



Microsoft | Open Door

Virtualization 360:  
Microsoft  
Virtualization  
Strategy, Products,  
and Solutions for the  
New Economy

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Microsoft Corporation

**Microsoft®**

# Microsoft's Vision

## Dynamic IT

*Enabling IT Pros and Development Teams Across the IT Lifecycle*

- Move from Physical to Logical
- Managed by policy
- State-aware, Self-healing
- Available, secure and real-time



- Completely Services-based
- Federated and connected
- On-premise, off-premise, hosted
- Efficient dev-to-IT operations

**Virtualization is a  
Key Driver**

**Control Costs**

**Increase  
Availability**

**Improve Business  
Agility**

# Microsoft's Virtualization Strategy



**Make Virtualization as Pervasive as Possible**



**Preserve Customer's Existing Investments**



**Establish Management as the Key Enabler**



# Tremendous Market Momentum for Microsoft Virtualization



Server  
Consolidation  
Energy  
Reduction



Rapid  
Provisioning  
High  
Availability  
Business  
Continuity



Dynamic  
Datacenters  
IT as a Service

# Server Virtualization – The Datacenter is Evolving

## Traditional Datacenter

- Well-known, Stable & Secure
- Utilization <15%



## Virtualized Datacenter

- Utilization Increases to >50%
- Management Costs Decrease



## Private Cloud

- Management Costs Decrease Significantly
- IT as a Service



## Public Cloud

- Capacity on Demand
- Global Reach



# Preparing for Cloud Computing



Ramp up virtualization efforts and expertise

Standardize on scalable server hardware



Standardize on management platform across deployment models



Fine-tune processes around IT/people interaction



Architect IT services for shared and abstracted compute resource pools



# Case Study



**Customer:** La Direction des Domaines de l'Etat

**Web Site:** [www.finances.gov.ma](http://www.finances.gov.ma)

**Number of Employees:** 553

**Country or Region:** Morocco

**Industry:** Government—Finance, tax, and monetary policy agencies

**Partner:** Nelite

## Customer Profile

Consisting of 38 offices, La Direction des Domaines de l'Etat manages government property and public estates in Morocco.

## Software and Services

- Technologies
  - Hyper-V
  - Remote Desktop Services
- Microsoft Server Product Portfolio
  - Microsoft SQL Server 2008
  - Microsoft System Center Virtual Machine Manager 2008
  - Windows Server 2008 R2 Enterprise

## Government Department Cuts Licensing Costs by €60,000 with Virtualisation Solution

“We estimate that virtualisation will cut 70 per cent of our hardware and maintenance costs over the next 10 years.”

Mohammed Chafik Eladlouni, Head of IT, La Direction des Domaines de l'Etat

La Direction des Domaines de l'Etat is the part of the Moroccan Ministry of Economy and Finance responsible for managing government property and government-owned land. Before investing in virtualisation technology from another supplier, it asked Microsoft to demonstrate its Hyper-V solution. Following a successful pilot project, it has deployed Microsoft virtualisation technology in seven of its 38 offices, cutting licensing costs by €60,000 (U.S.\$73,000) and hardware and maintenance costs by 70 per cent over 10 years.

## Business Needs

One of the most prominent government organisations in Morocco, La Direction des Domaines de l'Etat is part of the Ministry of Economy and Finance. As well as managing government-owned land and buildings, it plays a vital role in supporting social and economic development across the country. It also promotes tourism to visitors from abroad. As well as its head office in Rabat, it has seven regional offices and a further 31 sites across the country.

invests significant time and effort in the deployment of its information systems. But, as a public sector organisation funded by taxes, it also needs to demonstrate that any infrastructure investment represents good value for money.

Over the past decade, the organisation has replaced operating systems and databases with Microsoft enterprise technology. The most recent update took place in 2009, and the organisation now has a highly

# Few Virtualization concerns

How do I streamline VM Provisioning?

Can I do Live migrations between servers with different processors?

How do i determine suitable host for my VM?

How can I optimize resources and performance ?

Can I host more than 1 VM per LUN?

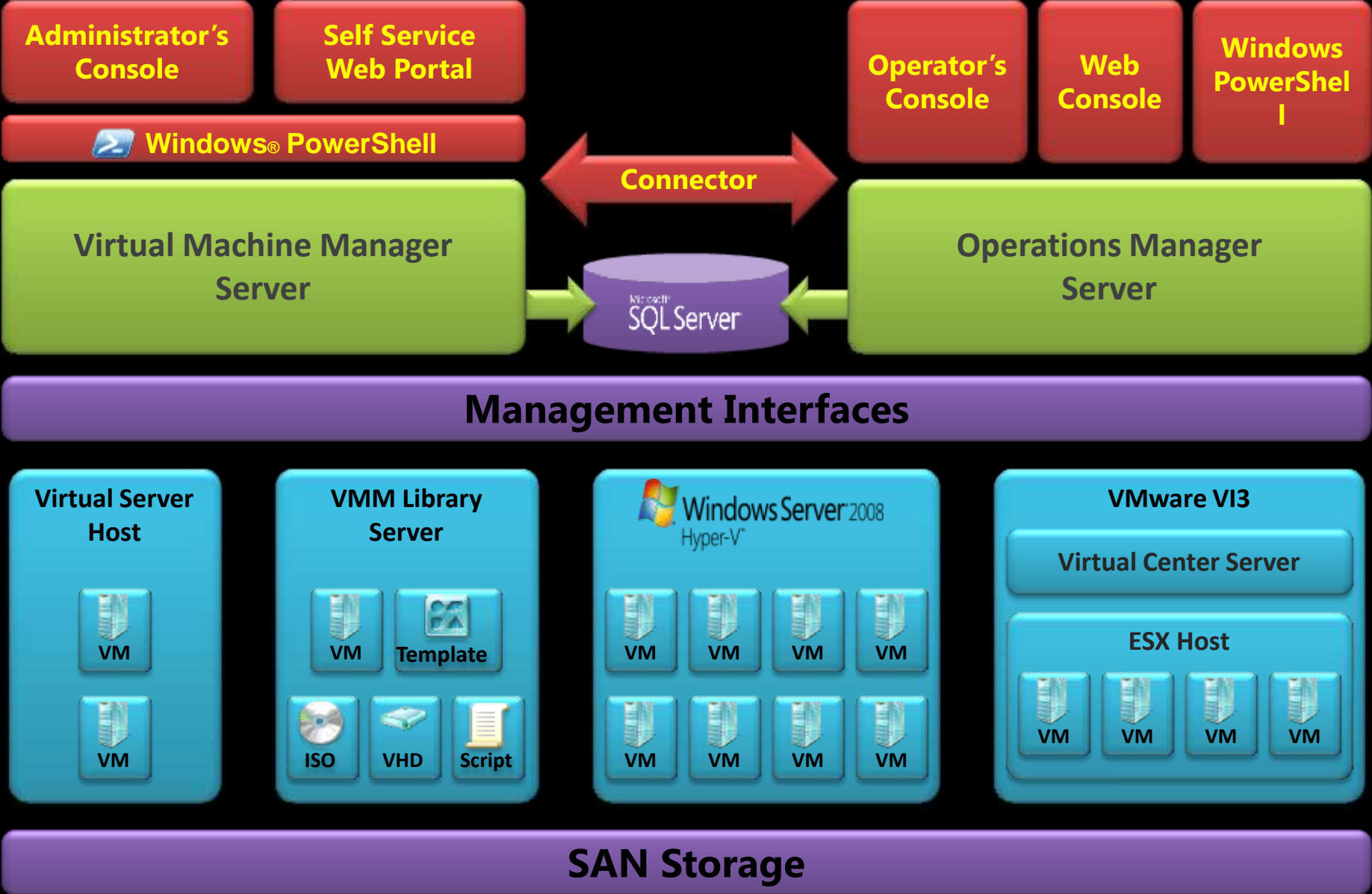
Can I monitor and manage services inside my VMs?

Can I migrate VM storage from 1 SAN to another?





# Building a Virtualized Environment



# Virtual Machine Manager 2008 R2

Live Migration	Clustered Shared Volumes	Hot addition/removal of storage	Maintenance Mode	SAN migrations in and out of clustered hosts
Expanded support for iSCSI SANs	Support for optimized networking	Support for Quick Storage Migration	Queuing of Live migrations	Support for third party CFS



## Support for Quick Storage Migration

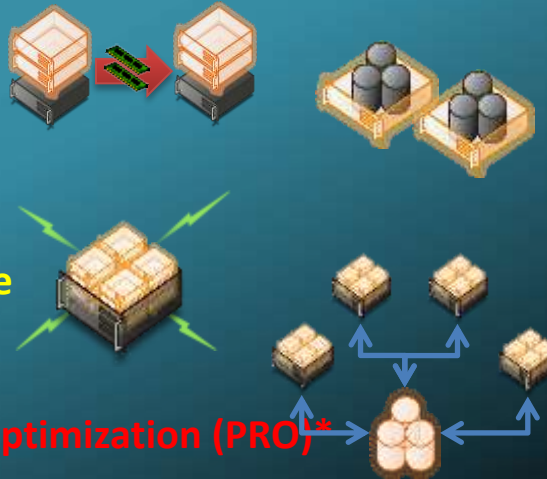
Virtual Machine Manager 2008 R2  
 supports Quick Storage Migration  
 for more  
 SAN migration  
 of SAN/IP  
 workloads and, significantly, the ability to migrate VMs to a different host machine.

# Continued Innovation with R2

*Windows Server 2008 R2 Hyper-V and System Center Virtual Machine Manager 2008 R2*

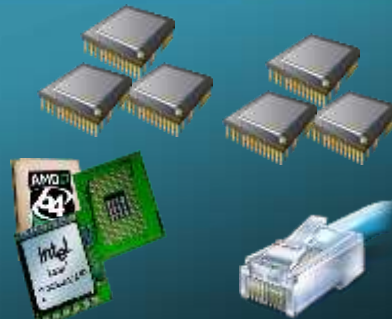
## Better flexibility

- Live Migration
- **Cluster Shared Volumes**
- Quick Storage Migration
- Hot Add/remove of Storage
- Processor compatibility mode
- Boot from VHD
- Green IT with Core Parking
- **Performance and Resource Optimization (PRO)\***
- **Intelligent Placement\***
- **Cross-Platform Support (VS2005,Hyper-V, ESX)\***
- **Self-Service Portal\***



## Improved Performance and Scalability

- 64 logical processor support
- **Improved memory management**
- TCP Offload support
- **Virtual Machine Queue (VMQ) Support**
- Improved Networking

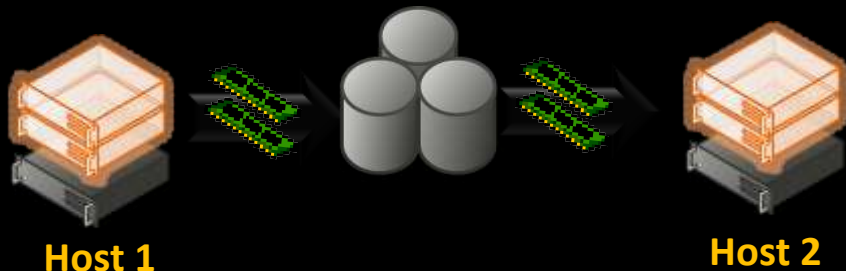


# Quick Migration vs. Live Migration

## Quick Migration

Windows Server 2008 Hyper-V)

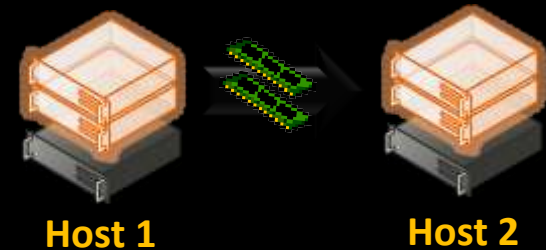
1. Save state
  - a. Create virtual machine on the target
  - b. Write virtual machine memory to shared storage
2. Move virtual machine
  - a. Move storage connectivity from source host to target host via Ethernet
3. Restore state and run
  - a. Take memory from shared storage and restore on Target
  - b. Run



## Live Migration

Windows Server 2008 R2 Server Hyper-V)

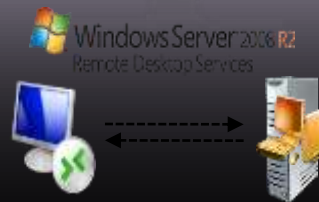
1. Virtual Machine State/Memory Transfer
  - a. Create virtual machine on the target
  - b. Move memory pages from the source to the target via Ethernet
2. Final state transfer and virtual machine restore
  - a. Pause virtual machine
  - b. Move storage connectivity from source host to target host via Ethernet
3. Un-pause and run



# RemoteFX and Dynamic Memory

*Technologies to increase user productivity and lower the cost per desktop*

## RemoteFX



***Microsoft RemoteFX in Windows Server 2008 R2 SP1 will enable a local-like, rich media experience for session-based or virtual desktops.***

## Dynamic Memory



***Dynamic Memory in Windows Server 2008 R2 SP1 enables better consolidation ratios with predictable performance***

# Why Hyper-V for Business Critical Workloads

- **Greater Scalability**

- **Scalability to 64 logical processors.** Hyper-V scales up to 64 logical processors on the physical system and up to four virtual processors for each VM.
- **Server core parking.** Places processor cores into a park/sleep mode when not in use. This enables the processor to consume less power without affecting system performance.

- **Increased Performance**

- **Second Level Address Translation (SLAT).** The Hyper-V SLAT feature takes advantage of this advanced processor technology to further improve VM performance and to reduce the non productive processing overhead on the hypervisor.
- **Virtual Machine Queue (VMQ) support.** Enables physical computer network interface cards (NICs) to use direct memory access (DMA) for VM memory, increasing I/O performance.

# Dynamic Data Center Toolkit for Enterprises

## ***VISION***

Partner-extensible toolkit that enables datacenters to dynamically pool, allocate, and manage resources to enable IT as a service.

## ***WHAT IS IT?***

A turnkey solution providing:

- Infrastructure readiness guidance
- Portals
  - On-boarding, admin and Self Service
- Lightweight provisioning engine
- Extensibility authoring UI





# Self Service Provisioning of VMS

Portals



Bob  
(Application Owner)

On Boarding



Sign Up

1. Org. details
2. Justification

Infrastructure Request

1. Compute
2. Network
3. Storage

Management

SCVMM

Compute Provider

Network Provider

SAN Provider

Resources

C1



Compute

N1

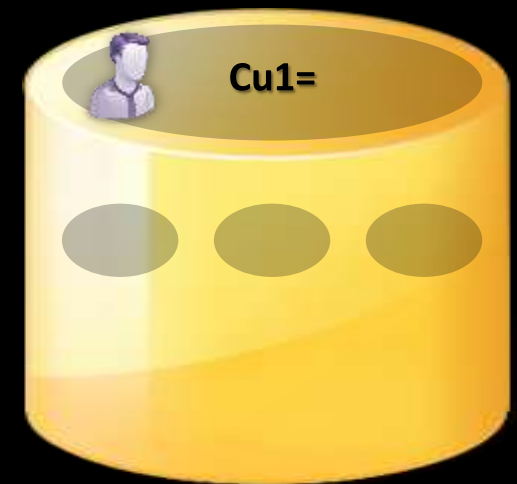


Network

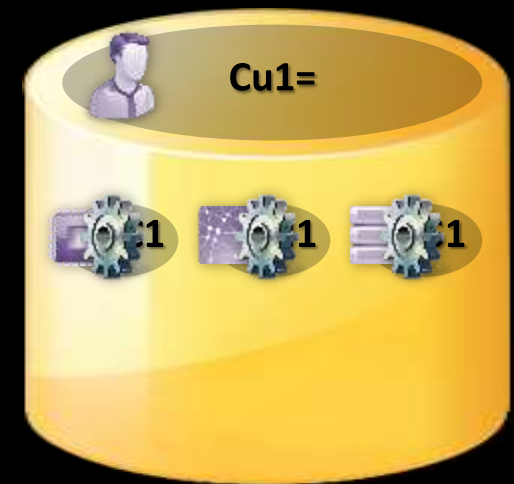
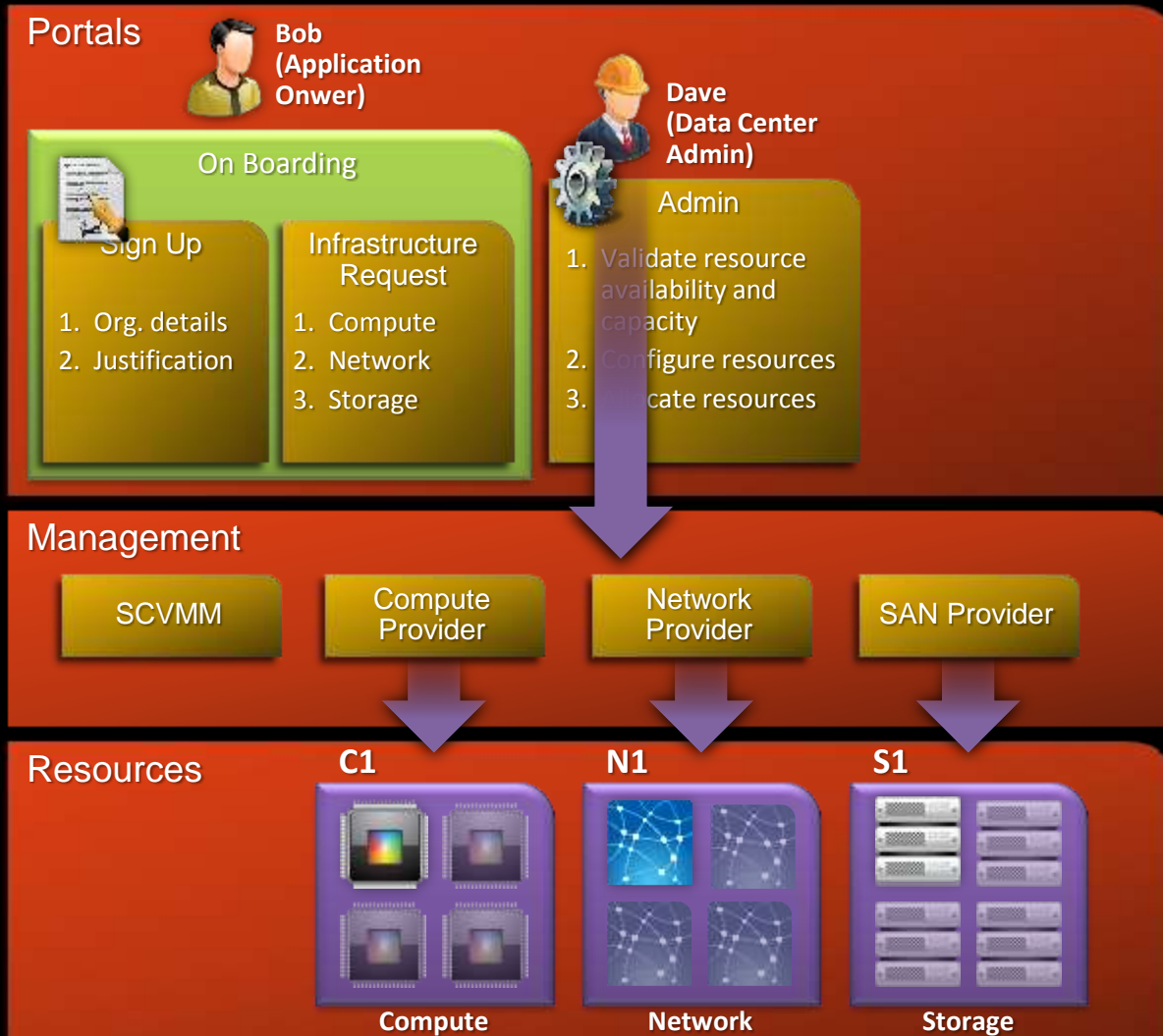
S1



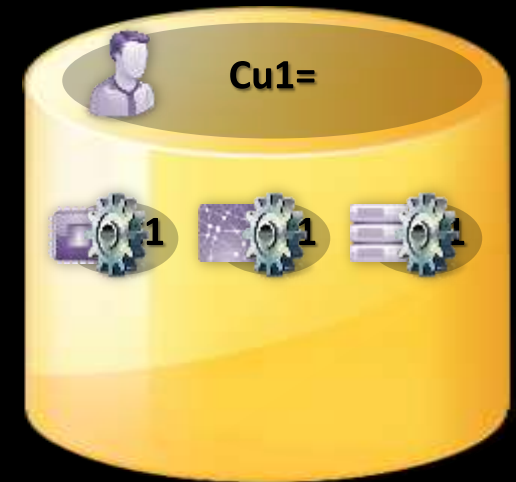
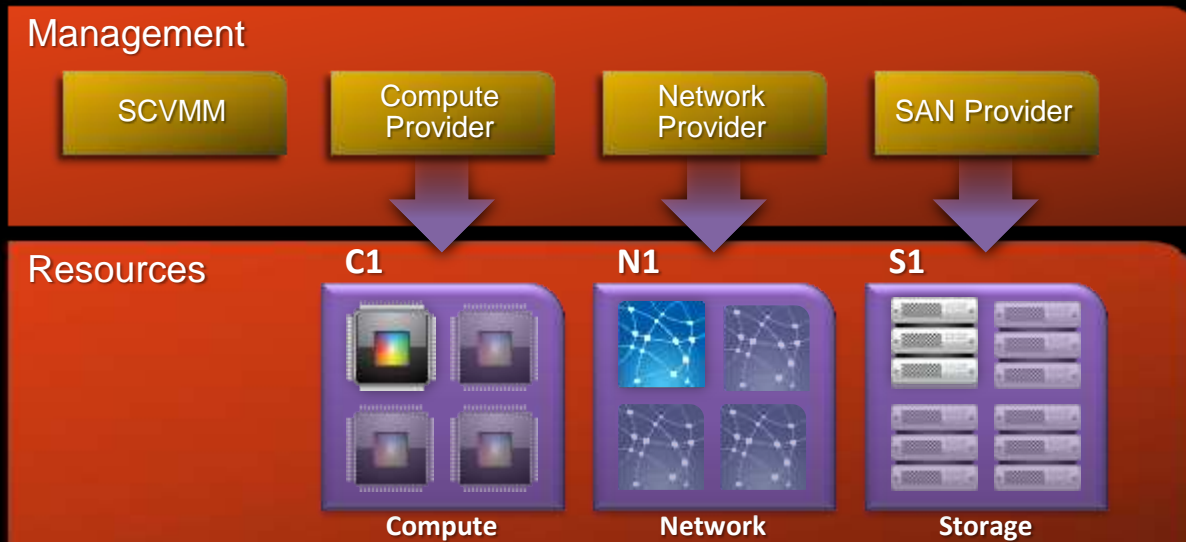
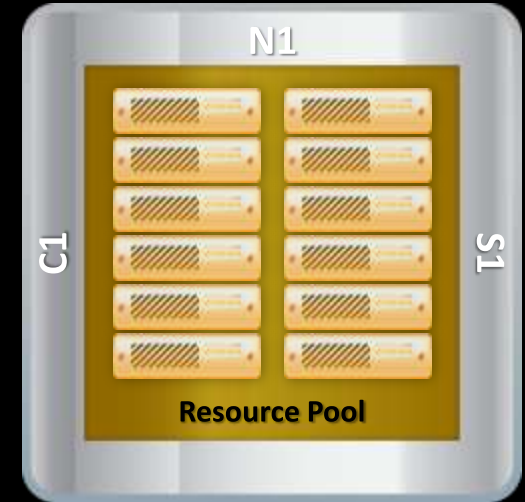
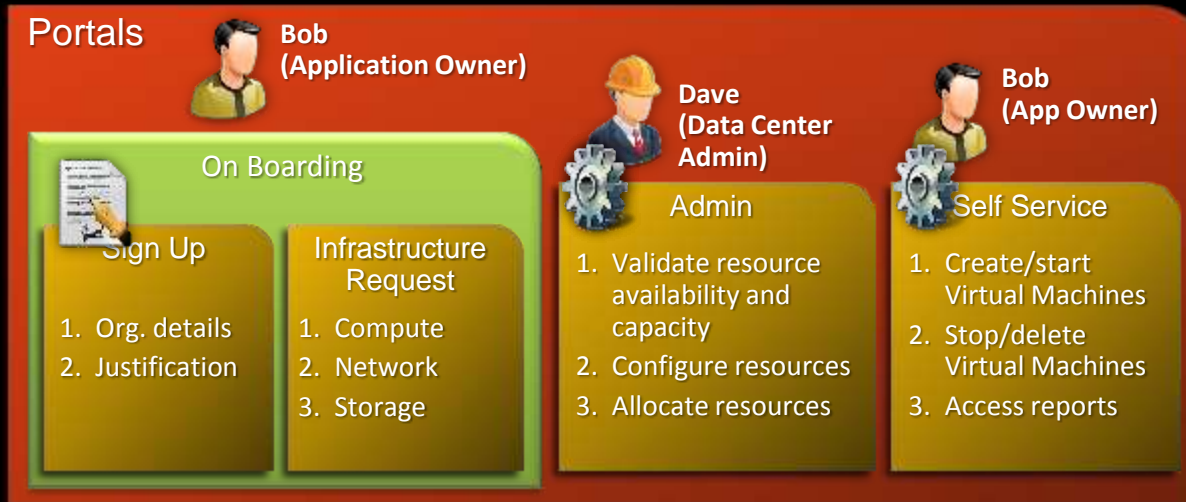
Storage



# Self Service Provisioning of VMS

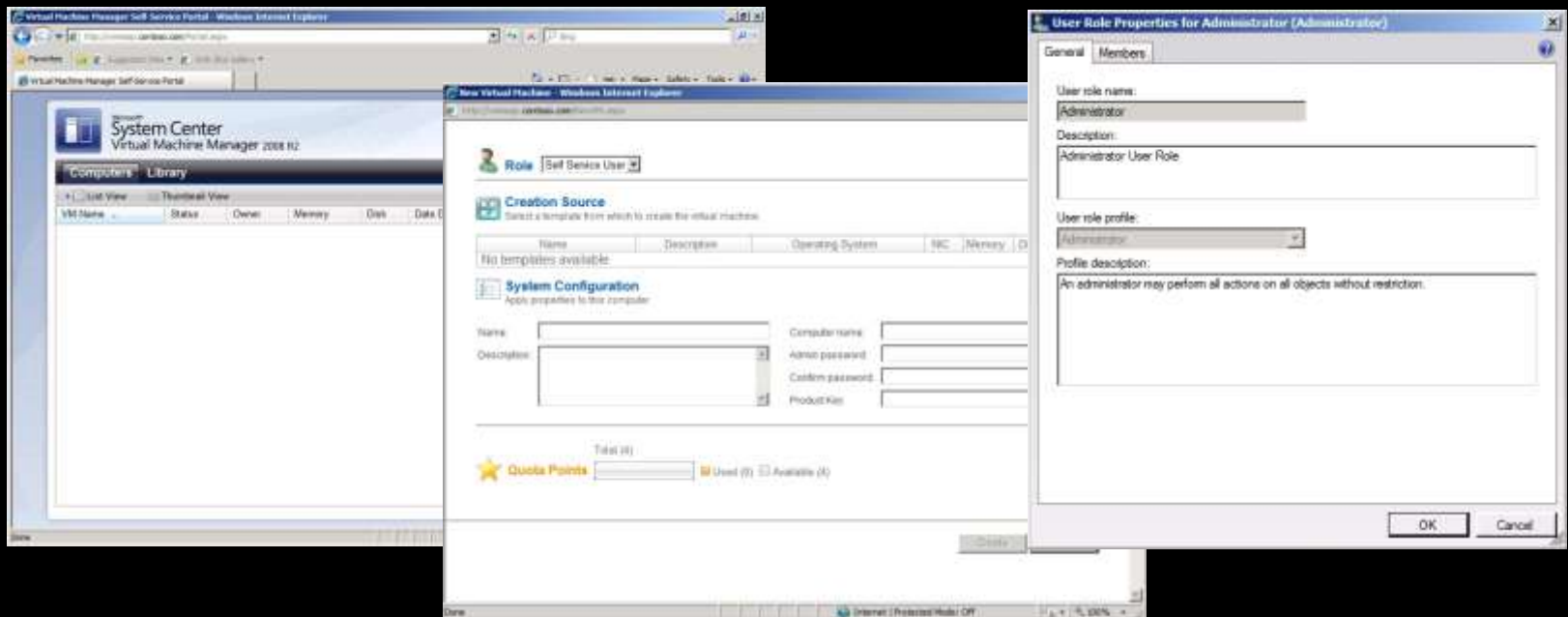


# Self Service Provisioning of VMS



# Self-Service Portal

- Gives a single access point for users to use their virtual machines
- Administrators control access through policies that designate capabilities
- End-users can:
  - View their own virtual machines
  - Manage their own virtual machines (On/Off/Reset)
  - Use the virtual machines via ActiveX® interface
  - Create new virtual machines with designated templates on designated servers



# Virtualize Your Key Applications

Microsoft®  
Exchange Server 2010

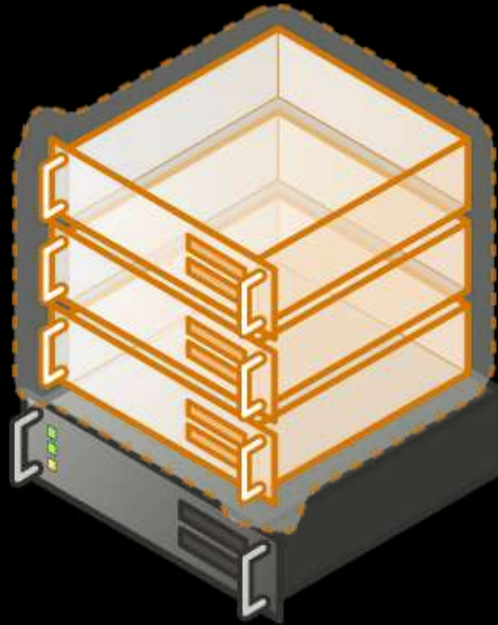
Microsoft®  
SQL Server® 2008

Microsoft®  
Office SharePoint  
Server 2007

Microsoft®  
System Center

Windows 7  
Enterprise

Windows Server 2008 R2



- Microsoft fully supports our **key server applications** in a virtualized environment
- Microsoft has **updated server workload** licensing to enable virtualization mobility
- **Management of the workloads is key**, not just the virtual machine

*“Maxol runs Exchange Server 2007, SQL Server 2005, Terminal Services, and file and print servers as key workloads in its virtual environment. Going forward, nearly every business application at Maxol will be a candidate for virtualization.”*

*- Maxol Case Study*

*“We’ve seen first-hand that we can virtualize everything from file, print, and web servers to database servers running SQL Server and Oracle, and actually have the virtual machine run **\*faster\*** than what it ran on our original physical box.”*

*- Janssen Jones, Indiana University*

# HP Storage for Virtualization

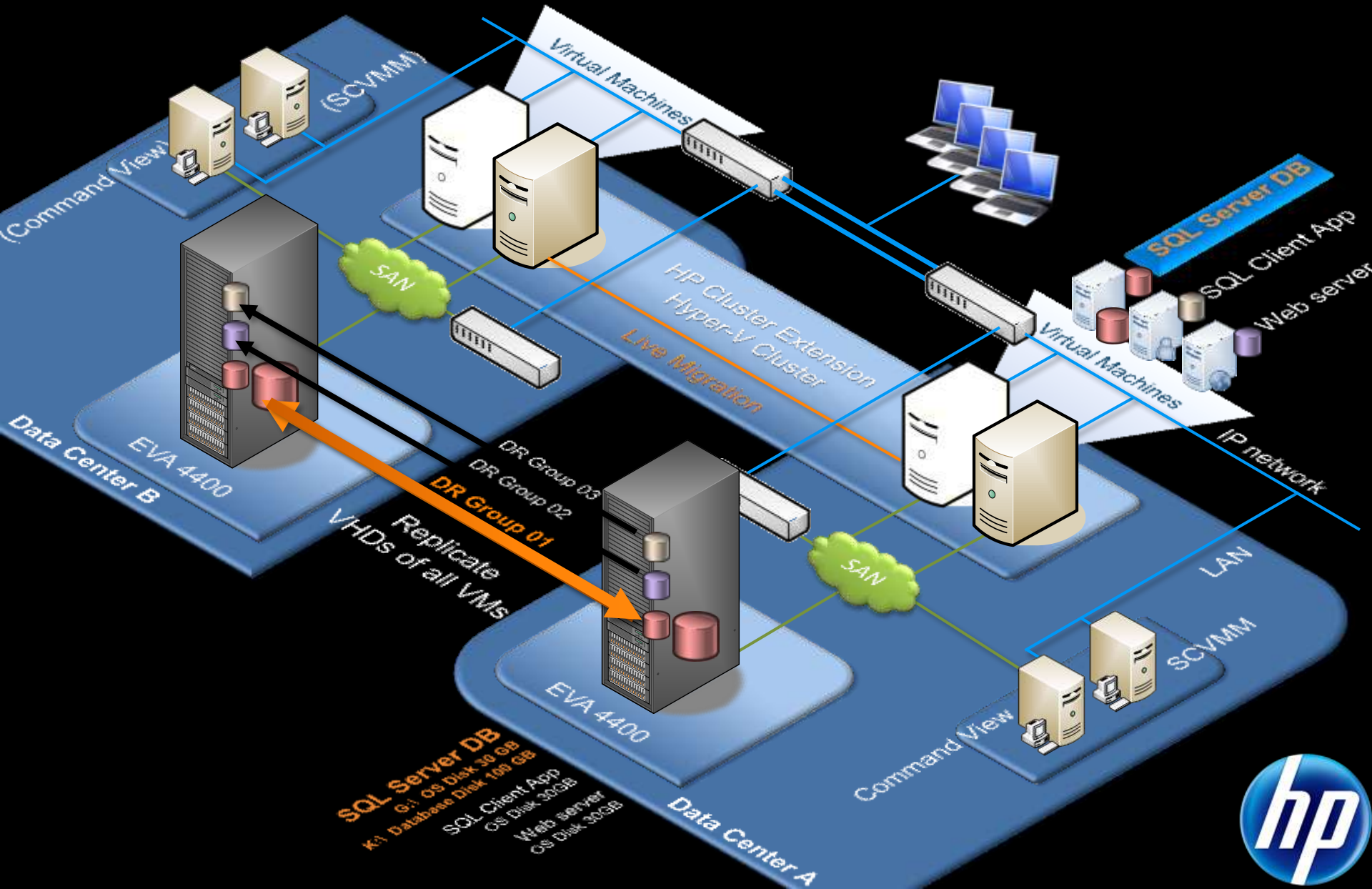
## Hyper-V Live Migration between Replicated Disk Arrays

- End-user transparent app migration across data centers; across servers *and storage*
- Zero Downtime Array Load Balancing
  - (IOPS, cache utilization, response times, power consumption, etc.)
- Zero Downtime Maintenance
  - Plan maintenance without the need to check for downtimes
- Follow the sun/moon data center access model
  - Move the app/VM closest to the users or closest to the cheapest power source
- Failover, Failback, Quick and Live Migration using the same management software
  - No need to learn x different tools and their limitations





# Long distance live migration using HP EVA CLX





# SQL Server Consolidation Scalability

## Configuration:

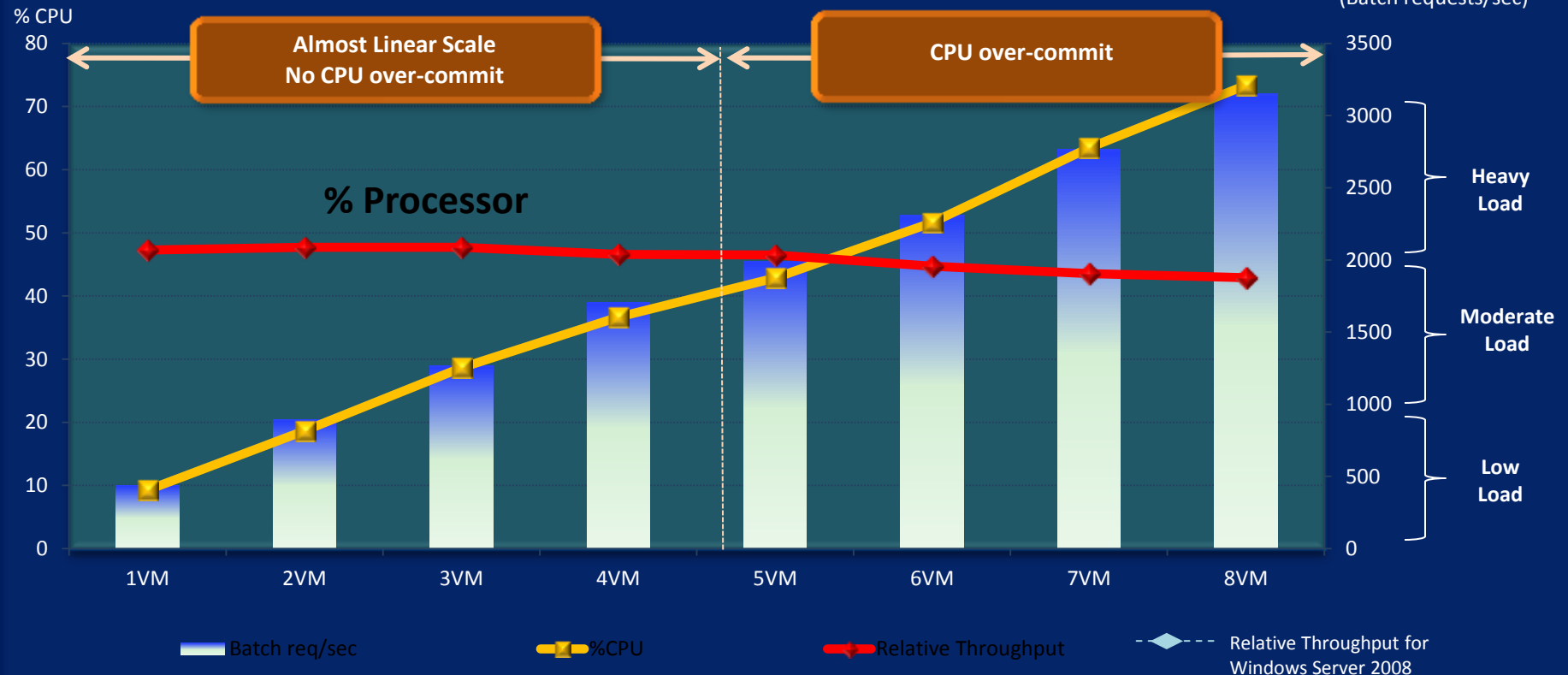
- OS: Microsoft® Windows Server® 2008 R2 Hyper-V™
- Hardware:
  - HP DL585 (16 core) with SLAT
  - HP EVA 8000 storage
- Virtual Machines: 4 virtual processors and 7 GB RAM per virtual machine; Fixed size VHD



## Results:

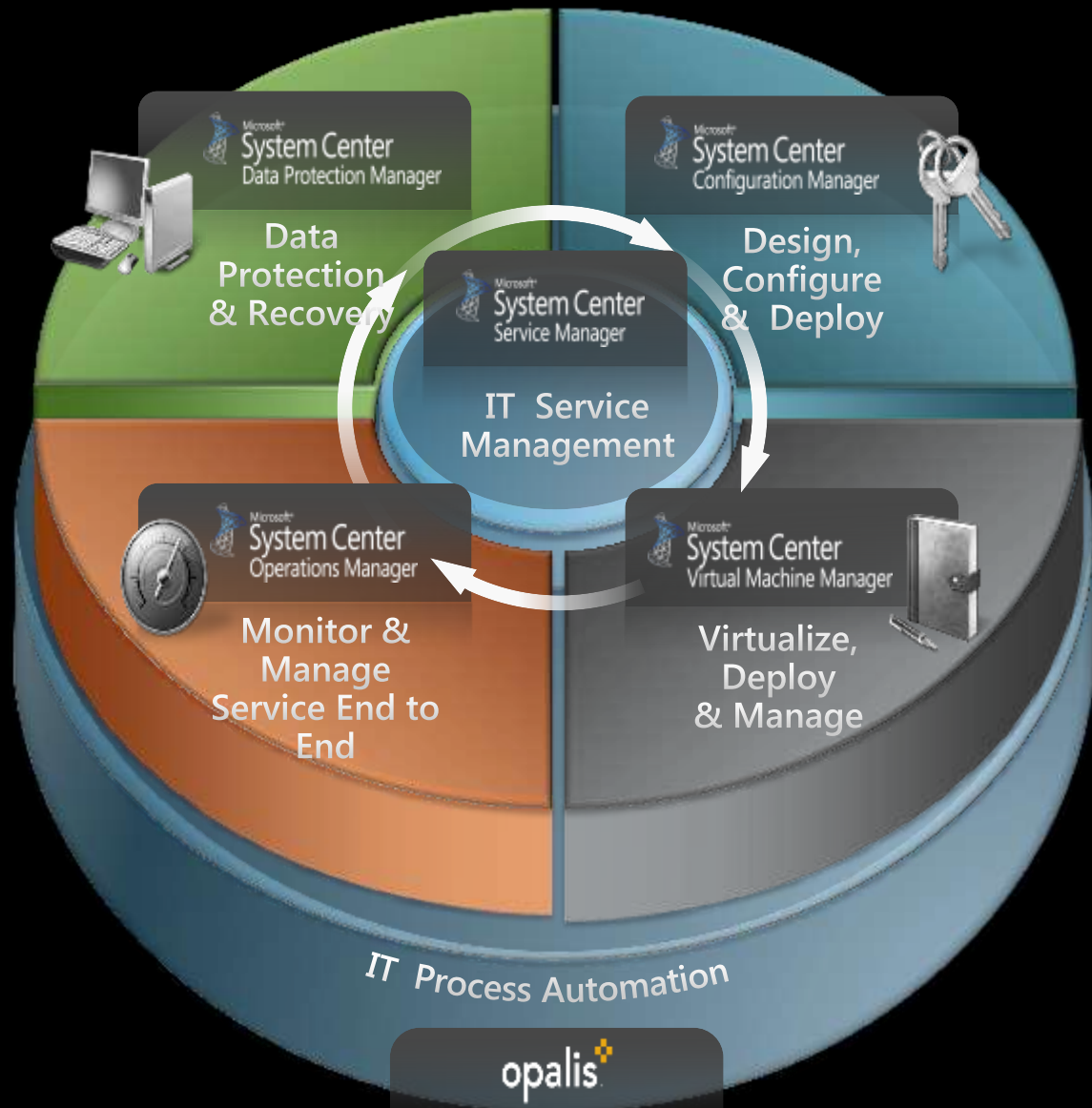
- Increased throughput with consolidation
- Near linear scale in throughput with no CPU over-commit
- **Improved performance with Windows Server 2008 R2 and SLAT processor architecture**

## Virtual Instances Scalability



# System Center: End-to-End Service Management for the Datacenter

- Lower the cost of delivering datacenter services through integrated, end-to-end management of physical and virtual environments
- Manage datacenter service across datacenter / cloud spectrum
- Single user environment lowers training and operational costs
- Lay the foundation for the Private cloud with System Center and Windows Server 2008 R2
- 1/3 to 1/6 the cost of solutions from VMware



# Comprehensive Management Tools

*Choices for End-User Productivity*

**DISTRIBUTED**

**CENTRALIZED**

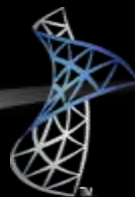
Traditional  
Laptop/  
Mobile

Client Hosted  
Virtualization

Application  
Virtualization

Session  
Virtualization

Virtual  
Desktop  
Infrastructure



Microsoft®  
**System Center**



Comprehensive Management Tools

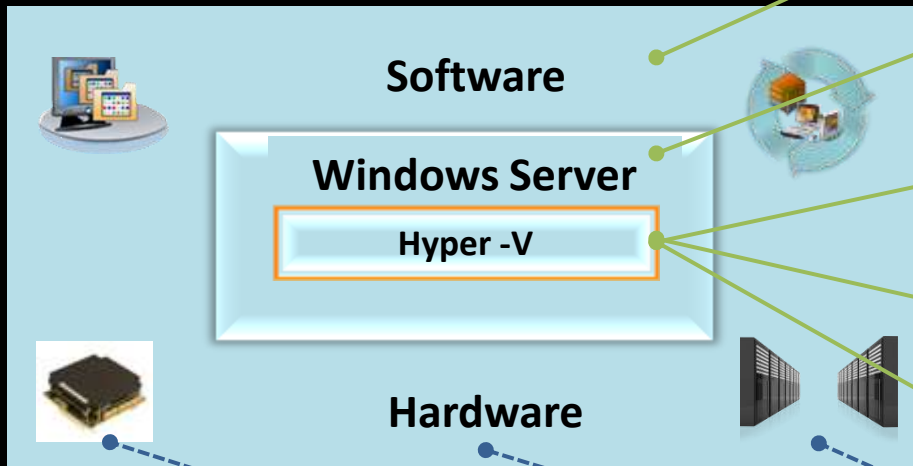
# System Center Virtual Machine Manager (VMM) Partner Ecosystem for Performance and Resource Optimization (PRO)



# Compute Components



## Key Capabilities



### Management

- WMI, PowerShell

### Scalability

- 256/64 logical processor support
- 64 bit / large memory

### High Availability

- Live Migration
- Failover Clustering

### Resource Optimization

- Dynamic Memory
- Core Parking support
- SLAT support

### Enhanced VDI

- RemoteFX

### Broad Choice

- Windows Server HW Logo

### Server based graphics

- vGPU for VDI / RemoteFX

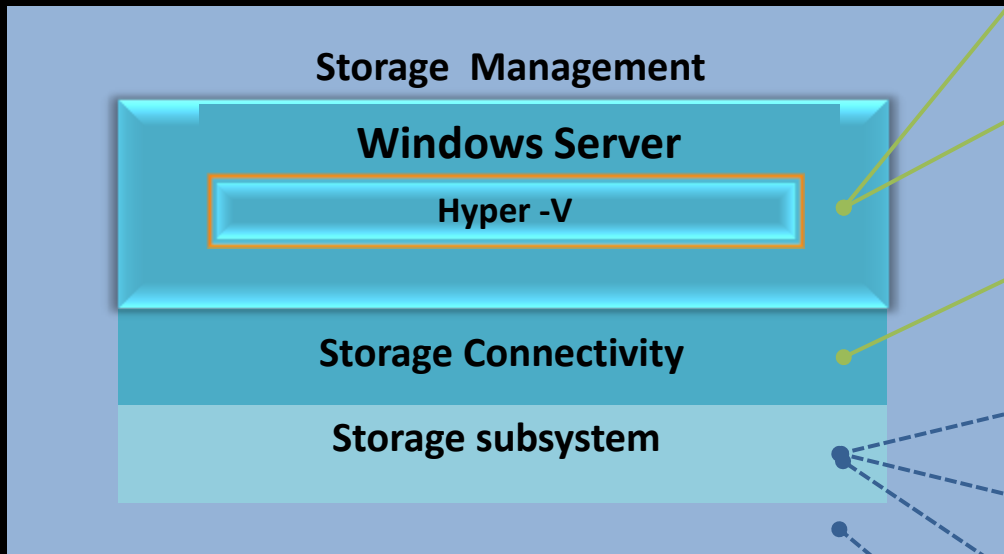
### Optimized Processor Features

- HW virtualization support
- Core Parking
- SLAT

# Storage Components



## Key Capabilities



**Storage availability**

- Cluster Shared Volumes
- MPIO

**Rich OS Storage Technology**

- VSS, VDS
- Storage hot add/remove
- Storage driver model

**Storage Connection**

- iSCSI
- Fiber Channel
- SAS, SATA

**Storage availability**

- Data replication
- Backup

**Storage consolidation**

- De-duplication
- Thin Provisioning

**Storage Virtualization**

- Virtual LUNs
- Storage aggregation

**Integrated Storage Management**

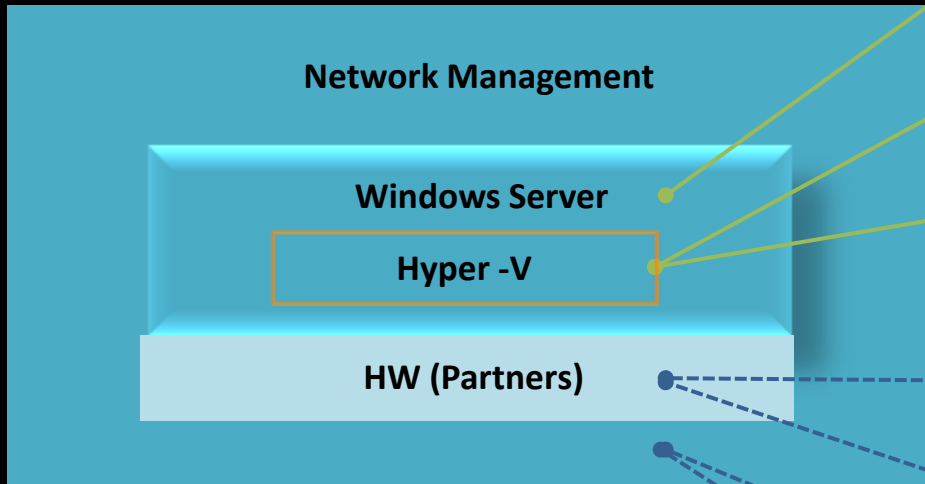
- PRO
- Management Pack

— Microsoft  
- Partner

# Networking Components



## Key Capabilities

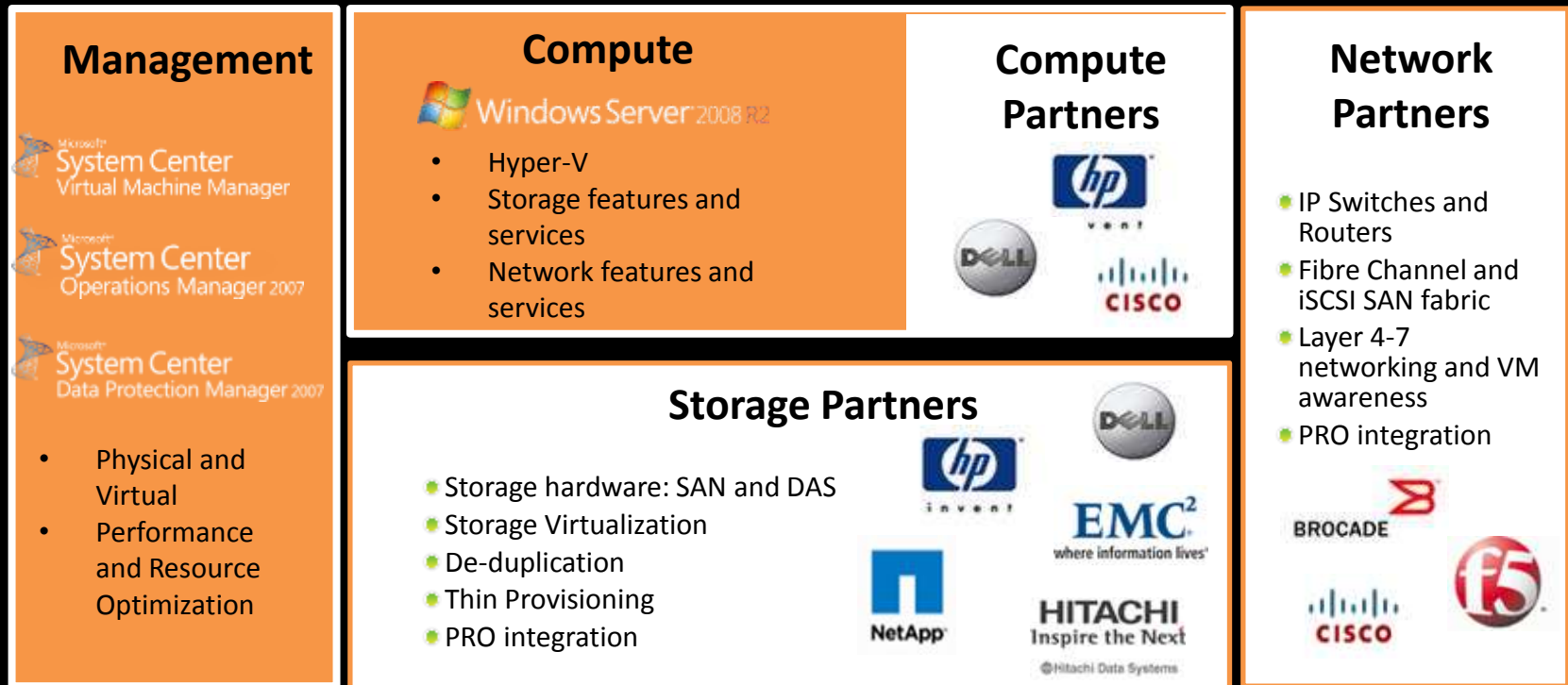


- Security**
  - Secure Network protocols
  - NAP
- Flexibility**
  - VLAN
- Resource Optimization**
  - VMQ Support
  - Jumbo Frames
  - Offloads
- Resource Optimization**
  - VMQ Support
  - Jumbo Frames
  - Offloads
- Availability**
  - NIC Teaming
- Management Integration**
  - PRO Pack
- Traffic optimization**
  - Network profile management

— Microsoft  
- - - Partner



# Microsoft Datacenter Optimization Solution Stack



Windows Server 2008 and System Center form the Foundation for an Optimized Virtual Datacenter

# System Center Configuration Manager vNext and Application Delivery Management

- DEMO

# Microsoft VDI Solution



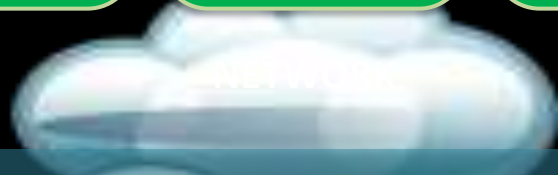
PCs Running Windows  
7



Windows  
Fundamentals for  
Legacy PCs



Windows Embedded  
for Thin Clients












3<sup>rd</sup> party  
Partner  
Solutions

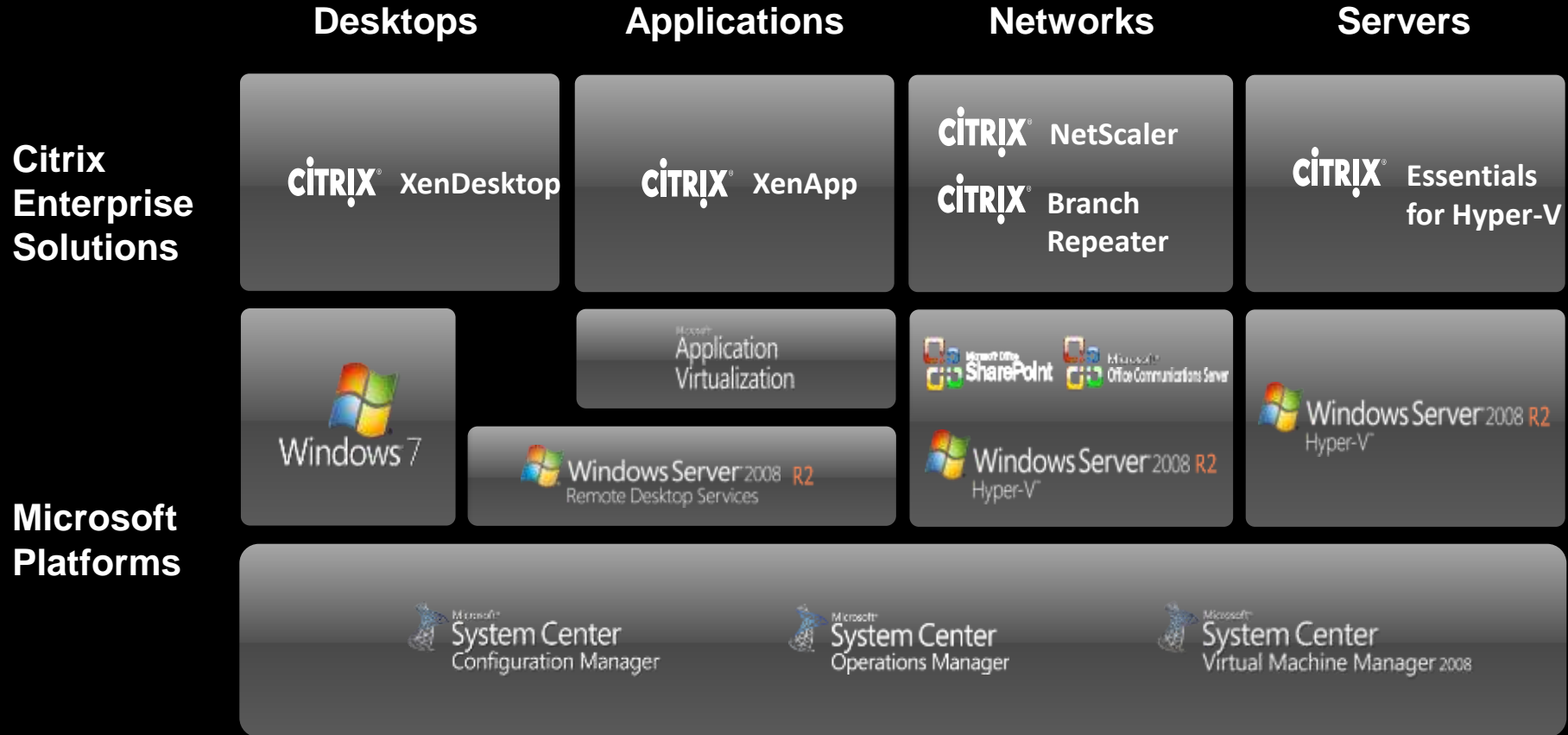


**CITRIX**

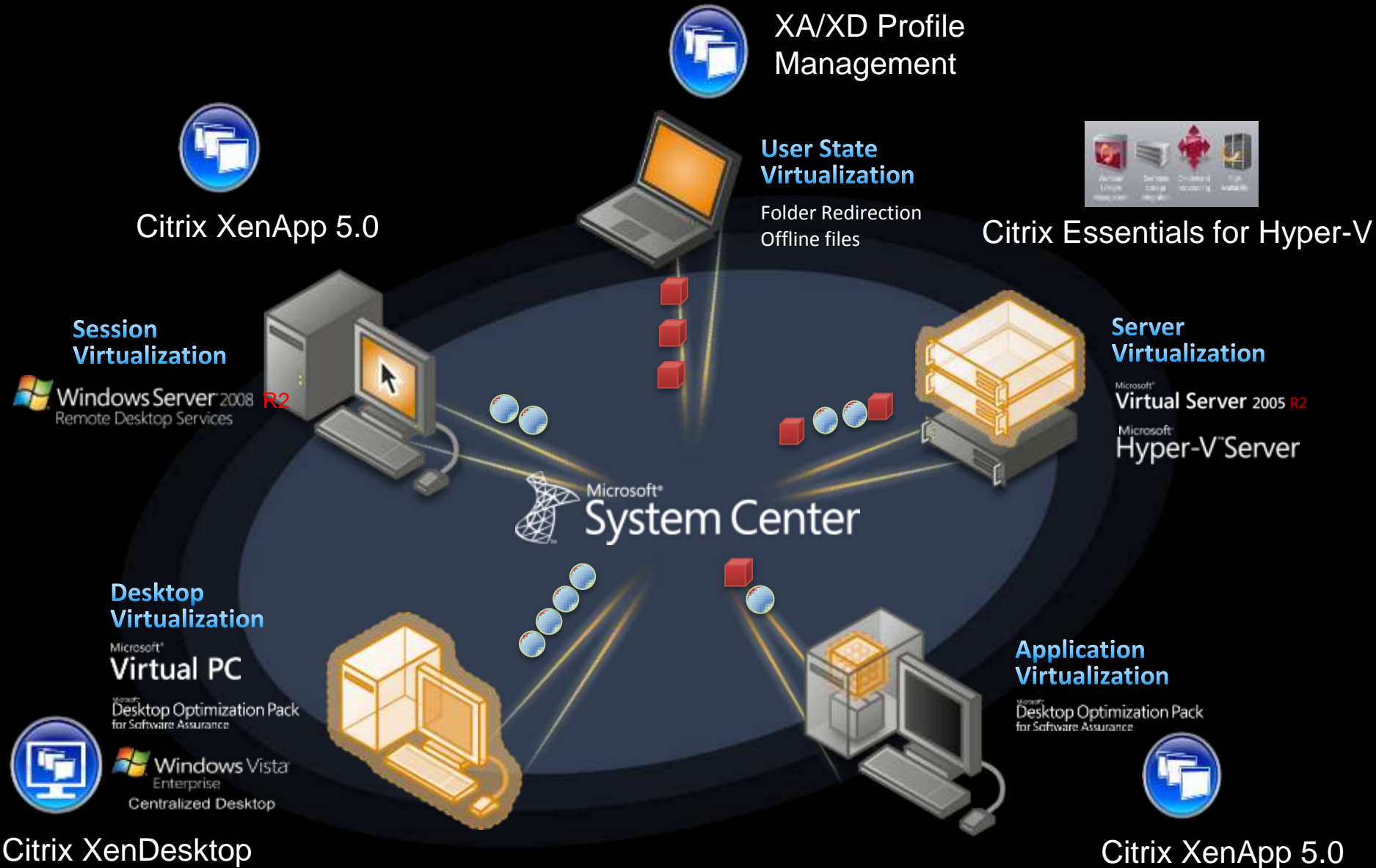


<b>User state Virtualization</b>	 Windows Roaming Profiles	 Windows Folder Redirection	<b>Integrated Management</b>  Microsoft System Center Operations Manager 2007 R2  Microsoft System Center Virtual Machine Manager 2008 R2  Microsoft System Center Configuration Manager 2007 R2
<b>Application Delivery</b>	 Microsoft Application Virtualization	 Microsoft RemoteApp	
<b>Desktop Delivery</b>	 Windows Server 2008 R2 Remote Desktop Services		
<b>Virtualization Platform</b>	 Windows Server 2008 R2 Microsoft Hyper-V Server 2008 R2		

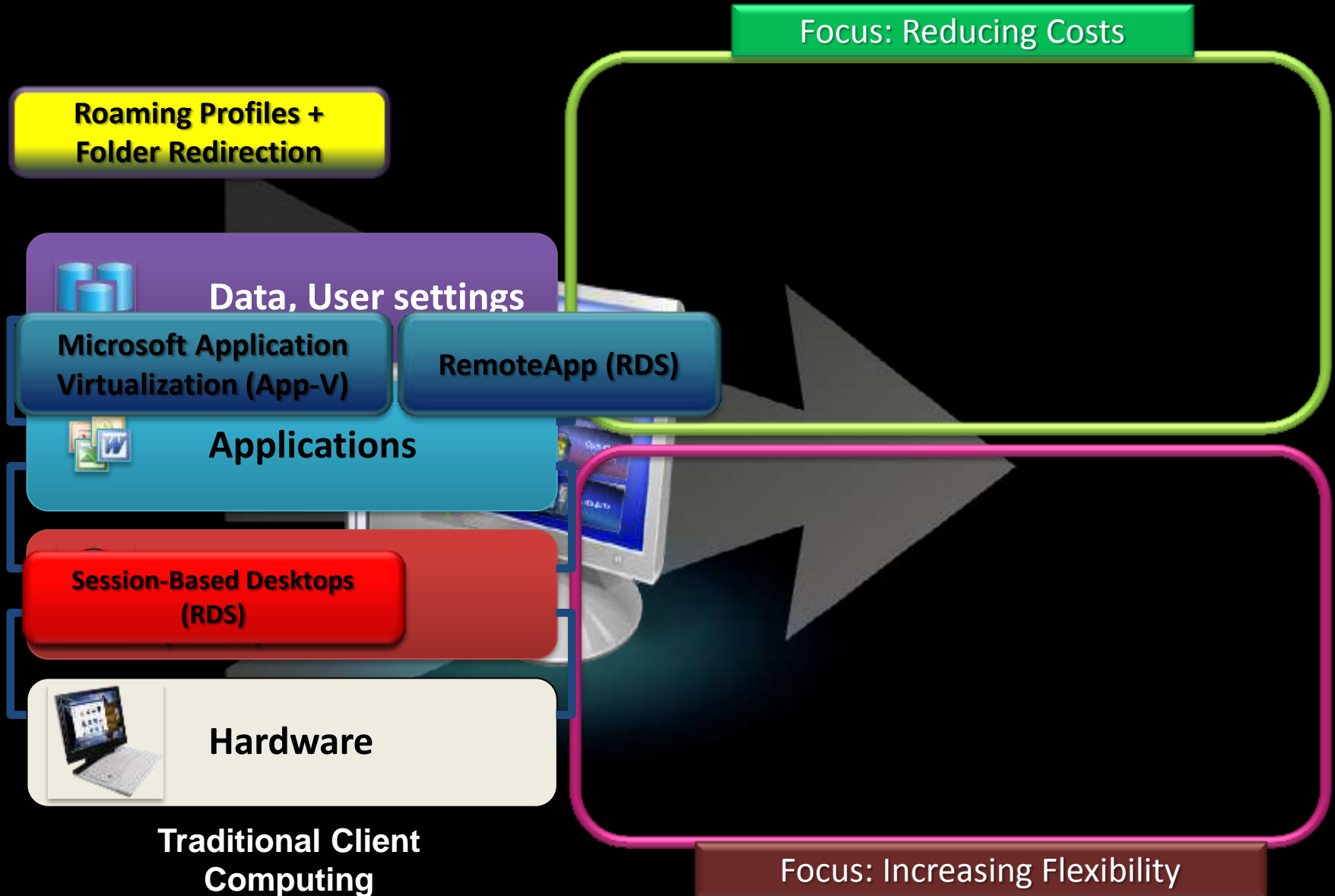
# Citrix Enterprise Solutions – Built on Microsoft



# Microsoft Virtualization with Citrix



# Broad Portfolio for Desktop Virtualization



# Microsoft VDI Solution



**Comprehensive Portfolio and Cost-Effective**



**Strong Focus on Providing Rich User Experience**



**Belief that Desktop Virtualization is component of a broader Desktop Management Strategy/Approach**



# Microsoft's Virtualization Strategy



**Make Virtualization as Pervasive as Possible**



**Preserve Customer's Existing Investments**



**Establish Management as the Key Enabler**



# Partners to go to...



**Microsoft<sup>®</sup>**

**We're**  **all in.**