

Windows Server 2008 R2與SCVMM 2008 R2虛擬化預覽

周伯彥 Edward Chou

技術經理

Microsoft Taiwan

議程

- Windows 2008 R2擴充的項目
 - Live Migration (即時轉移)
 - Clustered Shared Volumes (叢集共用)
 - Network Virtual Machine Queues
 - Power Efficiency (電源管理)
 - Native VHD (原生VHD支援)
 - VDI Support
- SCVMM 2008 R2擴充的項目
 - 整合資訊
 - 支援Hyper-V V2的新功能
 - PRO Management Pack

Server 2008 R2 Hyper-V 增強的部分

Virtualization Feature	WS08 Hyper-V RTM	WS08 Hyper-V SP2	Windows Server 2008 R2 Hyper-V
Logical Processor Support	16	24	64
Total number of powered on VM's	128	192	384
Total Virtual Processors Supported	128	192	512
Guest Virtual Processor Support	4 (WS08 only)	4 (WS08 only)	4 (Win7/WS08)

- 許多效能上的增進

議程

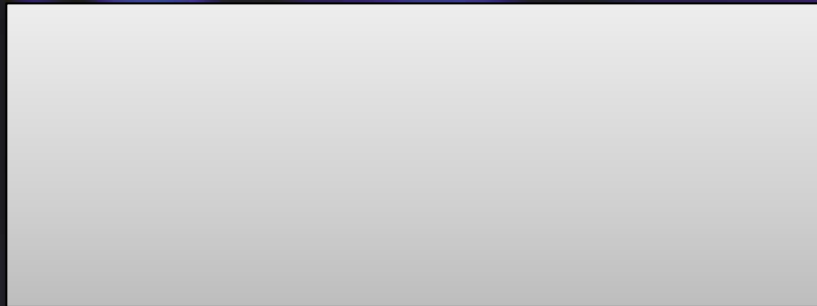
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VM Migration

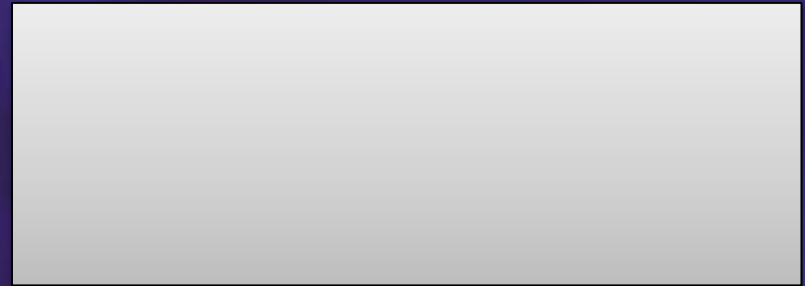
- Planned VM migration scenarios:
 - Hardware maintenance
 - Load balancing for performance
 - Consolidation for power
- Windows Server 2008 includes Quick Migration
 - VM stored on SAN managed by Microsoft Cluster Services
 - Suspend of VM on one system to shared disk followed by resume on another
 - Outage is time it takes to save and restore VMs memory

Live Migration Operation

Memory



Server 1



Server 2

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Overview of Storage Improvements

Virtualization Feature	WS08 Hyper-V RTM	WS08 Hyper-V SP2	Windows Server 2008 R2 Hyper-V
Diff Disk Scaling Performance	1x	1x	4x – 5x
IO Sizes (Virtual SCSI)	64KB	64KB	8MBytes
IO Size (Virtual IDE)	64KB	64KB	64KB
VHD Block Size	512KB	512KB	2MB
Fixed VHD Creation Speed	1x	1x	3x – 4x
Hot add of storage	No	No	Yes
SCSI Command Pass-through	No	No	Yes

Clustered Shared Volumes

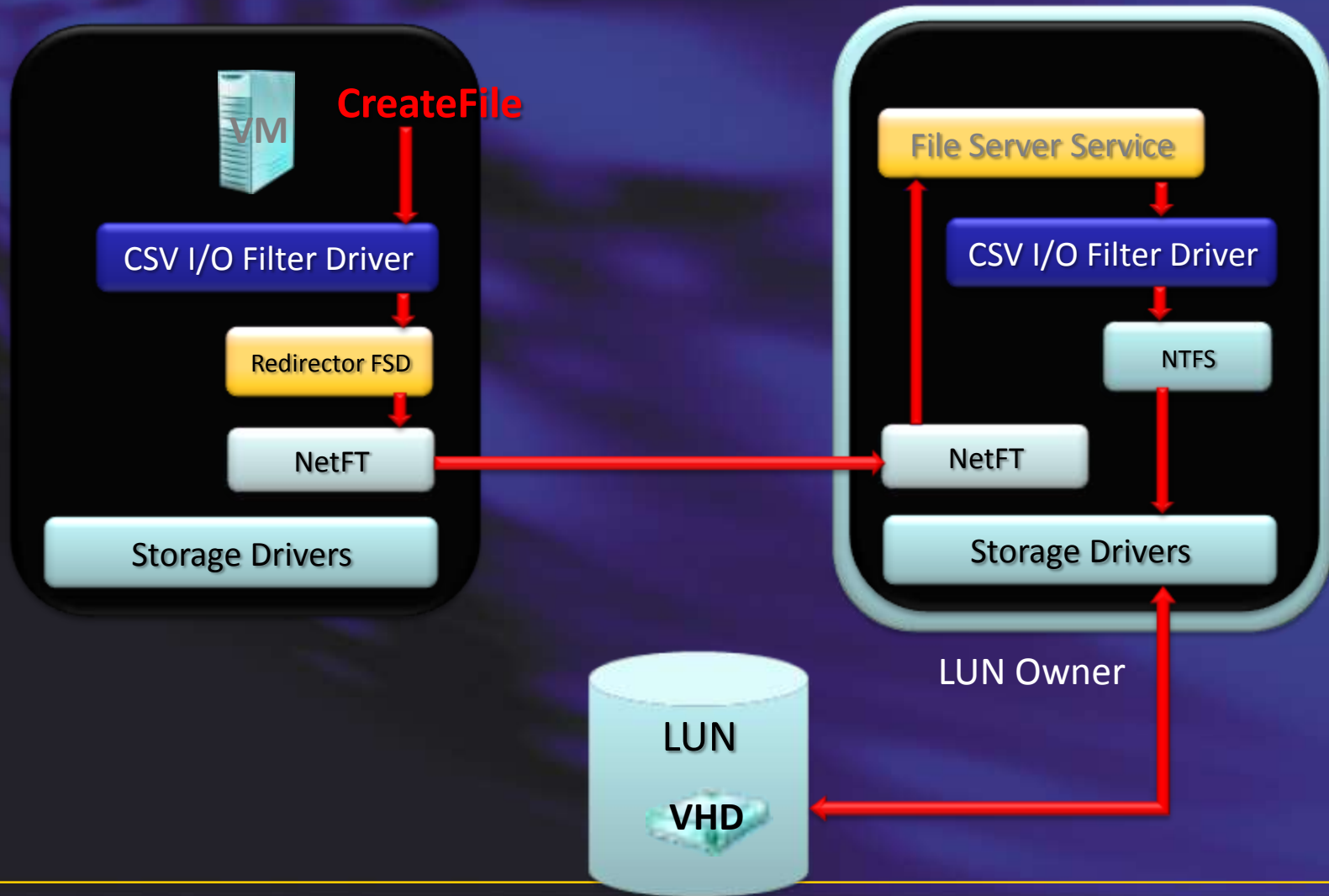
- 透過叢集共用磁碟區支援即時移轉

- 即時移轉利用 Windows Server 2008 R2 中容錯移轉叢集內全新的 Cluster Shared Volumes (CSV) 功能。CSV 磁碟區容許相同容錯移轉叢集中的多個節點同時存取相同的邏輯單元數 (LUN)。從 VM 的角度看來，每個 VM 看起來好像自己各擁有 LUN，但其實每個 VM 的 .vhd 檔案都是儲存在相同的 CSV 磁碟區上。

- 改進叢集節點連線容錯

- 因為 CSV 架構的關係，改進的叢集節點連線容錯對於叢集上執行的 VM 有著直接的影響。CSV 架構會實作一種機制，稱為動態 I/O 重新導向，它可根據連線的可用性在容錯移轉叢集內路由 I/O。

Clustered Shared Volumes Architecture

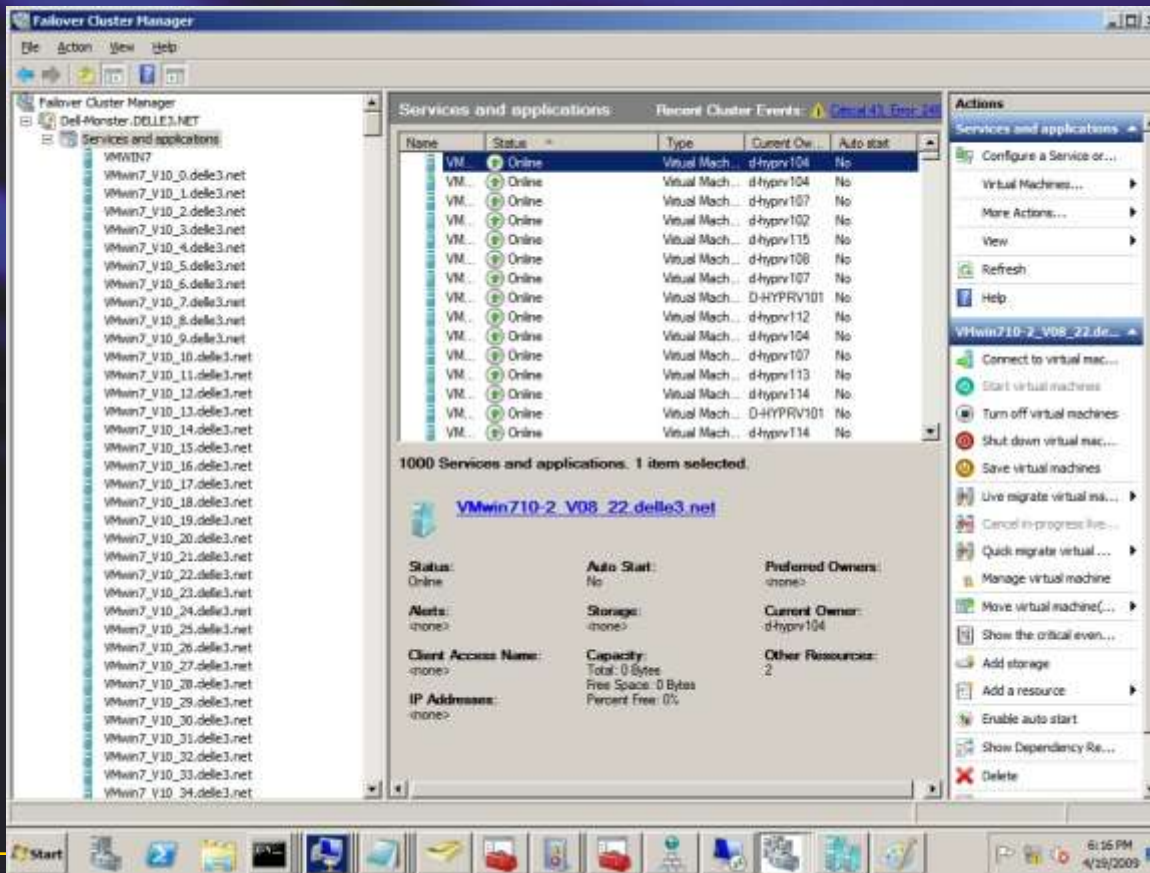


Clustered Shared Volumes Architecture



CSV 承載能力

- 1000 VMs running on a 16-node cluster with 16.5 TB shared storage:



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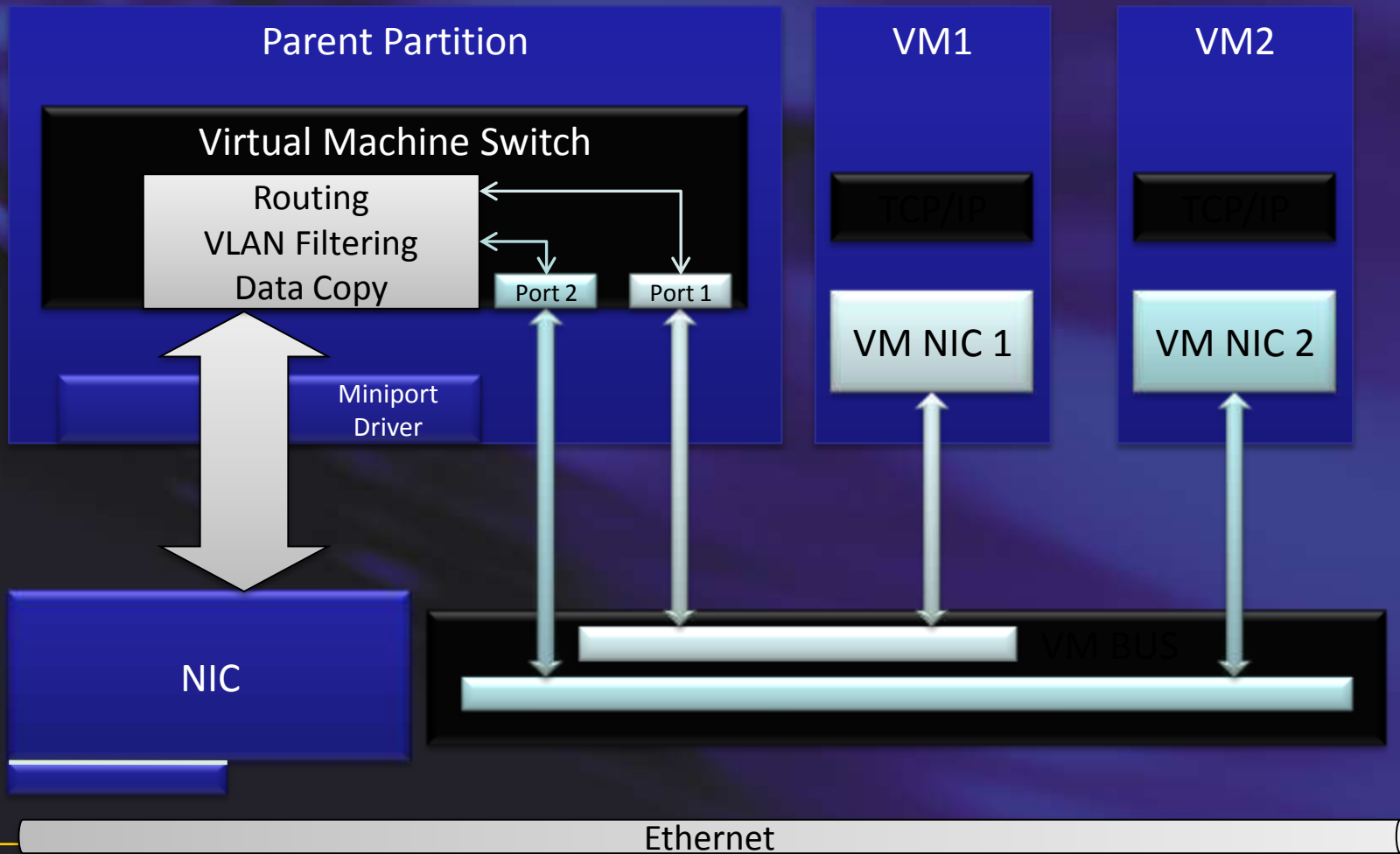
加強網路傳輸的效能

Virtualization Feature	WS08 Hyper-V RTM	WS08 Hyper-V SP2	Windows Server 2008 R2 Hyper-V
IPv6 offloads	No	No	Yes
LSOv2	Limited (LSOv1 from VM)	Limited (LSOv1 from VM)	Supported
Guest to guest throughput	Good	Good	Better
VMQ	No	No	Yes (off by default)
Chimney	No	No	Yes (off by default)
Jumbo Frames	No	No	Yes
Virtual Switch MAC learning	Good	Good	Better (every packet)
Virtual NIC interrupts	VPO	VPO	VPO receive / distributed for send

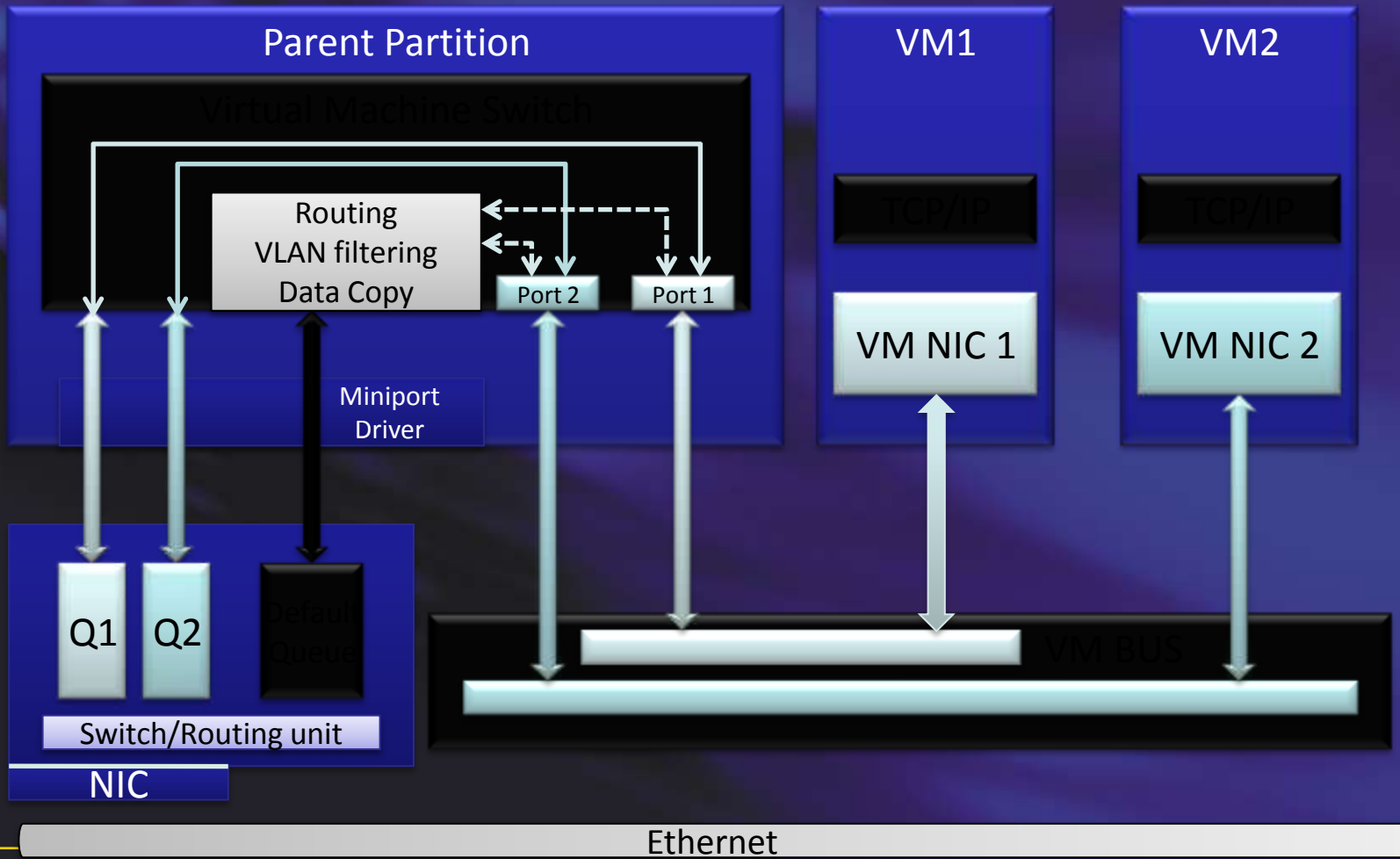
加強網路傳輸效能

- VM Chimney 可讓 VM 傾印其網路處理負載到主機電腦的 NIC。就和在實體的 TCP Offload 案例中一樣，現在 Hyper-V 將此功能簡單擴充到虛擬世界中。這同時造福了 CPU 和整體的網路輸送量效能，並且它完全由「即時移轉」所支援。
- 在預設下，Windows Server 2008 R2 中的 VM Chimney 是停用的，主要用於短期的硬體相容性理由。但若結合相容的硬體，目前包括了 Intel 在內的廠商，VM Chimney 在處理 VM 網路流量時，可大幅減少主機伺服器的 CPU 負荷。這相當於更好的主機系統效能，同時提升 VM 的網路輸送量。
- 和 TCP Offloading 一樣，Windows Server 2008 也引進了對於 Jumbo 框架的支援。Windows Server 2008 R2 中的 Hyper-V™ 也擴充此功能到 VM。因此就和在實體網路案例中一樣，Jumbo Frames 也加入相同的基本效能增強到虛擬網路中。如此每個封包最多可包含到 6 倍的承載，這不僅改善了整體的輸送量，還可減少大型檔案傳輸的 CPU 使用率。

Virtualized Network I/O Data Path

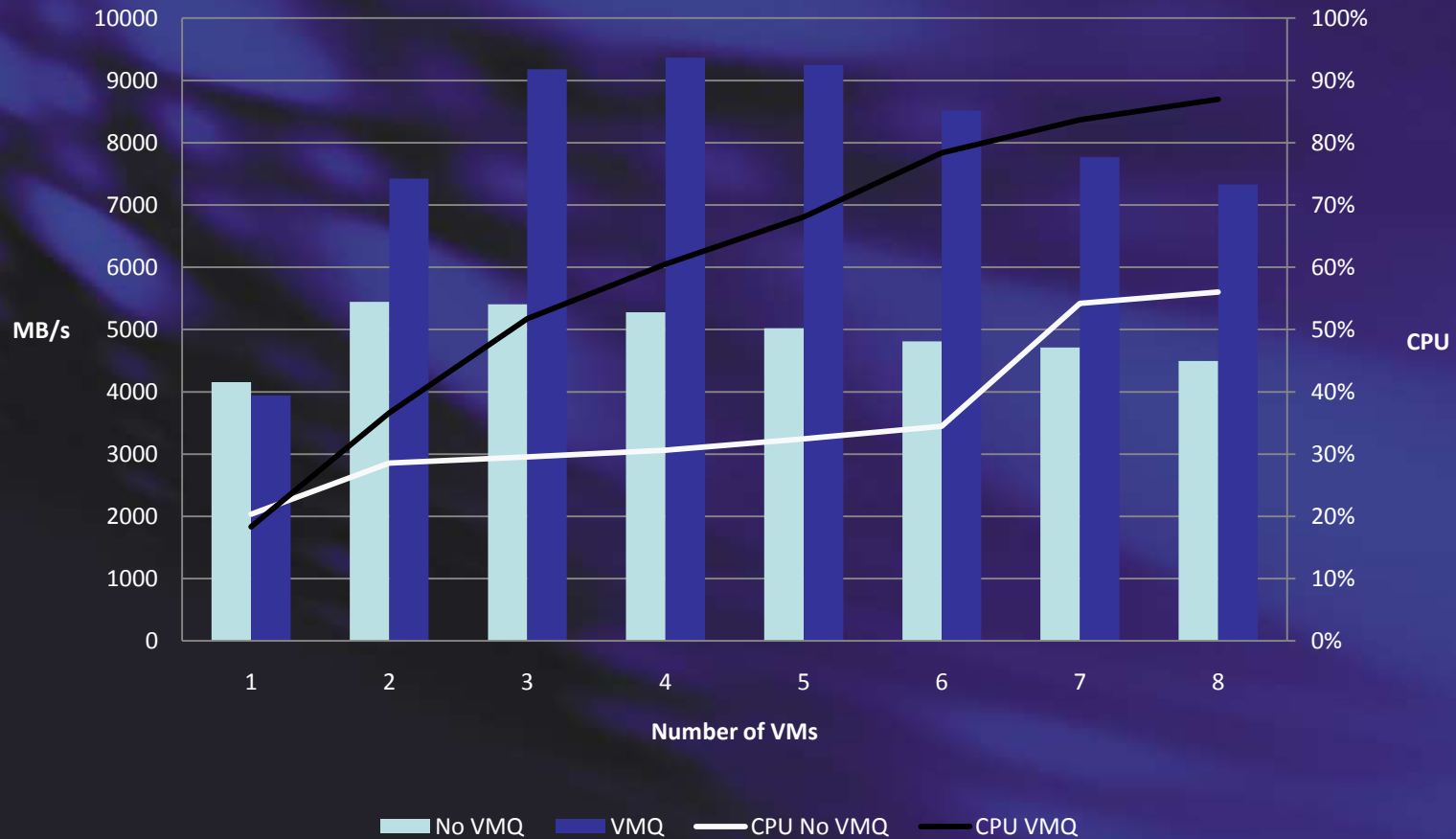


Network I/O Data Path With VMQ



VMQ Performance

VMQ Throughput and CPU Utilization
Shared Memory On, Lookahead split On



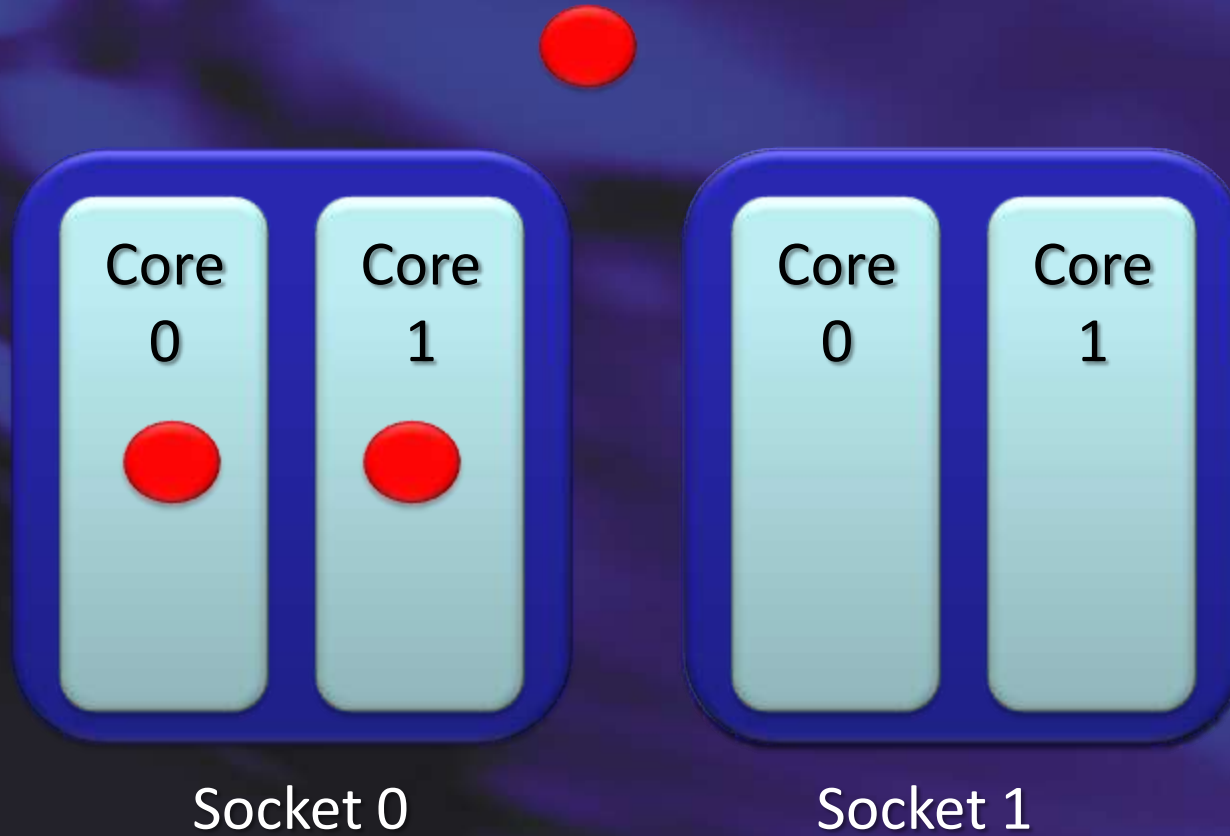
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Core Parking (核心休眠)

- Kernel in parent performs core-parking control
- Hypervisor maps processor usage data into the parent
 - Updates every 100ms
- Parent tells hypervisor which cores to park
 - Hypervisor lets processors finish work, but stops including them in scheduling decisions
 - Will use them if necessary to meet child CPU guarantees

Core Parking Operation



 Workload

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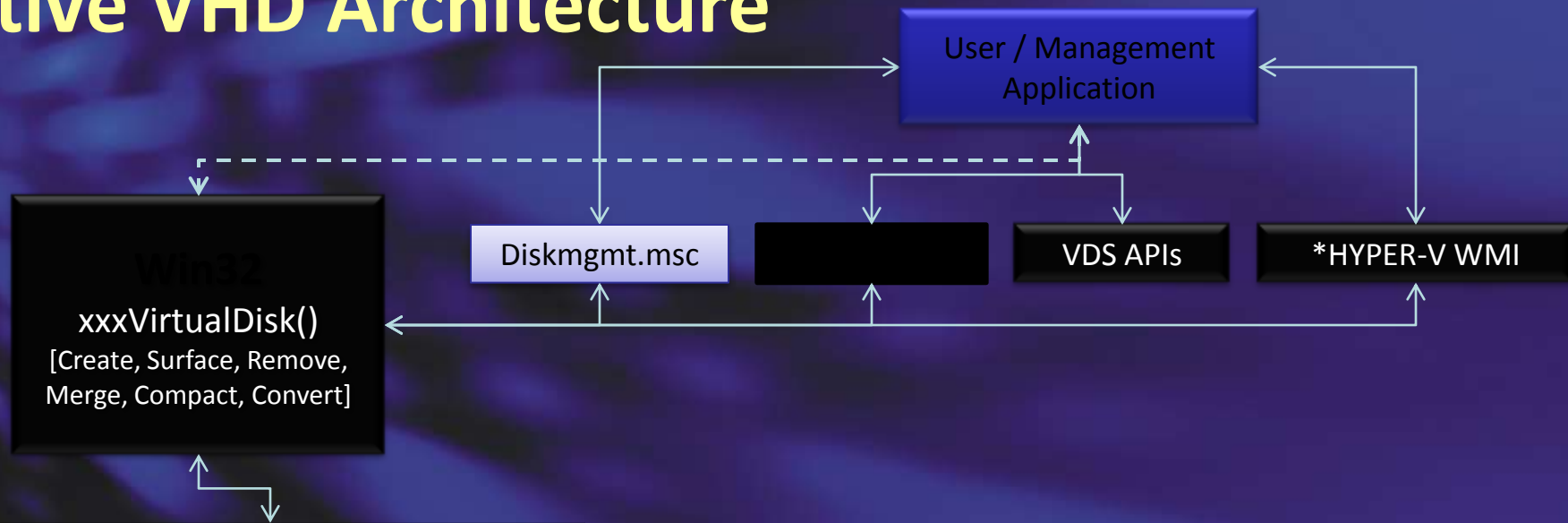
目前 VHD 使用方式

- In Microsoft products:
 - Container for virtual machine image (e.g. Hyper-V, Virtual Server, Virtual PC)
 - Container for backups (e.g. Windows Server Backup, Vista/Windows 7 Complete PC Backup)
 - Backing store for iSCSI LUNs (e.g. Windows Unified Data and Storage Server)
 - SCVMM management support
- Partners have adopted it as well
 - Citrix XenServer
 - Dozens of ISVs using it for evaluation redistribution

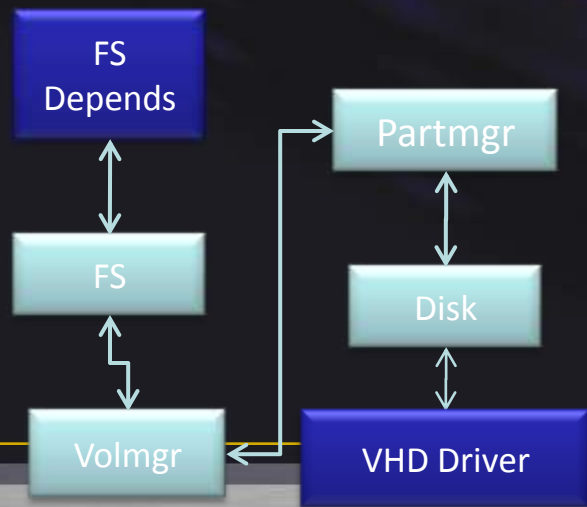
原生 VHD 支援

- Foundational support for booting from VHD and for Surface/Removal of VHDs
 - Orderly shutdown of volumes
 - Support for nested volumes (2 levels)
 - Servicing for mounted (offline) VHD volumes
- VHD operations
 - Create / Attach/ Detach
 - Meta-operations: Merge, Expand, Compact
- Tools and APIs:
 - Win32 APIs
 - VDS APIs (DCOM Remotable)
 - Hyper-V WMI for management operations
- Performance goal: within 10% of native

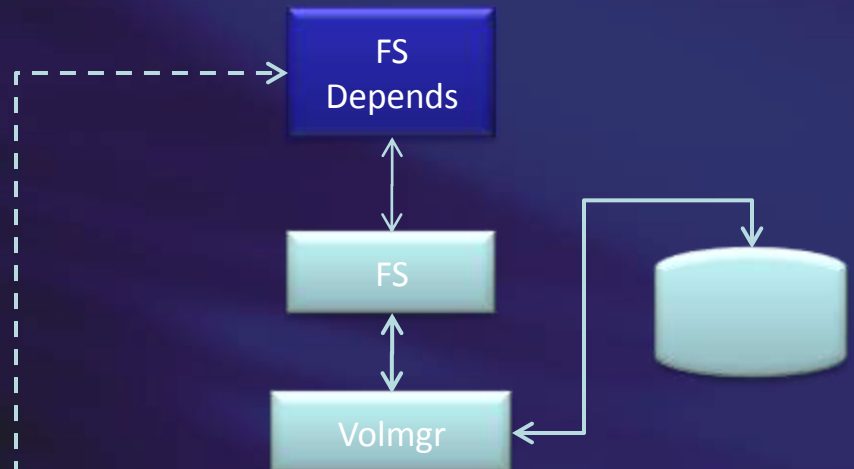
Native VHD Architecture



Virtual Volume Stack



Physical Volume Stack

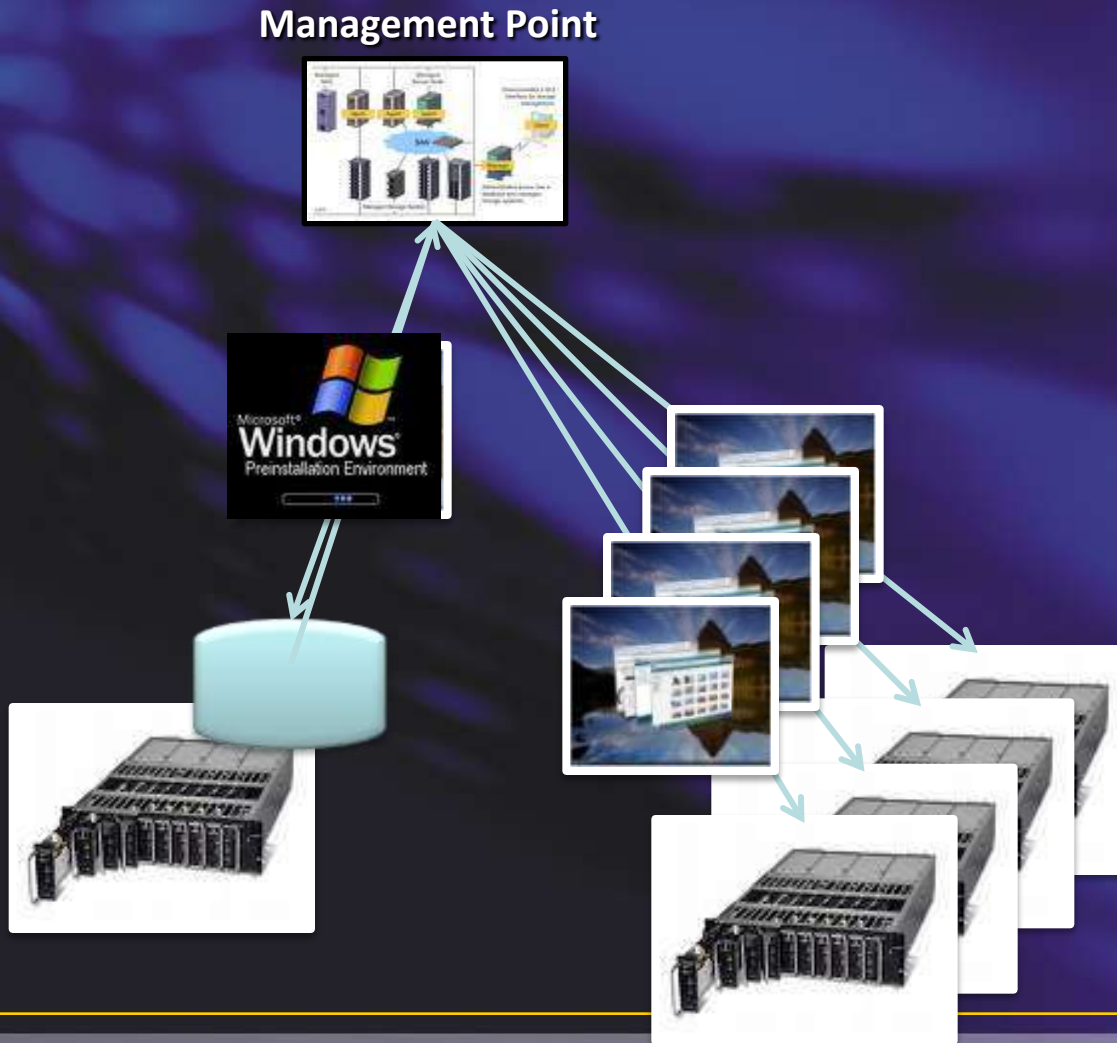


*Requires installation of Hyper-V role

VHD Boot

- Strategic direction for Windows in the Data Center
 - Image consolidation
 - Single image format for generalized and specialized physical images
 - Single generalized master image for virtual and physical environments
 - Reduced management TCO
 - Single toolset and process for management and deployment
- Enables other compelling scenarios
 - Rapid provisioning and repurposing
 - Rapid, reliable patching and rollback

Sample Provisioning



Create VHD

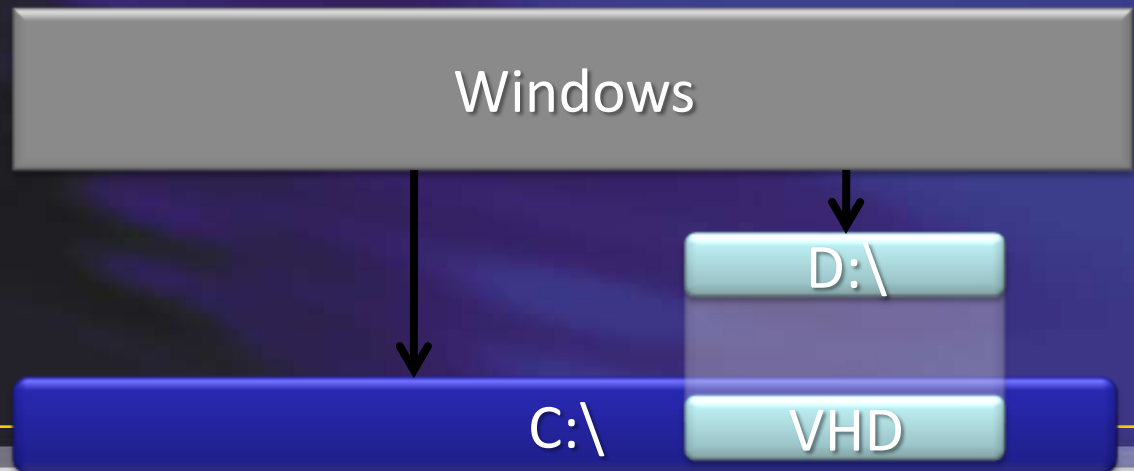
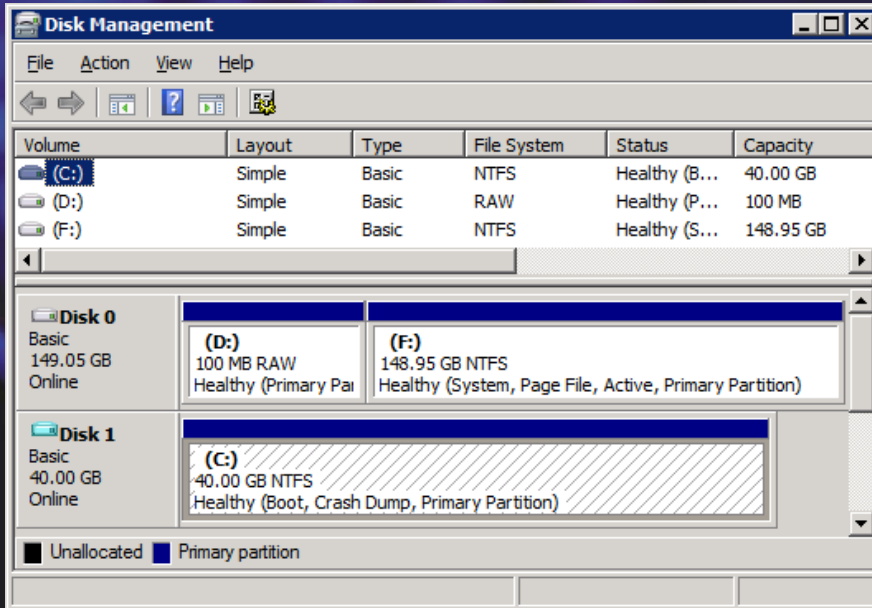
1. Deploy boot agent
2. Partition and format disk
3. Create empty VHD
4. Apply WIM
5. *Boot and specialize
6. Copy back to management server
7. Catalog in image library

* Optional

Deployment

1. *Deploy at scale
- * Deployment of specialized image requires sysprep

VHD Boot in Windows



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正式改名

Remote Desktop Services (RDS)!

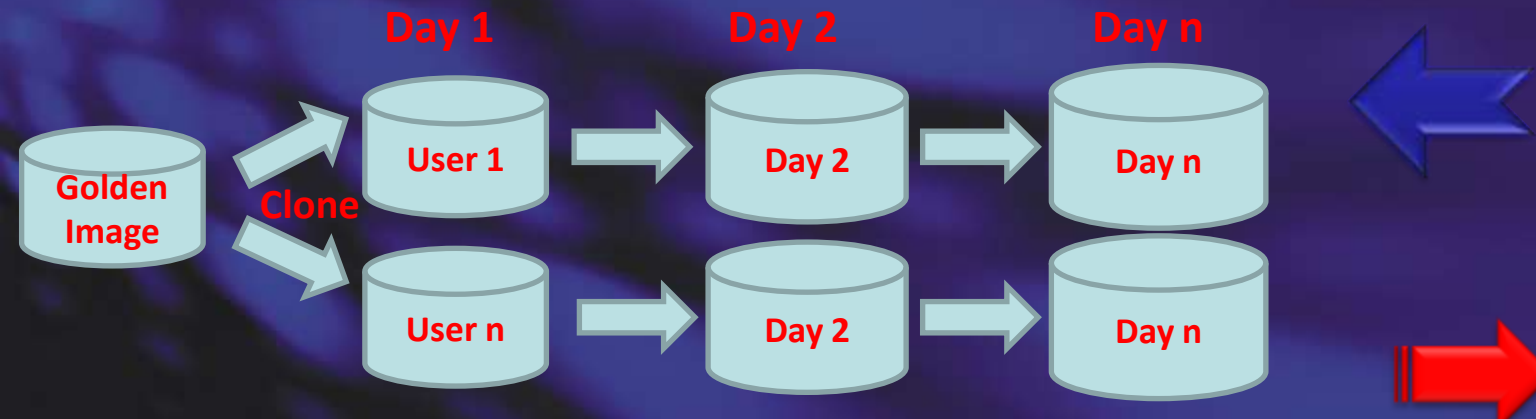
WS03	WS 2008	WS 2008 R2
Terminal Services	Terminal Services	Remote Desktop Services
Terminal Server	Terminal Server	RD Session Host
TS Session Directory	TS Session Broker	RD Connection Broker
TS Licensing Server	TS Licensing Server	RD Licensing Server
	TS Gateway	RD Gateway
	TS Web Access	RD Web Access
		RD Virtualization Host

RDS 新增支援項目

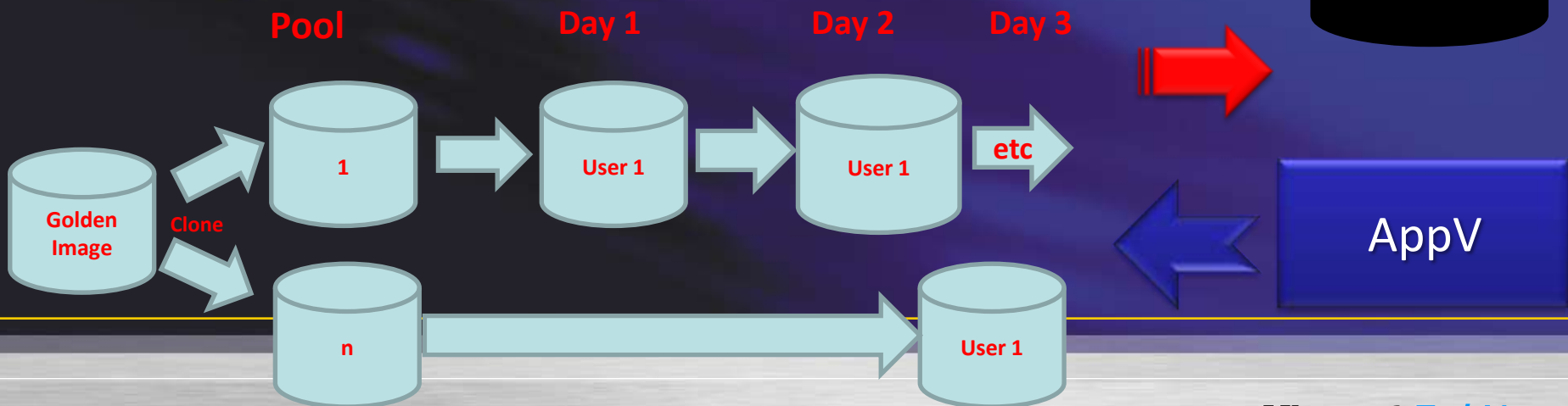
- 擴充遠端桌面服務以提供工具以啟用 VDI
- 簡化遠端桌面和應用程式的發行，以及提供遠端桌面和應用程式的存取
- 改善與 Windows 7 使用者介面的整合
- 多媒體重新導向
- 真正的多重監視器支援
- 音訊輸入和錄製
- 支援 Aero Glass
- Direct X 重新導向
- 改善音效/影片同步處理
- 語言列重新導向
- 工作排程

Pooled vs. Personal Virtual Desktops

Personal Virtual Desktop:



Pooled Virtual Desktop:



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System Center Virtual Machine Manager 2008

VMM 2008 Features (October 2008)

▪ Hypervisor Management	▪ Cluster integration
▪ Host Configuration	▪ Intelligent Placement
▪ Library Management	▪ Deployment and Storage
▪ Virtual Machine Creation	▪ Monitoring and Reporting
▪ Conversions: P2V and V2V	▪ Automation with PowerShell
▪ Delegation and Self-service	▪ PRO

New in VMM R2

▪ Manage Win2K8 R2 Hyper-V	▪ Multiple VMs per LUN using CSV
▪ Live Migration	▪ Maintenance mode
▪ Storage Migration	▪ Network optimizations
▪ SAN-related enhancements	▪ VDI integration
▪ Rapid Provisioning Support	

在正確的時間得到正確的資訊



The screenshot shows the Virtual Machine Manager interface. A 'PRD Tip' window is open, displaying a table of tips and a detailed view for a specific tip.

Source	Tip	State	Created
myhost01.extrahostname.com	Migrate a vm to free host memory	Active	04/24/08 10:07 PM
MyVM02	Add another IIS server to the Order Tracker...	Active	04/24/08 11:20 AM

Detail view:

MyVM02 (Age: 10 minutes)

Add another IIS server to the Order Tracker...

The web traffic for Order Tracker is exceeding expected levels. Adding another IIS server will increase the capacity available to Order Tracker site.

Cause:

Virtual Machine Summary:

- CPU: 1-processor 1.00 GHz
- Memory: 1.00 GB
- Storage: 127.00 GB

Buttons: Implement, Dismiss



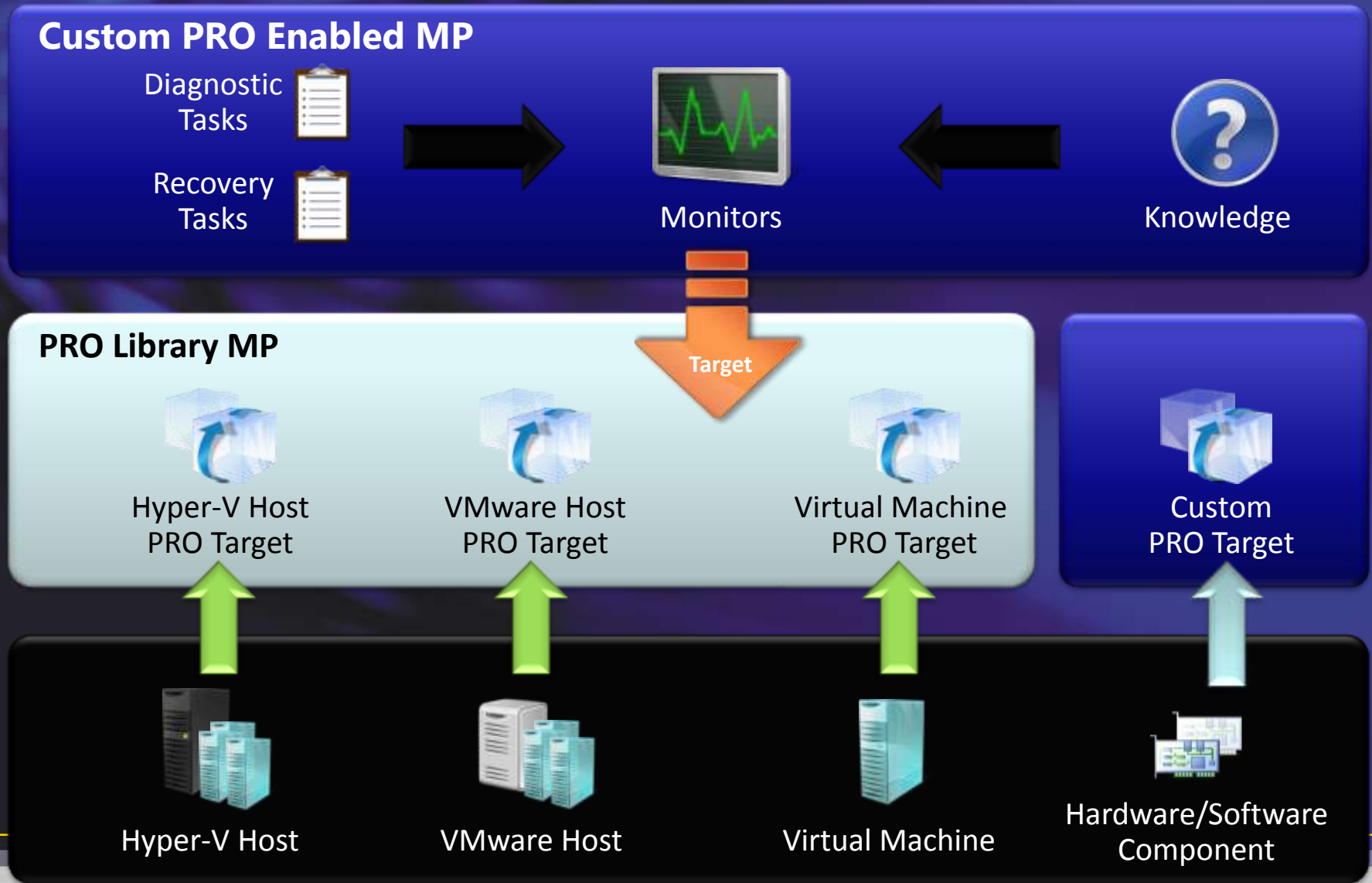
效能與資源的整合運用



Virtual Machine Manager: Architecture



PRO Management Pack Structure





在何處取得 TechNet 相關資訊？

- 訂閱 **TechNet 資訊技術人快訊**
<http://www.microsoft.com/taiwan/technet/flash/>
- 訂閱 **TechNet Plus**
<http://www.microsoft.com/taiwan/technet/>
- 參加 **TechNet 的活動**
<http://www.microsoft.com/taiwan/technet/>
- 下載 **TechNet 研討會簡報與錄影檔**
<http://www.microsoft.com/taiwan/technet/webcast/>

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