

vmware
by Broadcom

VMWARE SESSION

69. Infor Anwendertreffen



Computacenter

ABOUT ME

Marc Huppert

Principal Consultant

25 years + Virtualization Experience



<https://VCDX181.com>



@MarcHuppert

249 Credly Badges	987 Skills	255 Shares
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Datacenter

		<					

AGENDA

VMWARE SESSION



- VMware by Broadcom
- Lizenzmodelle
- Optimierung von VMs
 - Tuning Methoden
 - BIOS
 - Virtuelle Maschinen
 - Betriebssysteme





VMWARE BY BROADCOM



ALLGEMEINES ZU VMWARE BY BROADCOM

HARD FACTS

Übernahme der VMware durch
Broadcom am 22.11.2023

VMware gehört zu 100% der
Broadcom

Neuer Name:
VMware by Broadcom

Neue Business Units

VCF
inkl. vSAN, vSphere, NSX, Aria

Tanzu

Network & Security

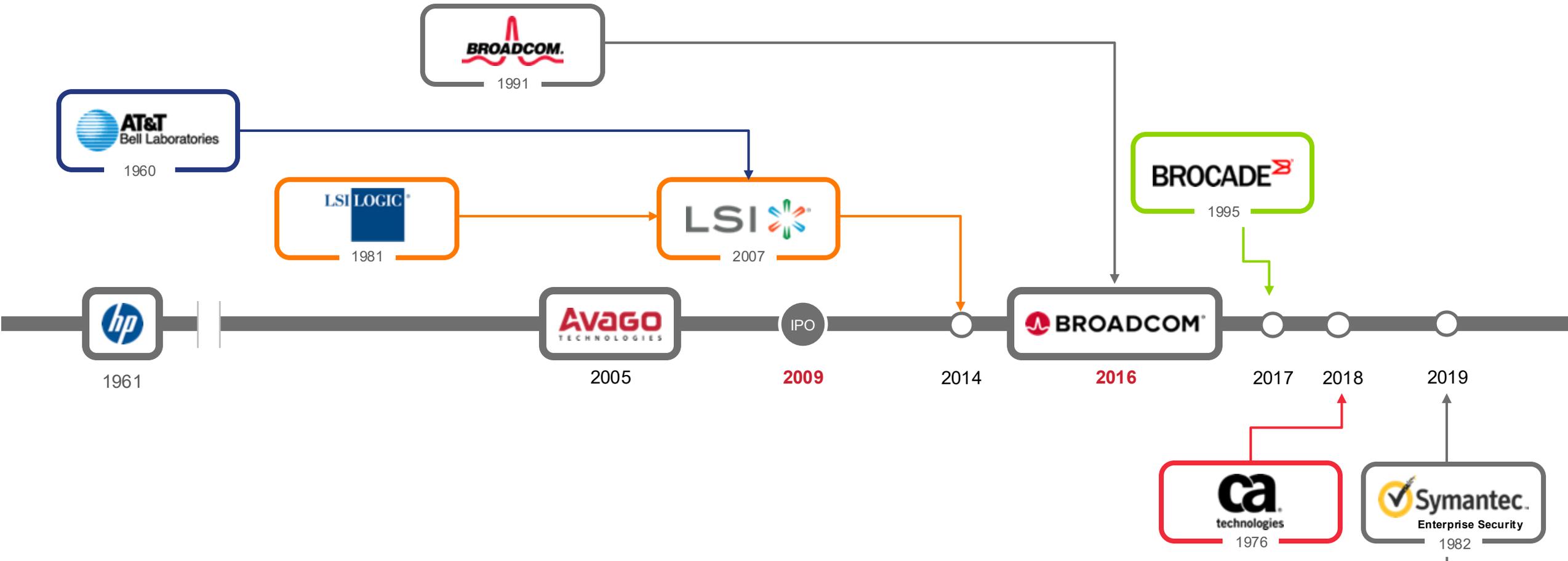
Edge Computing

Die bisherigen BU für **Carbon Black** und **End User Computing** sind bereits ausgegliedert. EUC ist von KKR gekauft worden.

Keine Support Renewals mehr möglich für Perpetual Lizenzen!!!! Kunden müssen Subscription kaufen



HISTORY BROADCOM



BROADCOM AT A GLANCE



Net revenue of
\$33.2B



One of the industry's
broadest IP portfolios with
>17,000 patents



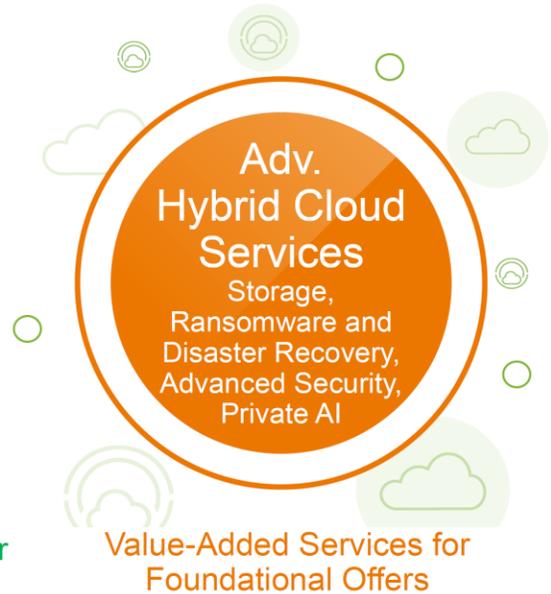
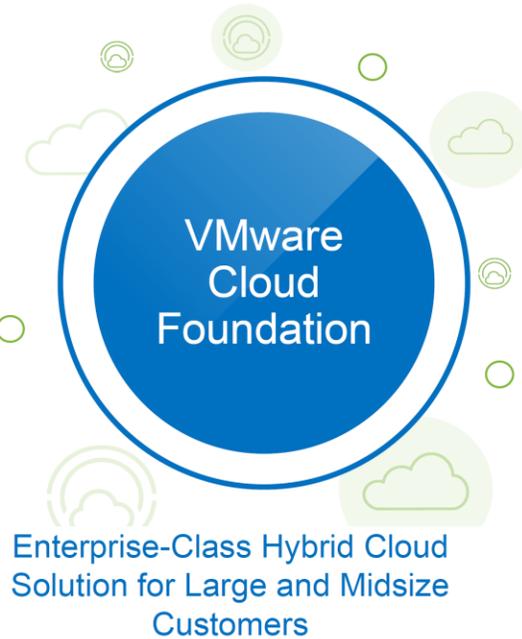
\$4.9B investment
in R&D



22 Category-Leading Semiconductor and Infrastructure Software Divisions



PRODUCTS



Simplify to 2 foundational offers plus add-ons

Attractive pricing to allow customers to benefit faster

Ease of doing business with improved customer experience

For small deployments, we continue to offer vSphere Standard and vSphere Essentials Plus

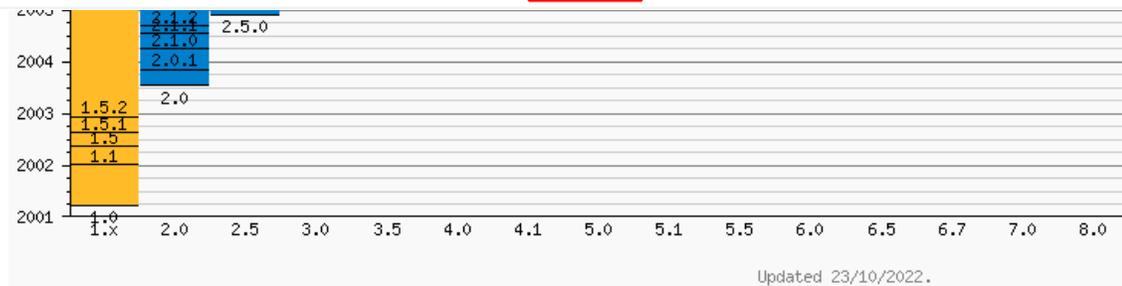


VERSIONS



https://support.broadcom.com/group/ecx/productlifecycle

VMware Cloud Foundation	No_Support_Product	VMware vSphere Replication 8.3.0	8.3.0	203564	02-Apr-2020	-
VMware Cloud Foundation	VMware	VMware vSAN - VMware vSphere (vSAN included)	7.0	202589	02-Apr-2020	02-Oct-2025
VMware Cloud Foundation	VMware Cloud Foundation	VMware vSAN - VMware vSphere (vSAN included)	7.0	202589	02-Apr-2020	02-Oct-2025
VMware Cloud Foundation	VMware vSAN	VMware vSphere Hypervisor (ESXi) 7.0U1c	7.0U1c	202805	17-Dec-2020	02-Oct-2025
VMware Cloud Foundation	VMware vSAN	VMware vSphere Hypervisor (ESXi) 7.0U1	7.0U1	202804	06-Oct-2020	02-Oct-2025
VMware Cloud Foundation	VMware vSAN	VMware vSphere Hypervisor (ESXi) 7.0b	7.0b	202803	23-Jun-2020	02-Oct-2025
VMware Cloud Foundation	VMware vSAN	VMware vSphere Hypervisor (ESXi) 7.0.0	7.0.0	202802	02-Apr-2020	02-Oct-2025
VMware Cloud Foundation	VMware vSAN	VMware vSAN - VMware vSphere (vSAN included)	7.0	202589	02-Apr-2020	02-Oct-2025



Updated 23/10/2022.





LIZENZMODELLE



Das Getränke „AIDA Comfort Deluxe“ (ab 25 Jahren) beinhaltet folgende Leistungen:

- ★ Cocktails und Mixgetränke (mit und ohne Alkohol)
- ★ Milchshakes und Froodies
- ★ Kaffee- und Teespezialitäten (mit und ohne Alkohol)
- ★ leckere Fruchtsäfte
- ★ gezapfte Softgetränke (Wasser, Fanta, Sprite und Coca-Cola)
- ★ Softgetränke aus Flaschen und Dosen (Fanta, Sprite, Coca-Cola, Red Bull und Thomas Henry Limonaden)
- ★ Weine und Sekt im Glas
- ★ frisch gezapfte Biere und ausgewählte Flaschenbier (mit und ohne Alkohol)
- ★ Spritzgetränke (z. B. Aperol Spritz, Hugo)



All Inclusive bezieht sich nur auf Speisen und Getränke an Bord.

Landausflüge, Shows und Exclusive Restaurants sind extra zu bezahlen.....

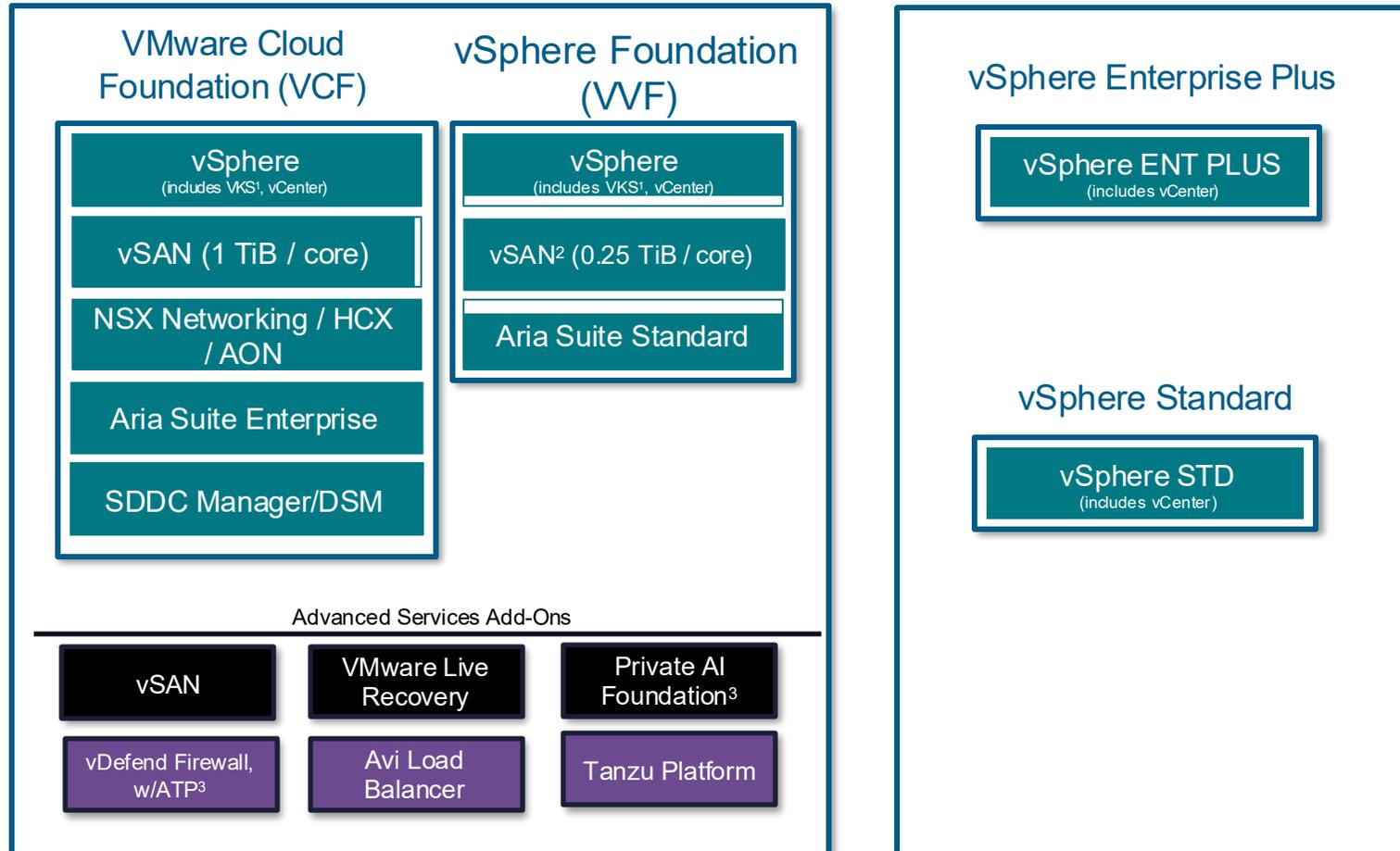


Gäste von 2 bis 24 Jahren erhalten das besondere „Kids & Teens Comfort“-Paket. Das Paket enthält folgende Leistungen:

- ★ alkoholfreie Cocktails und Mixgetränke
- ★ Kakao und Früchte- und Kräutertees
- ★ leckere Fruchtsäfte
- ★ gezapfte Softgetränke (Wasser, Fanta, Sprite und Coca-Cola)
- ★ Softgetränke aus Flaschen (Fanta, Sprite und Coca-Cola)
- ★ Milchshakes & Froodies



VCF DIVISION PRIMARY OFFERS

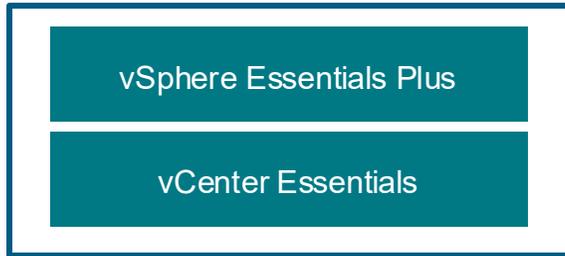


Support: Broadcom Maintenance

VSPHERE ESSENTIALS PLUS

END OF SALE NOVEMBER 11, 2024

vSphere Essentials Plus



Pricing and Licensing

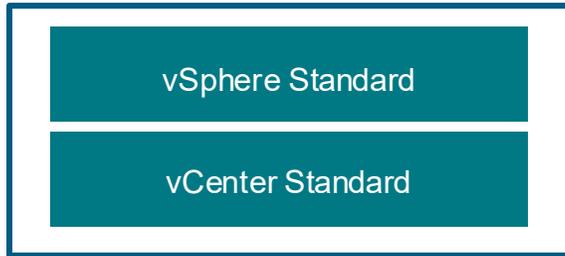
- End of Sale on November 11, 2024
- Existing customers can continue using product until end of subscription term
- Cannot renew or expand after Nov. 11, 2024
- Per core pricing
- Sold in 96-core license packs
- 16 cores per CPU minimum; 3 hosts maximum
- 3-year term recommended (annual billing available)
- Includes Broadcom Maintenance



VSPHERE STANDARD (VVS)



vSphere Standard



Licensing

End of Sale on April 10, 2025 @APAC

- Subscription
- Per core pricing
- 16 cores per CPU minimum
- Price per core per year with 3-year term recommended (annual billing available)
- Includes Broadcom Maintenance Support



VSPHERE ENTERPRISE PLUS

GA NOVEMBER 11, 2024

vSphere Enterprise Plus



Pricing and Licensing

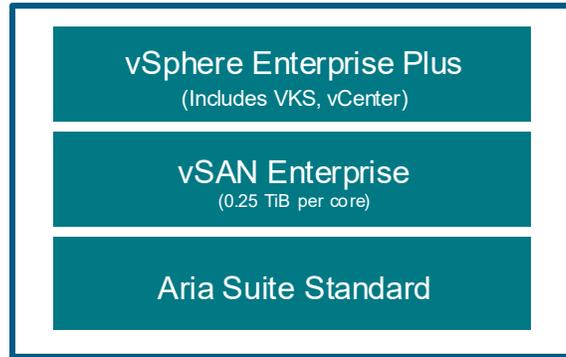
- Subscription
- Per core pricing
- 16 cores per CPU minimum
- 3-year term recommended (annual billing available)
- Includes Broadcom Maintenance



VSPHERE FOUNDATION (VVF)

PRICING AND PACKAGING

vSphere Foundation



Licensing

Subscription

Per core pricing

16 cores per CPU minimum

Price per core per year with 3-year term recommended (annual billing available)

Includes Broadcom Maintenance Support

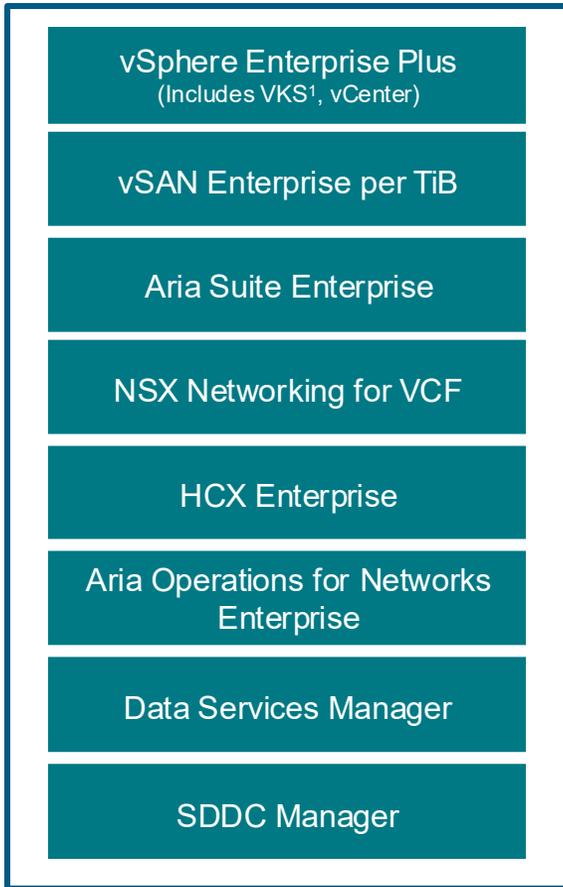
vSAN 0.25 TiB capacity per core available 11/22/24

(previously, vSAN 100 GiB trial capacity included in 8.0U2b release)

VMWARE CLOUD FOUNDATION (VCF)



VMware Cloud Foundation



Licensing

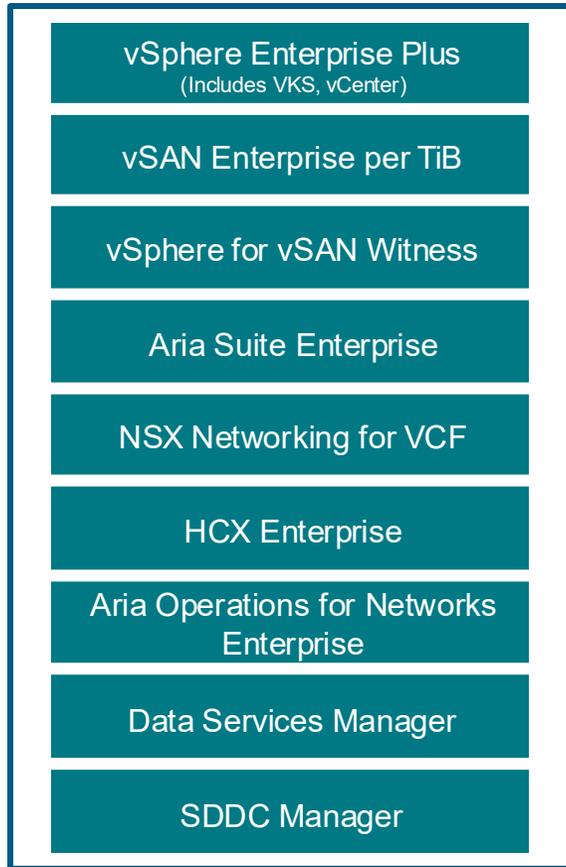
- Subscription
- Per core pricing
- 16 cores per CPU minimum
- Price per core per year with 3-year term recommended (annual billing available)
- vSAN: 1 TiB per core
- Broadcom Maintenance Support
- It is strongly recommended to attach the Support Account Manager Add-On



VMWARE CLOUD FOUNDATION EDGE (VCFE)



VMware Cloud Foundation Edge



Pricing and Licensing

Subscription

8 cores per CPU minimum

3-year term recommended (annual billing available)

vSAN: 1 TiB per core¹

Broadcom Maintenance

Includes complimentary vSphere for vSAN Witness to support deploying the vSAN Witness VM locally²

Restrictions:

Edge locations only

Minimum of 10 sites within 1 year of VCFE deployment

Maximum of 256 Cores per Edge site

VECO will be added to VCF Edge in the future (timing TBD)

SKU: VCF-CLD-FND-EDGE-5 VMware Cloud Foundation Edge 5 - For Edge Deployments Only

1. vSAN can only be aggregated and utilized across Cores where the vSphere for VCF Edge is deployed. VCF Edge licenses can be purchased for additional capacity.
2. If the vSAN Witness VM is deployed back at the data center, the host will require licensing. The vSphere for vSAN Witness license cannot be deployed at the data center.



ADD-ONS



Add-on	For	Description
vSAN	WF, VCF	vSAN Capacity Add-on (1 TiB)
vDefend Firewall	VCF	NSX GW- & Distributed FW, with and without Adv. Threat Prevention
Private AI Foundation	VCF	AI, needs NVIDIA AI Ent. Lic.
VMware Live Recovery	ALL	Site Recovery + Cyber Recovery
AVI Load Balancer	ALL	Load Balancer incl. WAF

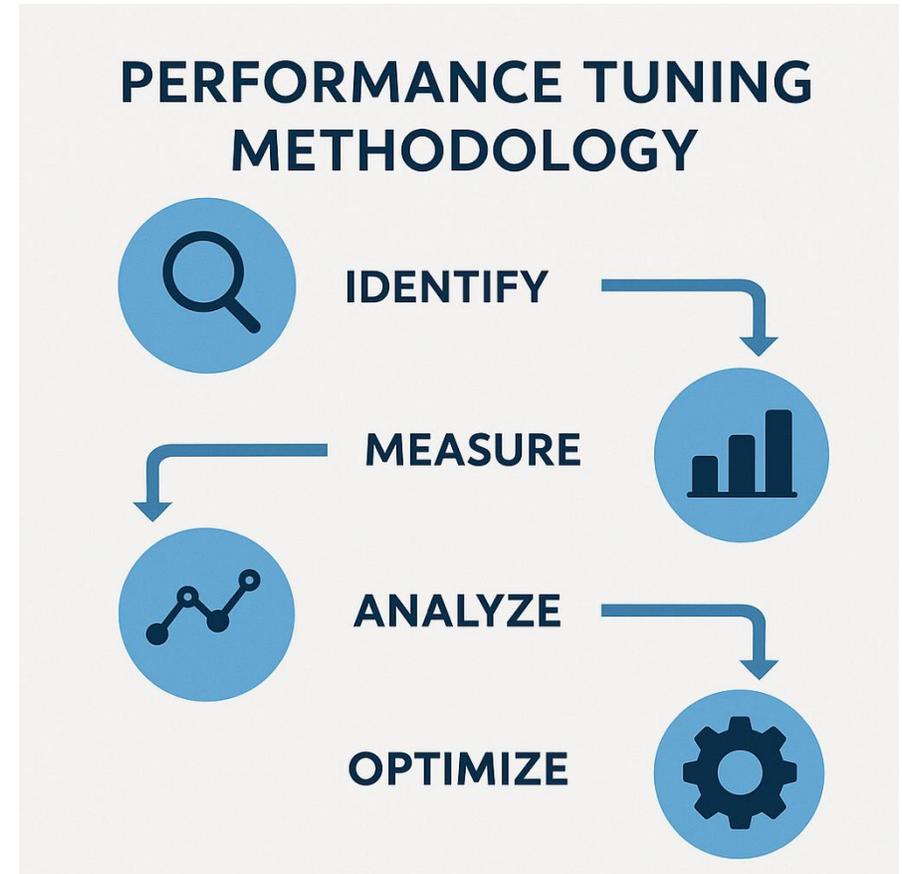




VMWARE TUNING



PERFORMANCE TUNING METHODOLOGY



METHODOLOGY



Follow these best practices for performance-tuning your vSphere infrastructure:

- Assess performance:
 - Use appropriate monitoring tools.
 - Record a numerical benchmark before changes.
- Identify the limiting resource.
- Make more resources available:
 - Allocate more.
 - Reduce competition.
 - Log your changes.
- Benchmark again.

**Do not make casual changes
to production systems.**



TOOLS



Many resource and performance monitoring tools are available to administrators to use with vSphere.

Inside the Guest OS

Perfmon DLL
Task Manager

Outside the Guest OS

vCenter Server
performance charts
vRealize Operations
Hyperic
vSphere/ESXi system logs
resxtop and esxtop

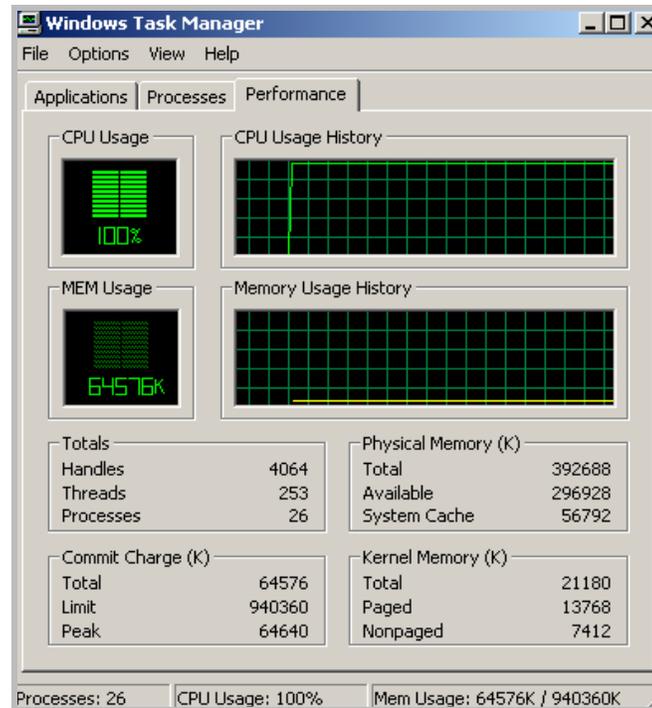


TOOLS



To monitor performance in the guest operating system, use tools that you are familiar with, such as Windows Task Manager.

Windows Task Manager



KNOW YOUR WORKLOAD



Always check your Power Management Settings

ESX POWER MANAGEMENT



hardware

- Overview
- PCI Devices
- Firmware

Virtual Flash

- Virtual Flash Resource Mana...
- Virtual Flash Host Swap Cac...

Alarm Definitions

Scheduled Tasks

Persistent Memory

Total	0 MB
Available	0 MB

Power Management

[EDIT POWER POLICY](#)

Technology	--
Active policy	Balanced



ESX POWER MANAGEMENT



- Default VM Compatibility
- Swap File Location
- System** ✓
- Licensing
- Host Profile
- Time Configuration
- Authentication Services
- Certificate
- Power Management
- Advanced System Settings

Persistent Memory

Total	0 MB
Available	0 MB

Power Management

[EDIT POWER POLICY](#)

The ESXi power policy provides hints to the system's power management hardware using the technologies listed (if any). BIOS settings control which power management technologies are available to ESXi. See [Host Power Management whitepaper](#) for details and best practices.

Technology	ACPI P-states, ACPI C-states
Active policy	High performance



PWR_MGMT_PROFILES DELL



System Profile Settings		System Profile (Power Management Profile)					
	System Profile	Perf. Per Watt (DAPC)	(...)	Performance	Cust.	Custom Recommended	
P-State	CPU Power Management	System DBPM (DAPC)	(...)	Maximum Performance	any	OS DBPM	or Maximum Performance
	Memory Frequency	Maximum Performance	(...)	Maximum Performance	any	Maximum Performance	
	Turbo Boost	Enabled	(...)	Enabled	any	Enabled	
	Energy Efficient Turbo	Enabled	(...)	Disabled	any	Disabled	
C1E	C1E	Enabled	(...)	Disabled	any	Enabled	
Deep C	C States	Enabled	(...)	Disabled	any	Enabled	
	Collab. CPU Performance Control	Disabled	(...)	Disabled	any	Disabled	
	Memory Patrol Scrub	Standard	(...)	Standard	any	Standard	
	Memory Refresh Rate	1x	(...)	1x	any	1x	
	Uncore Frequency	Dynamic	(...)	Maximum	any	Maximum	
	Energy Efficient Policy	Balanced Performance	(...)	Performance	any	Performance	
	# of TB Enabled Cores for CPU 1	All	(...)	All	any	All	
	# of TB Enabled Cores for CPU 2	All	(...)	All	any	All	
Monitor/Mwait	Enabled	(...)	Enabled	any	Enabled		



PWR_MGMT_PROFILES HPE

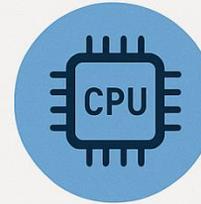


Power Management		Power Profile (Power Management Profile)				
	Power Profile	Balanced Power and Perf.	(...)	Maximum Performance	Cust.	Custom Recommended
P-State	Power Regulator	Dynamic Power Savings Mode	(...)	Static High Performance Mode	any	OS Control Mode or SHPM
Deep C	Min. Proc. Idle Power Core C-State	C6 State	(...)	No C-states	any	C6 State
	Min. Proc. Idle Power Package Core C-State	Package C6 (retention) State	(...)	No Package State	any	PC6 (retention) State
	Advanced Power Options					
	Intel QPI Link Power Management	Enabled	(...)	Disabled	any	Disabled
	Intel QPI Link Frequency	Auto	(...)	Auto	any	Auto
	Intel QPI Link Enablement	Auto	(...)	Auto	any	Auto
	Energy/Performance Bias	Balanced Performance	(...)	Maximum Performance	any	Maximum Performance
	Maximum Memory Bus Frequency	Auto	(...)	Auto	any	Auto
	Channel Interleaving	Enabled	(...)	Enabled	any	Enabled
	Maximum PCI Express Speed	Maximum Supported	(...)	Maximum Supported	any	Maximum Supported
	Dynamic Power Savings Mode Response	Fast	(...)	Fast	any	Fast
	Collaborative Power Control	Enabled	(...)	Enabled	any	Disabled
	Redundant Power Supply Mode	Balanced Mode	(...)	Balanced Mode	any	Balanced Mode
	Intel DMI Link Frequency	Auto	(...)	Auto	any	Auto

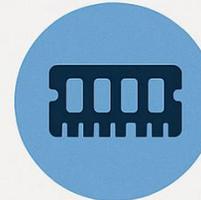


VIRTUAL MACHINES

PERFORMANCE TUNING OF VIRTUAL MACHINES



CPU

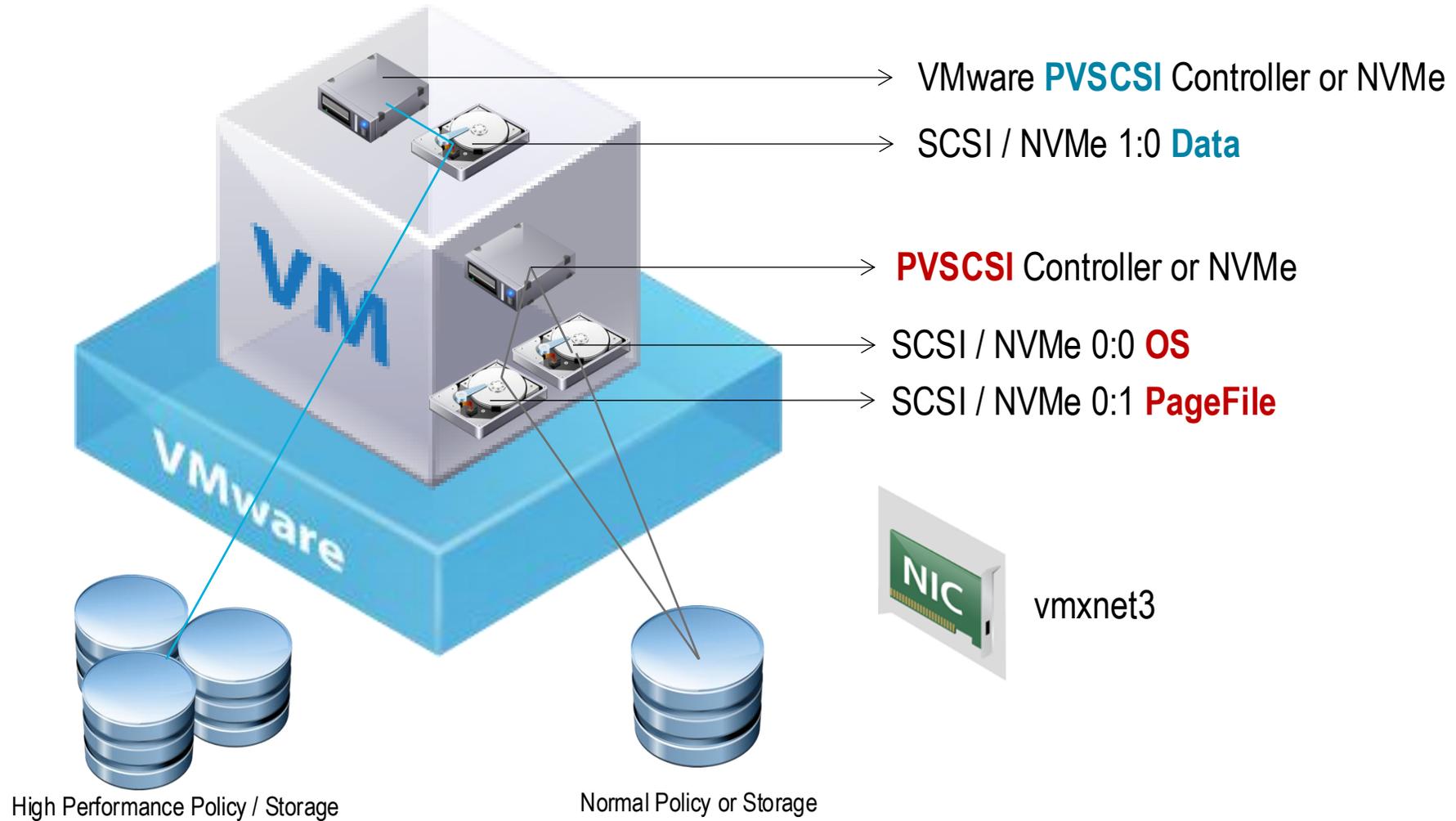


MEMORY



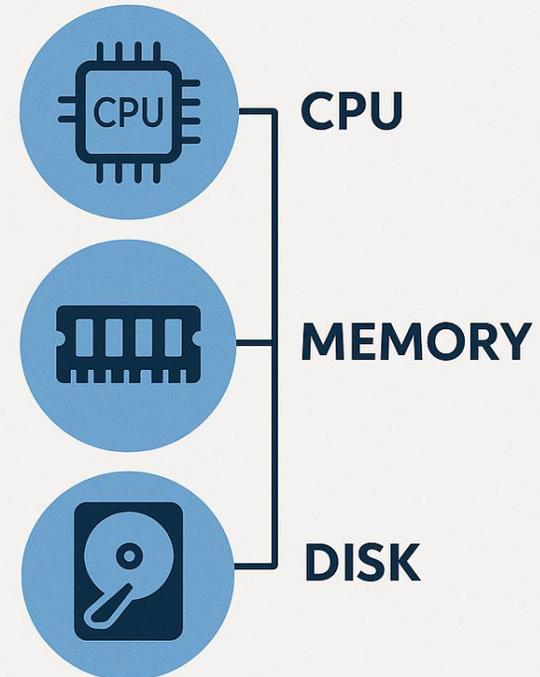
STORAGE

OPTIMAL VM



GUEST OS

PERFORMANCE TUNING OF GUEST OPERATING SYSTEMS



ENERGY CONTROL

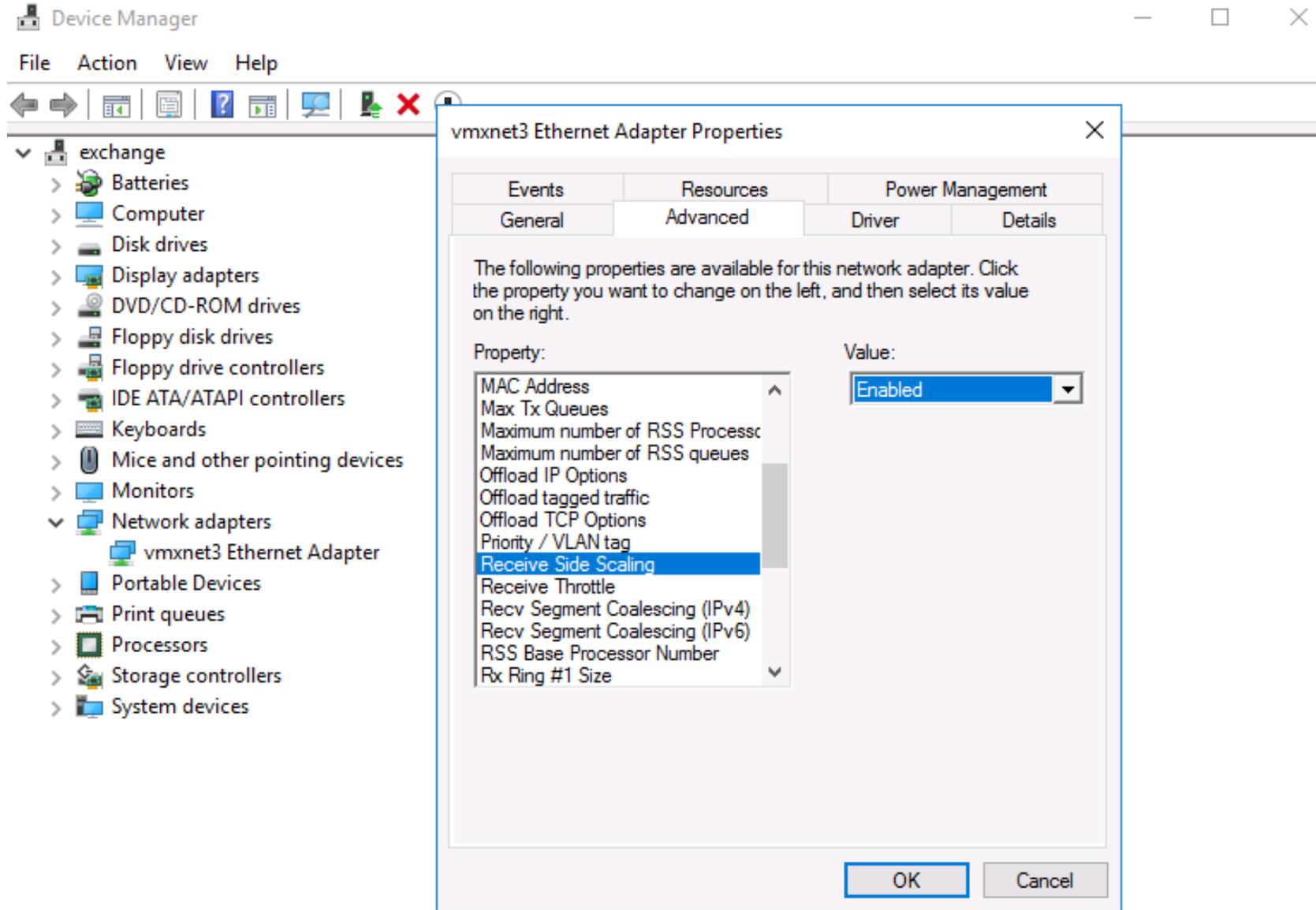


The screenshot shows the Windows Device Manager window with the 'Network adapters' category expanded. The 'vmxnet3 Ethernet Adapter' is selected, and its properties dialog box is open. The 'Power Management' tab is active, displaying the following settings:

- Allow the computer to turn off this device to save power
- Allow this device to wake the computer
 - Only allow a magic packet to wake the computer

The 'OK' button is highlighted with a blue border.





The screenshot shows the Windows Device Manager interface. On the left, the 'Network adapters' category is expanded, showing the 'vmxnet3 Ethernet Adapter'. A dialog box titled 'vmxnet3 Ethernet Adapter Properties' is open, with the 'Advanced' tab selected. The 'Property:' list includes 'Receive Side Scaling', which is highlighted and set to 'Enabled' in the 'Value:' dropdown. Other properties listed include MAC Address, Max Tx Queues, Maximum number of RSS Processes, Maximum number of RSS queues, Offload IP Options, Offload tagged traffic, Offload TCP Options, Priority / VLAN tag, Receive Throttle, Recv Segment Coalescing (IPv4), Recv Segment Coalescing (IPv6), RSS Base Processor Number, and Rx Ring #1 Size.

POWER OPTIONS



Power Options

← → ▾ ↑  > Control Panel > All Control Panel Items > Power Options

Control Panel Home

Choose what the power button does

Create a power plan

 Choose when to turn off the display

 Change when the computer sleeps

Choose or customize a power plan

A power plan is a collection of hardware and system settings (like display brightness, sleep, etc.) that manages how your computer uses power. [Tell me more about power plans](#)

Preferred plans

Balanced (recommended)

Automatically balances performance with energy consumption on capable hardware.

[Change plan settings](#)

High performance

Favors performance, but may use more energy.

[Change plan settings](#)

Show additional plans



PAGE FILE



Virtual Memory ×

Automatically manage paging file size for all drives

Paging file size for each drive

Drive	[Volume Label]	Paging File Size (MB)
C:	[System]	None
D:	[Transaction]	None
E:	[Mailbox]	None
S:	[Swap]	4000 - 4000

Selected drive: S: [Swap]
Space available: 4063 MB

Custom size:
Initial size (MB):
Maximum size (MB):

System managed size
 No paging file Set

Total paging file size for all drives

Minimum allowed: 16 MB
Recommended: 2943 MB
Currently allocated: 4000 MB



DISABLE PAGING EXECUTIVE



Registry Editor

File Edit View Favorites Help

SafeBoot
ScEvents
ScsiPort
SecureBoot
SecurePipeServers
SecurityProviders
Server Applications
ServiceAggregatedEvents
ServiceGroupOrder
ServiceProvider
Session Manager
AppCompatCache
Configuration Manager
DOS Devices
Environment
Executive
FileRenameOperations
I/O System
Kernel
KnownDLLs
Memory Management
NamespaceSeparation
Power
Quota System
SubSystems
WPA
SNMP
SQMServiceList
Srp
SrpExtensionConfig
StillImage
Storage
StorageManagement
StorPort
StSec
SystemInformation

Name	Type	Data
(Default)	REG_SZ	(value not set)
ClearPageFileAtShutdown	REG_DWORD	0x00000000 (0)
DisablePagingExecutive	REG_DWORD	0x00000001 (1)
ExistingPageFiles	REG_MULTI_SZ	\??\S:\pagefile.sys
LargeSystemCache	REG_DWORD	0x00000000 (0)
NonPagedPoolQuota	REG_DWORD	0x00000000 (0)
NonPagedPoolSize	REG_DWORD	0x00000000 (0)
PagedPoolQuota	REG_DWORD	0x00000000 (0)
PagedPoolSize	REG_DWORD	0x00000000 (0)
PagingFiles	REG_MULTI_SZ	s:\pagefile.sys 4000 4000
PhysicalAddressExtension	REG_DWORD	0x00000001 (1)
SecondLevelDataCache	REG_DWORD	0x00000000 (0)
SessionPoolSize	REG_DWORD	0x00000004 (4)
SessionViewSize	REG_DWORD	0x00000030 (48)
SystemPages	REG_DWORD	0x00000000 (0)

Computer\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\Memory Management



OPTIMIZE PVSCSI



Registry Editor

File Edit View Favorites Help

Name	Type	Data
(Default)	REG_SZ	(value not set)
DriverParameter	REG_SZ	RequestRingPages=32,MaxQueueDepth=254

Computer\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\pvscsi\Parameters\Device



DISABLE NIC OFFLOADING



Registry Editor

File Edit View Favorites Help

Computer\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters

Name	Type	Data
(Default)	REG_SZ	(value not set)
DataBasePath	REG_EXPAND_SZ	%SystemRoot%\System32\drivers\etc
DeadGWDetectDefault	REG_DWORD	0x00000001 (1)
Domain	REG_SZ	office.home
DontAddDefaultGatewayDefault	REG_DWORD	0x00000000 (0)
EnableICMPRedirect	REG_DWORD	0x00000001 (1)
ForwardBroadcasts	REG_DWORD	0x00000000 (0)
Hostname	REG_SZ	exchange
ICSDomain	REG_SZ	mshome.net
IPEnableRouter	REG_DWORD	0x00000000 (0)
MaxUserPort	REG_DWORD	0x0000e7d1 (59345)
NameServer	REG_SZ	
NV Domain	REG_SZ	office.home
NV Hostname	REG_SZ	exchange
ReservedPorts	REG_MULTI_SZ	6001-6002 6004-6004
SearchList	REG_SZ	
ShutDownTimeAtLastDomainJoin	REG_BINARY	89 0d 70 f5 f3 cf d2 01
SyncDomainWithMembership	REG_DWORD	0x00000001 (1)
TcpTimedWaitDelay	REG_DWORD	0x0000003c (60)
UseDomainNameDevolution	REG_DWORD	0x00000001 (1)
DisableTaskOffload	REG_DWORD	0x00000001 (1)



VMXNET3 TUNING



```
netsh int tcp set global chimney=Disabled
netsh int tcp set global autotuninglevel=Disabled
netsh int tcp set supplemental custom congestionprovider=none
netsh int tcp set global ecncapability=Disabled
netsh int ip set global taskoffload=disabled
netsh int tcp set global timestamps=Disabled
```

```
Administrator: Command Prompt
C:\Windows\system32>netsh int tcp set global timestamps=Disabled
Ok.

C:\Windows\system32>netsh int tcp show global
Querying active state...

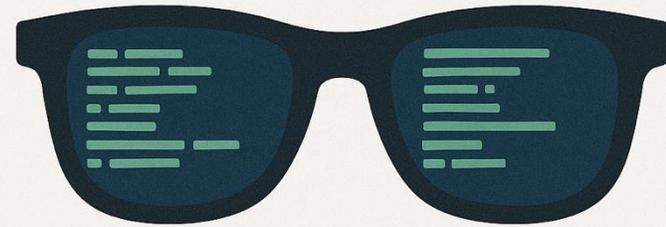
TCP Global Parameters
-----
Receive-Side Scaling State           : enabled
Chimney Offload State                : disabled
NetDMA State                         : disabled
Direct Cache Access (DCA)           : disabled
Receive Window Auto-Tuning Level    : disabled
Add-On Congestion Control Provider  : none
ECN Capability                       : disabled
RFC 1323 Timestamps                 : disabled
Initial RTT                          : 3000
Receive Segment Coalescing State     : enabled
Non Sack Rtt Resiliency              : disabled
Max SYN Retransmissions              : 2

C:\Windows\system32>_
```



GEEK STUFF.....

**VMWARE
CLI**



**GEEK
STUFF**

DEEP DIVE INTO VMS



```
1:29:47am up 14 min, 515 worlds, 2 VMs, 4 vCPUs; CPU load average: 0.16, 0.00, 0.00
PCPU USED(%): 4.6 53 1.0 54 33 0.1 0.0 0.0 0.0 0.0 1.0 4.9 16 25 45 16 19 38 0.0 0.3 AVG: 15
PCPU UTIL(%): 4.7 59 0.7 60 32 0.2 0.3 0.3 0.2 0.3 1.0 4.5 16 27 47 17 19 39 0.6 0.5 AVG: 16
Group to expand/rollup (gid): 7799
```

ID	GID	NAME	NWLD	%USED	%RUN	%SYS	%WAIT	%VMWAIT	%RDY	%IDLE	%OVRLP	%CSTP	%MLMTD	%SWPWT
7799	7799	vm0-netperf-x64	9	160.23	131.88	29.93	768.09	2.24	0.05	65.98	0.68	0.00	0.00	0.00
7815	7815	vm1-netperf-x64	9	138.67	113.72	31.47	786.25	3.73	0.03	82.65	0.87	0.00	0.00	0.00

```
1:30:54am up 15 min, 516 worlds, 2 VMs, 4 vCPUs; CPU load average: 0.15, 0.00, 0.00
PCPU USED(%): 32 22 15 21 26 0.3 27 0.0 0.9 0.8 40 32 2.1 0.8 0.2 60 29 0.0 0.2 0.4 AVG: 15
PCPU UTIL(%): 35 22 18 21 30 0.5 30 0.0 0.3 0.8 42 33 2.2 0.8 0.5 62 32 0.3 0.2 0.0 AVG: 16
```

ID	GID	NAME	NWLD	%USED	%RUN	%SYS	%WAIT	%VMWAIT	%RDY	%IDLE	%OVRLP	%CSTP	%MLMTD	%SWPWT
36947	7799	vmx	1	26.76	0.04	26.72	99.93	-	0.01	0.00	0.00	0.00	0.00	0.00
36949	7799	vmast.36948	1	0.07	0.07	0.00	99.91	-	0.00	0.00	0.00	0.00	0.00	0.00
36951	7799	vmx-vthread-5:v	1	0.00	0.00	0.00	99.98	-	0.00	0.00	0.00	0.00	0.00	0.00
36952	7799	vmx-vthread-6:v	1	0.00	0.00	0.00	99.98	-	0.00	0.00	0.00	0.00	0.00	0.00
36953	7799	vmx-vthread-7:v	1	0.00	0.00	0.00	99.98	-	0.00	0.00	0.00	0.00	0.00	0.00
36959	7799	vmx-mks:vm0-net	1	0.01	0.01	0.00	99.96	-	0.01	0.00	0.00	0.00	0.00	0.00
36960	7799	vmx-svga:vm0-ne	1	0.00	0.00	0.00	99.98	-	0.00	0.00	0.00	0.00	0.00	0.00
36961	7799	vmx-vcpu-0:vm0-	1	65.64	66.39	0.00	33.58	1.13	0.01	32.45	0.32	0.00	0.00	0.00
36962	7799	vmx-vcpu-1:vm0-	1	64.89	65.65	0.00	34.30	1.09	0.03	33.20	0.34	0.00	0.00	0.00
7815	7815	vm1-netperf-x64	9	136.58	113.04	30.18	786.69	3.76	0.08	83.22	0.86	0.00	0.00	0.00

A virtual machine consists of more than vCPU worlds.



TURBO BOOST



ID	GID	NAME	NWLD	%USED	%RUN	%SYS	%WAIT	%VMWAIT	%RDY	%IDLE
10829732	10829732	win2012	16	2.47	5.08	0.03	1600.00	0.10	0.04	799.56
10882898	10882898	windows10vm	12	404.65	402.10	0.00	803.19	0.00	0.01	0.00
1751906	12684175	vmx	1	0.01	0.01	0.01	100.00	-	0.00	0.00
1751908	12684175	NetWorld-VM-175	1	0.00	0.00	0.00	100.00	-	0.00	0.00
1751909	12684175	NUMASchedRemapE	1	0.00	0.00	0.00	100.00	-	0.00	0.00
1751910	12684175	vmast.1751907	1	0.06	0.12	0.00	100.00	-	0.00	0.00
1751912	12684175	vmx-vthread-6	1	0.00	0.00	0.00	100.00	-	0.00	0.00
1751913	12684175	vmx-mks:win2k8-	1	0.00	0.01	0.00	100.00	-	0.00	0.00
1751915	12684175	vmx-svqa:win2k8	1	0.00	0.00	0.00	100.00	-	0.00	0.00
1751917	12684175	vmx-vcpu-0:win2	1	130.91	100.32	0.00	0.12	0.00	0.00	0.12
1751919	12684175	vmx-vcpu-1:win2	1	128.18	100.44	0.00	0.00	0.00	0.00	0.00
1751918	12684175	LSI-1751907:0	1	0.01	0.02	0.00	100.00	-	0.00	0.00



READY TIME

128 vCPUs!!



ID	GID	NAME	NWLD	%USED	%RUN	%SYS	%WAIT	%VMWAIT	%RDY	%IDLE	%OVRLP
16043	16043	vm0-kernel-comp	138	247.48	373.24	8.85	13408.74	194.11	23.91	12215.00	35.3
ID	GID	NAME	NWLD	%USED	%RUN	%SYS	%WAIT	%VMWAIT	%RDY	%IDLE	%OVRLP
2101942	16043	vmx	1	10.77	0.01	10.76	99.85	-	0.00	0.00	0.00
2101945	16043	NUMASchedRemapE	1	0.00	0.01	0.00	99.83	-	0.02	0.00	0.01
2101946	16043	vmast.2101943	1	0.12	0.22	0.00	99.64	-	0.00	0.00	0.00
2102074	16043	vmx-vthread-132	1	0.00	0.00	0.00	99.86	-	0.00	0.00	0.00
2102075	16043	vmx-filtPoll:vm	1	0.00	0.00	0.00	99.85	-	0.01	0.00	0.00
2102076	16043	vmx-vthread-134	1	0.00	0.00	0.00	99.86	-	0.00	0.00	0.00
2102077	16043	vmx-vthread-135	1	0.00	0.00	0.00	99.86	-	0.00	0.00	0.00
2102078	16043	vmx-mks:vm0-ker	1	0.13	0.27	0.00	99.58	-	0.01	0.00	0.00
2102079	16043	vmx-svga:vm0-ke	1	0.14	0.18	0.00	99.62	-	0.06	0.00	0.00
2102080	16043	vmx-vcpu-0:vm0-	1	3.31	4.32	0.00	95.48	0.01	0.06	95.46	0.23
2102082	16043	vmx-vcpu-1:vm0-	1	1.69	2.43	0.00	96.87	1.30	0.55	95.57	0.24
2102083	16043	vmx-vcpu-2:vm0-	1	1.62	2.48	0.00	96.80	1.24	0.58	95.56	0.29
2102084	16043	vmx-vcpu-3:vm0-	1	1.84	2.60	0.00	96.91	1.20	0.35	95.71	0.25
2102085	16043	vmx-vcpu-4:vm0-	1	1.98	2.49	0.00	97.08	1.26	0.28	95.83	0.15
2102086	16043	vmx-vcpu-5:vm0-	1	1.81	2.55	0.00	96.80	1.24	0.50	95.56	0.32
2102087	16043	vmx-vcpu-6:vm0-	1	1.85	2.73	0.00	96.91	1.25	0.22	95.66	0.27
2102088	16043	vmx-vcpu-7:vm0-	1	1.75	2.43	0.00	96.87	1.26	0.56	95.61	0.15
2102089	16043	vmx-vcpu-8:vm0-	1	1.80	2.59	0.00	96.75	1.25	0.52	95.50	0.25
2102090	16043	vmx-vcpu-9:vm0-	1	1.79	2.64	0.00	96.85	1.19	0.37	95.66	0.25
2102091	16043	vmx-vcpu-10:vm0	1	1.80	2.56	0.00	96.84	1.19	0.46	95.65	0.21
2102092	16043	vmx-vcpu-11:vm0	1	1.85	2.64	0.00	96.77	1.24	0.45	95.52	0.21
2102093	16043	vm:								5.63	0.09
2102094	16043	vm:								5.52	0.22
2102095	16043	vm:								5.51	0.21

Group (VM) stats aggregate world stats.



NUMA



```
[root@wdc-rm-195-dhcp221 ~]# numactl --hardware
available: 2 nodes (0-1)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
node 0 size: 1023 MB
node 0 free: 837 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
node 1 size: 1023 MB
node 1 free: 920 MB
node distances:
node  0  1
  0:  10  20
  1:  20  10
[root@wdc-rm-195-dhcp221 ~]# lstopo -s
depth 0:      1 Machine (type #1)
depth 1:      2 NUMANodes (type #2)
depth 2:      8 Sockets (type #3)
depth 3:      8 Caches (type #4)
depth 4:      8 Caches (type #4)
depth 5:      8 Caches (type #4)
depth 6:     32 Cores (type #5)
depth 7:     32 PUs (type #6)
[root@wdc-rm-195-dhcp221 ~]# █
```

```
C:\Users\Administrator\Desktop> coreinfo -n -s
Coreinfo v3.31 - Dump information on system CPU and memory topology
Copyright (C) 2008-2014 Mark Russinovich
Sysinternals - www.sysinternals.com

Logical Processor to Socket Map:
****-----
-----****-----
-----****-----
-----****-----
-----****-----
-----****-----
-----****-----
-----****-----
Socket 0
Socket 1
Socket 2
Socket 3
Socket 4
Socket 5
Socket 6
Socket 7

Logical Processor to NUMA Node Map:
*****-----
*****-----
*****-----
*****-----
*****-----
*****-----
*****-----
*****-----
NUMA Node 0
NUMA Node 1
```



I DONT NEED IT...

DAS KANNSTE SCHON
SO MACHEN
ABER DANN
ISSES HALT
KACKE!

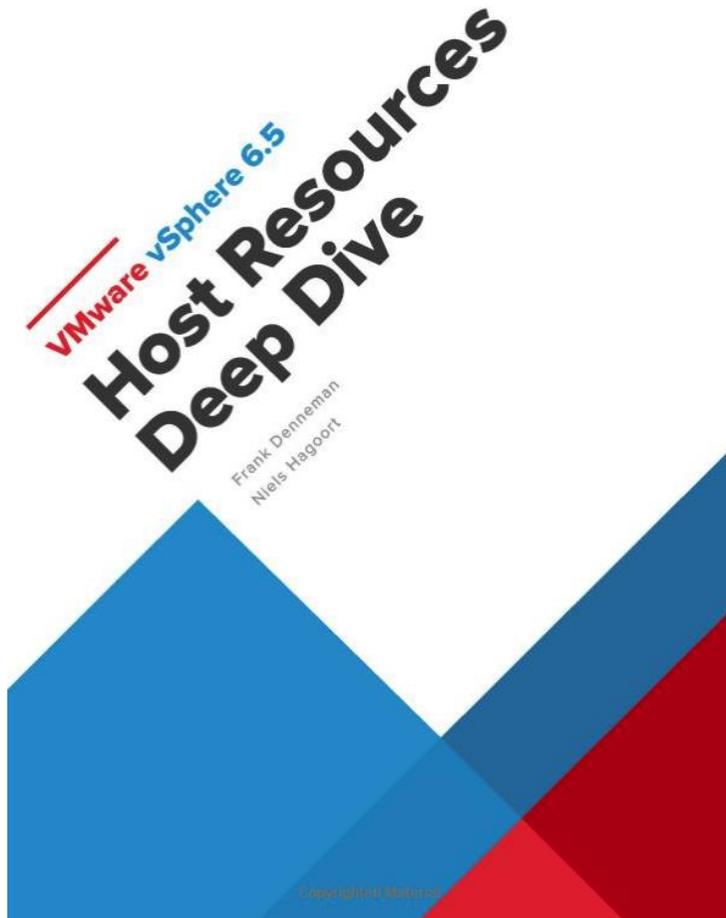
PERFORMANCE TUNING



HOST RESOURCES DEEP DIVE



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QUESTIONS?



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