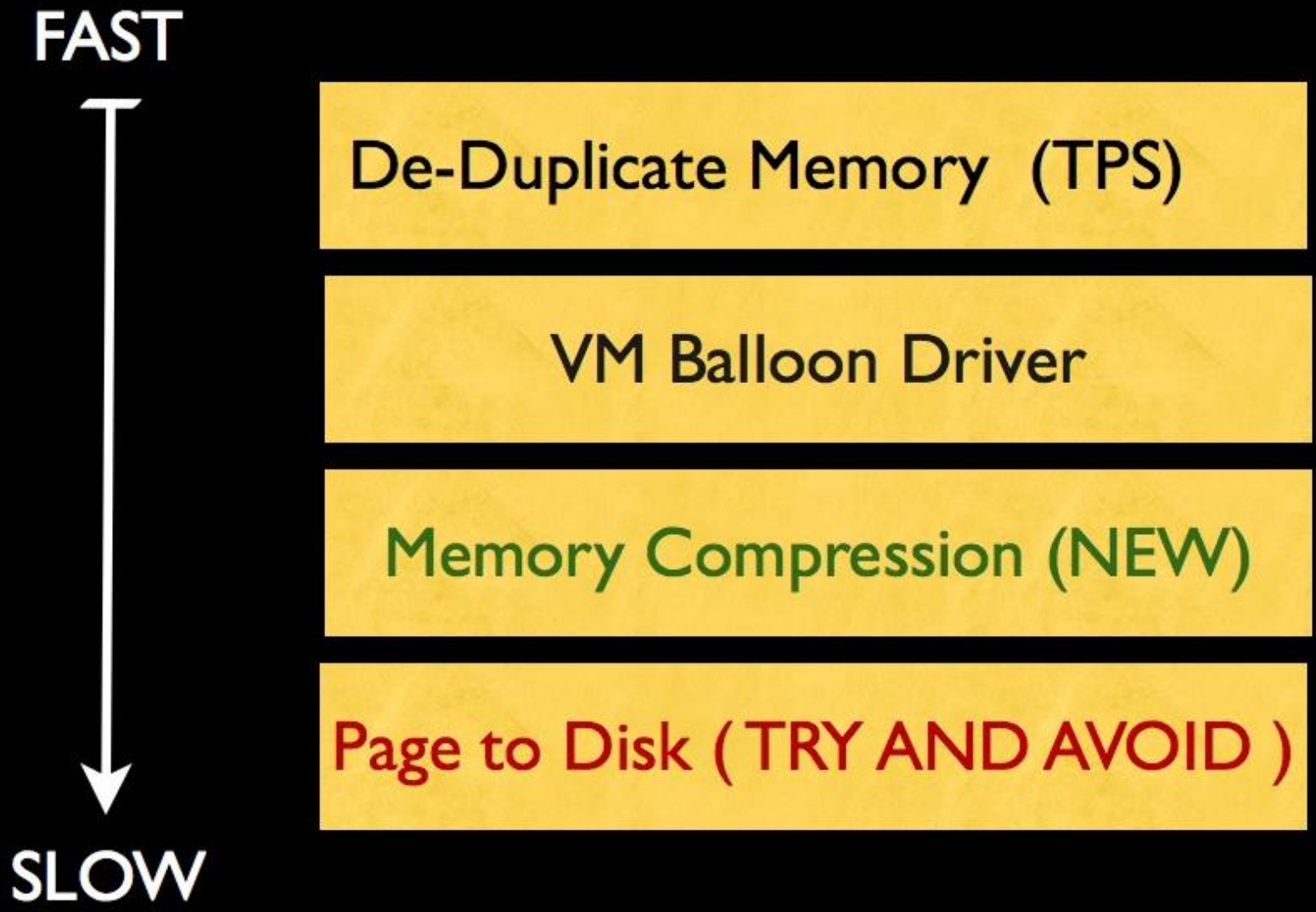
Looks Acceptable <

The Pie Method of CPU Allocation

Put Each VM in a Low, Normal, High Bucket



Understand Memory Overcommit



Memory Issues

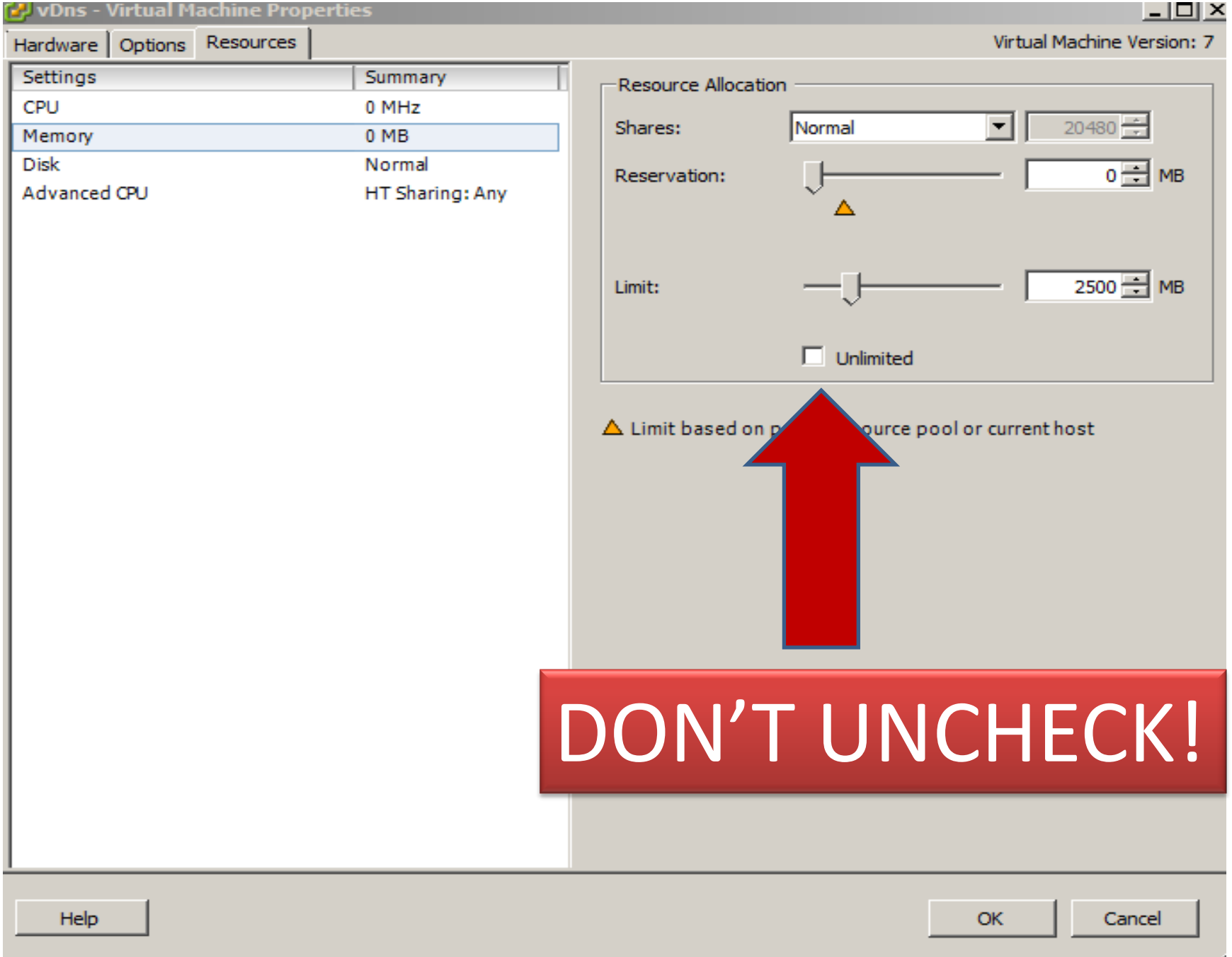
Is the VM Swapping Inside The Guest VM?

- Add more memory to the VM

Is Memory Ballooning Occurring Even If Memory Not Overcommitted?

- Check for Memory Limits on VMs. – REMOVE!

Is there a high Swap In/Swap Out Rate on ESX Host ?


vDns - Virtual Machine Properties
Hardware
Options
Resources
Virtual Machine Version: 7
Settings
Summary
CPU
0 MHz
Memory
0 MB
Disk
Normal
Advanced CPU
HT Sharing: Any
Resource Allocation
Shares:
Normal
20480
Reservation:
0
MB
Limit:
2500
MB
Unlimited
Limit based on p
ource pool or current host
DON'T UNCHECK!
Help
OK
Cancel

192.168.15.88 VMware ESX, 4.1.0, 260247

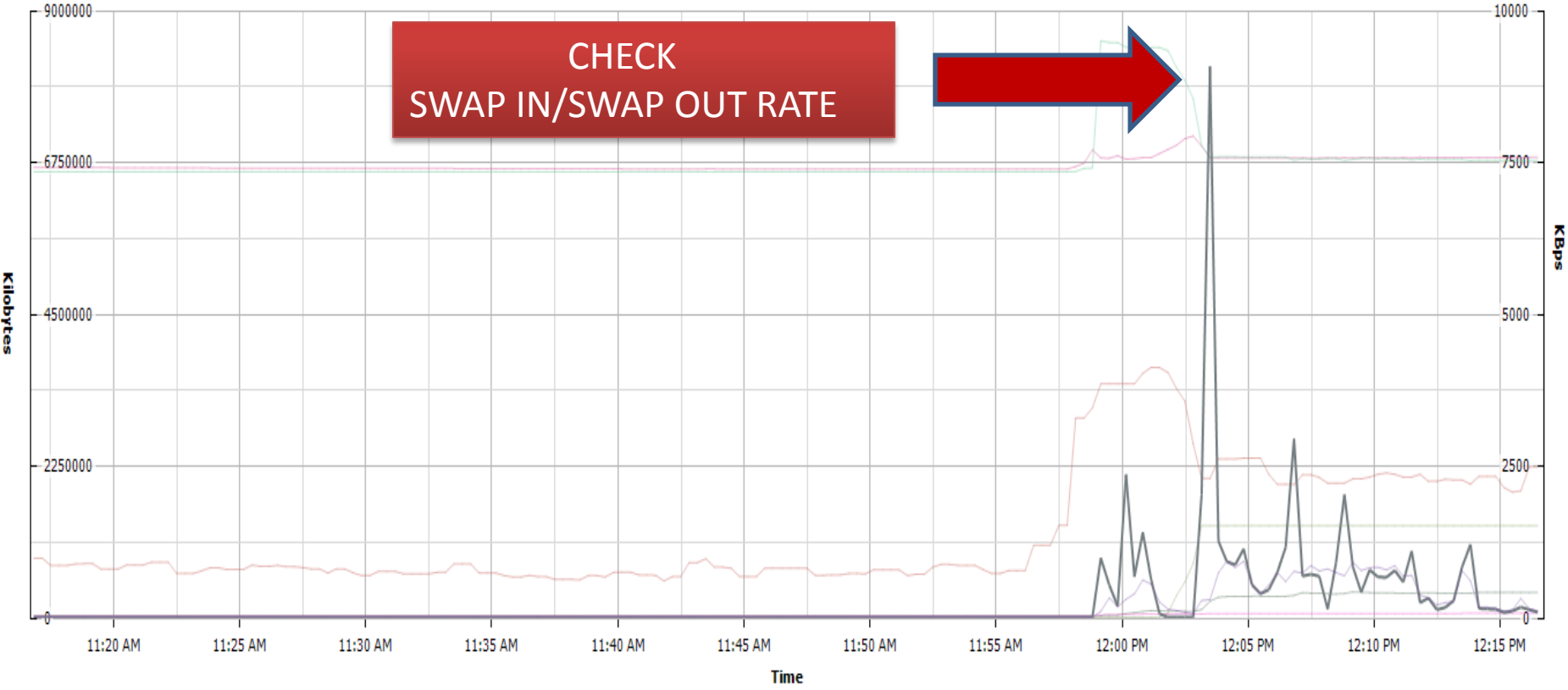
Getting Started | Summary | Virtual Machines | Performance | Configuration | Tasks & Events | Alarms | Permissions | Maps | Storage Views | Hardware Status

Overview | Advanced

Memory/Real-time, 11/30/2010 11:16:43 AM - 11/30/2010 12:16:43 PM Chart Options...

Graph refreshes every 20 seconds

Switch to: Memory



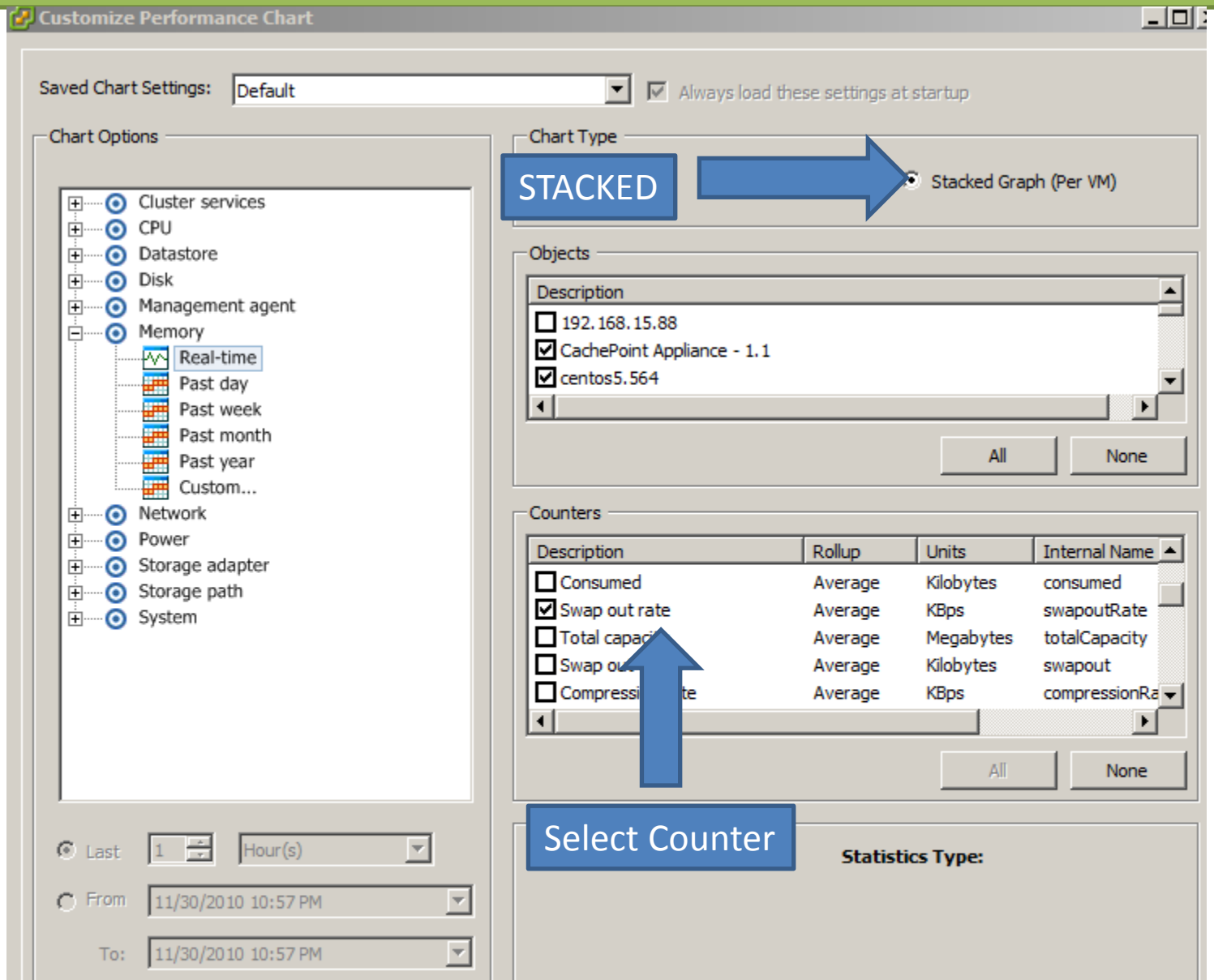
Performance Chart Legend

Key	Object	Measurement	Rollup	Units	Latest	Maximum	Minimum	Average
	192.168.15.88	Active	Average	Kilobytes	2237296	3713692	541752	1251394.3
	192.168.15.88	Consumed	Average	Kilobytes	6832804	7150924	6656884	6722027.4
	192.168.15.88	Swap out rate	Average	KBps	86	9089	0	241.289
	192.168.15.88	Swap in rate	Average	KBps	101	928	0	142
	192.168.15.88	Balloon	Average	Kilobytes	1363148	1363148	0	320086.02
	192.168.15.88	Granted	Average	Kilobytes	6790968	8564208	6615816	6777875.5

Use Chart Options To Add Swap Out/In Rate

Administrator

Chart Options – Your Friend



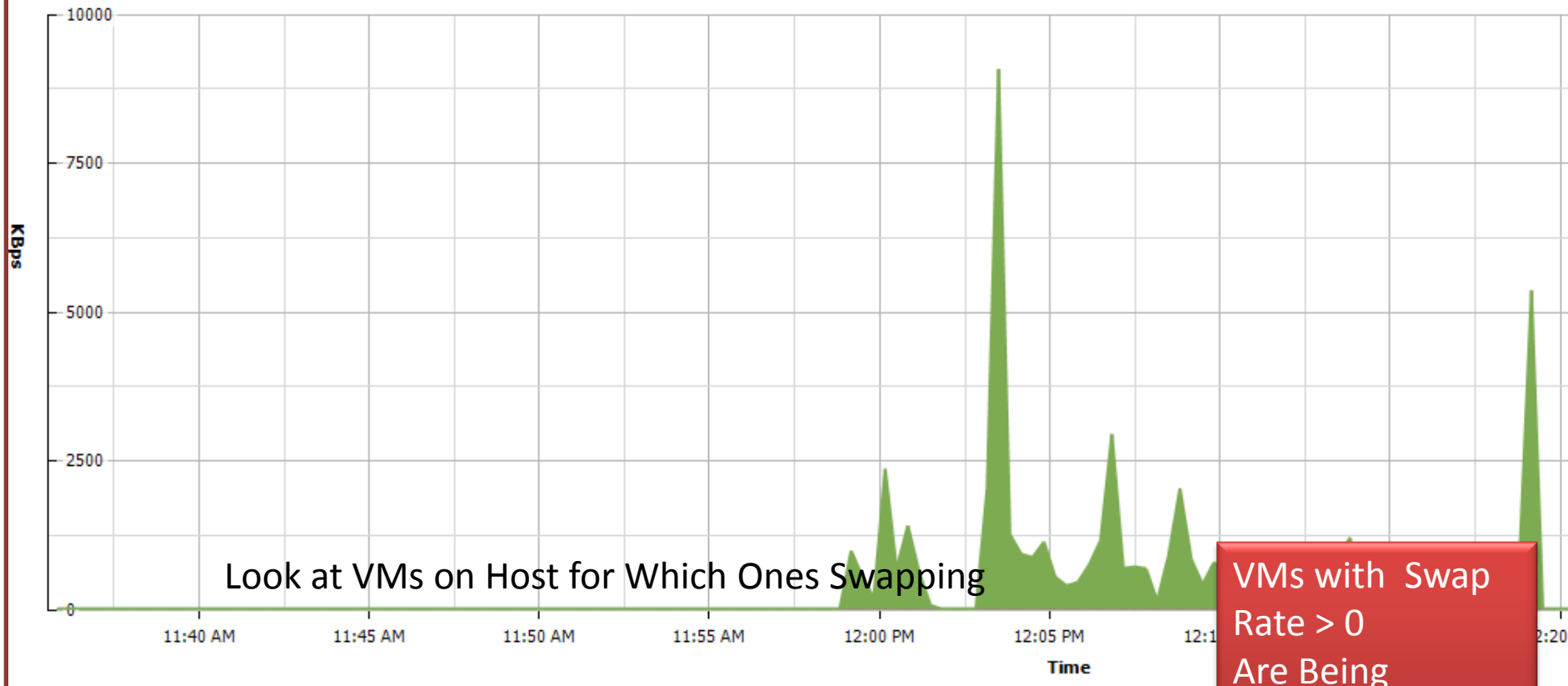
92.168.15.88 VMware ESX, 4.1.0, 260247

Getting Started | Summary | Virtual Machines | Performance | Configuration | Tasks & Events | Alarms | Permissions | Maps | Storage Views | Hardware Status

Overview | Advanced

Memory/Real-time, 11/30/2010 11:35:34 AM - 11/30/2010 12:35:34 PM Chart Options...

Graph refreshes every 20 seconds



Look at VMs on Host for Which Ones Swapping

VMs with Swap Rate > 0 Are Being Affected By Swapping

Performance Chart Legend

Key	Object	Measurement	Rollup	Units	Latest	Maximum	Minimum	Avera
☐	vDataOnTap	Swap out rate	Average	KBps				
■	vDns	Swap out rate	Average	KBps	0	0	0	0
☐	vMAK	Swap out rate	Average	KBps				
■	vMonitor	Swap out rate	Average	KBps	743	9089	0	376.267
■	VMware Auto D...	Swap out rate	Average	KBps	0	0	0	0
☐	vSphere Manag...	Swap out rate	Average	KBps				

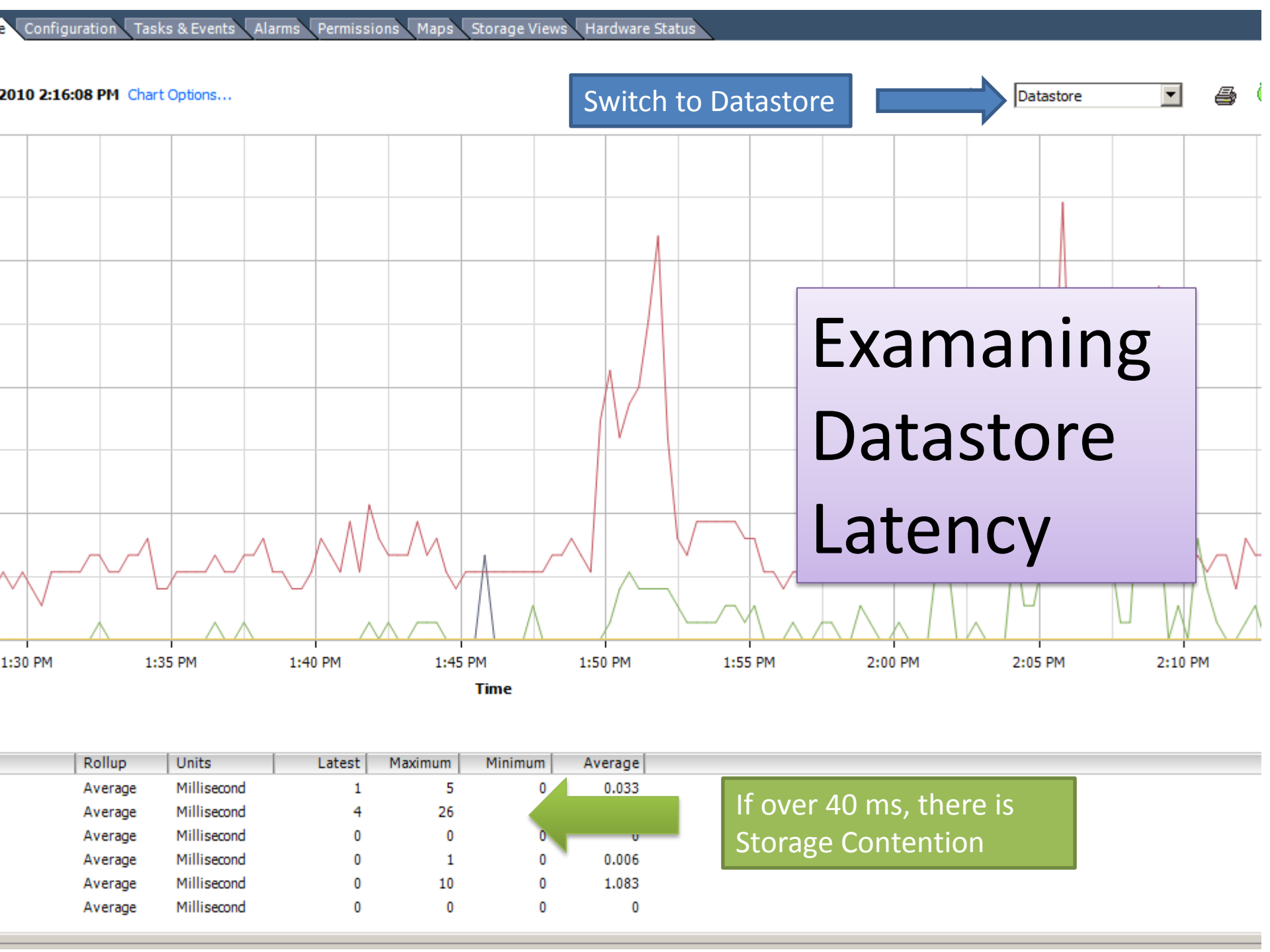
Memory Swapping Solutions

- Reduce the level of memory over-commit.
- Enable the balloon driver in all VMs.
- Reduce memory reservations.
- Use resource controls to dedicate memory to critical VMs.

Storage Issues

Excessive demand being placed on the storage device.

Misconfigured storage. - Disks per LUN, RAID levels, Caches, HBA queues, IOPS, Alignment Issues. Vendor Specific.


Configuration
Tasks & Events
Alarms
Permissions
Maps
Storage Views
Hardware Status
2010 2:16:08 PM
Chart Options...
Switch to Datastore
Datastore
Examaning Datastore Latency
1:30 PM
1:35 PM
1:40 PM
1:45 PM
1:50 PM
1:55 PM
2:00 PM
2:05 PM
2:10 PM
Time
Rollup
Units
Latest
Maximum
Minimum
Average
Average Millisecond 1 5 0 0.033
Average Millisecond 4 26
Average Millisecond 0 0 0 0
Average Millisecond 0 1 0 0.006
Average Millisecond 0 10 0 1.083
Average Millisecond 0 0 0 0
If over 40 ms, there is Storage Contention

Debugging Storage Issues

The Ultimate Tool for Storage Debugging vscsiStats
http://communities.vmware.com/docs/DOC-10095

Look at your HBA's with esxtop, then choose "u"

Look at your Storage Vendors Tools

Storage Resolutions

Storage I/O Control in vSphere 4.1 Can Fairly Allocate Datastore Access Across ESX Hosts. Must be Enabled in vSphere Client

Request both storage CAPACITY (TB) and storage PERFORMANCE (IOPS). Examine the IOPS of your workload versus your storage capability. This is often mismatched.

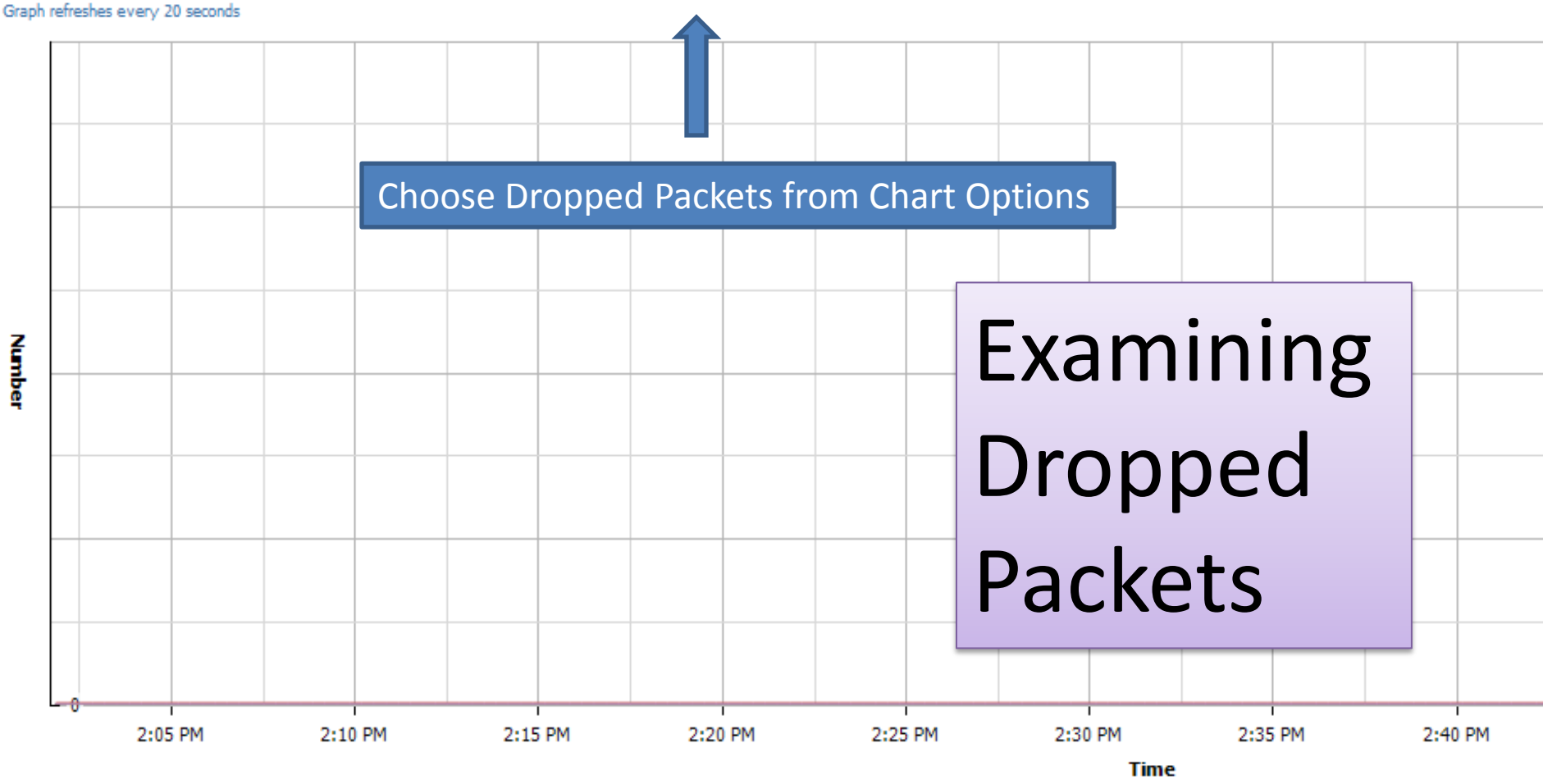
Network Issues

Look at Dropped Packets

Overview | Advanced

Network/Real-time, 11/30/2010 2:01:42 PM - 11/30/2010 3:01:42 PM Chart Options...

Graph refreshes every 20 seconds



Performance Chart Legend

Key	Object	Measurement	Rollup	Units	Latest	Maximum	Minimum	Average
	vmnic0	Transmit packets dropped	Summation	Number	0	0	0	0
	vmnic1	Transmit packets dropped	Summation	Number	0	0	0	0
	vmnic2	Transmit packets dropped	Summation	Number	0	0	0	0
	vmnic3	Transmit packets dropped	Summation	Number	0	0	0	0
	vmnic0	Receive packets dropped	Summation	Number	0	0	0	0
	vmnic1	Receive packets dropped	Summation	Number	0	0	0	0

Network Resolutions (Transmit)

Move some VMs with high network demand to a different vSwitch.

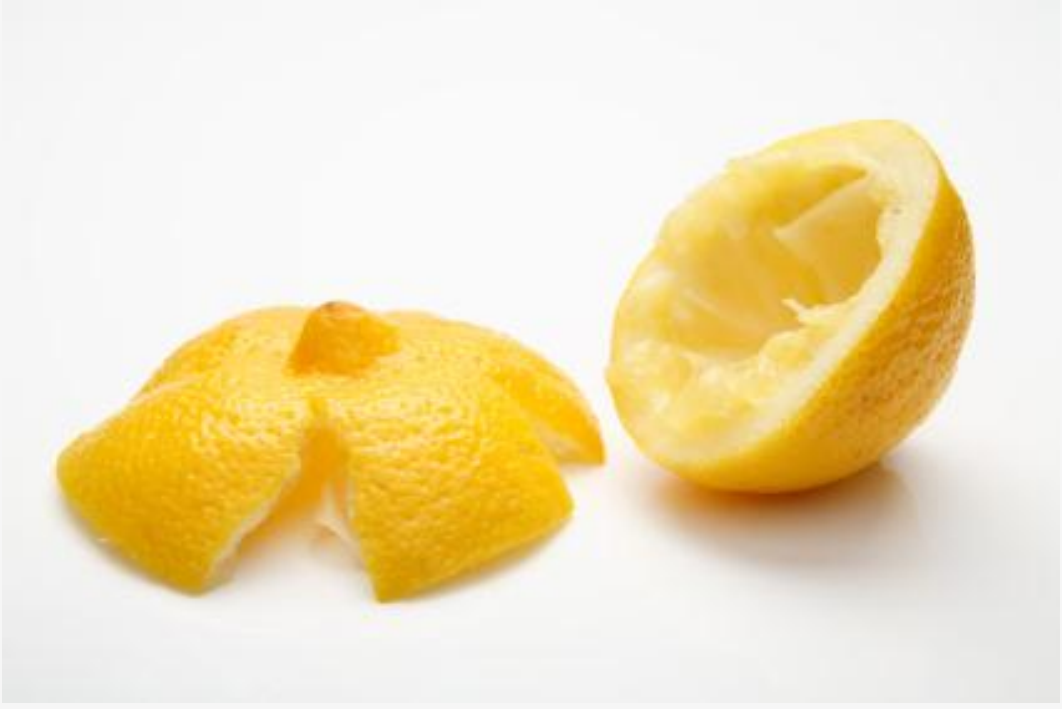
Add additional uplink capacity to the vSwitch.

Network Resolutions (Receive)

- Add vCPUS
- Try VMXNet3 Adapter Type
- Add additional vNICS
- Tune Guest VM OS

There Is Only So Much Juice You Can Squeeze

Buy More Hardware!



Thanks!

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