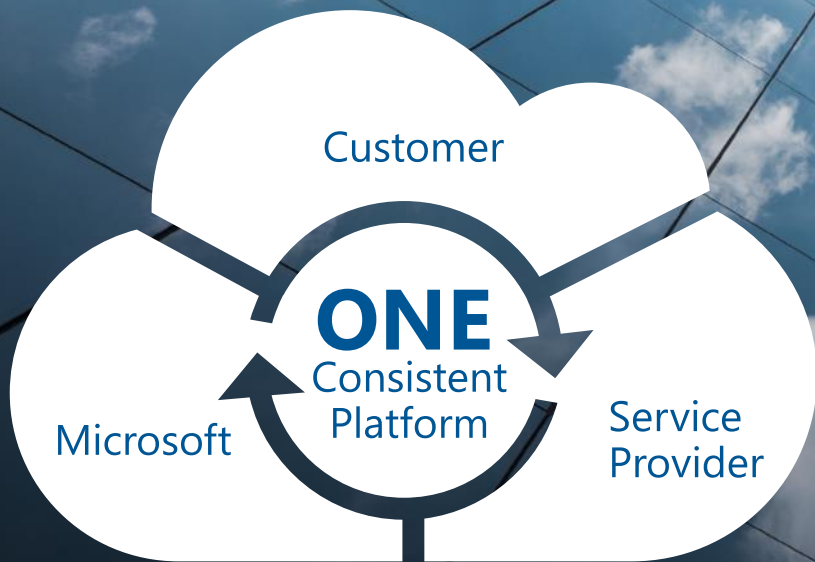


# CloudOS

Ovidiu Pismac  
MCSE Security, CISSP, MCSE Private Cloud, Server & Desktop Infrastructure  
Microsoft Romania  
[ovidiup@microsoft.com](mailto:ovidiup@microsoft.com)



# Microsoft's vision: Cloud OS



Enterprise-grade platform

Hybrid design

People-focused approach

Development

Management

Identity

Virtualization

Data

# Cloud pitch

<https://www.youtube.com/watch?v=L241wexn1QY>

# Microsoft Azure Cloud Leader on IAAS in Gartner

Figure 1. Magic Quadrant for Cloud Infrastructure as a Service, Worldwide



Source: Gartner (May 2015)

# Microsoft Leader in PaaS

Figure 1. Magic Quadrant for Enterprise Application Platform as a Service, Worldwide



Figure 1. Magic Quadrant for Enterprise Application Platform as a Service, Worldwide



# Microsoft Azure Leader in Cloud Storage



# Microsoft Azure Leader in Disaster Recovery as a Service



# Microsoft Azure Active Directory

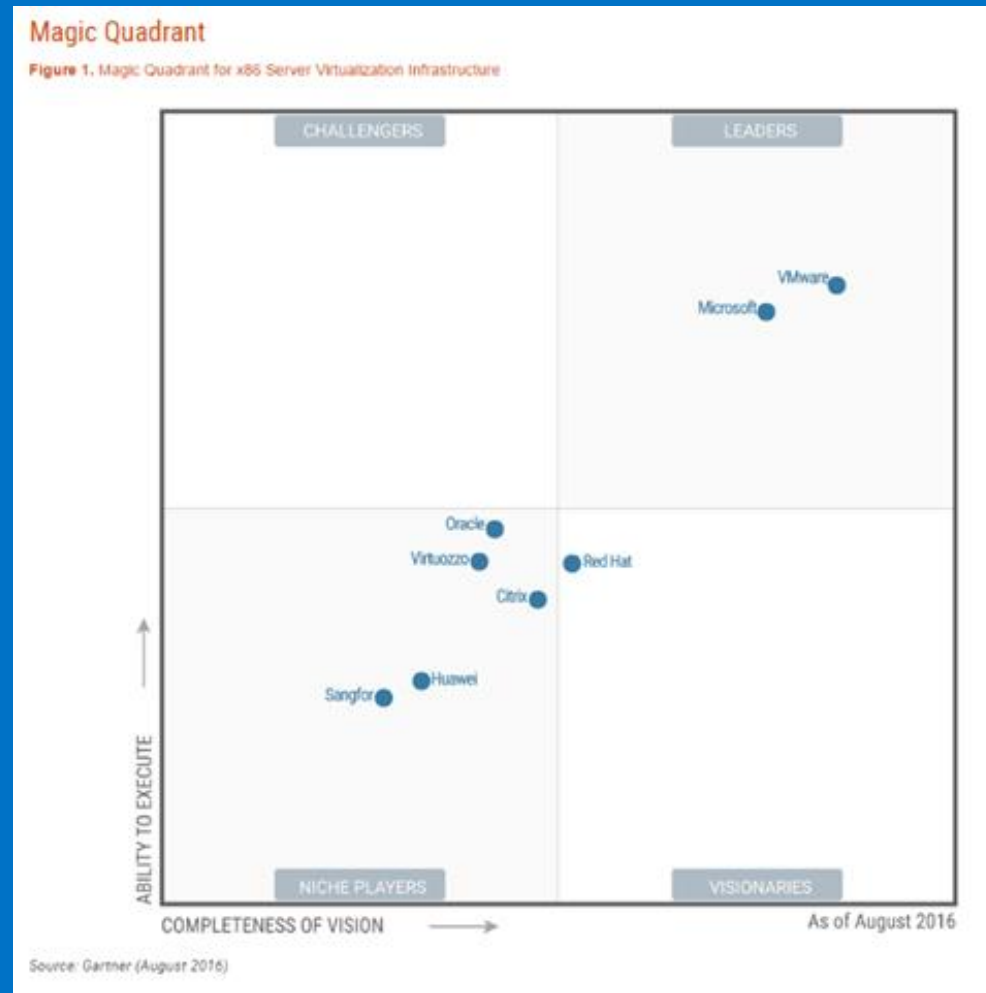


# Microsoft Enterprise Mobility Suite -EMS



As of June 2016




# Microsoft is a leader in the Gartner 2016 x86 Virtualization Magic Quadrant



# Microsoft SCCM – Client Management Tools – leader for 11 years



# Microsoft & Gartner

	Leaders Quadrant			
Gartner MQs	 Microsoft	 amazon web services	 salesforce	Google
Application Development Lifecycle Management	●			
Business Intelligence and Analytics Platforms	●			
Cloud Infrastructure as a Service (IaaS)	●	●		
CRM Customer Engagement Center	●		●	
Data Warehouse and Data Management Solutions for Analytics	●			
Disaster Recovery as a Service (DRaaS)	●			
Enterprise Application Platform as a Service	●		●	
Enterprise Content Management	●			
Horizontal Portals	●		●	
Identity as a Service (IDaaS)	●			
Mobile Application Development Platforms	●		●	
Operational Database Management Systems	●	●		
Public Cloud Storage Services	●	●		
Sales Force Automation	●		●	
Social Software in the Workplace	●		●	
Unified Communications	●			
Web Conferencing	●			
X86 Server Virtualization Infrastructure	●			

# Gartner client endpoint protection

## Magic Quadrant

Figure 1. Magic Quadrant for Endpoint Protection Platforms



# System Center Endpoint Protection AV TEST

<https://www.av-test.org/en/antivirus/business-windows-client/windows-10/december-2015/microsoft-system-center-endpoint-protection-4.8-154674/>

## The best antivirus software for Windows Client Business User

AV-TEST Product Review Report – Nov-Dec/2015

[Download as PDF](#)

[Back to overview](#)



Version 4.8  
Platform Windows 10 (64 bit)  
Report 154674  
Date Nov-Dec/2015

[Website](#)

Microsoft

### System Center Endpoint Protection

During November and December 2015 we continuously evaluated 11 endpoint protection products using settings as provided by the vendor. We always used the most current publicly-available version of all products for the testing. They were allowed to update themselves at any time and query their in-the-cloud services. We focused on realistic test scenarios and challenged the products against real-world threats. Products had to demonstrate their capabilities using all components and protection layers.



### Protection

Protection against malware infections (such as viruses, worms or Trojan horses)  
[More Information](#)

Protection against 0-day malware attacks, inclusive of web and e-mail threats (Real-World Testing)

140 samples used

November December Industry average



Detection of widespread and prevalent malware discovered in the last 4 weeks (the AV-TEST reference set)

14,658 samples used



Protection Score ●●●●●● 4.5/6.0

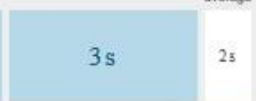
### Performance

Average influence of the product on computer speed in daily usage  
[More Information](#)

Use cases: visiting websites, downloading software, installing and running programs and copying data

Number of test cases

November December Industry average



Performance Score ●●●●●● 4.5/6.0

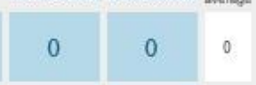
### Usability

Impact of the security software on the usability of the whole computer (lower values indicate better results)  
[More Information](#)

False warnings or blockages when visiting websites

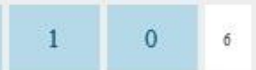
500 samples used

November December Industry average



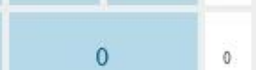
False detections of legitimate software as malware during a system scan

1,301,224 samples used



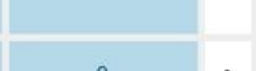
False warnings concerning certain actions carried out whilst installing and using legitimate software

40 samples used



False blockages of certain actions carried out whilst installing and using legitimate software

40 samples used



Usability Score ●●●●●● 6.0/6.0

# System Center Endpoint Protection AV TEST

## The best antivirus software for Windows Client Business User

AV-TEST Product Review and Certification Report – Mar-Apr/2016

 Download as PDF

[Back to overview](#)



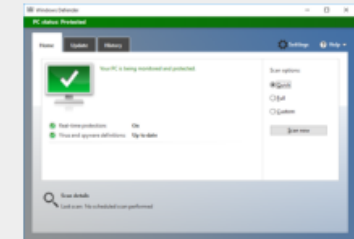
Version 4.8  
Platform Windows 10 (64 bit)  
Report 161574  
Date Mar-Apr/2016

[Website](#)

Microsoft

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During March and April 2016 we continuously evaluated 12 endpoint protection products using settings as provided by the vendor. We always used the most current publicly-available version of all products for the testing. They were allowed to update themselves at any time and query their in-the-cloud services. We focused on realistic test scenarios and challenged the products against real-world threats. Products had to demonstrate their capabilities using all components and protection layers.



### Protection

Protection against malware infections (such as viruses, worms or Trojan horses)

[More information](#)

#### Protection against 0-day malware attacks, inclusive of web and e-mail threats (Real-World Testing)

164 samples used

#### Detection of widespread and prevalent malware discovered in the last 4 weeks (the AV-TEST reference set)

22,795 samples used

	March	April	Industry average
Protection against 0-day malware attacks, inclusive of web and e-mail threats (Real-World Testing)	88.9%	88.0%	97.0%
Detection of widespread and prevalent malware discovered in the last 4 weeks (the AV-TEST reference set)	99.5%	99.8%	99.0%

# System Center Endpoint Protection VB100% from 2007- 2016

<https://www.virusbulletin.com/testing/results/recent/vb100-antimalware/microsoft-ff>

The screenshot shows the Virus Bulletin website interface. At the top, there's a navigation bar with 'virus BULLETIN' logo and 'Covering the global threat landscape'. Below that, there are tabs for 'Blog', 'Bulletin', 'VB100', 'VBSpam', 'VBWeb', 'Consulting', 'Conference', 'Resources', and 'About Us'. The main heading is 'VB100 Results Overview: > Microsoft Forefront'. Below this, it says 'See results for: Microsoft OneCare | Microsoft Security Essentials | Microsoft Windows Defender | MS Forefront (VBSpam)'. There's a 'Test history' section with a grid of green checkmarks, and a red circle highlights the text '26 Pass, 0 Fail from June 2007 (22 tests not entered)'. Below that is a table with columns: 'Test', 'Result', 'RAP Average', 'Response (formerly trojans)', 'Worms/Bots', 'Polymorphic viruses', and 'Article'. The table lists several tests with a '100' result and various RAP averages. On the right side, there's a sidebar with 'VB100' header and a list of links: 'Latest Comparative', 'Recent Test Summary', 'Vendor Test History', 'Compare Vendors', 'Test Results by Platform', 'Full Test History', 'RAP Test Results', 'Test Schedule', and 'Purchase Comparatives'. There's also an advertisement for 'Looking to make a career move?' and 'Browse the VB job directory'.

**virus BULLETIN** Covering the global threat landscape

REVERSING LABS TitaniumCloud™ Threat intelligence on over 1B files Detailed Malware, Goodware & Detection info

Blog Bulletin **VB100** VBSpam VBWeb Consulting Conference Resources About Us

### VB100 Results Overview: > Microsoft Forefront

See results for: Microsoft OneCare | Microsoft Security Essentials | Microsoft Windows Defender | MS Forefront (VBSpam)

#### Test history

26 Pass, 0 Fail from June 2007 (22 tests not entered)

Compare with... Go

Test	Result	RAP Average	Response (formerly trojans)	Worms/Bots	Polymorphic viruses	Article
April 2015 Windows 8 Professional Microsoft System Center Endpoint Protection	100	71.5%				
December 2014 Windows 7 Professional Microsoft System Center Endpoint Protection	100	73.3%				
October 2014 Windows Server 2008 R2 Microsoft System Center Endpoint Protection	100	88.5%				
August 2014 Windows 8 Professional Microsoft System Center Endpoint Protection	100	94.2%				
June 2014 Windows Server 2012 Microsoft System Center Endpoint Protection	100	77.9%				
April 2014 Windows 7 Professional Microsoft Sytem Center	100	73.3%				

Advertisement: Looking to make a career move? Browse the VB job directory for the latest positions in anti-malware

# Endpoint Protection - ICSA Labs certified

<https://www.icsalabs.com/vendor/microsoft-corporation>



TESTING SERVICES

CERTIFIED PRODUCTS

HEALTH IT

BLOG

KNOWLEDGE

NEWS & EVENTS

COMPANY

## Microsoft Corporation



Microsoft (Nasdaq "MSFT") is the worldwide leader in software, services and solutions that help people and businesses realize their full potential. Microsoft is working to deliver business ready security to help companies achieve their business goals while managing risk and helping ensure that the right people always have access to the information they need to get their jobs done. Microsoft Forefront Security products deliver protection, access, and management solutions, built around user identity and integrated with a highly secure, interoperable platform. Our solutions help to deliver a more contextual and user-centric security solution aligned to the needs of our customers.

Visit <http://www.microsoft.com/>

Technology Program	Vendor	Product Testing Reports ▲	Certification	Product Version	Date	Certification Type	Operating System
Anti-Spyware	Microsoft Corporation	<a href="#">System Center 2012 Endpoint Protection</a>	Anti-Spyware Certification			Corporate	Windows 7 64-bit
Anti-Virus	Microsoft Corporation	<a href="#">System Center 2012 Endpoint Protection</a>	Desktop / Server Anti-virus Detection			Corporate	Windows 7 64-bit
Anti-Virus	Microsoft Corporation	<a href="#">System Center 2012 Endpoint Protection</a>	Anti-Virus Cleaning			Corporate	Windows 7 64-bit
Anti-Virus	Microsoft Corporation	<a href="#">System Center 2012 Endpoint Protection</a>	Desktop / Server Anti-virus Detection			Corporate	Windows 8 64-bit
Anti-Virus	Microsoft Corporation	<a href="#">System Center 2012 Endpoint Protection</a>	Anti-Virus Cleaning			Corporate	Windows 8 64-bit
Anti-Virus	Microsoft Corporation	<a href="#">System Center Endpoint Protection (Defender)</a>	Desktop / Server Anti-virus Detection			Corporate	Windows 10 64-bit
Anti-Virus	Microsoft Corporation	<a href="#">System Center Endpoint Protection (Defender)</a>	Anti-Virus Cleaning			Corporate	Windows 10 64-bit

# Endpoint Protection WestCoast Labs CheckMark certified

<http://www.checkmarkcertified.com/enterprise/>

The screenshot displays the WestCoast Labs website's CheckMark Certification section. At the top, the WestCoast Labs logo is visible, followed by a navigation menu with links for 'About', 'Real Time Testing', 'Vendor Services', 'Checkmark', and 'End Users'. Below the navigation is a breadcrumb trail: 'Home > Checkmark Certification > Search'. The main heading is 'Checkmark Certification', with a 'Contact Us' button on the right. The central content area is titled 'Checkmark Search' and shows a search result for 'Vendor > Microsoft (Enterprise)'. This result includes a 'Checkmark Platinum' award logo and the text 'Microsoft (Enterprise)'. Below this, there are two columns of product information. The left column, titled 'Checkmark Platinum Products', lists 'SCEP' with a sub-item 'Anti-Malware' (marked with a checkmark) and two other items: 'Anti-Malware' and 'Real Time Web Threats (Malicious URLs)'. The right column, titled 'Checkmark Certified Products', lists 'SCEP' with a sub-item 'Anti-Virus Desktop' (marked with a red dot). At the bottom of the search results, there is a button labeled 'List all Checkmark Platinum Award Vendors'.



**National Information Assurance Partnership**  
**Common Criteria Certificate**

*is awarded to*

**Microsoft Corporation**

*for*

**Microsoft Windows 8 and Windows Server 2012**



The IT product identified in this certificate has been evaluated at an accredited testing laboratory using the Common Methodology for IT Security Evaluation (Version 3.1) for conformance to the Common Criteria for IT Security Evaluation (Version 3.1). This certificate applies only to the specific version and release of the product in its evaluated configuration. The product's functional and assurance security specifications are contained in its security target. The evaluation has been conducted in accordance with the provisions of the NIAP Common Criteria Evaluation and Validation Scheme and the conclusions of the testing laboratory in the evaluation technical report are consistent with the evidence adduced. This certificate is not an endorsement of the IT product by any agency of the U.S. Government and no warranty of the IT product is either expressed or implied.

**Date Issued: 2015-01-09**

**Validation Report Number: CCEVS-VR-VID10520-2015**

**CCTL: Leidos (formerly SAIC) Common Criteria Testing Laboratory**

**Assurance Level: PP Compliant**

**Protection Profile Identifier:**

**General-Purpose Operating System Protection Profile**



National Information Assurance Partnership  
**Common Criteria Certificate**

*is awarded to*

**Microsoft Corporation**

*for*

**Microsoft Windows 10**



The IT product identified in this certificate has been evaluated at an accredited testing laboratory using the Common Methodology for IT Security Evaluation (Version 3.1) for conformance to the Common Criteria for IT Security Evaluation (Version 3.1). This certificate applies only to the specific version and release of the product in its evaluated configuration. The product's functional and assurance security specifications are contained in its security target. The evaluation has been conducted in accordance with the provisions of the NIAP Common Criteria Evaluation and Validation Scheme and the conclusions of the testing laboratory in the evaluation technical report are consistent with the evidence adduced. This certificate is not an endorsement of the IT product by any agency of the U.S. Government and no warranty of the IT product is either expressed or implied.

**Date Issued: 2016-01-29**

**Validation Report Number: CCEVS-VR-VID10677-2016**

**CCTL: Leidos (formerly SAIC) Common Criteria Testing Laboratory**

**Assurance Level: PP Compliant**

**Protection Profile Identifier:**

**Protection Profile for Mobile Device Fundamentals Version 2.0**

Original Signed By

*Director, Common Criteria Evaluation and Validation Scheme*  
National Information Assurance Partnership

Original Signed By

*Information Assurance Director*  
National Security Agency

# The value of the Microsoft Virtualization & management platform

## Features

The features you need, native to the platform. No additional product/licensing necessary



## Technology

The same technology that supports Azure—supporting your business



## Integration

Better together with other Microsoft technologies, such as Active Directory, SQL, Exchange, and SharePoint



## Third-party

Linux support, along with many third-party vendors: SAP, Oracle, and others



Moving to Hyper-V is the first step to the Cloud with Azure and Azure Stack  
Using System Center & Operations Management Suite for management at all three layers: physical, virtual and application



# Hybrid Cloud Story

Windows Server 2008 R2  
System Center 2007

Introduced  
virtualization  
platform/  
management

Windows Server 2012  
System Center 2012

Industry-leading  
scale and  
performance

Windows Server 2012 R2  
System Center 2012 R2  
Microsoft Azure

Azure as  
design point

Windows Server 2016  
System Center 2016  
Microsoft Azure

Cloud-first  
innovation:  
Infrastructure  
and application  
platform

# Release history and roadmap



Windows Server 2003



Windows Server 2003 R2



Windows Server 2008



Windows Server 2008 R2



Windows Server 2012



Windows Server 2012 R2



Windows Server 2016

2003

2005

2008

2010

2012

2013

2016

Operations Manager

Data Protection Manager

Virtual Machine Manager

Operations Manager

Service Manager Orchestrator

Data Protection Manager

Virtual Machine Manager

Operations Manager

System Center 2012

Windows Azure Services for Windows Server

System Center 2012 R2

Azure Pack

System Center 2016

Azure Stack

Managed server infrastructure with robust web platform

Virtualization & management

Dynamic datacenter

Private cloud and the Cloud Platform

Cloud Platform

# 10 reasons you'll love Windows Server 2016

- 1.** Active Directory
- 2.** Security
- 3.** Compute
- 4.** Network
- 5.** Storage
- 6.** Remote Desktop Services (RDS)
- 7.** Nano Server
- 8.** Containers
- 9.** PowerShell
- 10.** Server Management Tools (SMT)

# 10 reasons you'll love Windows Server 2016

## SECURITY

1. Shielded VMs
2. Shielded VMs
3. Compute
4. Network
5. Storage

## Software Defined Datacenter

6. Remote Desktop Services (RDS)

## APPLICATION PLATFORM

8. Containers
9. PowerShell
10. Server Management Tools (SMT)

## MANAGEMENT

# Windows Server 2016 Security



## Hyper-V (Fabric) Security

### Protecting virtual machines

- ✓ Shielded VMs (Server 2012, 2016 guests)
- ✓ Guarded fabric attesting to host health
- ✓ Secure boot for Windows and Linux

### Hyper-V platform

- ✓ Nano based Hyper-V host
- ✓ Virtualization Based security – Device Guard

### Secure containers

- ✓ Hyper-V containers
- ✓ Containers hosted in a Shielded VM



## Infrastructure and application security

### Privileged Identity

- ✓ Credential Guard
- ✓ Just In Time administration
- ✓ Just Enough administration

### Threat resistance

- ✓ Control Flow Guard
- ✓ Code Integrity (Device Guard)
- ✓ Built in anti-malware
- ✓ Nano Server reduces attack surface

### Threat detection

- ✓ Enhanced threat detection

# Protect virtual machines

## Host Guardian Service

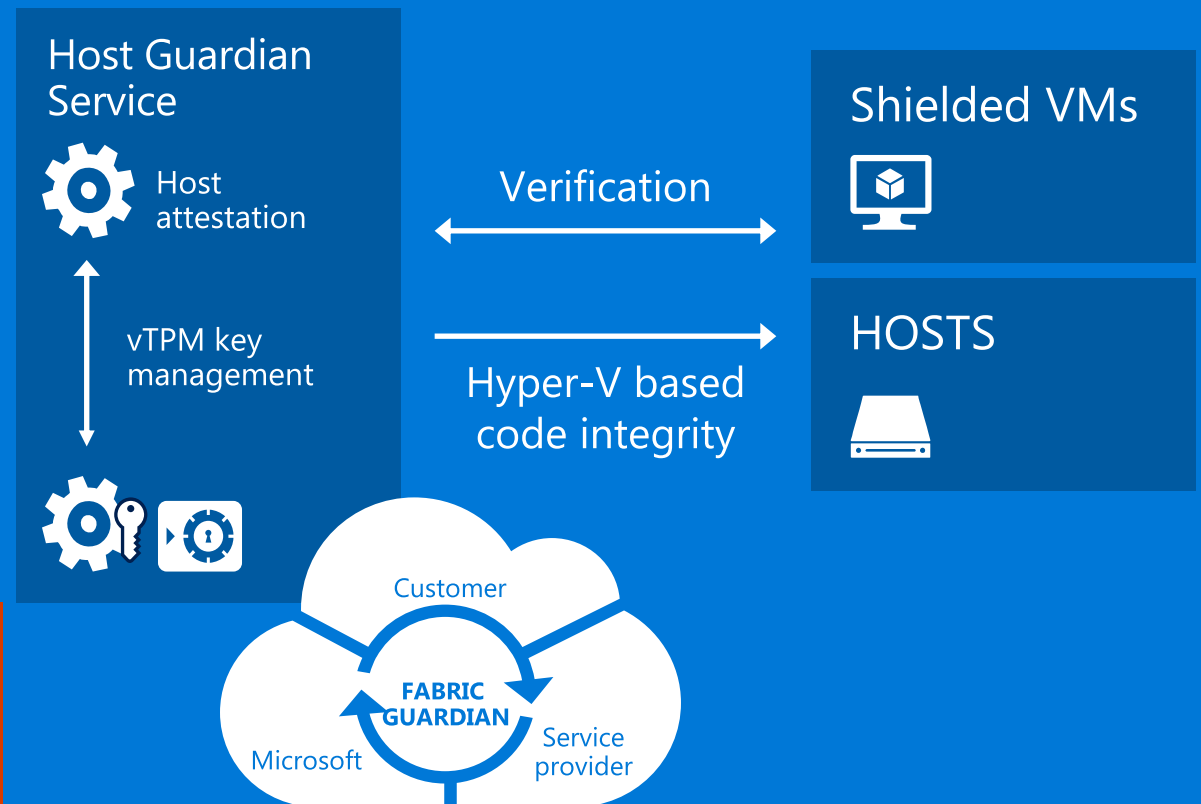


### *Spotlight capabilities*

**Host Guardian Service** holds keys of the legitimate fabrics as well as encrypted virtual machines

Host Guardian Service runs as a service to verify if it is a trusted machine

Host Guardian Service can **live anywhere** even as a virtual machine



<https://gallery.technet.microsoft.com/shielded-vms-and-guarded-98d2b045>

<https://blogs.technet.microsoft.com/datacentersecurity/2016/06/06/step-by-step-creating-shielded-vms-without-vmm/>

# Protect virtual machines

## Shielded Virtual Machines



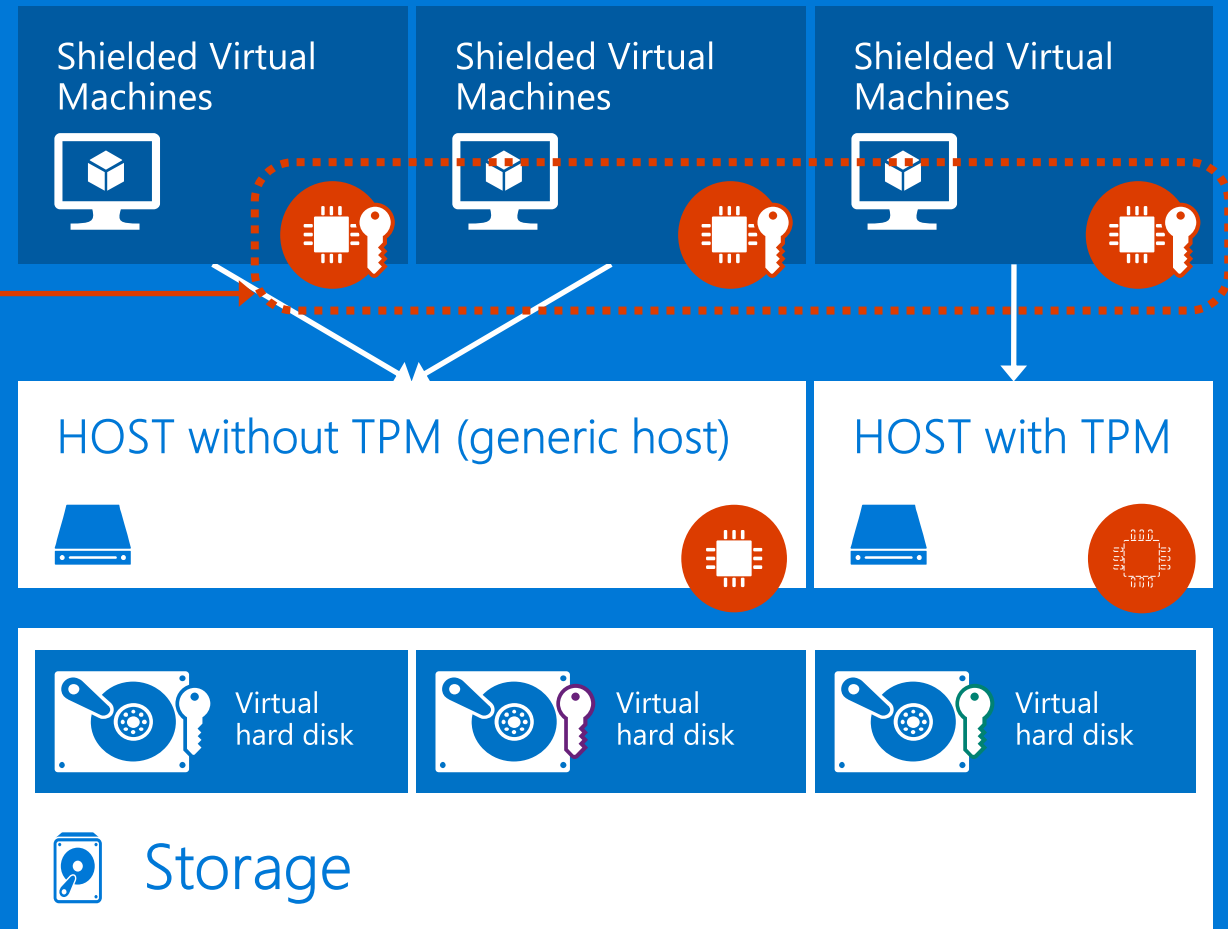
### Spotlight capabilities

**Shielded Virtual Machines** can only run in fabrics that are designated as owners of that virtual machine

Shielded Virtual Machines will need to be **encrypted** (by **BitLocker** or other means) in order to ensure that only the designated owners can run this virtual machine

You can **convert** a **running virtual machine** into a Shielded Virtual Machine

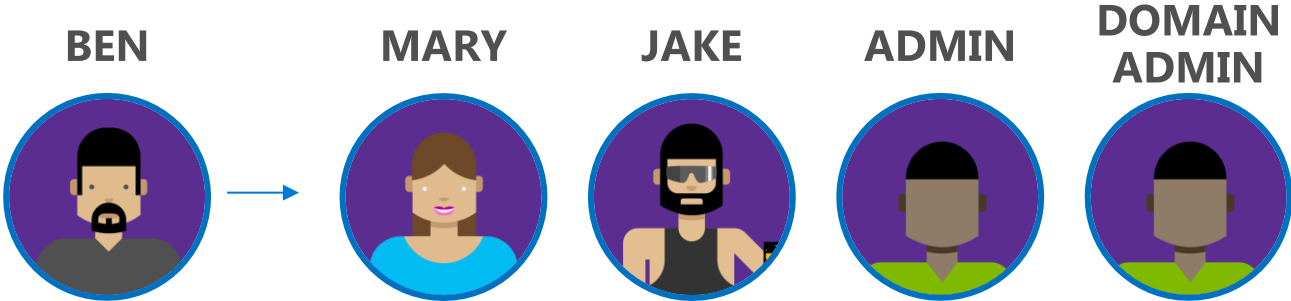
Host Guardian Service



# Windows Server 2016 approach

## Credential Guard

Prevents Pass the Hash and Pass the Ticket attacks by protecting stored credentials through Virtualization based Security



## Just Enough

Administration Limits administrative privileges to the bare-minimum required set of actions (limited in space)

**Just Enough and Just in Time** administration

## Just in Time

Administration Provide privileged access through a workflow that is audited and limited in time



JEA + JIT = limited in time & capability

# Protecting Active Directory and Admin privileges

<http://aka.ms/privsec>

2-4 weeks

1-3 months

6+ months

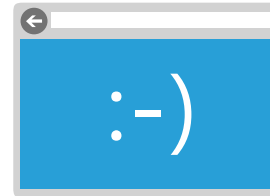
First response to the most frequently used attack techniques

3. Unique Local Admin Passwords for Workstations  
<http://Aka.ms/LAPS>

4. Unique Local Admin Passwords for Servers  
<http://Aka.ms/LAPS>

1. Separate Admin account for admin tasks

2. Privileged Access Workstations (PAWs)  
Phase 1 – Active Directory admins  
<http://Aka.ms/CyberPAW>



# Protecting Active Directory and Admin privileges

<http://aka.ms/privsec>

2-4 weeks

1-3 months

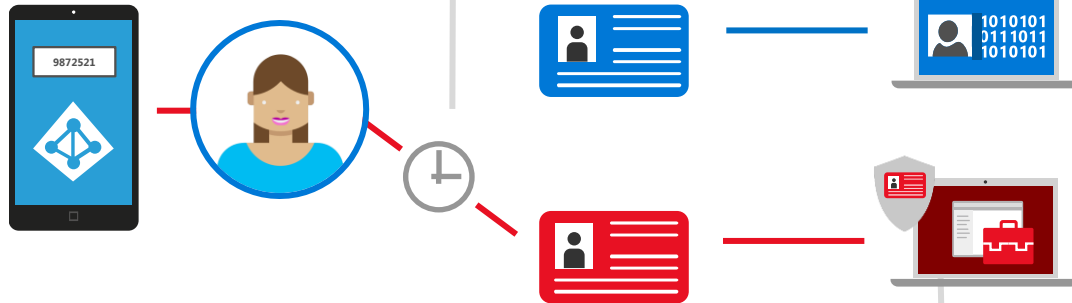
6+ months

Build visibility and control of administrator activity, increase protection against typical follow-up attacks

2. Time-bound privileges (no permanent admins)

<http://aka.ms/PAM> <http://aka.ms/AzurePIM>

3. Multi-factor for elevation



1. Privileged Access Workstations (PAWs)

Phases 2 and 3 – All Admins and additional hardening (Credential Guard, RDP Restricted Admin, etc.)

<http://aka.ms/CyberPAW>

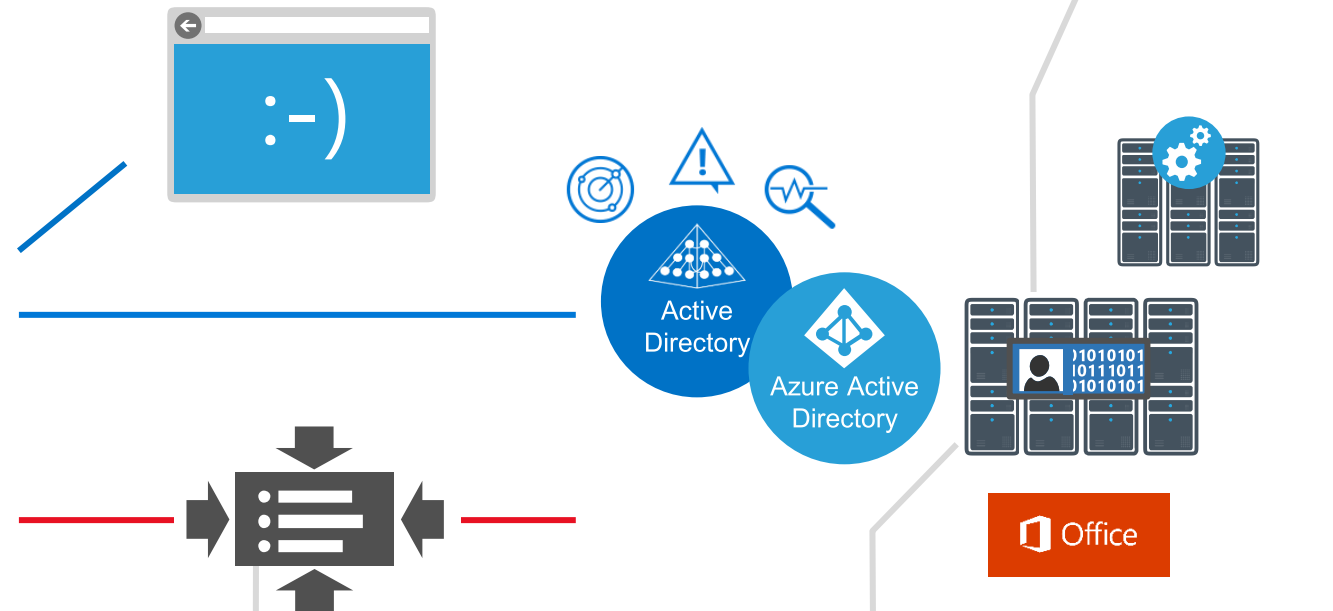
4. Just Enough Admin (JEA)

for DC Maintenance

<http://aka.ms/JEA>

6. Attack Detection

<http://aka.ms/ata>



5. Lower attack surface of Domain and DCs

<http://aka.ms/HardenAD>

# Protecting Active Directory and Admin privileges

<http://aka.ms/privsec>

2-4 weeks

1-3 months

6+ months

Build visibility and control of administrator activity, increase protection against typical follow-up attacks

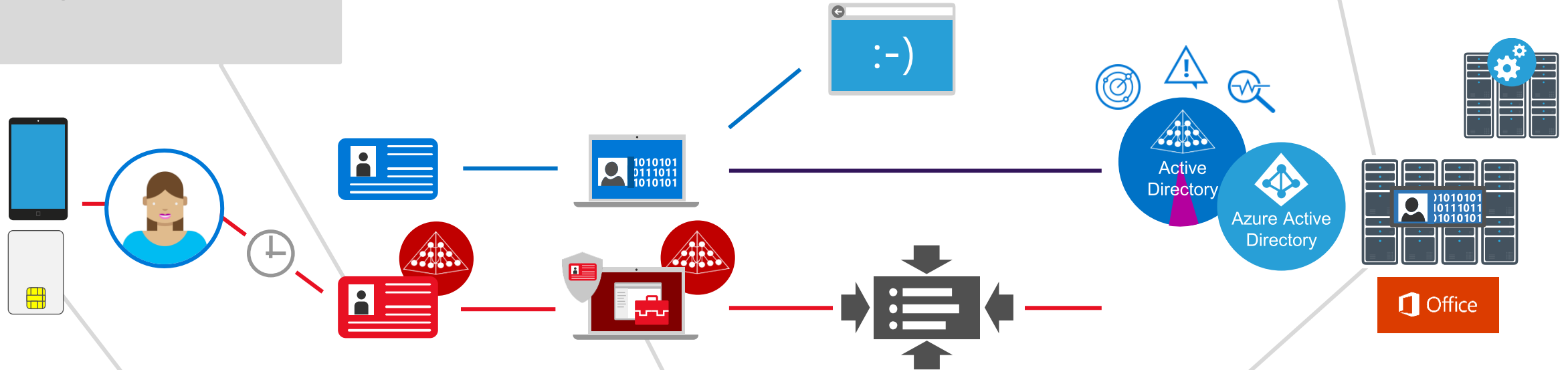
1. Modernize Roles and Delegation Model

2. Smartcard or Passport Authentication for all admins  
<http://aka.ms/Passport>

3. Admin Forest for Active Directory administrators  
<http://aka.ms/ESAE>

4. Code Integrity Policy for DCs (Server 2016)

5. Shielded VMs for virtual DCs (Server 2016 Hyper-V Fabric)  
<http://aka.ms/shieldedvms>



# New deployment option: Nano Server

Just enough OS

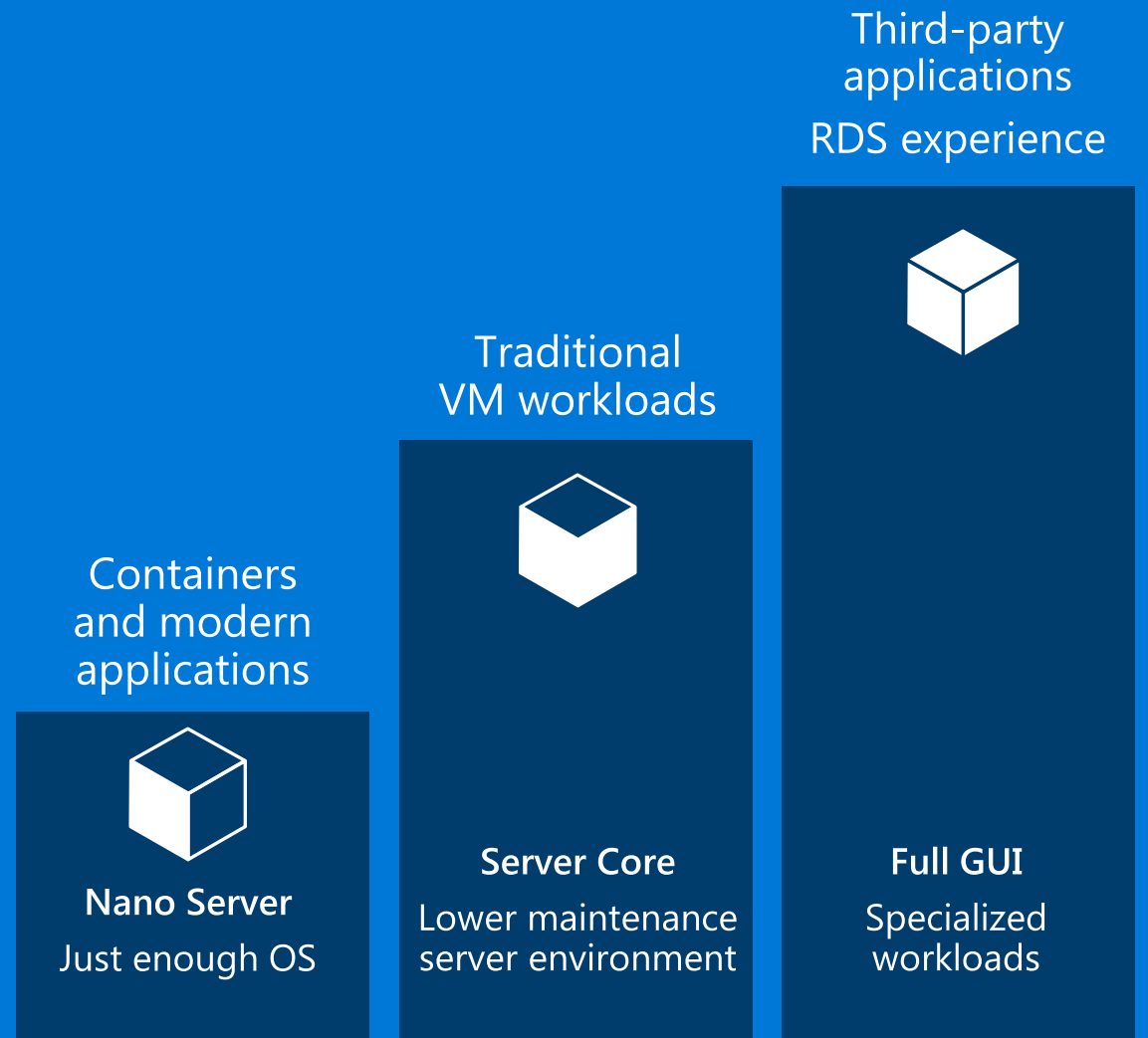
Optimized for modern applications

Higher density and performance

Reduced attack surface and servicing requirements

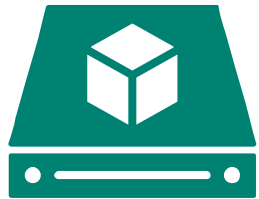
Next-gen distributed app frameworks

Interoperate with existing server applications



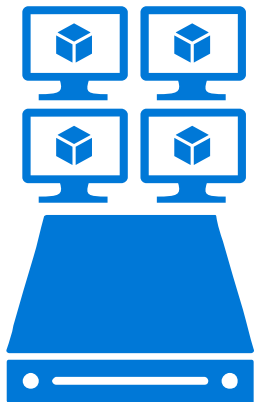
# Windows Server 2016 Containers

A new approach to build, ship, deploy, and instantiate applications



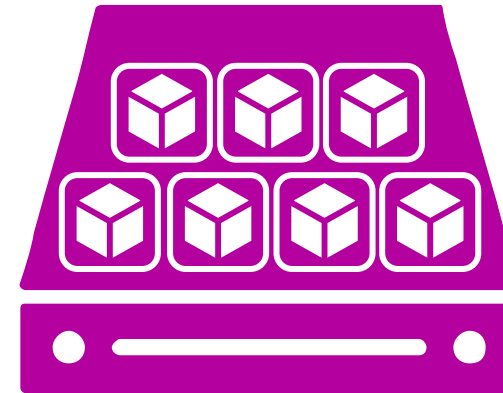
**Physical**

Applications traditionally built and deployed onto physical systems with 1:1 relationship  
New applications often required new physical systems for isolation of resources



**Virtual**

Higher consolidation ratios and better utilization  
Faster app deployment than in a traditional, physical environment  
Apps deployed into VMs with high compatibility success  
Apps benefited from key VM features; i.e., live migration, HA



**Physical/Virtual**

Package and run apps within **containers**

## Key Benefits

- Further accelerate of app deployment
- Reduce effort to deploy apps
- Streamline development and testing
- Lower costs associated with app deployment
- Increase server consolidation

# Windows Server Containers

## Anatomy and key capabilities

### Spotlight capabilities

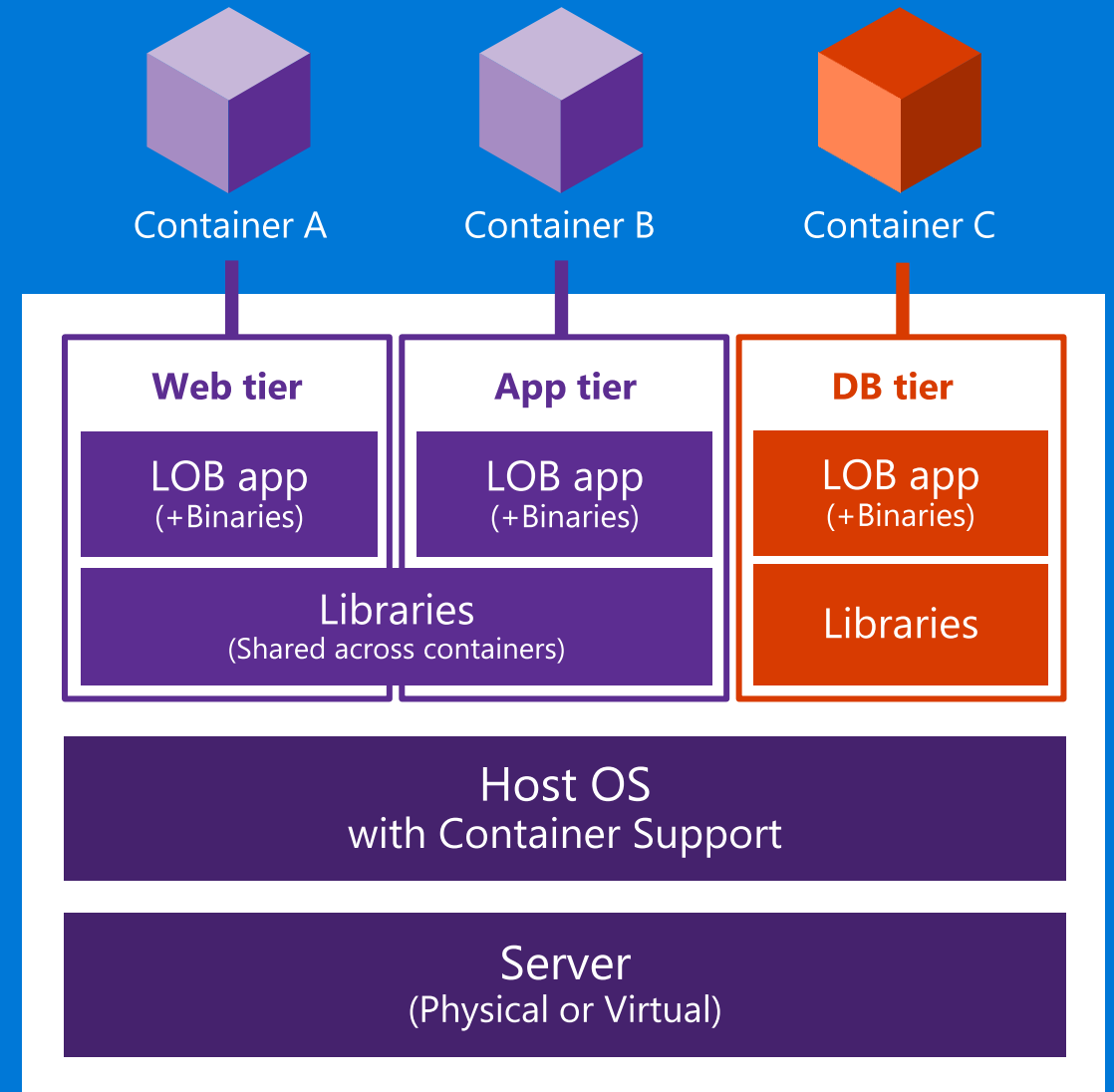
Build: write, run, and scale within containers

Run: container capabilities built into Windows Server

Manage: deploy and manage using PowerShell

Resources: define resources per container

Network: IP options for connectivity



# Hyper-V Containers

## Anatomy and key capabilities

### Spotlight capabilities

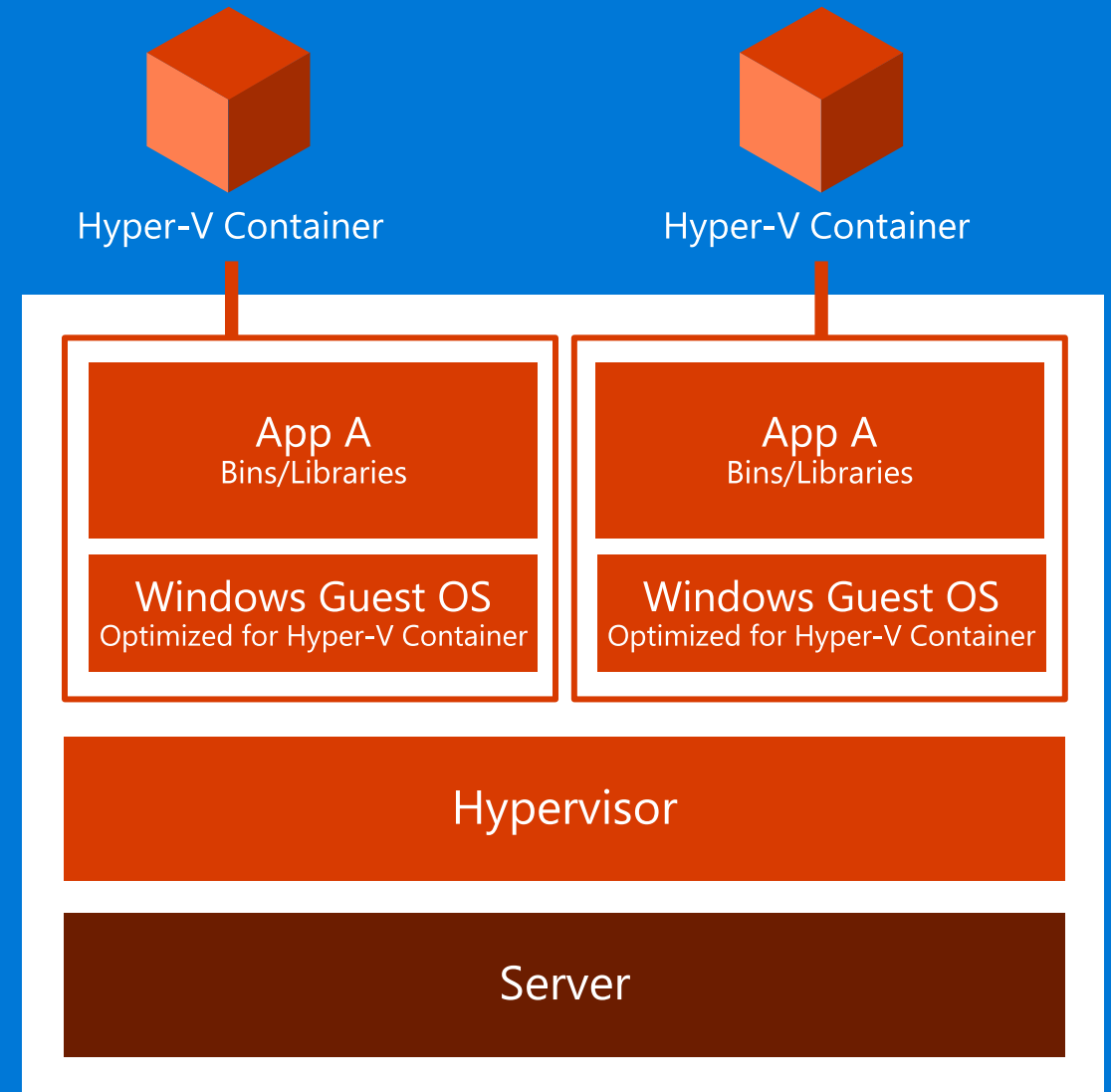
Consistency: consistent container APIs

Compatibility: identical container images

Strong isolation: dedicated kernel copy

Highly trusted: proven Hyper-V technology

Optimized: virtualization layer and OS optimized



# Technology comparison

## Comparing containers and virtual machines

	Windows Server Containers	Linux Containers	Virtual Machines
Base image	Same as host	Same as host	Any Windows/Linux
Multi-tenant security	No	No	Yes
Resource managed	Yes	Yes	Yes
Density	Higher	Higher	Lower
Startup time	Shorter	Shorter	Longer
Disk footprint	Smaller	Smaller	Larger
Application compatibility	Medium	Medium	High

**Operating System:** Containers share same OS as host system, but can run inside virtual machines to enable OS flexibility.

**Security:** Virtual machines offer a higher level of protection against threats such as kernel exploits.

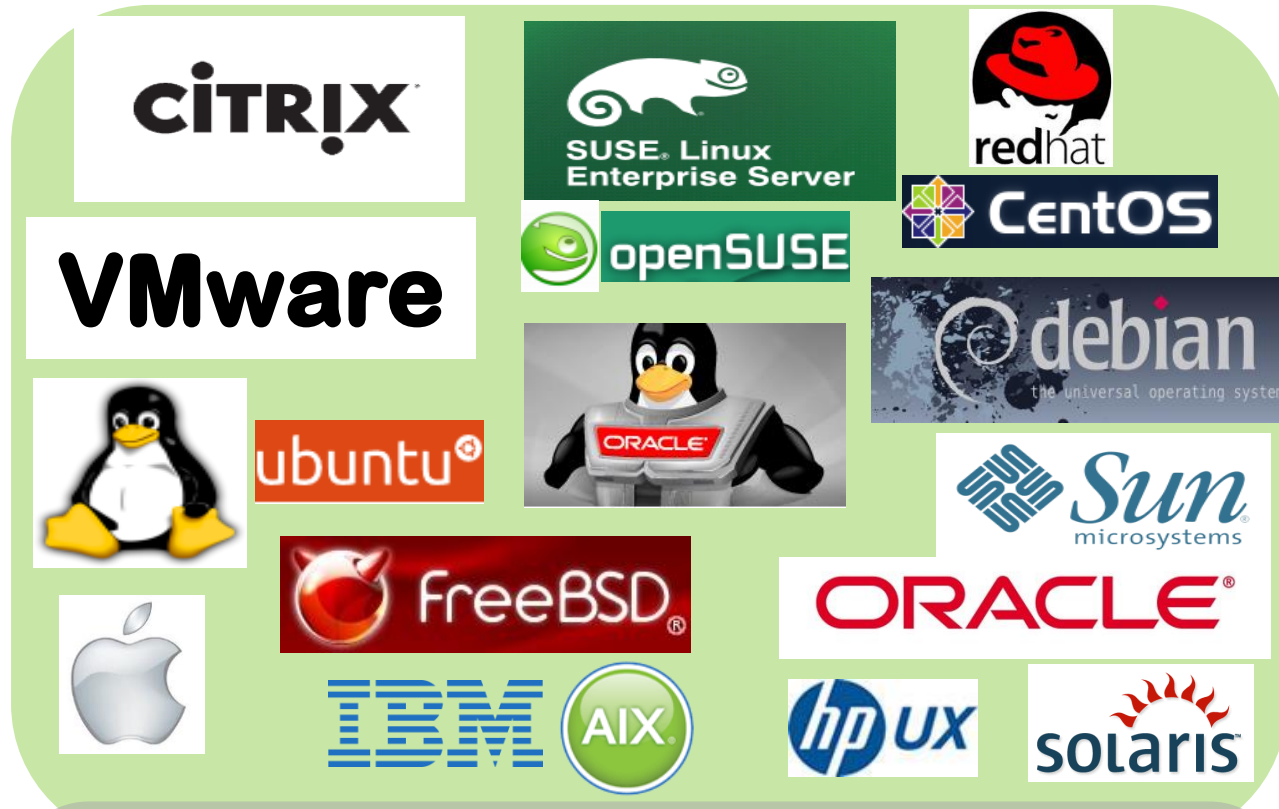
**VM features:** Whilst containers have faster startup time, virtual machines benefit from features such as live migration.

**App compatibility:** For greatest benefit, apps should be designed, architected and written for containers i.e. stateless, componentized versus ports of traditional, monolithic apps.

# Windows Server 2016 Hyper-V Capabilities

- Support for Nano Server
- Virtual Secure Mode
- Nested Virtualization
- VM Compute Resiliency
- Hyper-V Hot Add/Remove Fixed Memory
- Hyper-V Hot Add/Remove Virtual NICs
- Storage Quality of Service
- Production Checkpoints
- Hyper-V Aware Host Anti-Malware
- Multi-Level Storage Tiering
- Instant Fixed Disk Creation on ReFS
- VM Storage Resiliency
- Domain Less Clusters
- Cluster Upgrade & Cluster Node Quarantine
- Multi-Site Clustering
- Hyper-V Backup: Massive Scale Improvements
- Hyper-V Backup: Guest Cluster Support

# Microsoft and Interoperability



**Microsoft commitment** to support Linux – Red Hat, CentOS, SUSE, Open Suse, Debian, Ubuntu, Oracle Linux and FreeBSD 10 on Hyper-V or Azure;

**System Center supports** administering non-Windows platforms: Linux: Red Hat, CentOS, SUSE, OpenSUSE, Debian, Ubuntu, Oracle Linux; Unix (IBM AIX, HP-UX, Oracle Solaris) and Mac OS X systems

**System Center Virtual Machine Manager** manages Hyper-V and VMware ESX servers

“DHMC runs both Windows Server as guest operating systems under Hyper-V, as well as Linux. To date, DHMC has virtualized Web servers, sites on Microsoft Office SharePoint® Server, reporting servers, medical applications, domain controllers, file and print servers, Citrix servers, and more.”

Dartmouth Hitchcock Medical Center Case Study

# Software defined storage

- Flexible choices across a breadth of storage
- Not just bits, but also choice in integrated solutions
- Reduce storage costs



# High performance storage, fraction of the cost

## Storage Spaces Direct

Use standard servers with local storage to build highly available and scalable software-defined storage

## Storage Spaces Replica

Create affordable business continuity and disaster recovery among datacenters

## Storage QoS

Prevent noise neighbors from impacting high priority workloads with a Storage QoS policy

File share



Volume



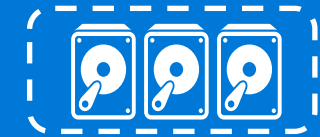
Virtual disk



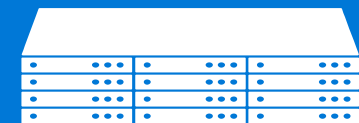
Storage Servers



Storage pool



Enclosure



Physical disks



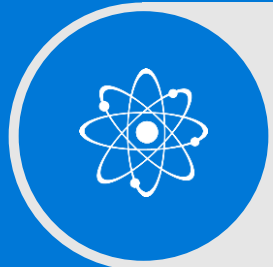
# Scale compute and storage together with storage spaces direct

<https://blogs.msdn.microsoft.com/clustering/2015/05/27/testing-storage-spaces-direct-using-windows-server-2016-virtual-machines/>  
<https://www.starwindsoftware.com/blog/microsoft-storage-spaces-direct-4-node-setup-2>



## Cloud design points and management

- Standard servers with local storage
- New device types such as SATA and NVMe SSD
- Prescriptive partner hardware configurations
- Deploy/manage/monitor with System Center & PowerShell



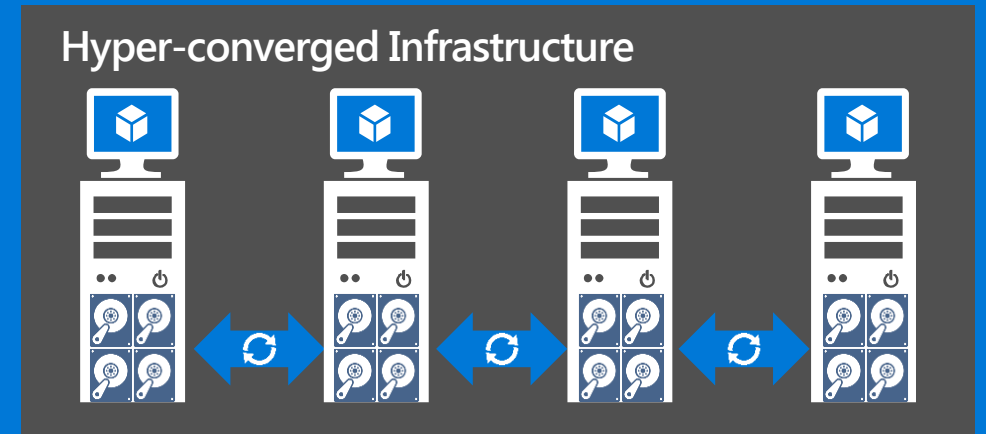
## Reliability, scalability, flexibility

- Fault tolerance to disk, server, chassis or rack failures
- Built-in cache with real-time storage tiering for performance
- Built-in erasure coding for efficiency
- Fast VM creation and efficient VM snapshots



## Simplifying the datacenter

- Collapsing storage and compute
- Removes storage area network
- Storage controller is a software service

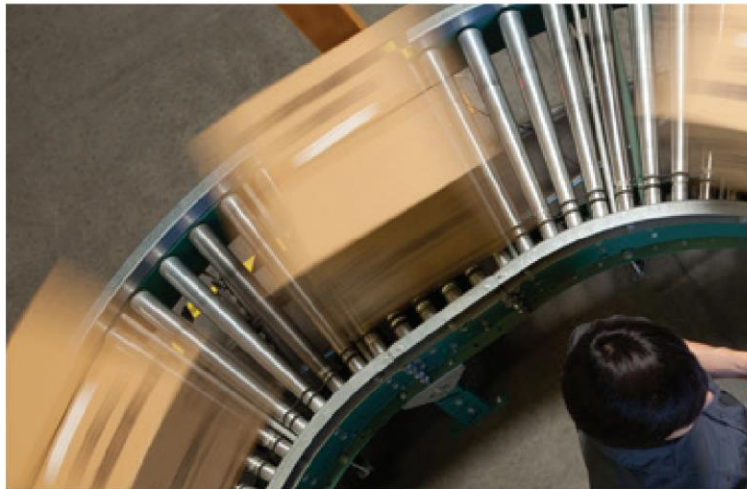


# Cisco & Windows Server Storage Services

## Cisco UCS C3260 Rack Server for Microsoft Software-Defined Storage

Solution Brief  
May 2016

Microsoft Windows Server 2012 R2 Storage Spaces and Scale-Out File Server on 2-Node Cisco UCS C3260 Storage Server



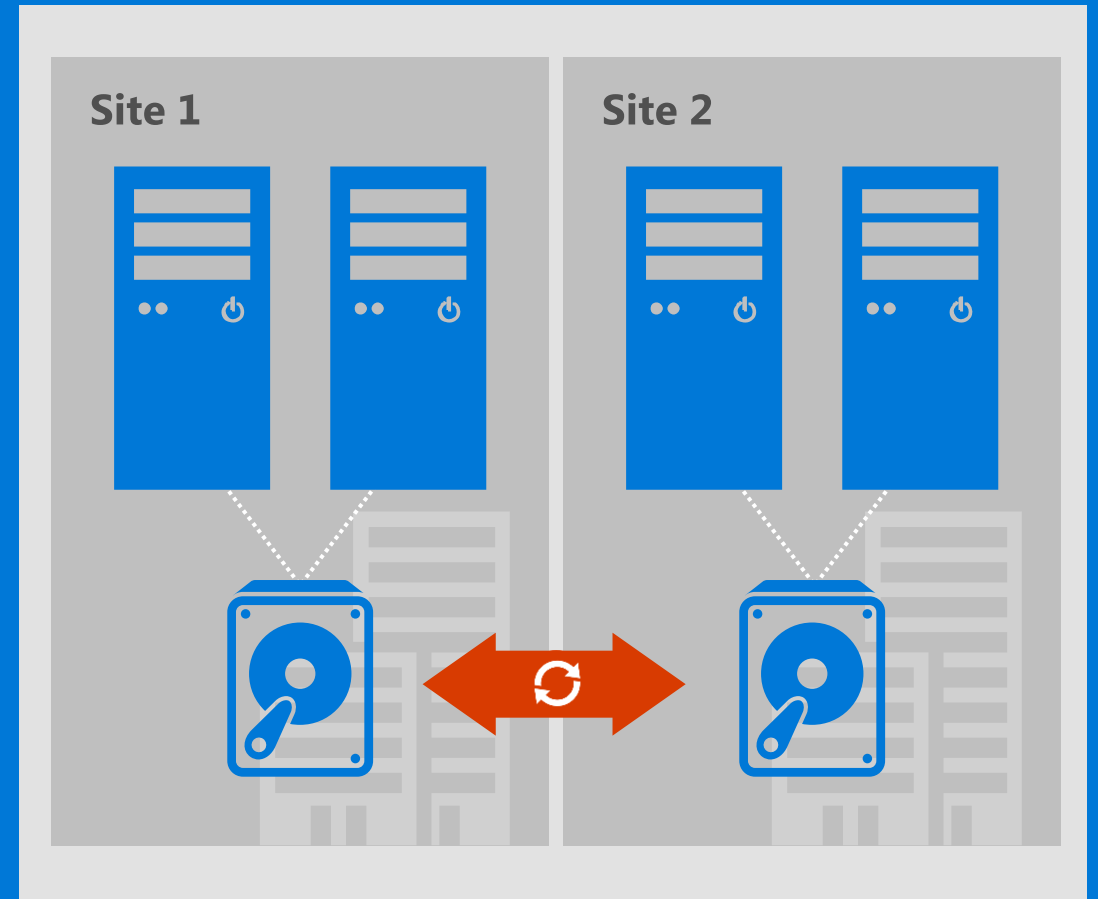
# Storage Replica

**Synchronous replication:** Storage agnostic mirroring of data in physical sites with crash-consistent volumes ensuring zero data loss at the volume level.

**Increase resilience:** Unlocks new scenarios for metro-distance cluster to cluster disaster recovery and stretch failover clusters for automated high availability.

**Flexible:** Server to server, cluster to cluster, and stretch cluster. Local disks, Storage Spaces Direct, clustered disks. NTFS, REFS, CSVFS. TCP, RDMA. Synchronous and asynchronous.

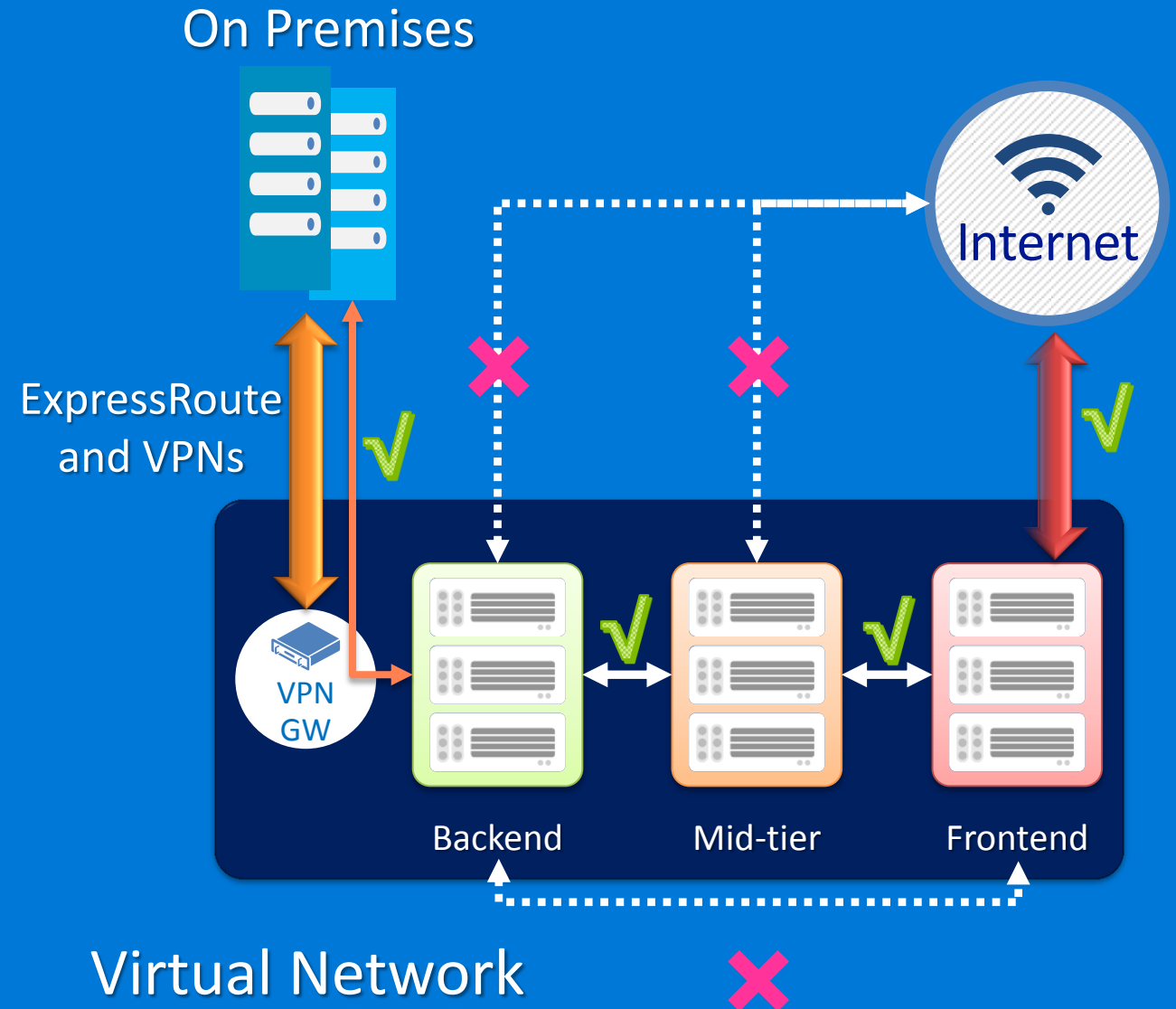
**Streamlined management:** Graphical management for individual nodes and clusters through Failover Cluster Manager and Azure Site Recovery. Full PowerShell and SMAPI support.



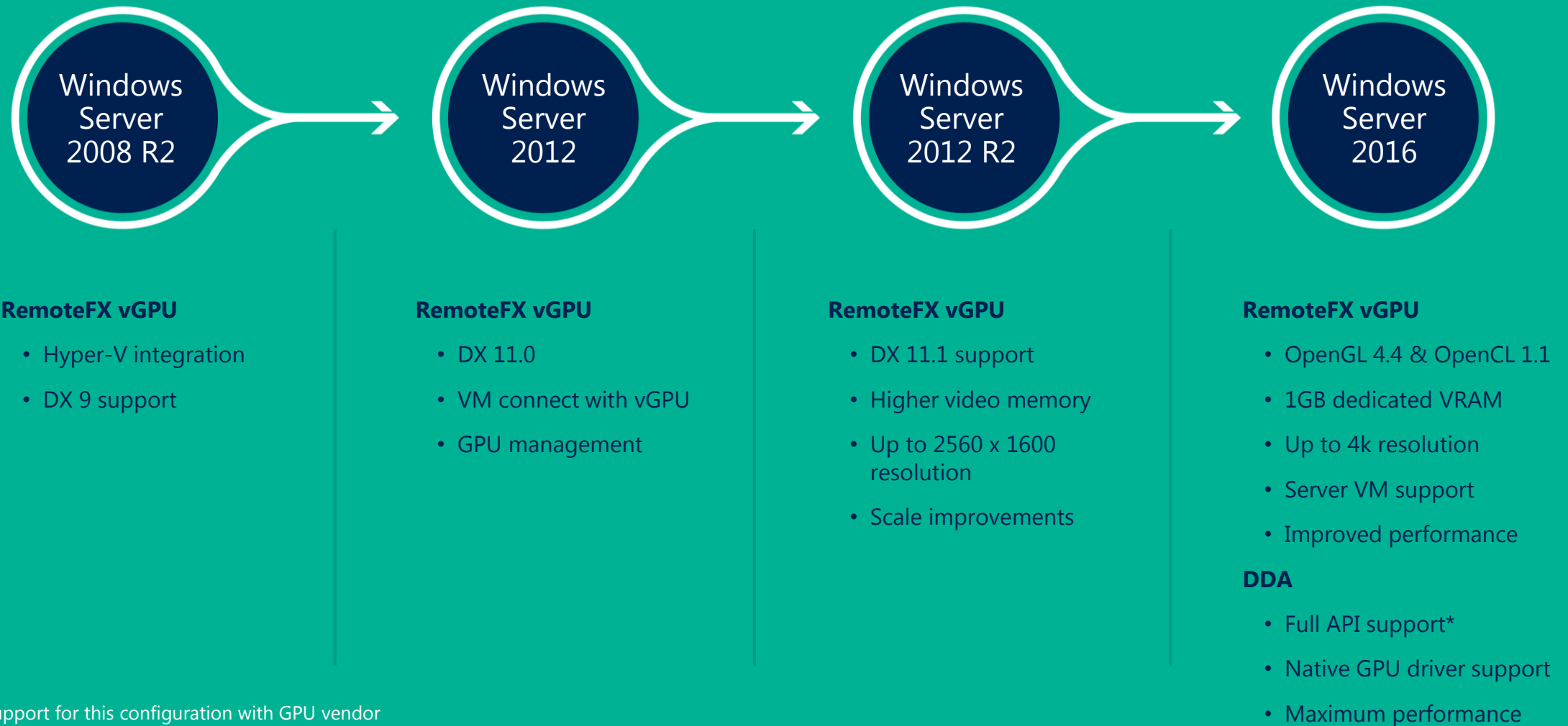
<https://technet.microsoft.com/en-us/windows-server-docs/storage/storage-replica/storage-replica-overview#synchronous-replication>

# New Distributed Firewall and Load Balancer

- Segment network to meet security needs
- ACLs on both directions
- Can protect Internet and internal traffic
- Enables DMZ subnets
- Associated to subnets/VMs and now NICs
- ACLs can be updated independent of VMs



# Windows Server 2016 RDS graphics virtualization evolution



\*Verify card support for this configuration with GPU vendor

# Next generation of hybrid cloud: Azure to your datacenter

Several new solutions that will continue to expand the industry's most complete cloud

## **Microsoft Azure Stack**

a next-generation cloud infrastructure that brings Azure IaaS and PaaS capabilities to customers' datacenters

## **Windows Server 2016 & System Center 2016**

the next versions of the popular application platform and management solutions

## **Microsoft Operations Management Suite**

a new hybrid management solution that helps you manage your corporate workloads no matter where or what they run (i.e., AWS, OpenStack, Azure, VMware, Linux, Windows Server)

# Visibility – Solution Offerings



## E2E on-premise monitoring experience

- ✓ End-to-end monitoring and diagnostics of infrastructure and workloads
- ✓ Alerts, notifications and other controls
- ✓ Strong native support, and incremental 3<sup>rd</sup> party
- ✓ Integrates with other on-premise systems

System Center

## On-demand & hybrid monitoring experience

- ✓ Hybrid extensions (across on-premise and cloud)
- ✓ Transition between day-to-day monitoring and analytics driven diagnostics
- ✓ Better aligned to market requirements
- ✓ Wider and deeper health insights

System Center +  
Operations Management Suite (OMS)



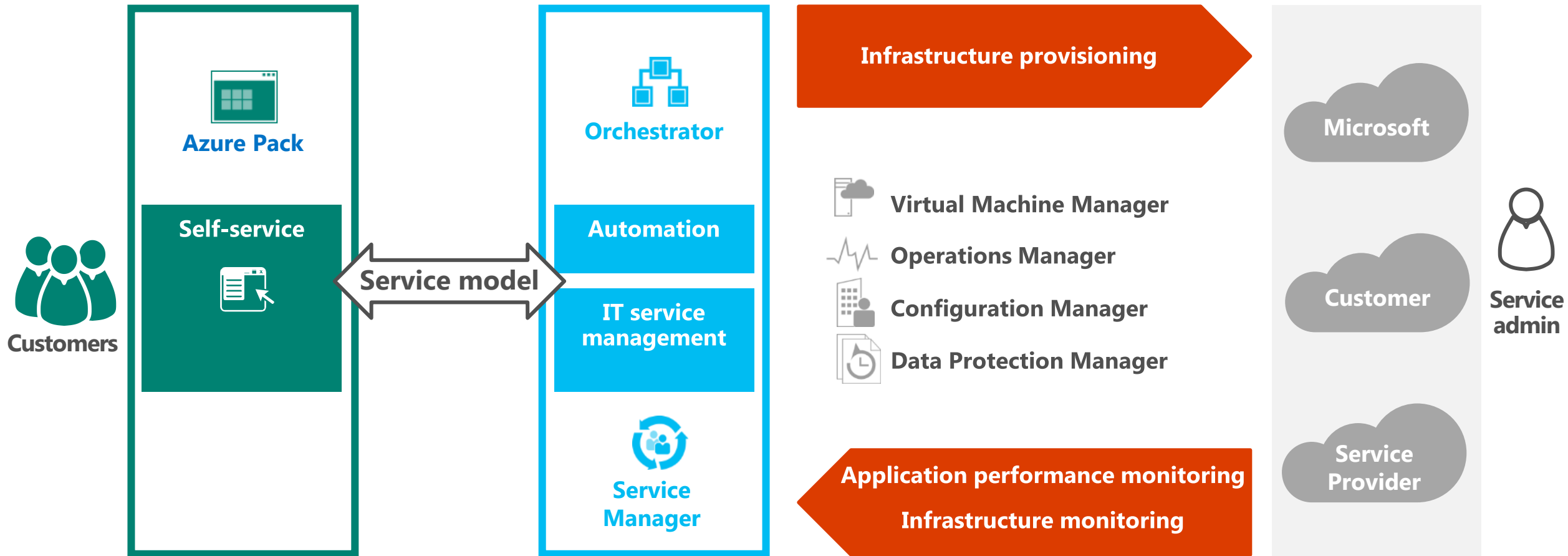
## Cloud-inspired & platform agnostic

- ✓ Data analytics
- ✓ Bottomless capacity and elastic scalability
- ✓ No infrastructure to maintain
- ✓ Innovations on-boarded at a faster rate

Operations Management Suite (OMS)

# System Center

## Unified management for the Cloud OS



# Why Microsoft for Management & Virtualization



## Low TCO/High ROI

- Lower upfront investment costs
- Lower deployment, management, and maintenance costs
- Extends current IT investments



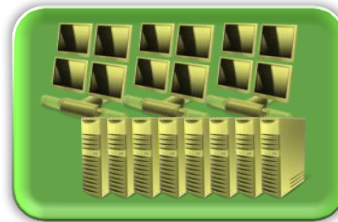
## Datacenter to Desktop

- Full range of products and solutions
- Large partner ecosystem



## The Platform You Know

- Single management platform
- Use the skills, tools, and processes you already know



## End-to-End Management

- Physical, virtual machine and application management
- Interoperate with existing Microsoft infrastructure
- Easily manage a heterogeneous environment



**Microsoft** Partner Network™

# Benefits of System Center

- control physical or virtual on-premise infrastructure
- control cloud infrastructures: Azure, Amazon etc.
- application performance monitoring - **SCOM**
- monitoring of services, applications, network devices –**SCOM**
- asset management, deployment of operating systems and applications, mobile device management, antivirus management, security configuration management – **SCCM & Endpoint Protection**
- backup on disk, tape and Azure for Microsoft and VMware - **DPM**
- Service Desk solution with incident management, problem management, change management, self service -**Service Manager**
- virtual datacenter management on-premise and cloud **Virtual Machine Manager & SCOM**
- orchestration and processes automatization & integration with VMware, HP Open View, IBM Tivoli, CA Unicenter, BMC, Linux/Unix, Symantec - **Orchestrator**

# System Center 2016 solution overview

## System Center capabilities

### Infrastructure provisioning

Enterprise-class multi-tenant infrastructure for hybrid environments



### Infrastructure monitoring

Comprehensive monitoring of physical, virtual, and cloud infrastructure



### Automation

Application-owner agility while IT retains control



### Backup

End-to-end backup and recovery for private clouds, physical machines, clients, and server applications



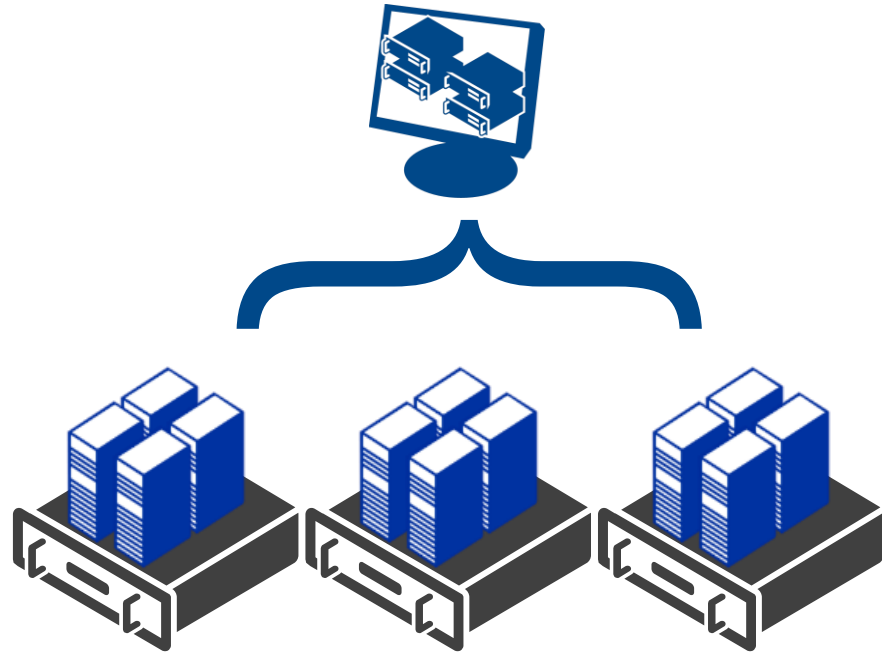
### IT service management

Flexible service delivery



# System Center for the datacenter

Virtual Machine Manager  
VM & cloud management



Hyper-V hosts



Operations Manager  
Infrastructure & application  
monitoring & alerting



Service Manager  
IT service management &  
IaaS self-service



Orchestrator  
Integration & automation of  
key technologies & processes



Data Protection Manager  
Continuous protection of key  
applications & workloads

# Infrastructure provisioning

Enterprise-class multi-tenant infrastructure for hybrid environments



## IT demands

Effectively manage virtual environments at-scale

Reduce infrastructure complexity

Deliver efficient infrastructure services across customer base

Utilize a single tool for on-premises and cloud provisioning

## System Center delivers

Enterprise-class virtualization management with robust Linux support

Support for Windows Server scale & performance:  
Fiber-channel SAN connectivity

Simplified provisioning & migration

- Windows Server file storage & Storage Spaces management
- Automated Hyper-V cluster upgrades with VMM
- Service templates & runbooks for System Center components
- Protection & recovery across datacenters

Multi-tenant cloud infrastructure

- Multi-hypervisor clouds
- Virtual networks management
- Automated standards-based switch configuration
- Multi-tenant edge gateway provisioning
- Service management automation

Extend familiar management to Windows Azure

- Workloads migrated to Microsoft Azure Virtual Machines
- Microsoft Azure Integration Pack

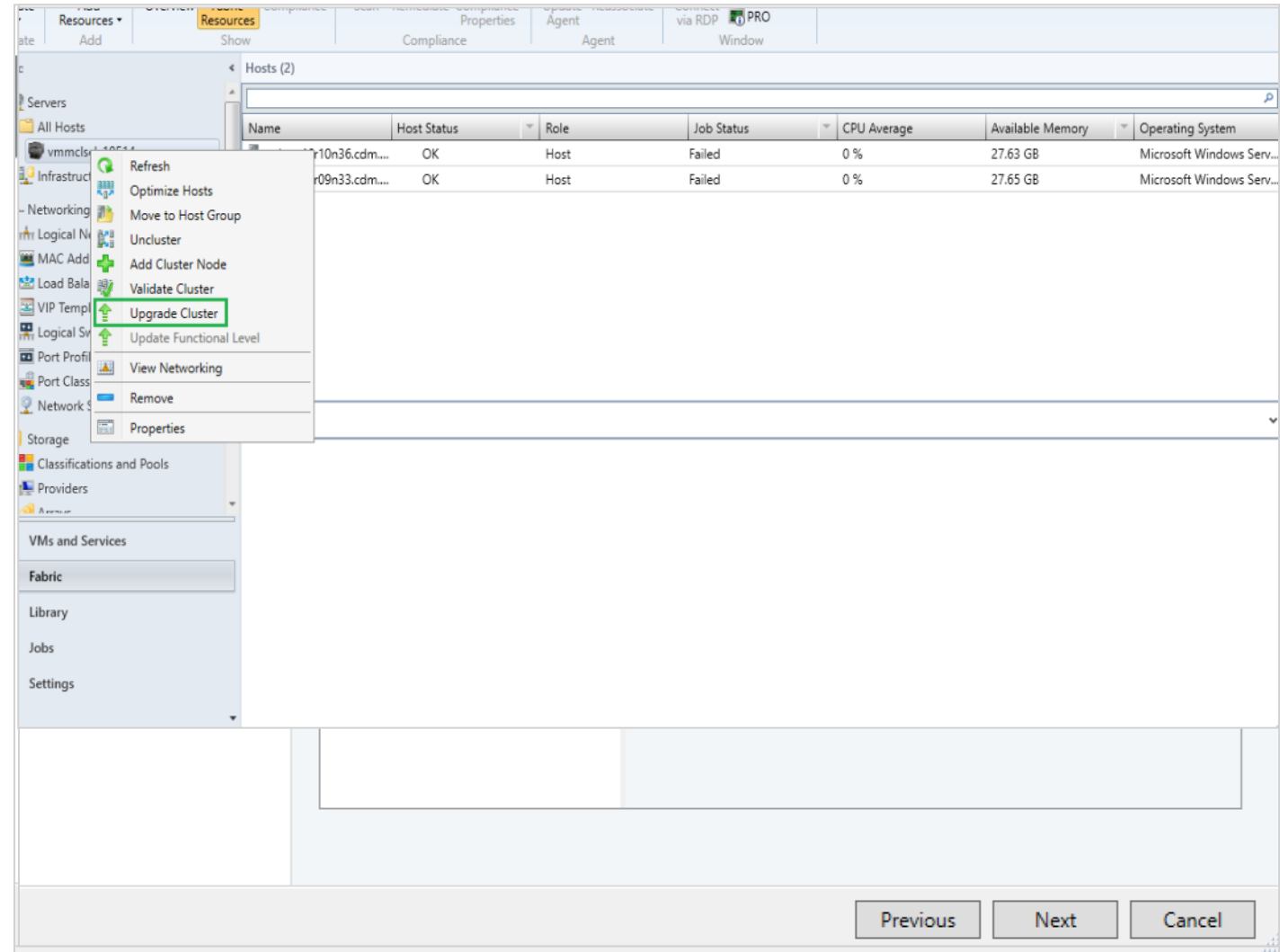
# Virtual Machine Manager

Gain control and visibility of core infrastructure

**Software-defined datacenter management** – Continuously available file-based server application storage with shared storages through enhanced Scale-Out File Server management

**Resource provisioning** – Unify management by adding Microsoft Azure subscriptions to VMM and perform basic actions on Azure instances. Deploy Storage Spaces Direct, both in hyper-converged and disaggregated topologies. Centrally manage Hyper-V hosts, host clusters, and SOFS with VMM. Single point to manage multiple hypervisor platforms, including support for VMware ESX hosts and vCenter servers

**Managing fabric resources and clusters** – Centrally monitor end-to-end storage performance and create policies to meet quality of services.



# Accelerated VM Deployment

with System Center Virtual Machine Manager

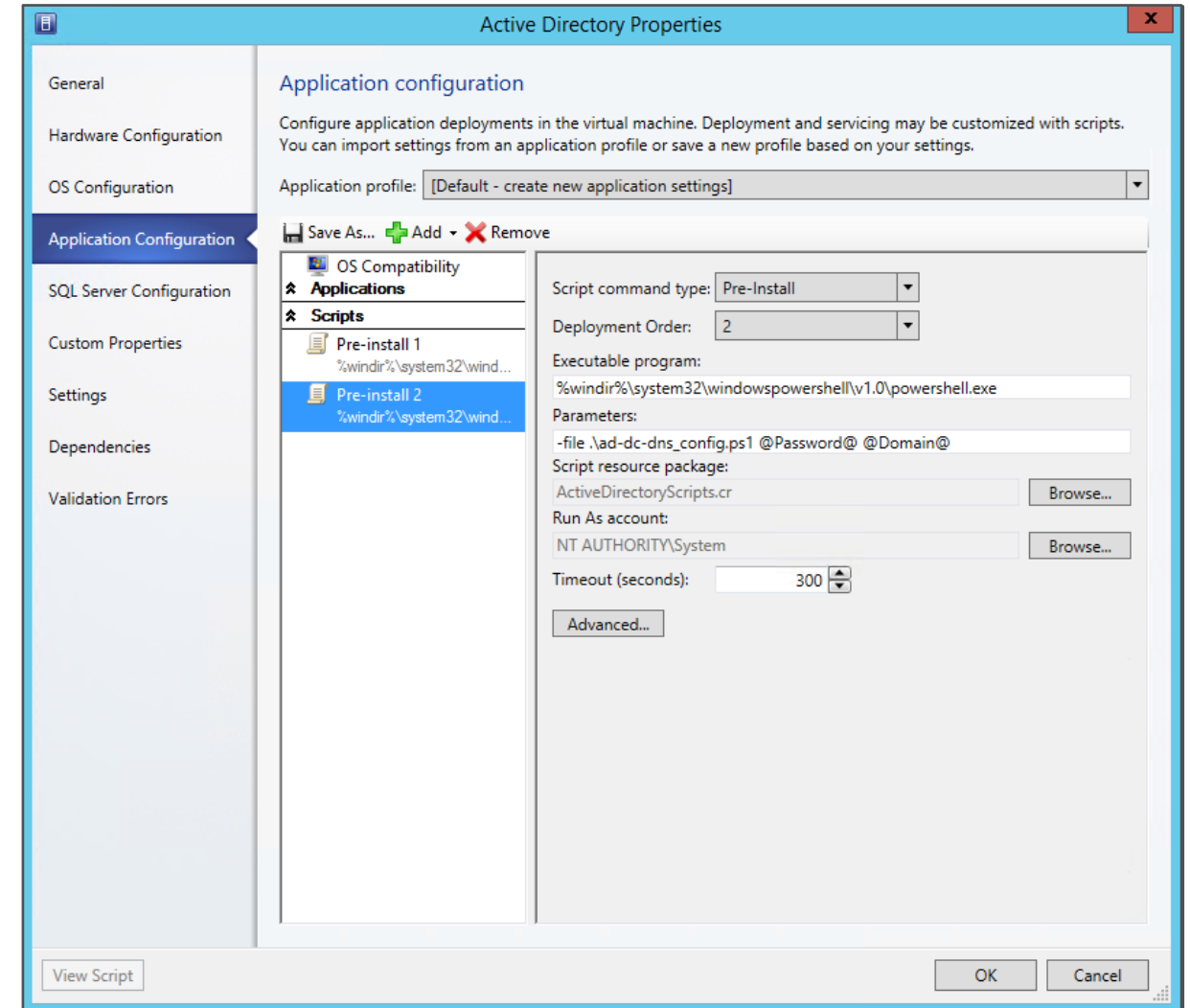
## VM Templates with Virtual Machine Manager

Allow a **standardized, repeatable mechanism** to rapidly deploy virtualized operating systems.

**Hardware** – VMM uses hardware profiles, along with a **sysprepped VHD/X** file to streamline deployment. VMM will create the sysprepped VHD/X for you.

**OS Configuration** – Go beyond regular template configuration with granularity around domain join, admin password, product key, but even the **Windows Server Roles & Features**.

**Application Configuration** – Add application-level configurations, such as MS Deploy Web Packages, Server App-V, SQL DAC or **specific pre or post installation scripts to tailor deployment**.



# Provisioning: Private cloud & virtual datacenters



Virtual Machine  
Manager

- ✓ Template driven infrastructure
- ✓ Simplified provisioning & migration
- ✓ Multi-cloud management of Azure and AWS VMs
- ✓ Hyper-V and VMware management
- ✓ Virtual storage and network management
- ✓ Partner extensible solution for capacity optimization and billing

## WHAT'S NEXT SC 2016

### Ease of Use

- Simplified Networking
- Unified experience for cluster creation
- Easier cluster upgrades with rolling upgrade
- Improved Failover Cluster consistency
- Improved diff disk features

### Security and Infrastructure

- Shielded VM management
- Guarded host management
- Improved resiliency during intermittent faults for cluster availability

### Expanded Fabric Management

- Enhanced SOFS management
- Azure Site Recovery integration with Storage Replica and SAN replication
- Storage QoS policy management
- Manage Port ACLs
- CDN support for guests
- Deploy and manage SDN at scale
- Nano Server management

*Enables enterprise operations teams to virtualize applications simplifying datacenter and cloud management*



# Azure Pack - For service providers and enterprises



Microsoft Azure  
technology in your  
datacenter

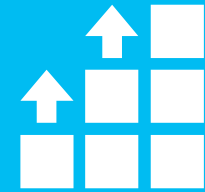
Enterprise class



Easy and cost effective



Open and interoperable



Azure Pack

Windows Server + System Center

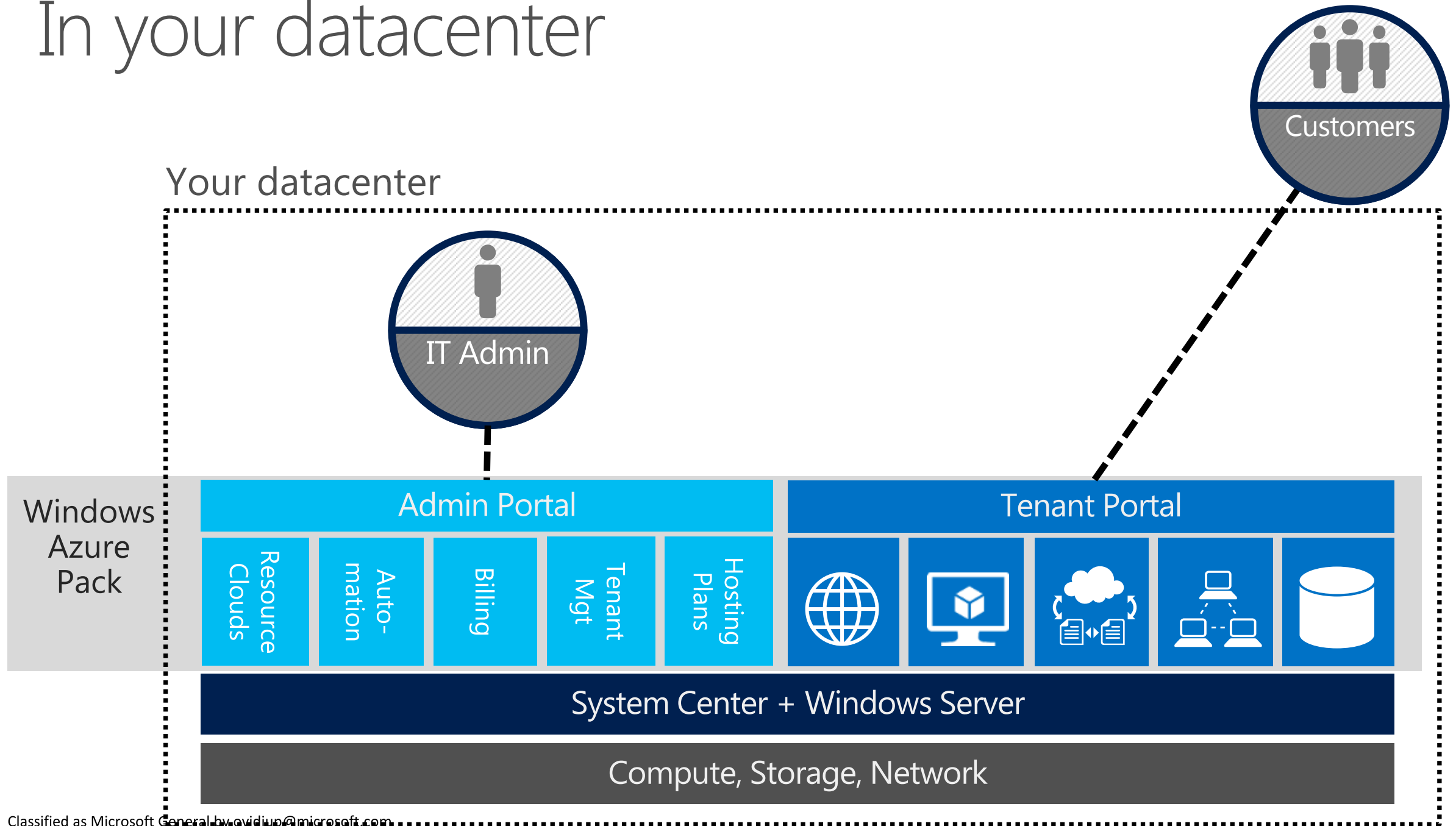
- Familiar technology
- On-prem connect
- Azure consistent
- Virtualization
- Management
- Service bus

- Multi-tenant cloud
- Web PaaS, and IaaS
- Templated services
- Standard hardware
- Automation

- VM portability
- Web App Portability
- OData Integration API
- Node.js, PHP, ASP.NET
- GitHub, BitBucket etc
- Linux support

# In your datacenter

Your datacenter



# Operations Manager

## Comprehensive infrastructure & application monitoring

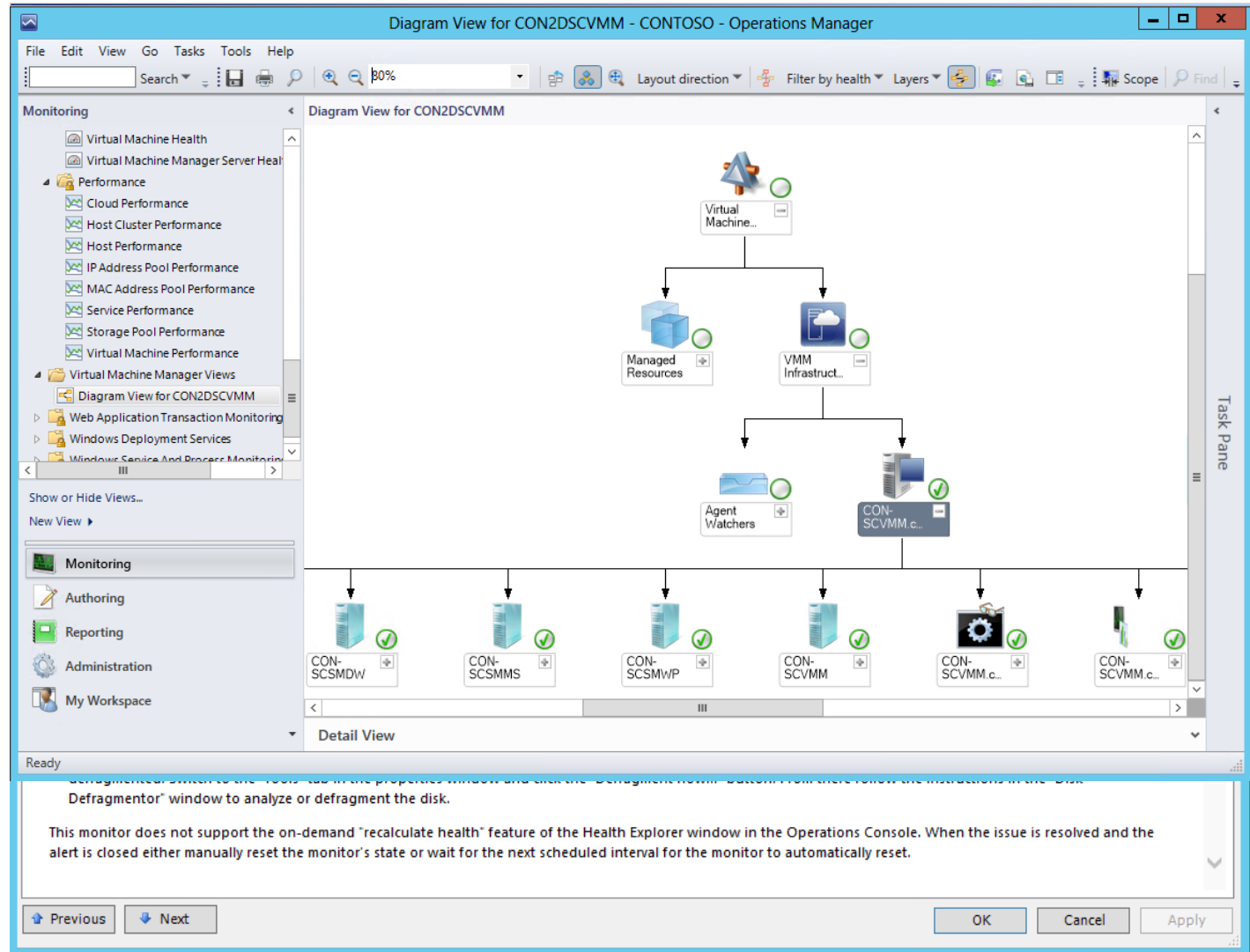
**Rich dashboards** – Monitors the key elements of the infrastructure: physical, virtual, hardware, software, and within applications and presents the key information through simple visual dashboards

**Centralized alerting** – OpsMgr collects information about monitored services and raises an alert if there's an issue

**Topology views** – Visualize key systems and applications across physical and virtual

**Maintenance schedule** – Schedule maintenance at a future time, schedule maintenance jobs, and view modes from a single screen

**Extend OM with OMS** – Configure assessment, alert management, and capacity planning by connecting OM with OMS



# Windows Server Monitoring

## Windows Server Management Pack

Enables IT to **detect, alert on,** and **automatically respond** to critical events and performance indicators.

Supports **Windows Server 2003 through to Windows Server 2016**

Automatically adds new views for **Health Monitoring, Operating System Events & Performance**

Within views, there are a number of **state views, performance dashboards,** and **topologies,** providing granular depth & insight across the **OS, storage, memory** and **CPU.**



# Active Directory Monitoring

## With System Center Operations Manager

### Active Directory Management Pack

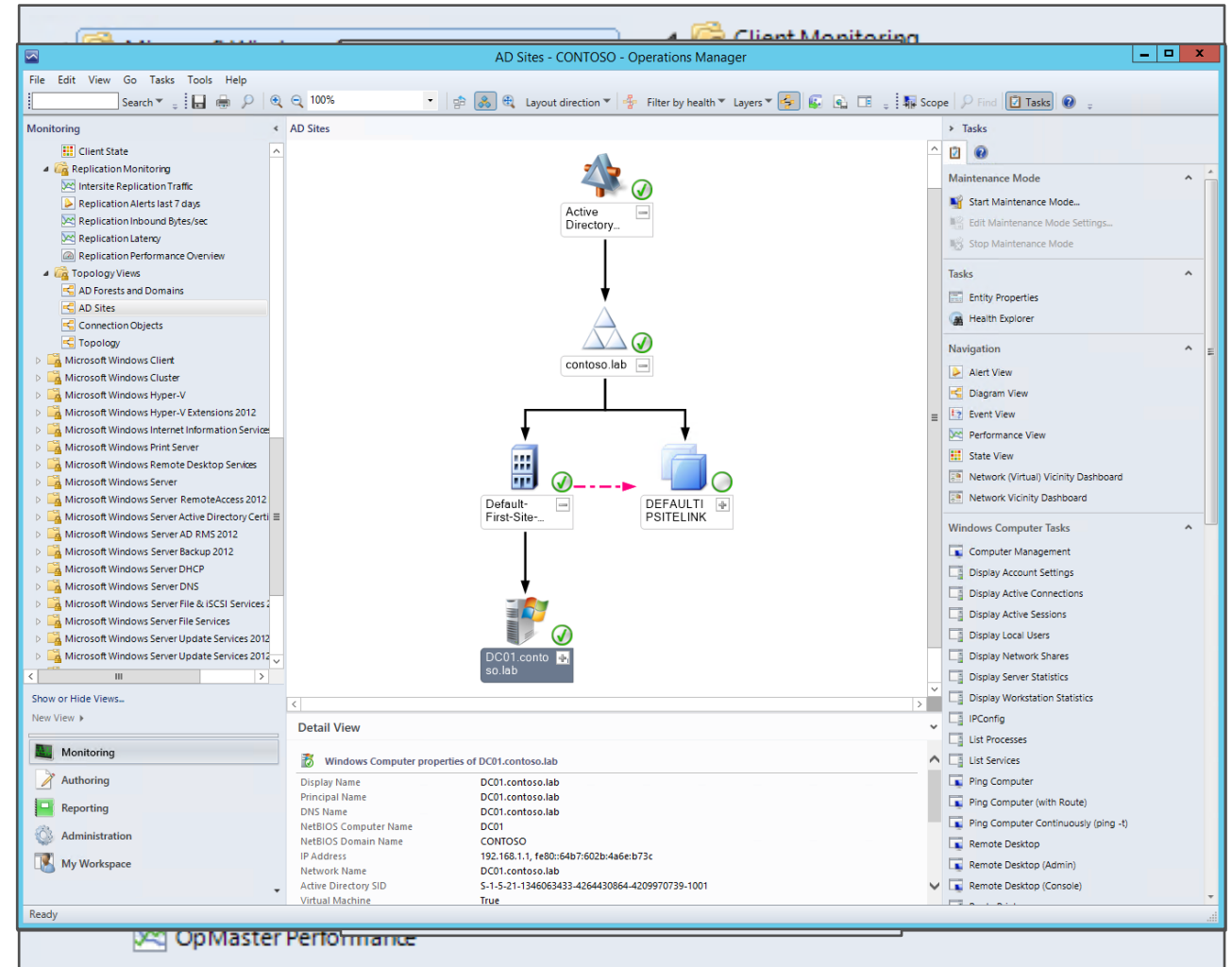
Provides **proactive** and **reactive monitoring** of your Active Directory deployment

Monitors **events** that are placed in the **Application, System, and Service event logs** by various Active Directory components and subsystems

Monitors the overall **health** of the Active Directory system, alerts you to **critical performance issues** and **enables context-sensitive actions**.

Monitors **Domain Controllers** and **health of clients** using AD resources along with **health of vital processes** that your Active Directory deployment depends upon, including **Replication, Trusts, LDAP, SYSVOL, Directory Services** and more.

Provides a **number of inbox reports & rich views** to showcase a variety of AD-related current & historical information.



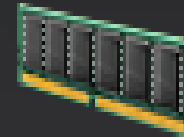
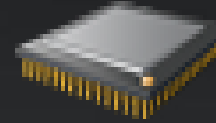
# Network Monitoring in Operations Manager

- Out of the box discovery, monitoring, and reporting
- Server to network dependency discovery
- Multi-vendor support
- Multi protocol support
  - SNMPv1/v2c/v3
  - IPv4 and IPv6
- Deliver robust platform for partners to build on



# Network Monitoring

- **Port/Interface**
  - Up/Down (operational & admin status)
  - Volumes of inbound/outbound traffic
  - % Utilization
  - Drop & Broadcast rates
- **Processor**
  - % Utilization
- **Memory**
  - In depth memory counters (Cisco Only)
  - Free memory



# Network monitoring in Operations Manager

## Advantages of System Center

**Network Summary Dashboard** – provides a view of important data for the nodes and interfaces of the network



**Nodes** – A node can be any device connected to a network. Nodes can be switches, routers, firewalls, load balancers, or any other networked device



**Network Summary Dashboard - OM\_Contoso - System Center Operations Manager 2012**

**Monitoring**

- Discovered Inventory
- Distributed Applications
- Task Status
- UNIX/Linux Servers
- Windows Computers
- Agentless Exception Monitoring
- Data Protection Manager 2012
- Data Warehouse
- Microsoft Audit Collection Services
- Microsoft SQL Server
- Microsoft Windows Internet Informati...
- Microsoft Windows Server
- Network Monitoring
  - Active Alerts
  - Hosts
  - HSRP Groups
  - Legacy Network Devices
  - Network Devices
  - Network Summary Dashboard
  - Routers
  - Switches

**Network Summary Dashboard**

**Nodes with Slowest Response (Previous 24 hours)**

Node State	Node Name	Average Response Time (ms)
✓	10.193.220.129	21
✓	10.193.220.211	15.9
✓	10.193.220.141	15.4
✓	10.193.220.174	15.1
✓	10.193.220.242	14.4
✓	10.193.220.228	13.8
✓	10.193.220.210	13.6
✓	10.193.220.135	13.1
✓	10.193.220.226	12.9

**Nodes with Highest CPU Usage (Previous 24 hou...)**

Node State	Node Name	CPU Usage
✓	10.193.220.129	8%
✓	10.193.220.196	7%
✓	10.193.220.135	6%
✓	10.193.220.132	6%
✓	10.193.220.197	3%
✓	10.193.220.242	3%
✓	10.193.220.141	1%

**Interfaces with Highest Utilization (Previous 24 hours)**

Node State	Node Name	Interface State	Interface Name
✓	10.193.220.135	✓	IF-10.193.220.135/10128 [Gi0/28] [10.193.220.6] [Link to 43_1217_Ci4506_01(g...
✓	10.193.220.129	✓	IF-10.193.220.129/4 [Gi2/1] [10.193.220.1] [Link to 43_1217_Ci3560_01(g0/28)]
✓	10.193.220.129	✓	IF-10.193.220.129/9 [Gi2/6] [10.193.220.5] [Link to 43_1217_Ci3560_02(g0/28)]
✓	10.193.220.132	✓	IF-10.193.220.132/10128 [Gi0/28] [10.193.220.2] [Link to 43_1217_Ci4506_01(g...
✓	10.193.220.135	✓	PORT-10.193.220.135/1.1 [Gi0/1] [Link to 43_1217_Ci3750_Stack01 [g1/0/28]]
✓	10.193.220.196	✓	PORT-10.193.220.196/1.27 [Gi1/0/27] [Link to 43_1217_Ci3560_01 [g0/1]]
✓	10.193.220.196	✓	PORT-10.193.220.196/1.28 [Gi1/0/28] [Link to 43_1217_Ci3560_02 [g0/1]]
✓	10.193.220.132	✓	PORT-10.193.220.132/1.1 [Gi0/1] [Link to 43_1217_Ci3750_Stack01 [g1/0/27]]
✓	10.193.220.196	✓	PORT-10.193.220.196/2.28 [Gi2/0/28] [Link to 43_1217_Ci3560_02 [g0/13]]

Task Pane

Ready

## Network Summary Dashboard

### Nodes with Slowest Response (Previous 24 hou...

Node State	Node Name	Average Response Time (ms)
	cmc.odyssey.com	7.5
	switch4.odyssey.com	2.6
	Library1.odyssey.com	1.9
	172.16.231.51	1.6
	cplit1921	1.6
	172.16.231.101	0.7

### Nodes with Highest CPU Usage

Node State	Node Name	CPU Usage
	2621xm.odyssey.com	0%

### Interfaces with Highest Utilization (Previous 24 hours)

Node State	Node Name	Interface State	Interface Name	Interface Usage
	switch1.odyssey.com		PORT-18	0%
	switch4.odyssey.com		PORT-1	0%
	switch4.odyssey.com		PORT-2	0%
	2621xm.odyssey.com		IF-1	0%
	switch1.odyssey.com		PORT-23	0%

### Interfaces with Most Receive Errors (Previous 24 hours)

Node State	Node Name	Interface State	Interface Name	Receive Errors/sec	Receive Discards/sec
	switch4.odyssey.com		PORT-1	0	0

# SCOM – Network Map Design

Vicinity View

Zoom to page Zoom: 75% Hops: 1 Show Computers

```
graph TD; Server[ZEUS098D.smx.net] --- Switch1[42_2619_Ci3560_02]; Switch1 --- Switch2[42_2619_Ci3750_Stack01]; Switch1 --- Switch3[42_2619_Ci4506_01];
```

Details View

Name	GNA-00-1F-29-46-DD-15<->PORT-42_2619_Ci3560_02/1.4
Description	Bridge

Tasks

- Health Explorer

Navigation

- Alert View
- Diagram View
- Event View
- Performance View
- State View

Network Connection Tasks

- Get Monitor State
- Reset State
- Trigger State

Report Tasks

- Alert Logging Latency
- Alerts
- Availability
- Configuration Changes
- Event Analysis
- Health

# Extensibility via partners

Operations Manager management pack catalog representative partners

<http://pinpoint.microsoft.com/en-US/category.aspx?catid=1&fpf=700004>

Bridgeways

Oracle, DB2, Apache HTTP Server, others

NiCE

Oracle, DB2, Domino, BlackBerry Enterprise Server (BES)

E-View

AS/400

Veeam

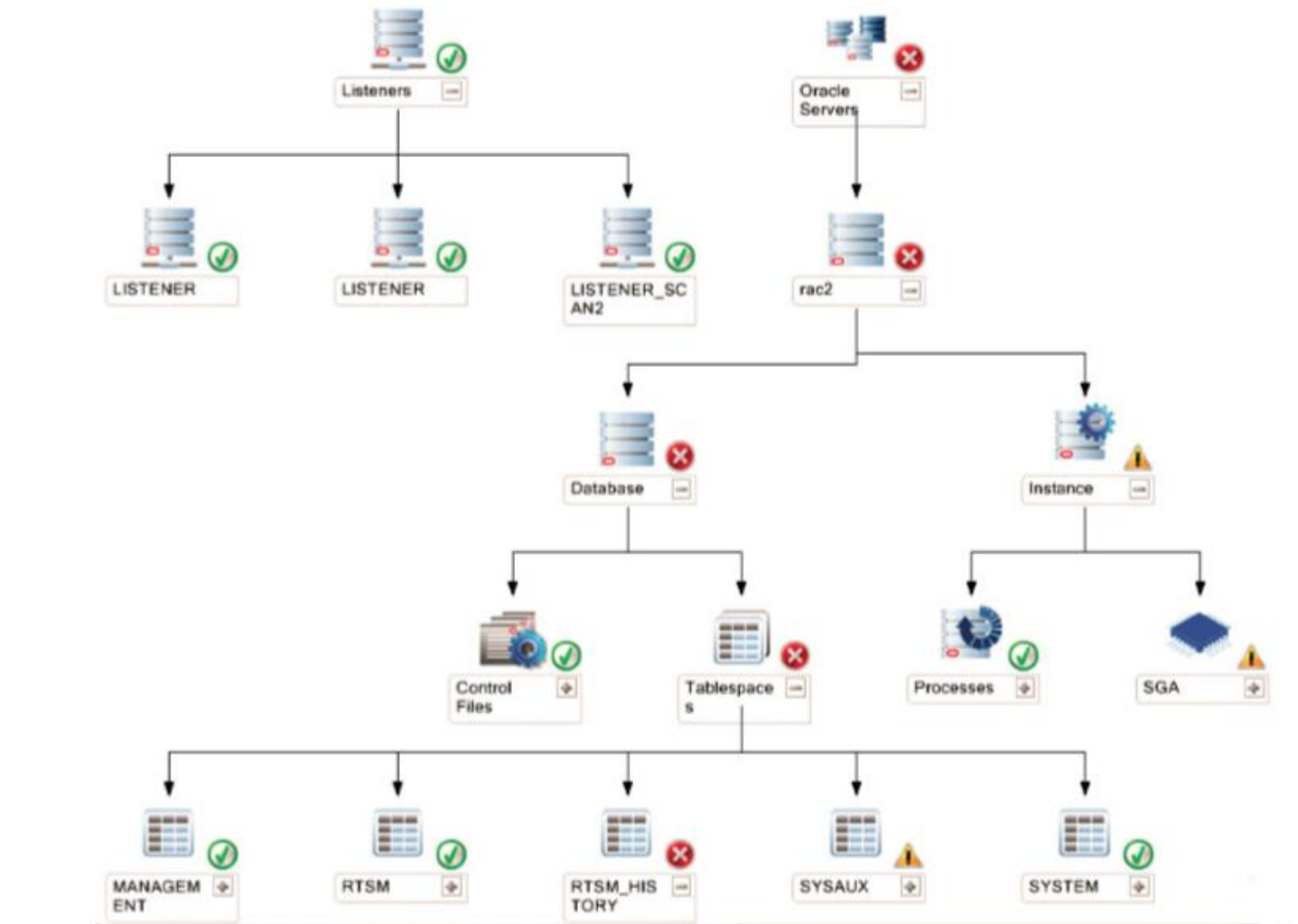
VMware ESX

# Extensibility via partners

## Oracle monitoring

- Insight how memory, physical design and maintenance affect performance
- Monitor the entire Oracle environment (RAC)
- Understand and manage your Oracle environment like an ecosystem that is constantly changing in terms of physical design, transactions, and memory

You need 3<sup>rd</sup> party management pack



# Extensibility via partners

## SAP monitoring

Flexible deployment options and configuration:  
management pack's SAP connector can be installed and ran on:

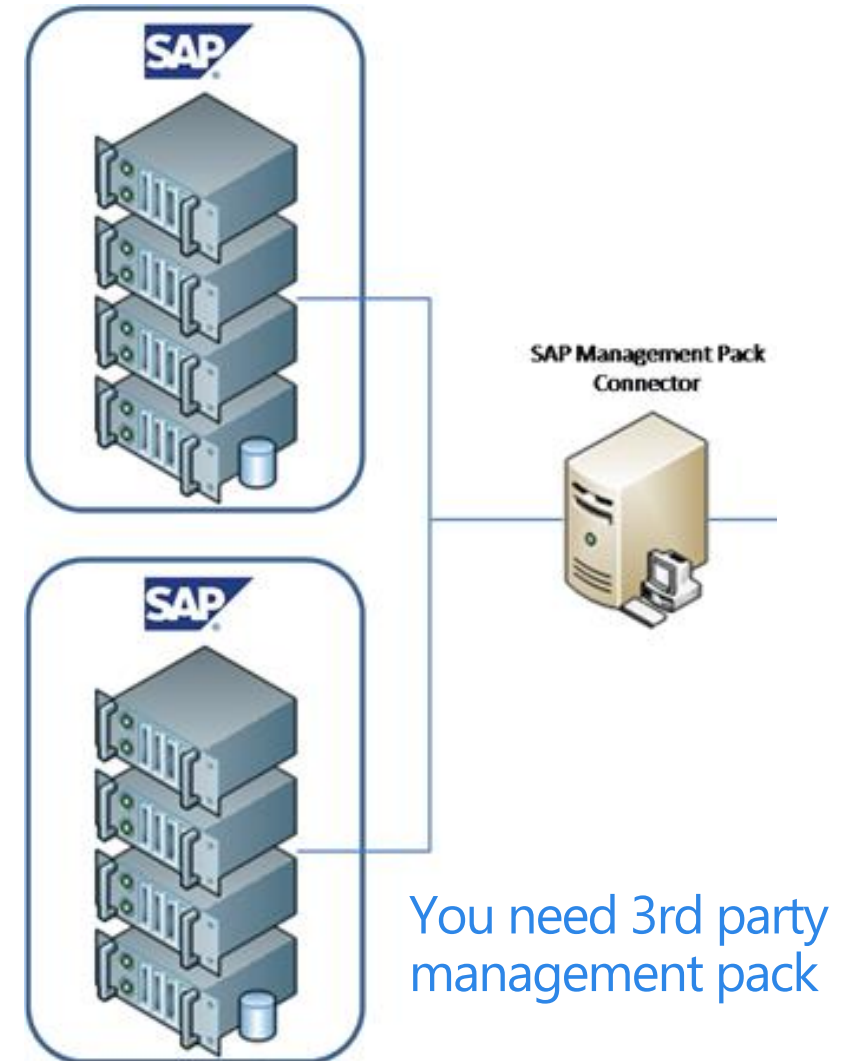
- SCOM Agent or management server machine
- One or more remote Windows servers
- Under the same active directory domain as the management server or outside the domain

## Built-in failover functionality

- Automatic failover/restore
- Automatic configuration synchronization

## Heterogeneous SAP support

Connect to SAP Systems running on any platform, be it Windows Server 2008, Unix, Linux, iSeries or zOS



# Hardware monitoring (e.g. Cisco)

The screenshot shows the 'Monitoring Overview' page in the vmdc-hyperv - Operations Manager. The interface includes a menu bar (File, Edit, View, Go, Tasks, Tools, Help), a search bar, and a left-hand navigation pane. The main content area displays 'Required Configuration Tasks' and 'State and Alerts'.

**Monitoring Overview**

**Required Configuration Tasks:**

- In order for Operations Manager to manage and monitor your network you must complete the following steps:
- Required: Configure computers and devices to manage
- Required: Import management packs
- Required: Enable Notification Channels
- Upgrade to full version

**State and Alerts:**

Category	Go to	Critical	Warning	Healthy	Maintenance Mode	Unknown Status
Computer Health	Go to Computers	0	0	1	0	0
Distributed Applications	Go to Distributed Applications	0	0	0	0	0

**Monitoring Navigation:**

- Monitoring
  - Active Alerts
  - Discovered Inventory
  - Distributed Applications
  - Task Status
  - UNIX/Linux Computers
  - Windows Computers
  - Agentless Exception Monitoring
  - Application Monitoring
  - Cisco Unified Computing System
    - Management Pack Events
    - State Summary
  - Cisco UCS Instance
    - Cisco UCS
      - Cisco UCS Manager - CiscoUCS
      - CiscoUCS Alert View
      - CiscoUCS State View

**Other Navigation:**

- Show or Hide Views...
- New View
- Monitoring
- Authoring
- Reporting
- Administration
- My Workspace

**Actions:**

- View all Active Alerts
- View Computer Health
- View Distributed Applications
- View Management Packs

**Key Concepts:**

- The Monitoring Overview
- Standard Views
- Health Explorer
- Properties of Alerts
- Monitoring Scenarios

**Learn About:**

- Finding Data and Alerts
- Using Views
- Managing Alerts
- Using Maintenance Mode
- Running Tasks
- Tuning Monitoring

VMs and Services

- Tenants
- Clouds
  - Cloud10septembrie
  - Cloud-Cisco-Connect
- VM Networks
- Storage
- All Hosts
  - hv-1
  - hv-2

VMs and Services

- Fabric
- Library
- Jobs
- Settings

UCSAddIn

- Hypervisor Hosts
  - hv-1.virt.local
  - hv-2.virt.local
- UCS Domains
- Add-in Settings

General Firmware Faults

**Fault Summary**

0 0 0 0

Suppression Status: N/A

**Status**

Overall Status: ↑ ok

Status

**Actions**

- Associate Service Profile
- Disassociate Service Profile
- Set Desired Power State
- KVM Console
- Turn on Locator LED

**Properties**

UCS: cisco (10.62.25.12)  
 Slot ID: 2 Chassis ID: 1  
 Product Name: Cisco UCS B200 M3  
 Vendor: Cisco Systems Inc  
 Revision: 0 PID: UCSB-B200-M3  
 Name: Serial Number (SN): FCH18077U1M  
 User Label:  
 UUID: 64c9e26a-435a-11e0-0000-0004f560004f  
 Service Profile: org-root/ls-blade-02  
 Locator LED:

**Summary**

Number of Processors: 2 Cores Enabled: 20  
 Cores: 20 Threads: 40  
 Effective Memory (MB): 262144 Total Memory (MB): 262144  
 Operating Memory Speed: 1866 Operating Memory Voltage: regular-voltage  
 Adapters: 1  
 NICs: 2 HBAs: 0  
 Original UUID: e76f3e6d-2628-49fa-98d8-6e5b4abe4677

Part Details

Connection Details



Administrator - vmmsrv.virt.local - Virtual Machine Manager

Home Folder

Create Service Create Virtual Machine Create Cloud Create Host Group Create VM Network Assign Cloud Overview VMs Services VM Networks Cisco UCSM PowerShell Jobs PRO Window

VMs and Services UCSAddIn

- Tenants
- Clouds
  - Cloud10septembrie
  - Cloud-Cisco-Connect
- VM Networks
- Storage
- All Hosts
  - hv-1
  - hv-2

VMs and Services Fabric Library Jobs Settings

Hypervisor Hosts
 

- hv-1.virt.local
- hv-2.virt.local
- UCS Domains
  - cisco (10.62.25.12)
    - Equipment
      - Chassis
        - Chassis -1
          - Blade -1
          - Blade -2
        - Rack-Mounts
      - Orgs
        - root
          - Service Profiles
          - Service Profile Templates
          - Host Firmware Packages
            - default
          - Sub-Organizations

General Firmware Faults

**Fault Summary**

0 0 0 0

Suppression Status: N/A

**Status**

Overall Status: ↑ ok

Status

**Actions**

- Associate Service Profile
- Disassociate Service Profile
- Set Desired Power State
- KVM Console
- Turn on Locator LED

**Properties**

UCS: cisco (10.62.25.12)  
 Slot ID: 1 Chassis ID: 1  
 Product Name: Cisco UCS B200 M3  
 Vendor: Cisco Systems Inc  
 Revision: 0 PID: UCSE  
 Name: Serial Number (SN): FCH1  
 User Label:  
 UUID: 64c9e26a-435a-11e0-0000-0004f560007f  
 Service Profile: org-root/ls-blade-01  
 Locator LED:

**Summary**

Number of Processors: 2 Cores Enabled: 20  
 Cores: 20 Threads: 40  
 Effective Memory (MB): 196608 Total Memory (MB): 196608  
 Operating Memory Speed: 1866 Operating Memory Voltage: regul  
 Adapters: 1  
 NICs: 2 HBAs: 0  
 Original UUID: 0ae32107-ed89-49d6-b9a1-3d605e9e973c

Part Details  
 Connection Details

## Monitoring

- Monitoring
  - Active Alerts
  - Discovered Inventory
  - Distributed Applications
  - Task Status
  - UNIX/Linux Computers
  - Windows Computers
  - Agentless Exception Monitoring
  - Application Monitoring
  - Cisco Unified Computing System
    - Management Pack Events
    - State Summary
    - Cisco UCS Instance(s)
      - cisco
        - cisco Alert View
        - cisco State View
        - Diagram

Show or Hide Views...

New View ▶

- Monitoring
- Authoring
- Reporting
- Administration
- My Workspace

## Active Alerts (1)

Look for:  Find Now Clear

Source Name Resolution

## Severity: Critical (1)

Source	Name	Resolution
Chassis 1	F0408 : Power Problem	New

## Tasks

Tasks

## Alert Actions

- View or edit the settings of this monitor
- Start Maintenance Mode...
- Edit Maintenance Mode Settings...
- Stop Maintenance Mode
- Overrides ▶
- Personalize view...

## Subscription

- Create...
- Modify...

## Tasks

- Alert Properties
- Close Alert
- Set Resolution State ▶
- Entity Properties
- Health Explorer
- Navigation
  - Alert View
  - Diagram View
  - Event View
  - Performance View
  - State View

## Alert Details

## F0408 : Power Problem

Source: Chassis 1  
 Full Path Name: Cisco UCS Instances\cisco\Chassis 1  
 Alert Monitor: F0408 sys\_chassis\_id Monitor  
 Created: 2/27/2015 11:54:47 AM

## Alert Description

Power state on chassis 1 is redundancy-failed  
 DN: sys/chassis-1  
 Acknowledge: no  
 Cause: power-problem  
 Code: F0408  
 Created: 2011-03-07T00:17:14.873  
 Id: 49439  
 Rule: equipment-chassis-power-problem  
 Tags: server

Ready

File Edit View Go Tasks

Search

**Monitoring**

- Monitoring
  - Active Alerts
  - Discovered Inventory
  - Distributed Applications
  - Task Status
  - UNIX/Linux Computers
  - Windows Computers
- Agentless Exception Monitors
- Application Monitoring
- Cisco Unified Computing System
  - Management Pack Events
  - State Summary
  - Cisco UCS Instance(s)
    - cisco
      - cisco Alert View
      - cisco State View
      - Diagram

Show or Hide Views...

New View

- Monitoring
- Authoring
- Reporting
- Administration
- My Workspace

Busy...

## Alert Properties

General Product Knowledge Company Knowledge History Alert Context Custom Fields

**F0408 : Power Problem**

**Key Details:**

Alert source: Chassis 1

Severity: Critical

Priority: High

Age: 18 Days, 4 Hours, 4 Minutes

TFS Work Item ID:

TFS Work Item Owner:

Owner:

Ticket ID:

**Alert Description:**

Power state on chassis 1 is redundancy-failed

DN: sys/chassis-1  
 Acknowledge: no  
 Cause: power-problem  
 Code: F0408

**Alert Status:**

Once you have identified the problem and taken corrective action, you can select 'Closed' which will remove the Alert from the system once changes are committed.

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File Edit View Go Tasks

Search

**Monitoring**

- Monitoring
  - Active Alerts
  - Discovered Inventory
  - Distributed Applications
  - Task Status
  - UNIX/Linux Computers
  - Windows Computers
  - Agentless Exception Monit...
  - Application Monitoring
  - Cisco Unified Computing S...
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      - cisco
        - cisco Alert View
        - cisco State View
        - Diagram

Show or Hide Views...

New View >

- Monitoring
- Authoring
- Reporting
- Administration
- My Workspace

Busy...

## Alert Properties

General Product Knowledge Company Knowledge History Alert Context Custom Fields

### Summary

<b>Fault Code</b>	F0408
<b>Fault Name</b>	Equipment Chassis Power Problem
<b>Fault Cause</b>	Power Problem
<b>Explanation</b>	This fault typically occurs when the chassis fails to meet the minimal power requirements defined in the power policy or when one or more power supplies have failed.
<b>Resolutions</b>	<p>If you see this fault, take the following actions:</p> <ul style="list-style-type: none"> <li>In Cisco UCS Manager, verify that all PSUs for the chassis are functional.</li> <li>Verify that all PSUs are seated properly within the chassis and are powered on.</li> <li>Physically unplug and replug the power cord into the chassis.</li> <li>If all PSUs are operating at maximum capacity, either add more PSUs to the chassis or redefine the power policy in Cisco UCS Manager.</li> <li>If the above actions did not resolve the issue, create a show tech-support file and contact <a href="#">Cisco TAC</a>.</li> </ul>

### Related Links

Get more details on Cisco UCS faults:

[Cisco UCS Faults and Error Messages Reference](#)

### Management Pack Information

Cisco UCS B-Series Management Pack

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State Summary - MGV Operations Manager

File Edit View Go Tasks Tools Help

Search Scope Find Tasks

**Monitoring**

- Monitoring
  - Active Alerts
  - Discovered Inventory
  - Distributed Applications
  - Task Status
  - UNIX/Linux Computers
  - Windows Computers
- Agentless Exception Monitoring
- Application Monitoring
- Cisco Unified Computing System
  - Management Pack Events
  - State Summary
  - Cisco UCS Instance(s)
    - cisco
      - cisco Alert View

**State Summary**

### Cisco UCS Instance State View (1)

Look for:  Find Now Clear

State	Name	Url	Ucs Version	Managing
Critical	cisco	https://cisco:443	3.0(1e)	scomsrv

### Cisco UCS Instance Alert View (1)

Icon	Source	Name	Resolution
<b>Severity: Critical (1)</b>			
Critical	Chassis 1	F0408 : Power Problem	New

**Tasks**

- tasks
  - Entity Properties
  - Health Explorer
- Navigation
  - Alert View
  - Diagram View
  - Event View
  - Performance View
  - State View
  - Network Vicinity Dashboard
- Cisco UCS Instance Tasks
  - Generate Discovery Events
  - Launch UCS GUI
  - Load UCS Fault Data
  - Load UCS Inventory Data
  - Ping UCS
  - Ping UCS Continuously (ping -t)
- Report Tasks
  - Agent Counts by Date, Management Group and
  - Alert Logging Latency
  - Alerts
  - Availability
  - Configuration Changes

https://cisco/ Cisco UCS Manager

View Favorites Tools Help

# Cisco Unified Computing System (UCS) Manager

Single point device management for Cisco UCS

**Launch UCS Manager**

Requires [Java Runtime Environment 1.6](#) or higher

**Launch KVM Manager**

# Storage Monitoring

The screenshot displays the Microsoft Operations Manager (MOM) console interface. The window title is "Management Server - om\_... - Operations Manager". The menu bar includes File, Edit, View, Go, Tasks, Tools, and Help. Below the menu is a search bar and buttons for "Find" and "Tasks".

The left-hand pane is titled "Monitoring" and contains a tree view of monitoring objects. The tree is expanded to show "Data ONTAP" > "Storage Systems". Under "Storage Systems", several items are listed: Aggregates, Alerts, Controllers, Dashboard, Diagram, LUNs, Management Server (highlighted), Qtrees, SnapMirror Status, Storage Utilization, vFilers, and Volumes. Below this list are "Events" and "Availability Events".

The main pane is titled "Management Server (1)" and contains a search box labeled "Look for:" with "Find Now" and "Clear" buttons. Below the search box is a table with a single row:

Name
BZSSCOM1...

The right-hand pane is titled "Tasks" and contains a list of "Health Service Tasks". The task "Data ONTAP: Add Controller" is highlighted in yellow. Other tasks in the list include "Check Health Service Startup Configuration", "Computer Management", "Data ONTAP: Manage Controller Credentials", "Data ONTAP: Manage DFM Servers", "Data ONTAP: Run Discovery task", "Data ONTAP: Run PRO Discovery task", "Data ONTAP: Run Virtualization Discovery task", "Disable Audit Collection", "Enable Audit Collection", "Flush Health Service State and Cache", "Get the agent processor utilization", "Get The Pool Member Monitoring a Top Lev", "Get Top Level Instances Monitored By a Poc", "Ping Computer", "Ping Computer (with Route)", "Ping Computer Continuously (ping -t)", and "Ping Computer Diagnostic Task (used by He".

At the bottom of the console, there is a "Show or Hide Views..." section with a "New View" button and a "Monitoring" view button.

## Health Service Tasks

- Check Health Service Startup Configuration
- Computer Management
- Data ONTAP: Add Controller
- Data ONTAP: Manage Controller Credentials**
- Data ONTAP: Manage DFM Servers
- Data ONTAP: Run Discovery task
- Data ONTAP: Run PRO Discovery task
- Data ONTAP: Run Virtualization Discovery task
- Disable Audit Collection
- Enable Audit Collection
- Flush Health Service State and Cache
- Get the agent processor utilization

## Monitoring

- Data ONTAP
  - Storage Systems
    - Aggregates
    - Alerts
    - Controllers
    - Dashboard
    - Diagram
    - LUNs
    - Management Server
    - Qtrees
    - SnapMirror Status
    - Storage Utilization
    - vFilers
    - Volumes
  - Events
    - Availability Events
    - Configuration Events
  - Performance
    - CPU Utilization
    - I/O Operations
    - I/O Throughput
    - Latency
    - Protocols
  - Virtualization
    - Alerts
    - Events
    - Hyper-V Hosts
    - Hyper-V LUNs
    - Hyper-V VHDs
    - Hyper-V VMs

## Reporting

- Reporting
  - Active Directory Server 2008 (Monitoring)
  - Active Directory Server Common Library
  - Application Monitoring
    - .Net Monitoring
      - Application Advisor Reports
        - Client Side Monitoring
        - Problem Analysis Reports
        - Resource Utilization Analysis
    - Client Monitoring Views Library
    - Microsoft Data Warehouse Reports
    - Microsoft Generic Report Library
    - Microsoft ODR Report Library
    - Microsoft Service Level Report Library
    - Network Management Reports
    - OnCommand Data ONTAP Reports
    - OnCommand Data ONTAP Virtualization Report

## Reports

- | Name                                                                       |
|----------------------------------------------------------------------------|
| Data ONTAP Aggregate Committed Space Percentage Report                     |
| Data ONTAP Controller Average System Latency Report                        |
| Data ONTAP Controller Committed Space Percentage Report                    |
| Data ONTAP Controller Rate Of Storage Utilization Report                   |
| Data ONTAP Controller Storage Efficiency Report                            |
| Data ONTAP Controllers Availability Report                                 |
| Data ONTAP Group Average System Latency Report                             |
| Data ONTAP Group Committed Space Percentage Report                         |
| Data ONTAP Longest SnapMirror Lag Time Report (Unit: Hours)                |
| Data ONTAP LUN Average Latency Report                                      |
| Data ONTAP Most Common Alerts Report                                       |
| Data ONTAP SnapMirror Average Lag Time Per Controller Report (Unit: Hours) |
| Data ONTAP Volume Average Latency Report                                   |
| Data ONTAP Volume Storage Efficiency Report                                |
| Data ONTAP Volume Storage Utilization Report                               |

# SQL and Microsoft apps monitoring

SQL Service Level Dashboard

## Service Levels

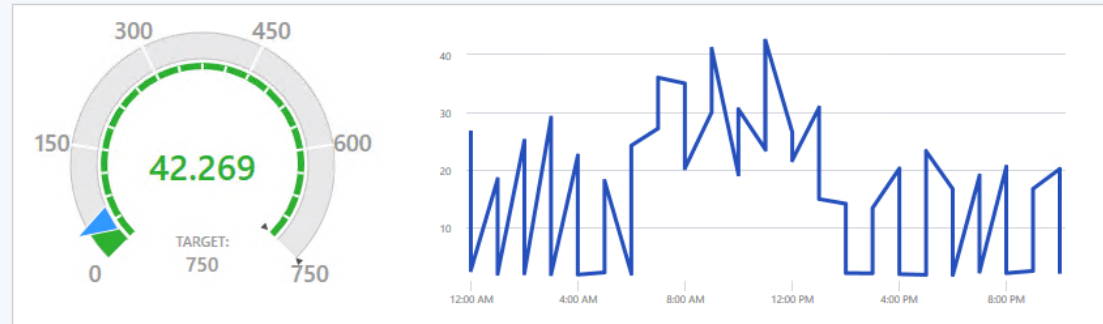
Name: **Contoso SQL Servers (1)**

SQL Computers

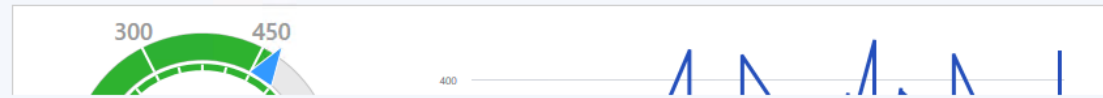
## Service Level Objectives

State	Name	Target Class	Instances
✖	Page Faults/sec SLO	SQL DB Engine	13
✔	SQL DB Engine Availability	SQL DB Engine	13
✖	SQL DB Engine Performance	SQL DB Engine	13
✖	Buffer Cache Hit Ratio SLO	SQL DB Engine	11
✔	Memory Grants Pending SLO	SQL DB Engine	11

DB02.contoso.com db02.contoso.com



OMDW DB04.contoso.com



SQL Performance Dashboard

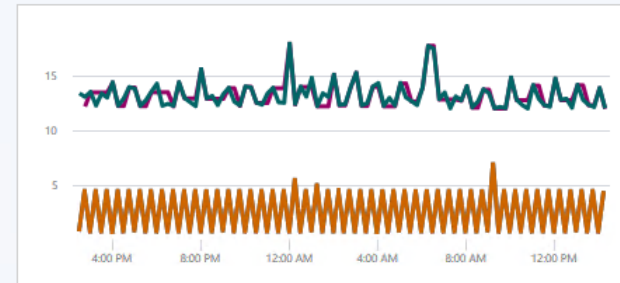
## SQL DB Engine State (2)

Icon	Health	Display Name	Maintenance Mode	Path
🚩	⚠	DB01.contoso.com		
🚩	⚠	DPM01.contoso.com		

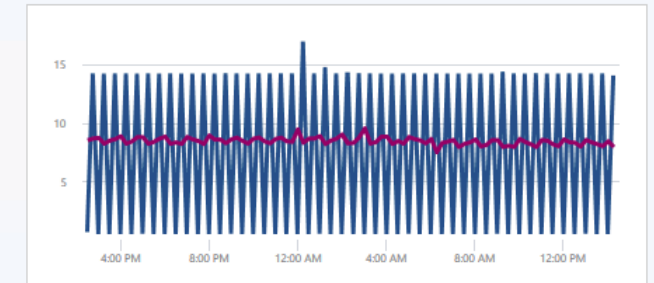
## DB Engine Details

Display Name	DB01.contoso.com
Path	DB01.contoso.com
Health	⚠ Warning
Object Display Name	DB01.contoso.com
Principal Name	DB01.contoso.com
DNS Name	DB01.contoso.com
NetBIOS Computer Name	DB01
NetBIOS Domain Name	CONTOSO

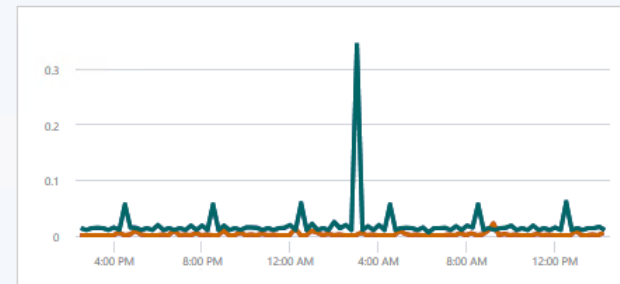
## SQL Transactions/sec



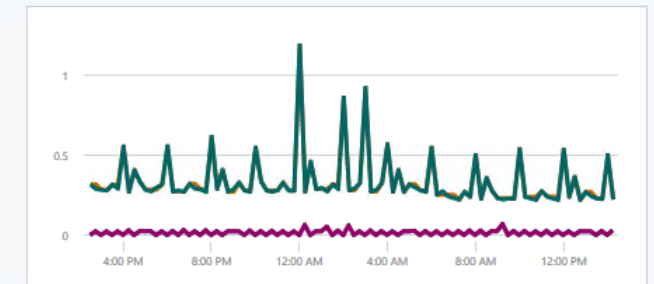
## SQL Batch Request/sec



## SQL Recompilations/sec



## SQL Compilations/sec



# SQL monitoring

What does out-of-the-box SQL monitoring reports look like?

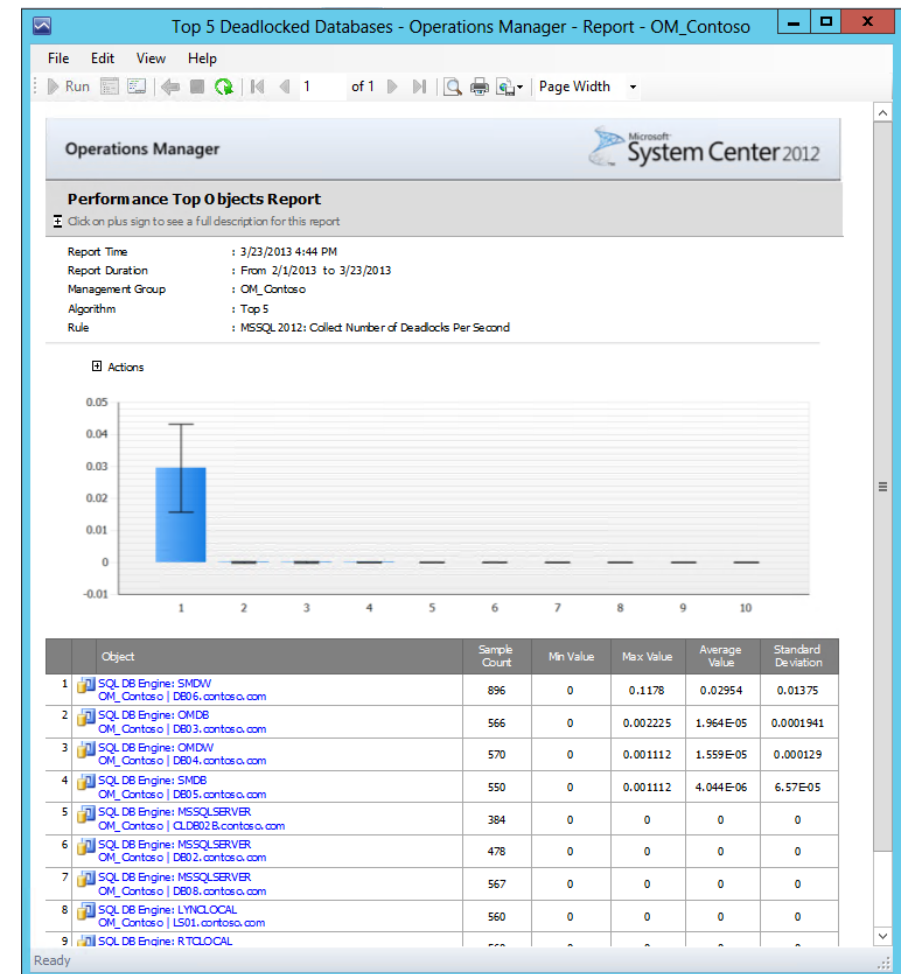
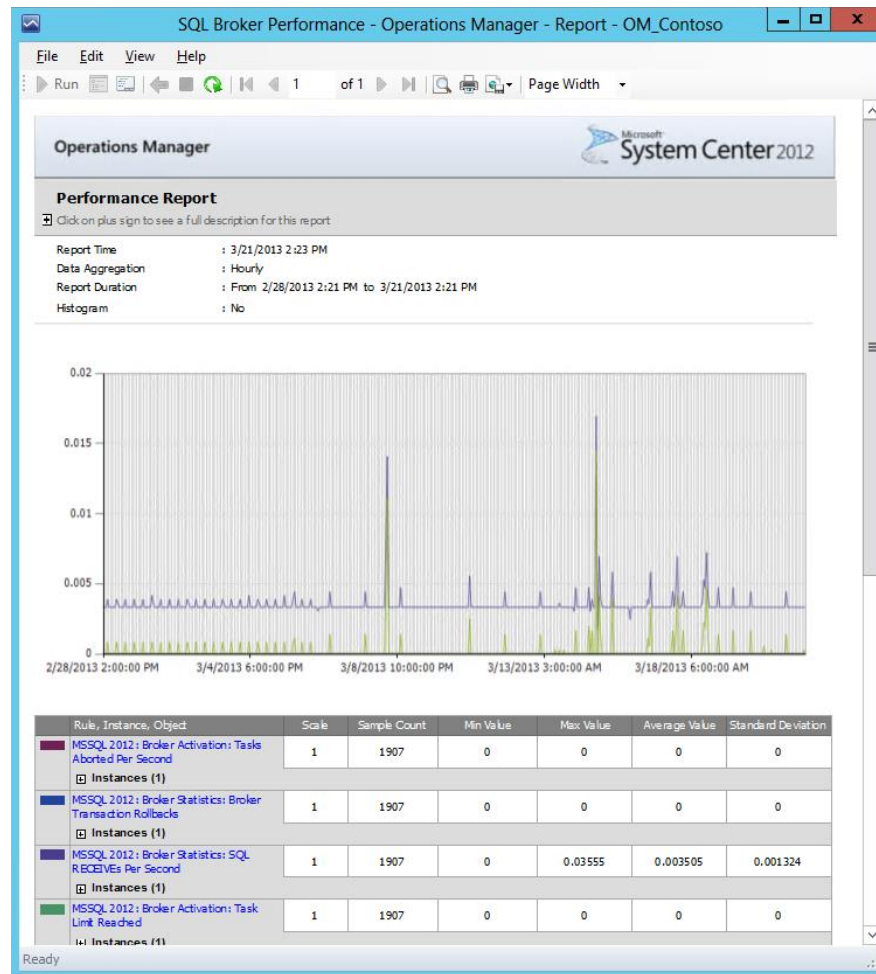
**Reporting**

- Network Management Reports
- nworks VMware VEM MP
- Red Hat Enterprise Linux Server 4 Operating System
- Red Hat Enterprise Linux Server 5 Operating System
- Red Hat Enterprise Linux Server 6 Operating System
- Solaris 10 Operating System
- Solaris 11 Operating System
- Solaris 9 Operating System
- SQL Server 2005 (Monitoring)**
- SQL Server 2008 (Monitoring)**
- SQL Server 2012 (Monitoring)**
- SUSE Linux Enterprise Server 10 Operating System

**Reports**

Name

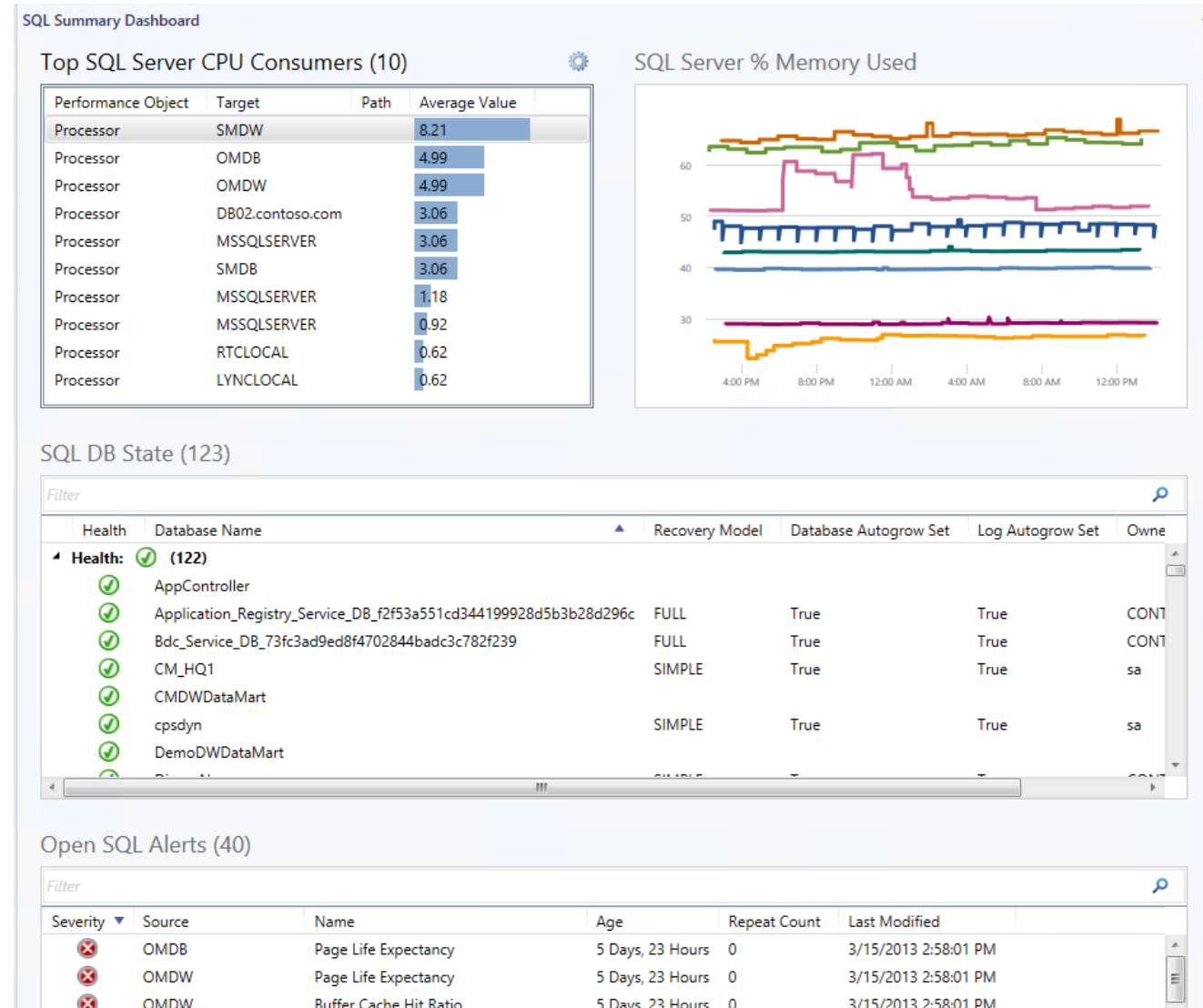
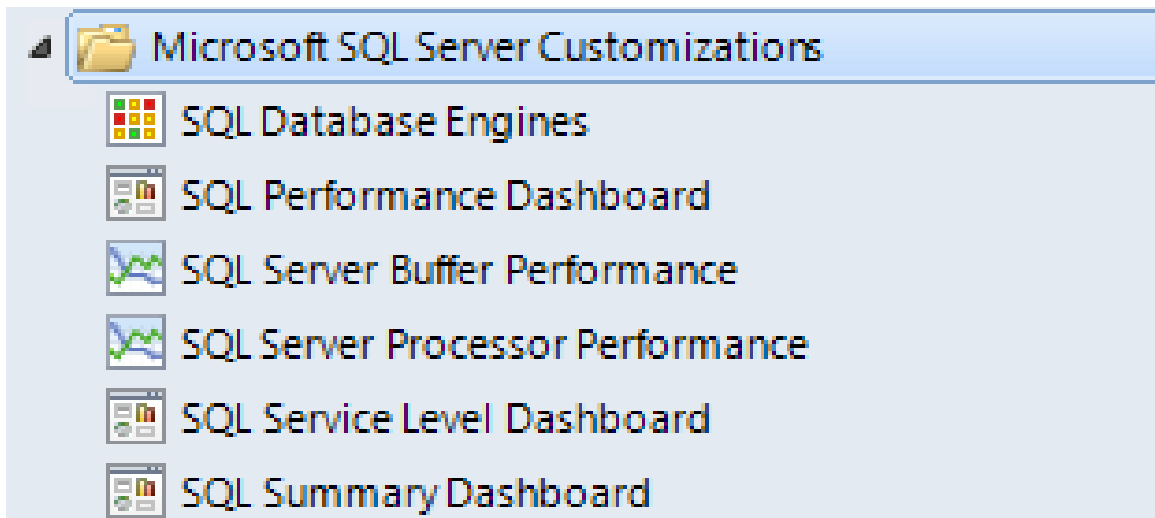
- SQL Broker Performance**
- SQL Database space
- SQL Server Configuration
- SQL Server Database Engine Counters
- SQL Server Lock Analysis
- SQL Server Service Pack
- SQL User Activity
- Top 5 Deadlocked Databases
- User connections by day
- User connections by peak hours





















# SQL monitoring

How can users customize their dashboard?

- By using Operations Manager default dashboard view, users can create grid view for monitored components
- Users can have many views as they want for different needs



# Java EE monitoring-supported platforms

		Supported JEE application servers	Supported operating systems matrix				
			RHEL	SLES	Solaris	AIX	Windows
 IBM	IBM Websphere	6, 7, 8					
	Oracle WebLogic	10gRel3, 11gRel1, 12cR1					
	Redhat JBoss	4, 5, 6, EAP 6, 7, WildFly 8					
	Apache Tomcat	5, 6, 7, 8					

# Application visibility across datacenter and clouds

## Online Claims Processing Application

Thu, May 22, 2014 12:34 PM EDT

Application Name	Response Time	Health Status	ART ms	ART Trend 10 minutes	Load trans/sec	Load Trend 10 minutes
▼ Azure App: Online Claims Processing			36		2.9	
Java Application Tier		—	45		0.8	
SQL Server DB Tier		—	3.6		194	
Oracle Database Tier		—	0.7		1.2	
CRM			60,041		0	
Operations Manager			66		0.7	
▶ Corporate ERP System			37		12	
HR Portal			44		0.8	

Microsoft acquired BlueStripe – integrated in Operations Management Suite

# Monitor and troubleshoot across environments



Operations  
Manager

- ✓ Infrastructure and application
- ✓ Custom log correlation & analytics
- ✓ Heterogeneous operating systems
- ✓ Flexible management packs
- ✓ Alerting and notifications
- ✓ Cloud monitoring including Azure, O365 and AWS
- ✓ Ecosystem of Partners

## WHAT'S NEXT SC 2016

### Workload Monitoring

- Azure MP
- O365 MP, SQL MP, Exchange MP
- VMM

### Windows Server vNext

- Nano Server, Windows storage, SMI-S support

### Infrastructure

- Feature updates on UR Cadence
- In-place upgrade from 2012R2
- LAMP Stack monitoring
- Networking performance (L2-L3)
- Discoverability : MP Catalog
- Scheduled Maintenance Mode
- Performance Updates
- Enhanced Data Visualization

### Log Analytics

- Custom log correlation
- Search and reporting
- Security & audit collection
- Mobile Access

### OM Partner Program

- Install Trial Software via OM Console

*Powerful monitoring solution for the worlds most complex environments*



IT Service Reliability



Speeds Troubleshooting



Enterprise Scale



Extensible Platform

# Orchestrator

## Workflow management solution for the datacenter

**Custom automation** – Build, test, debug, deploy, and manage automation in your environment

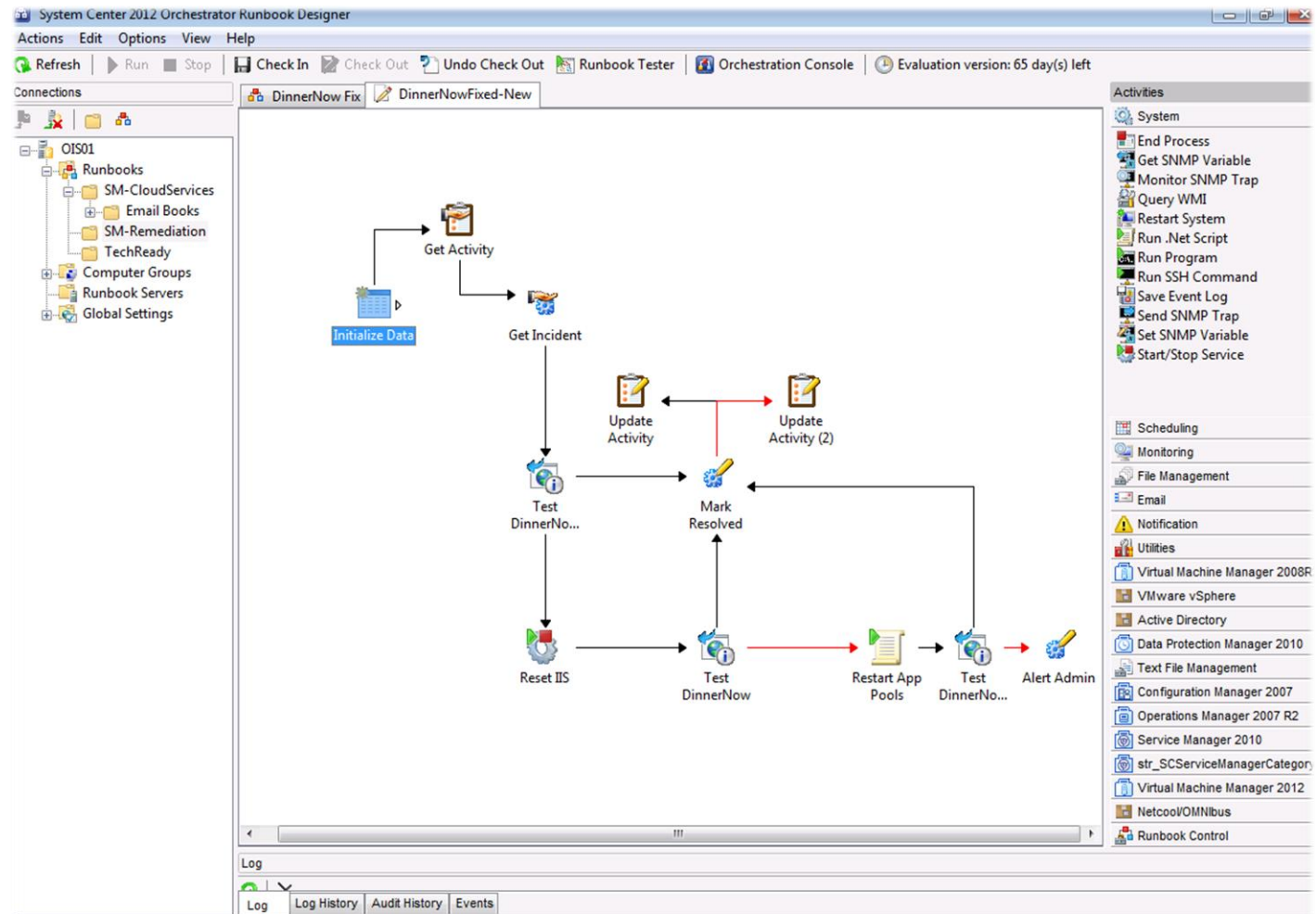
**Integration** – Integrates with System Center, other Microsoft products, and non-Microsoft products to enable interoperability across the datacenter

**Orchestration** – Provides the tools for orchestration to combine software, hardware, and manual processes into a seamless system

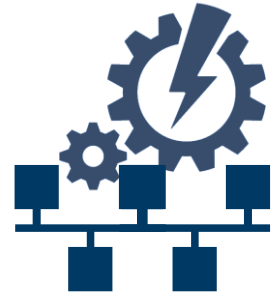
**Extensible** – Provides extensible integration to any system through the Orchestrator Integration Toolkit

**Simple** – Quick to install and configure, and start realizing value

**Manageable framework** – Author runbooks with PowerShell 5.0 scripts



# Automate deployments and orchestrate any cloud



Orchestrator  
Service  
Management  
Automation

- ✓ Automate On-Premises & Cloud
- ✓ Workflow & DSC
- ✓ Graphical & PowerShell authoring
- ✓ Integrate across systems
- ✓ Windows & Linux

## WHAT'S NEXT SC 2016

### Hybrid Runbook Worker

- Install on-premises or any cloud
- No inbound open ports required
- Highly available architecture

### PowerShell DSC

- Pull service to support large scale
- Supports on-premises or any cloud
- Management / Reporting

### Linux Support

- Native SSH module
- Linux support for DSC

### Gallery

- Native automation assets (Runbooks, PS Scripts, Assets, Modules, DSC)
- Automation Packs (Grouping of Assets)

### Graphical Authoring

- Author processes visually that span systems
- Forms based authoring using databus

### Migration to cloud

- SCO Integration Packs
- Runbooks

### Role Based Access Control

*Speed IT by automating the repetitive tasks and business processes across your environments*

# Service Manager

## IT Service Management with System Center integration

**IT Service Management** – Service Manager provides incident, problem, change, & release management. Service & request offerings, along with SLA Management, are also in the box

**ITaaS** – Rich Self Service Portal based on SharePoint providing role-based access to the service catalog

**Integration** – Connectors simplify and streamline integration between Service Manager and other System Center components

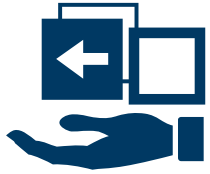
**Business intelligence** – Powerful data warehouse for rich, integrated reporting

**Cloud Services Process Pack** – Free download providing pre-built service requests, request offerings, and runbooks

**Online meetings** – Connect, share, and schedule meetings online with Skype for Business and Lync

The screenshot shows the 'Contoso Portal' interface for a 'Service Offering'. The page title is 'Private Cloud Infrastructure Services' with a sub-header 'Service offering'. A navigation sidebar on the left includes 'Home', 'Help Articles', 'My Requests', and 'My Activities'. The main content area features an 'Overview' section stating it contains offerings for private cloud resource subscriptions and virtual machines. Below this is a list of 'Available requests on Private Cloud Infrastructure Services', including: Cancel Cloud Resources Subscription, Cancel Tenant Registration, Register a Tenant, Request Service, Request Virtual Machine, Subscribe to Cloud Resources, Update Cloud Resources Subscription, Update Tenant Registration, and Update Virtual Machine. Navigation controls for 'Prev' and 'Next' are visible. A 'Help articles on Private Cloud' link is also present. At the bottom, there is a section 'Can't find a request for your need?' with a link to 'Create a general request about this service offering'.

# Service management for business agility



Service Manager  
Windows Azure  
Pack

- ✓ Enable Self Service
- ✓ Incident and Problem Management
- ✓ IT Marketplace
- ✓ Business Approval
- ✓ Integrate people, process and knowledge
- ✓ Ecosystem of Partners

## WHAT'S NEXT SC 2016

Performance improvements

Usability improvements

Workflow server scale-out

Azure Stack IT Marketplace

**New Self Service Portal – after  
November 2015 System Center  
2012 R2 Update Rollup**

*Empower business users with flexible, secure and automated service delivery*

 Increase productivity

 Lifecycle management

 IT self service

 Automated IT

# Data Protection Manager

## Centralized protection for key VMs and applications

**Workloads** – DPM protects key workloads, at a granular application level, up to every 15 minutes

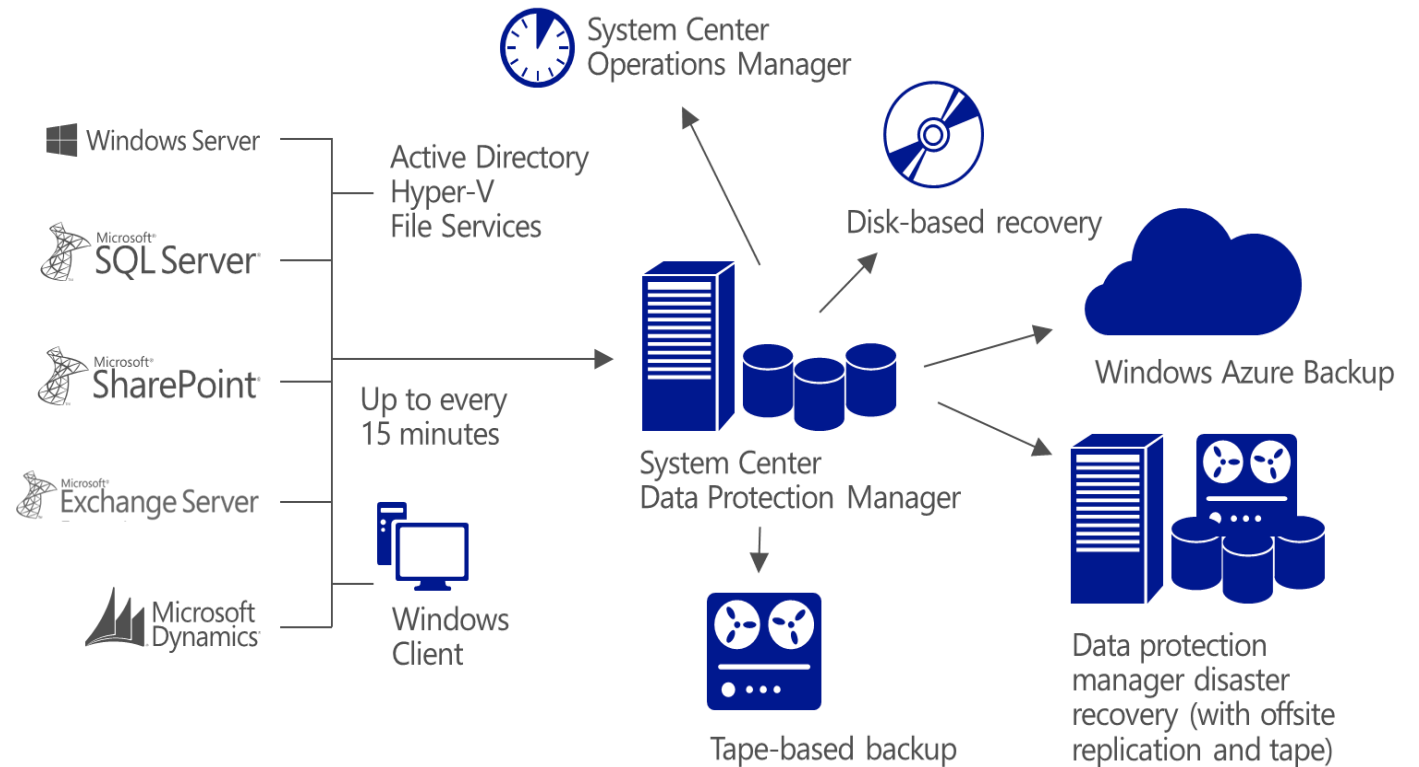
**Disk/Tape/Azure** – DPM supports protecting short-term to disk, long-term to tape, and Azure for cloud backup

**Centralized** – With integration with OpsMgr, the central console enables management of all DPM servers from a single location

**Scalable** – 800 VMs per DPM server, parallel backups, page-file exclusion, Live Migration support

**Mixed mode clusters** – Protect data in mixed mode clusters during upgrade without interruptions

**Encrypted VMs** – Backup Virtual TPM enabled VMs VHDs/VHDXs encrypted with BitLocker



DPM 2012 R2 with Update Rollup 11 (25 August 2016) – backup for VMWare 5.5 and 6.0!!!

<https://blogs.technet.microsoft.com/dpm/2016/08/26/four-simple-steps-to-backup-vmware-vm-s-using-sc-dpm/>

# Protection with backup



Data Protection  
Manager

- ✓ Physical, Virtual, Hybrid, Cloud
- ✓ Workload aware backup
- ✓ Deduplication support
- ✓ SCOM Centralized Reporting
- ✓ Long term retention of data in Azure
- ✓ Backup and Recovery for Azure
- ✓ Backup Windows and Linux VMs

## WHAT'S NEXT SC 2016

Azure IaaS, PaaS and workload backup

Centralized management from Azure

Recover data anywhere

Azure Express Route support

Shielded VM

Storage spaces direct

Nano Server

Mixed mode cluster upgrade

*Workload aware backup for hybrid clouds*



Secure



Reliable



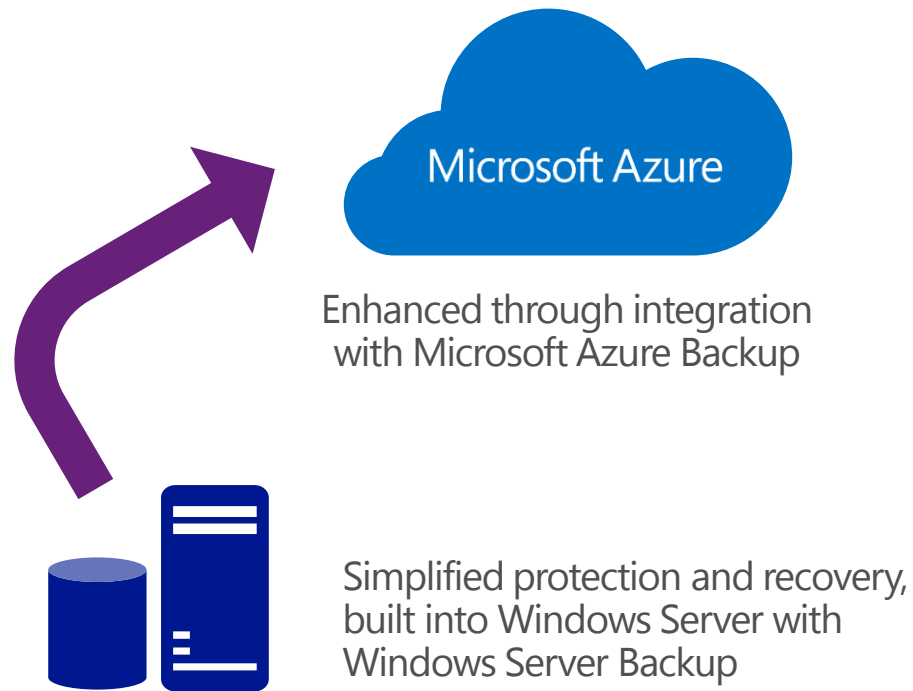
Efficient



Simple

# Protect your data

## Basic backup and recovery built into Windows Server



**Simplified protection:** Back up full volumes, selected volumes, system state, specific files, and folders.

**Bare Metal Recovery:** Fully recover a physical system.

**Policies:** Support backup versioning and simple, effective retention policies.

**Virtual machines:** Protect Hyper-V virtual machines whether they are running or not.

**Flexible storage:** Protect key data to local, including USB, or remote file server storage.

**Simplified scheduling:** Support automated backup once or multiple times per day.

**Azure Backup integration:** Reliable offsite data protection, integrated into the Windows Server Backup user interface.

---

Recover quickly from human error, service outages, and disasters with cost-effective solutions that are cloud-integrated for reliable offsite protection.

# Protect your data

## Centralized backup and recovery for critical company data

**Workload integration:** Protect Windows Server and Windows Client along with Exchange, SQL Server, SharePoint, and Microsoft Dynamics across Hyper-V and VMware.

**Long-term retention:** 9+ years with 4 week intervals.

**Flexible storage options:** Protect to disk or cloud.

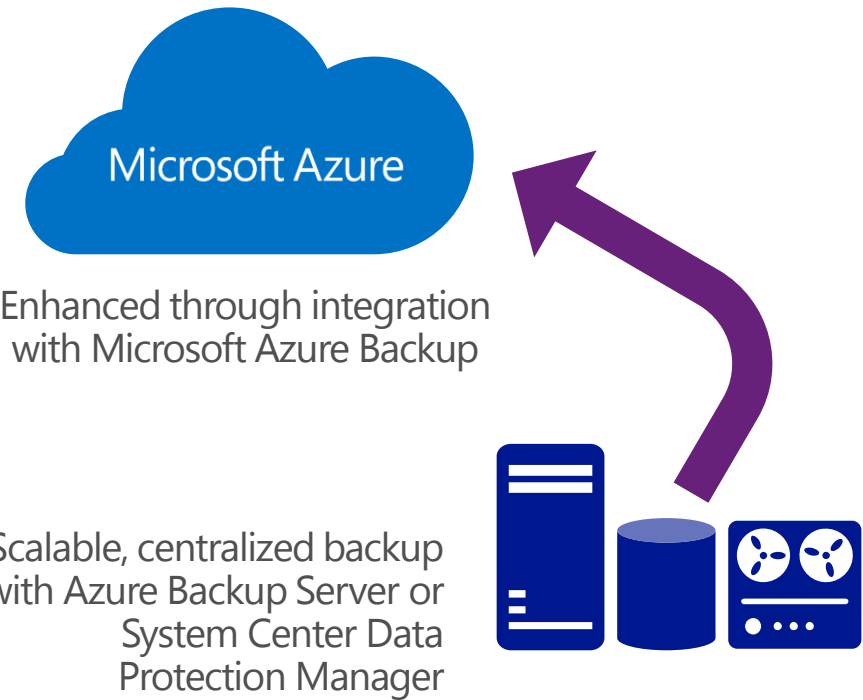
**Flexible deployment:** Run Azure Backup Server or System Center Data Protection Manager virtualized and reduce storage consumption through deduplication support.

**Low-cost disaster recovery:** Protect data on a primary site by using Data Protection Manager on a secondary site.

**Integration with Operations Management Suite or System Center Operations Manager:** Centralize monitoring of backup infrastructure.

**Azure Backup integration:** Provide reliable offsite data protection, integrated into the Data Protection Manager UI.

**Azure IaaS protection:** Run Azure Backup Server and protect Azure IaaS virtual machines.



Recover quickly from human error, service outages, and disasters with cost-effective solutions that are cloud-integrated for reliable offsite protection.

# SCCM – Configuration Manager

## Managing mobile devices and PCs



Configuration  
Manager with  
Intune

- ✓ Inventory and asset management
- ✓ Compliance and settings management
- ✓ Patch management
- ✓ Flexible OS deployment
- ✓ Client health and monitoring
- ✓ Device management
- ✓ Datacenter management improvements

## WHAT'S NEXT SC 2016

### Windows 10 support

- OS deployment support
- ConfigMgr 2012/R2 compatibility
- App policy management
- MDM enrollment with Azure AD
- Access restriction based on device enrollment and policy

### Update/upgrade improvements

- In-place upgrade - 2012 SP1 and 2012 R2
- New "add-on" capabilities

### Infrastructure

- Increased scale per primary site
- Extend peer caching for WinPE
- Content distribution improvements
- Client deployment update status monitoring

### Manage Windows 10 devices via MDM with on-premises infrastructure

- Updates via Intune
- Customer data not stored in cloud

*Enable employees to work anywhere on the devices that they choose*



Multiple Devices



Protect Information



Integrated Identity



Simplified Administration

# Why OMS?

## It's simple

A single portal for all your management tasks. No infrastructure to maintain.

## Time to value

Onboard fast. No content to create. Connects to your on-premises datacenter.

## Easy to integrate

Add new servers, or connect to your existing management tools within minutes.

## Hybrid and open

Manage workloads across Windows and Linux, hybrid and public clouds, Azure and AWS.

## Extend System Center

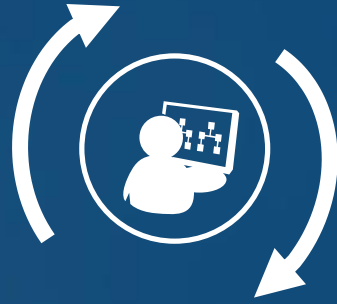
Complements your System Center investment to unleash new management scenarios.

# OMS Solutions



## Log analytics

Gain visibility across your hybrid enterprise cloud



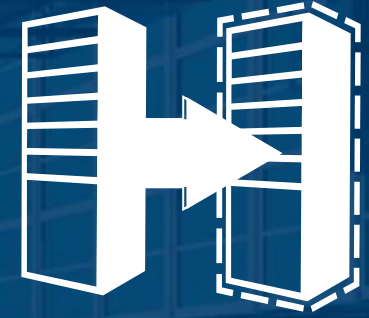
## Automation

Orchestrate complex and repetitive operations



## Availability

Increase data protection and application availability



## Security

Help secure your workloads, servers, and users

## Assessments

Security and best practices assessments: AD, SQL, malware, change tracking, audit

Overview

**Log Search**

**My Dashboard**

**Solutions Gallery**

**2.7GB**  
Servers and Usage

### AD Assessment

**4** Servers Assessed

- 3** High Priority Recommendations
- 6** Low Priority Recommendations
- 72** Passed Checks

### Alert Management

**0** Active critical alerts in the last 24 hours

**4** Active warning alerts in the last 24 hours

### Malware Assessment

**35%** NEEDS ATTENTION

- 1** Servers with Active Threats
- 38** Servers with Inadequate Protection

### Automation

ITAutomation

- 9** Runbooks
- 15** Jobs in the last 7 days

### Capacity Planning

- 23.6 %** Available Cores
- 62.3 %** Available Memory
- 42.5 %** Available Storage

### Change Tracking

- 20** Software changes in the last 24 hours
- 6** Windows service changes in the last 24 hours (excludes Status)

### Backup

ITProBackup

- 13** Servers backed up
- 3 TB** Backup data

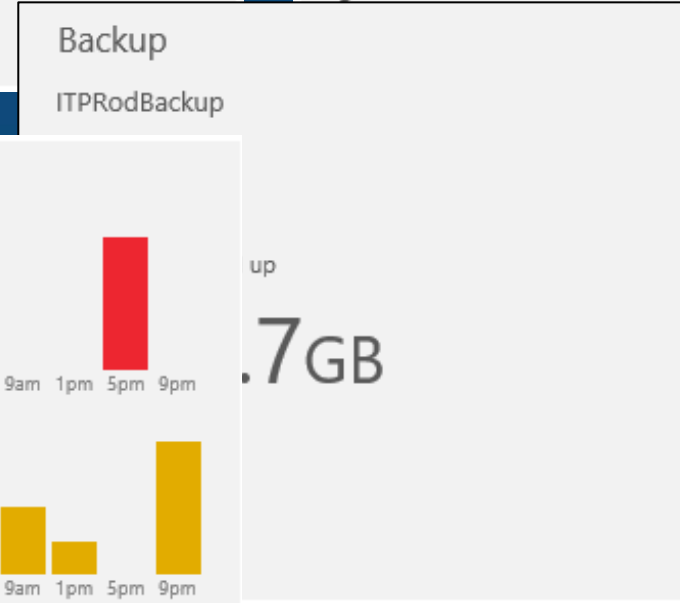
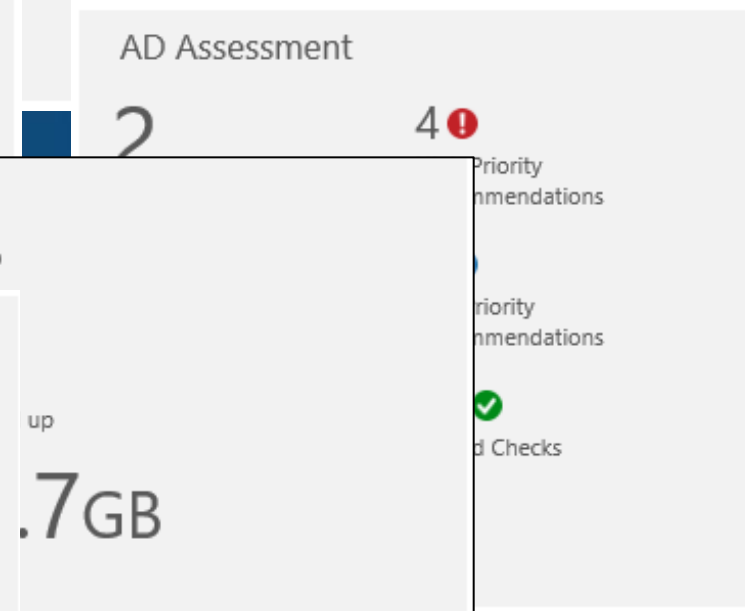
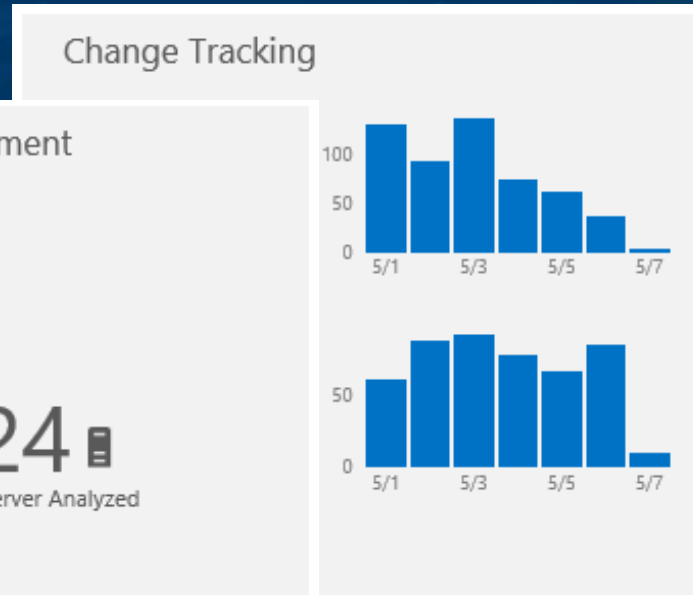
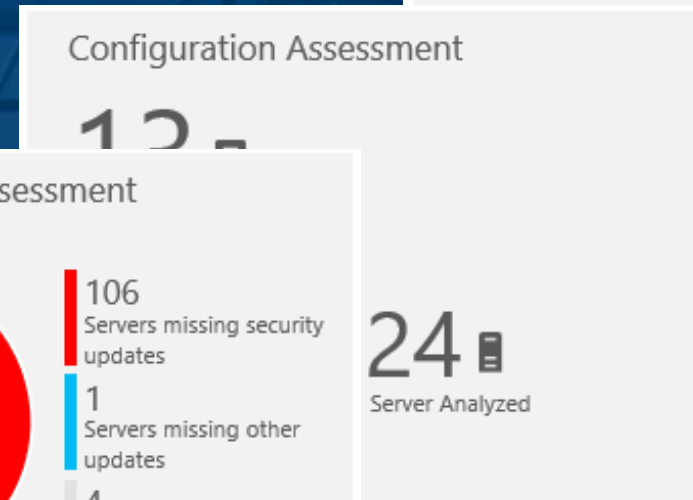
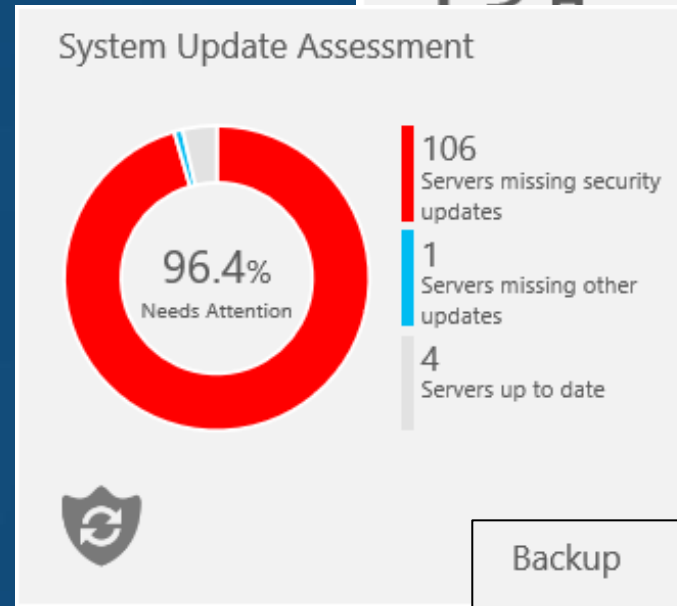
### Security and Audit

- 95** Active Computers in the last 24 hours
- 64** Accounts Authenticated in the last 24 hours

# Solution Packs

Collection of logic, visualization and data acquisition rules

- Powered by search
- Metrics pivoted around a particular problem areas
- Investigate and resolve operational issues
- Can be added/removed and customized

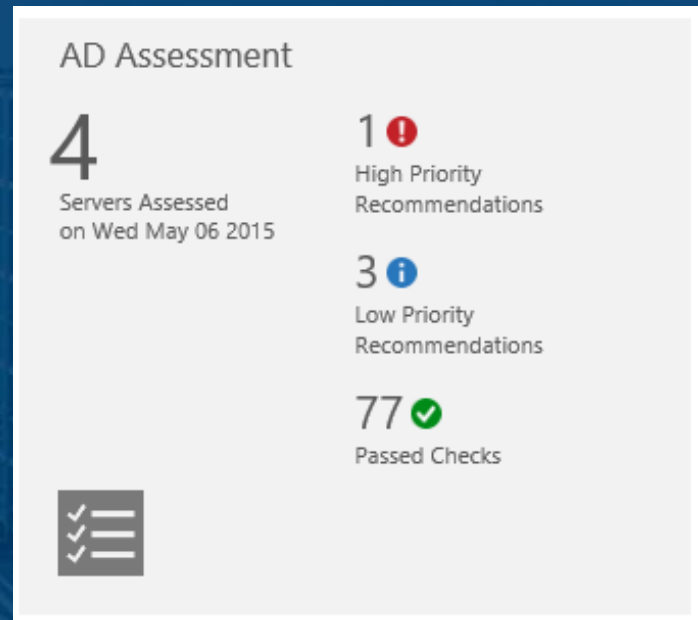
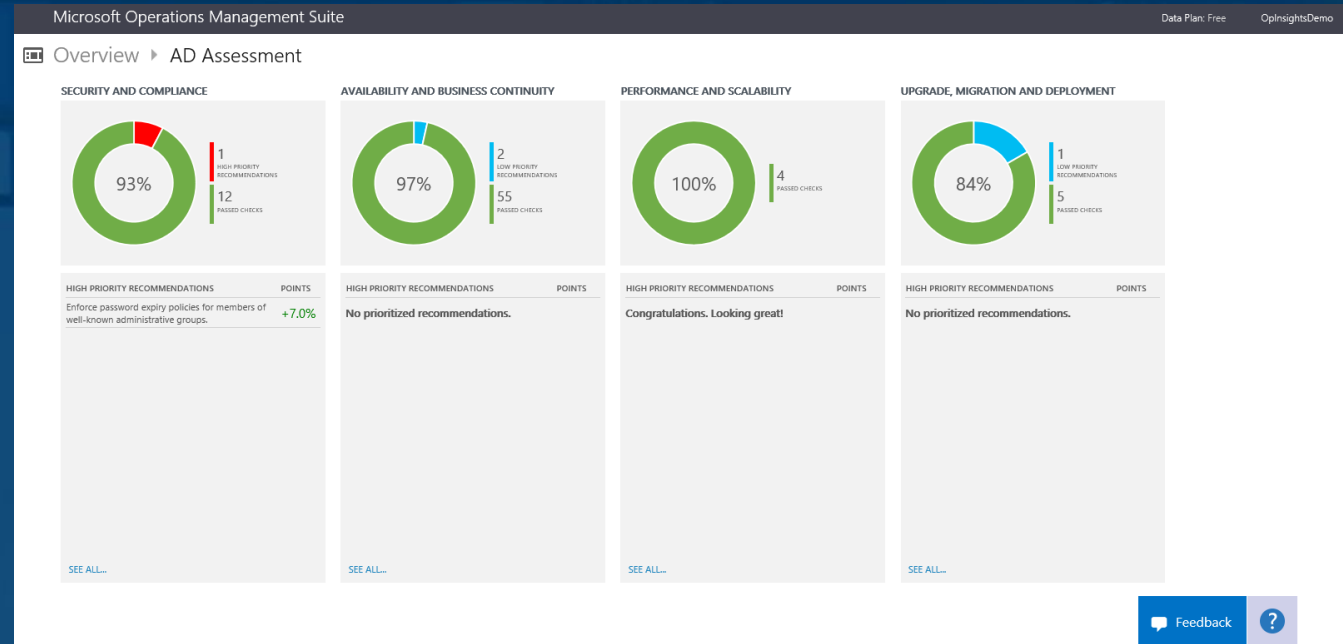


# Solution Packs

## Active Directory Assessment

Using best practices and data collection, identify potential issues

- Security and Compliance
- Availability and business continuity
- Performance and security
- Upgrade, migration and deployment

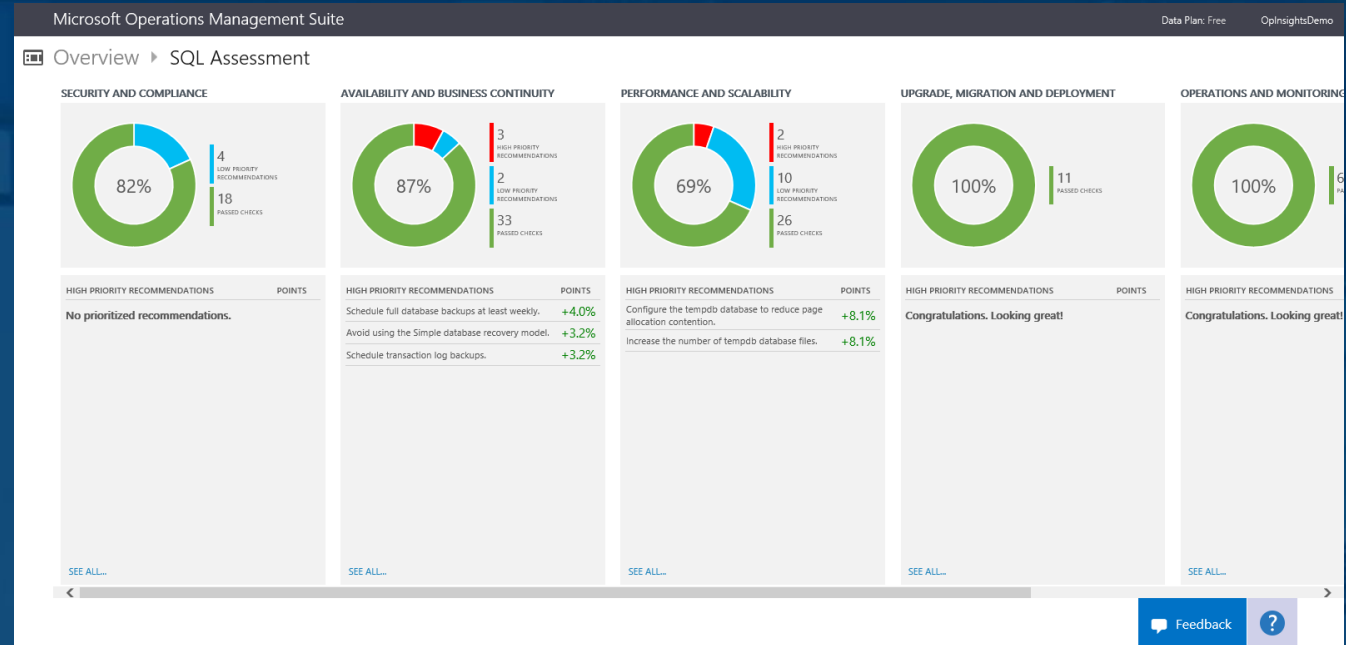


# Solution Packs

## SQL Server Assessment

Using best practices and data collection, identify potential issues

- Security and Compliance
- Availability and business continuity
- Performance and security
- Upgrade, migration and deployment
- Operations and monitoring
- Change and configuration



### AD Assessment

4

Servers Assessed  
on Wed May 06 2015

1

High Priority  
Recommendations

3

Low Priority  
Recommendations

77

Passed Checks

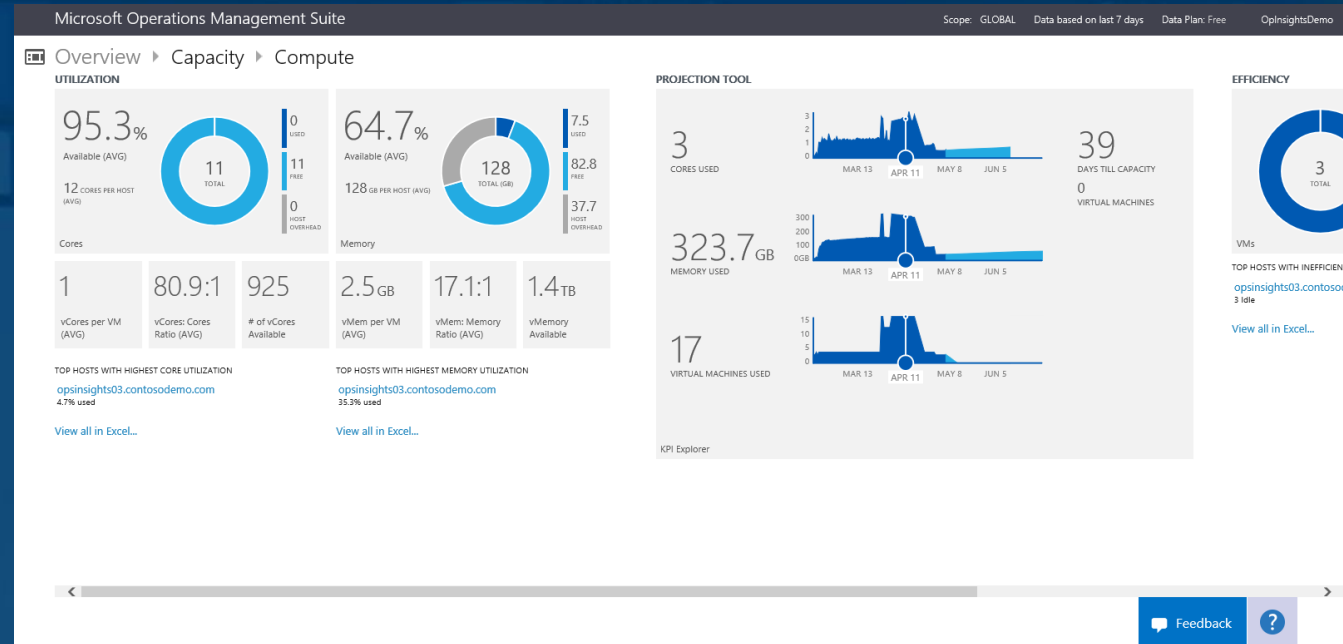


# Solution Packs

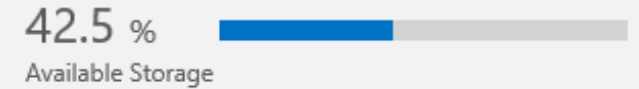
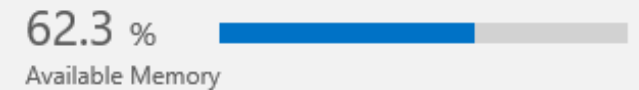
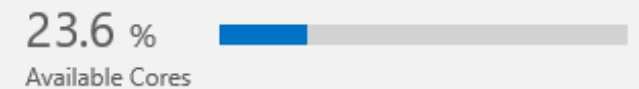
## Capacity planning

Plan for future capacity and trends using historical data

- VM utilization and efficiency
- Compute projection
- Storage utilization

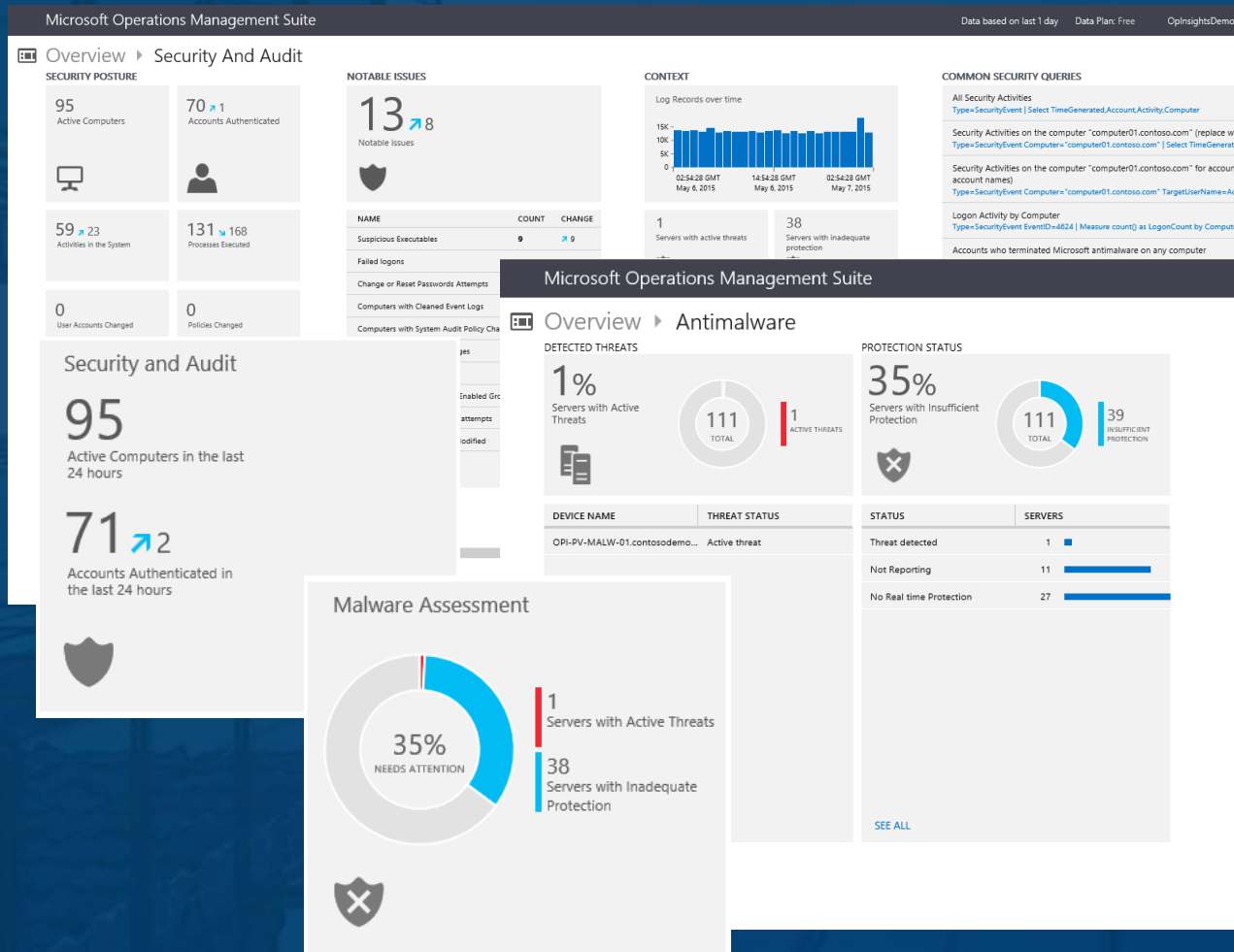


### Capacity Planning



# Champion security and compliance

## With events analysis and assessments



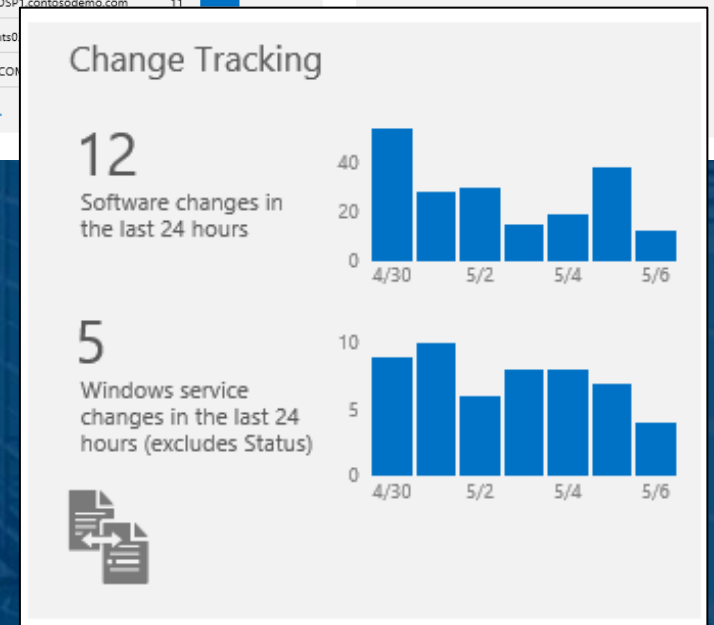
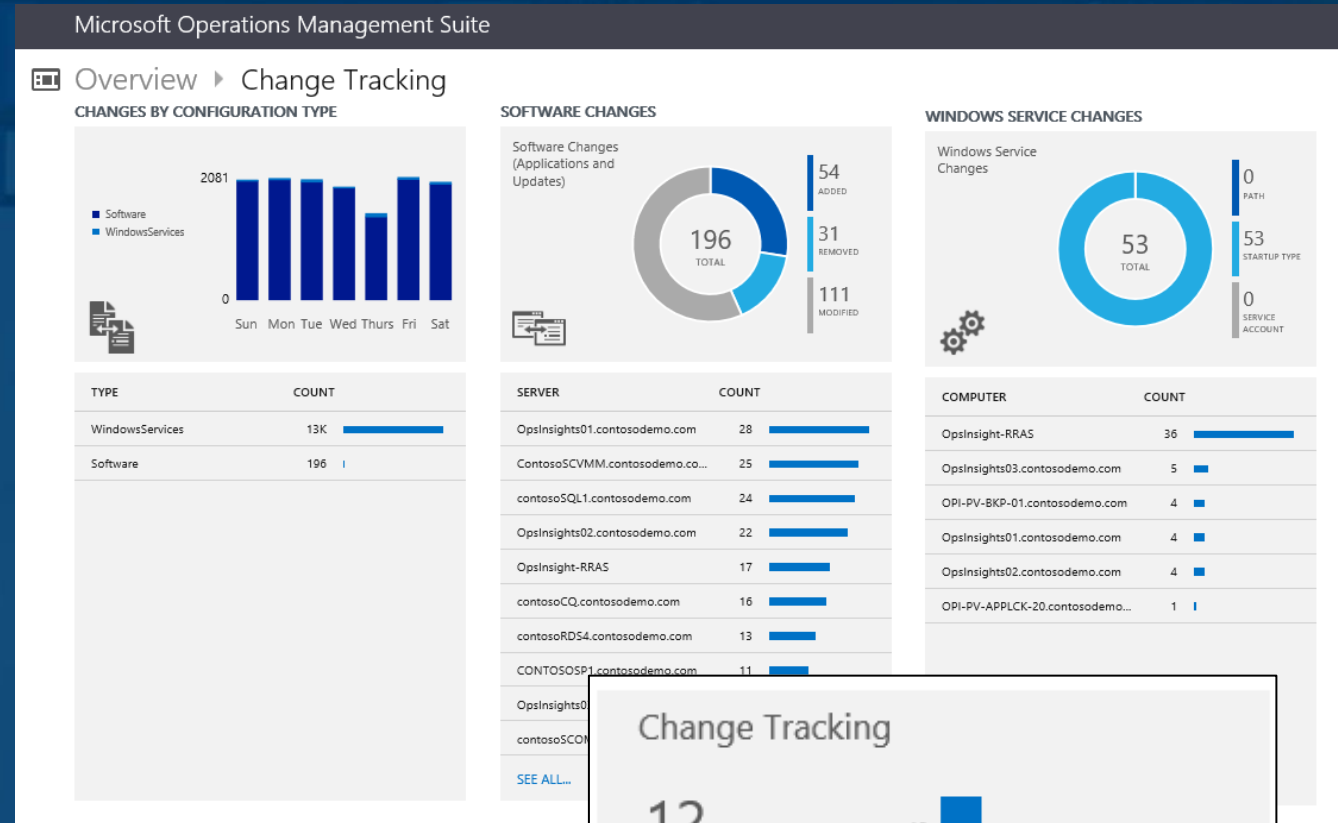
- Collect security related events and perform forensic and audit analysis
- Comprehensive updates assessment across datacenters and public clouds
- Detection of breaches and threats with malware assessment

# Solution Packs

## Change tracking

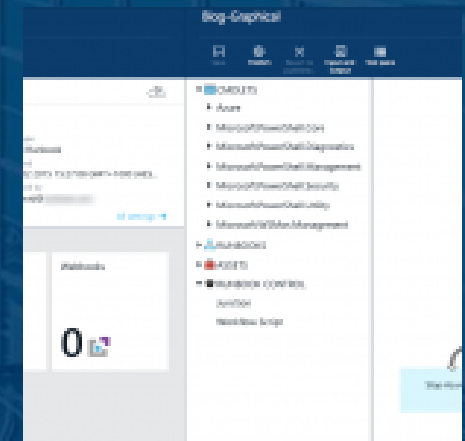
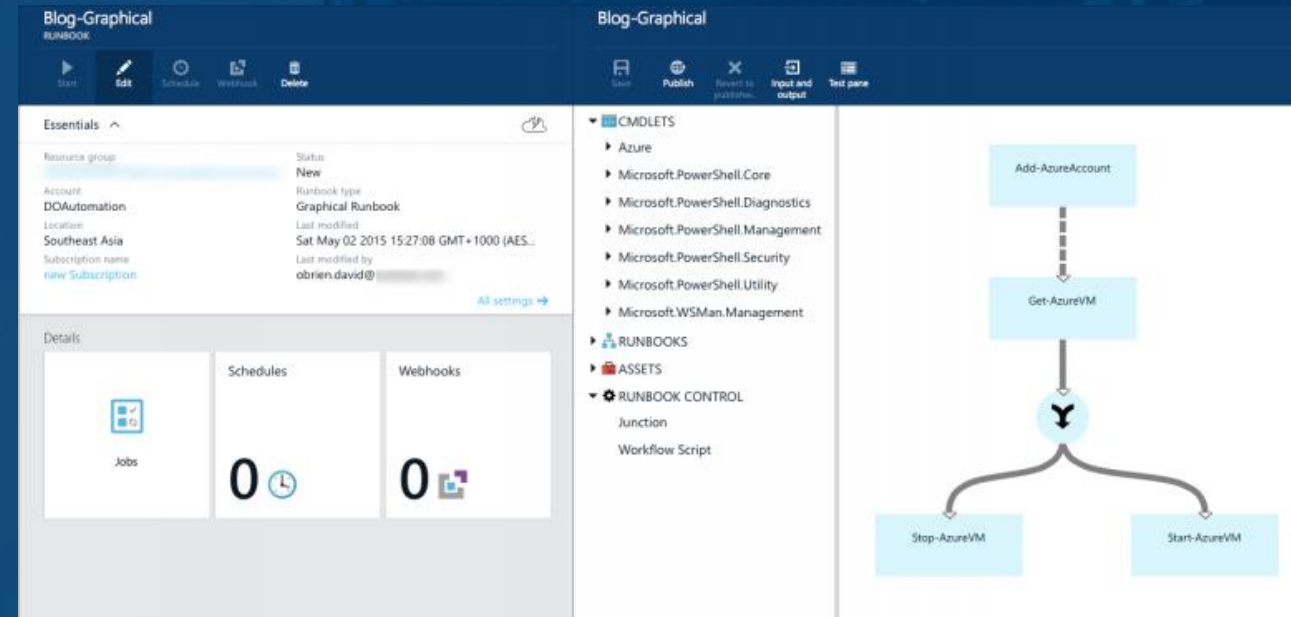
Track every change on your system across any environment

- Configuration type change
- Software changes
- Application changes
- Windows Service changes



# New Automation capabilities

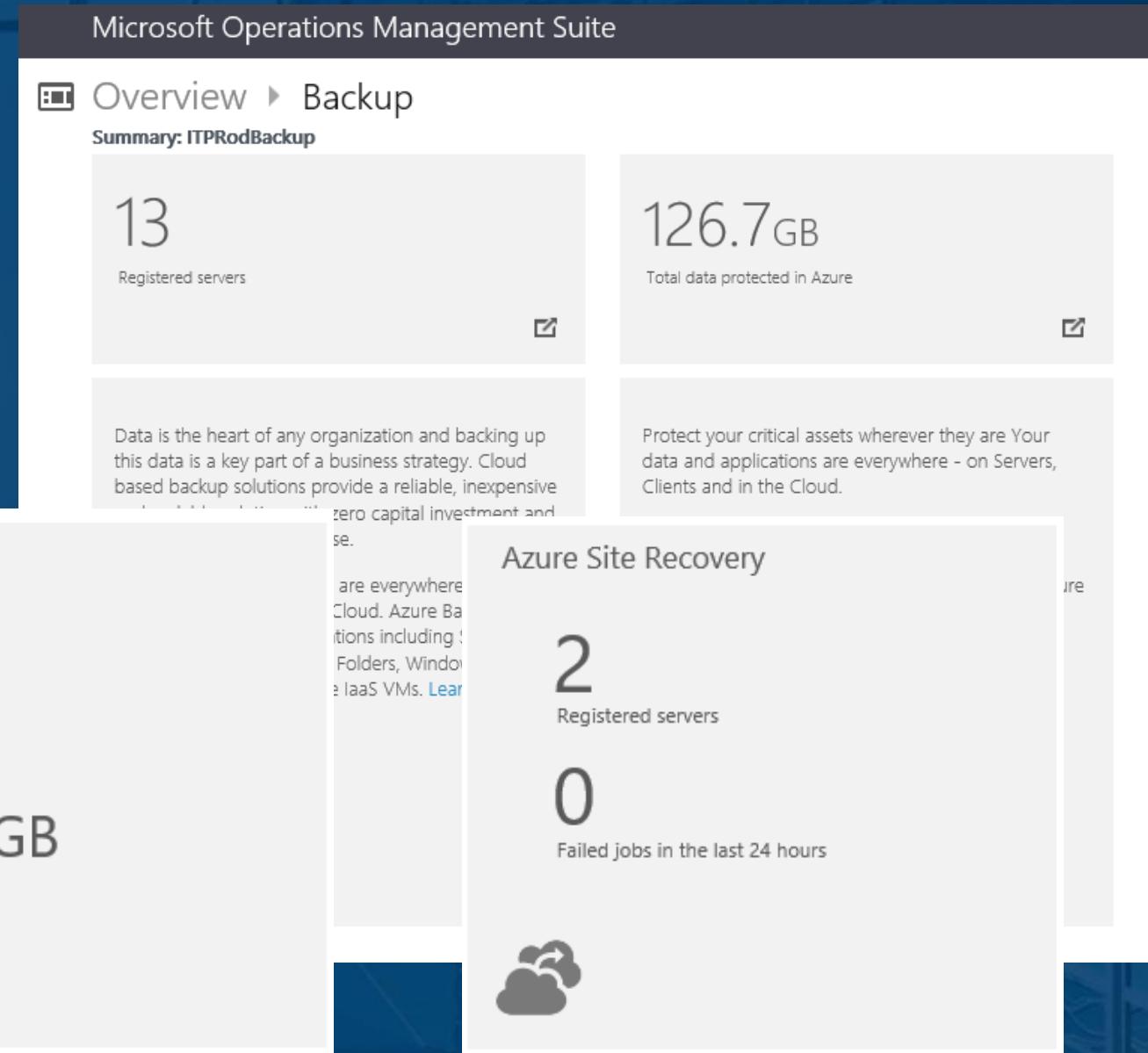
- Built-in integration with on-premises systems and PowerShell DSC nodes.
  - Run Azure Automation runbooks on-premises
  - Automation accessible via new REST API (including GitHub, VSO and ARM)
- Graphical workflow-authoring tool
- Runbook Management from the new Microsoft Azure portal



# Backup and recovery dashboard

Quick glance view of backup and protection status

- Registered servers
- Backup size
- Jobs status
- Link into Azure portal for backup and recovery

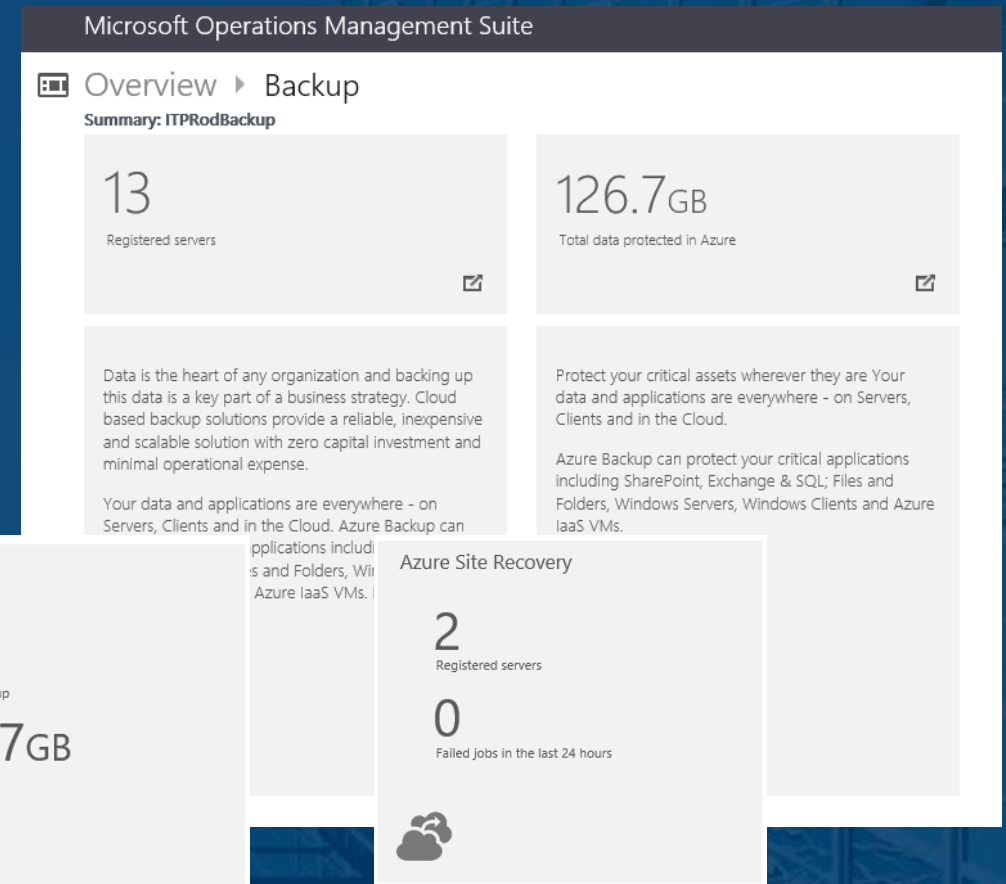


# Protect and extend your datacenter



## With Azure Site recovery and Azure Backup

- Automated virtual machine replication
- Protect your critical systems and applications
- Customize disaster recovery plans with easy-to-manage disaster recovery points
- Migrate from physical and virtual to Azure
- Access new scenarios including cloud bursting and dev/test



# Azure Backup Server

## Centralized protection for key VMs and applications

**Workloads** – Azure Backup Server protects key workloads, at a granular application level, up to every 15 minutes.

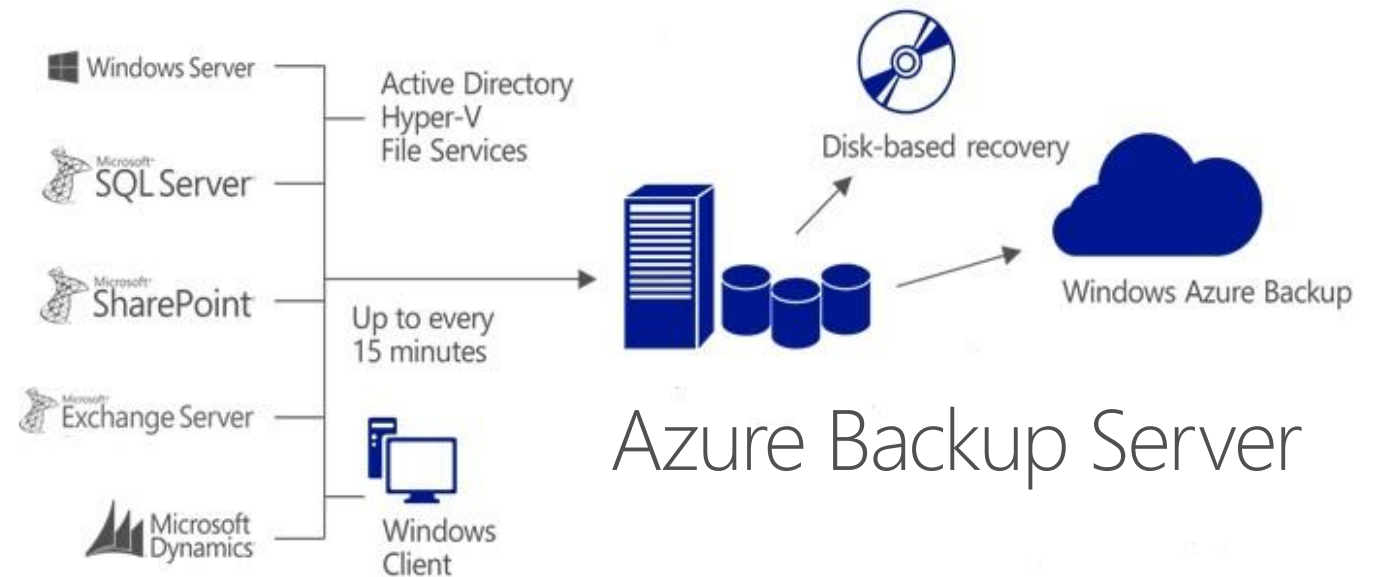
**Disk/Cloud** – Azure Backup Server supports protecting short-term to disk, and long-term to cloud.

**Centralized** –integration with Operations Management Suite, the central console enables management of servers from a single location.

**Azure Integration** – Azure Backup Server supports archiving data up to Windows Azure

**Low-Cost DR**

**Scalable** – multiple VMs per Azure Backup server, parallel backups, page-file exclusion, Live Migration support



Azure Backup Server

# Azure Site Recovery for Windows/ Linux physical machines and Hyper-V/VMware virtual machines

Microsoft Azure | Check out the new portal | CREDIT STATUS | Subscriptions | gr20@pcnet.ro

testasr

DASHBOARD | PROTECTED ITEMS | RECOVERY PLANS | SERVERS | RESOURCES | JOBS | EVENTS

TestASR

A new Azure Site Recovery vault was created!  
Follow these steps to get started.

Skip Quick Start the next time I visit

**SETUP RECOVERY**

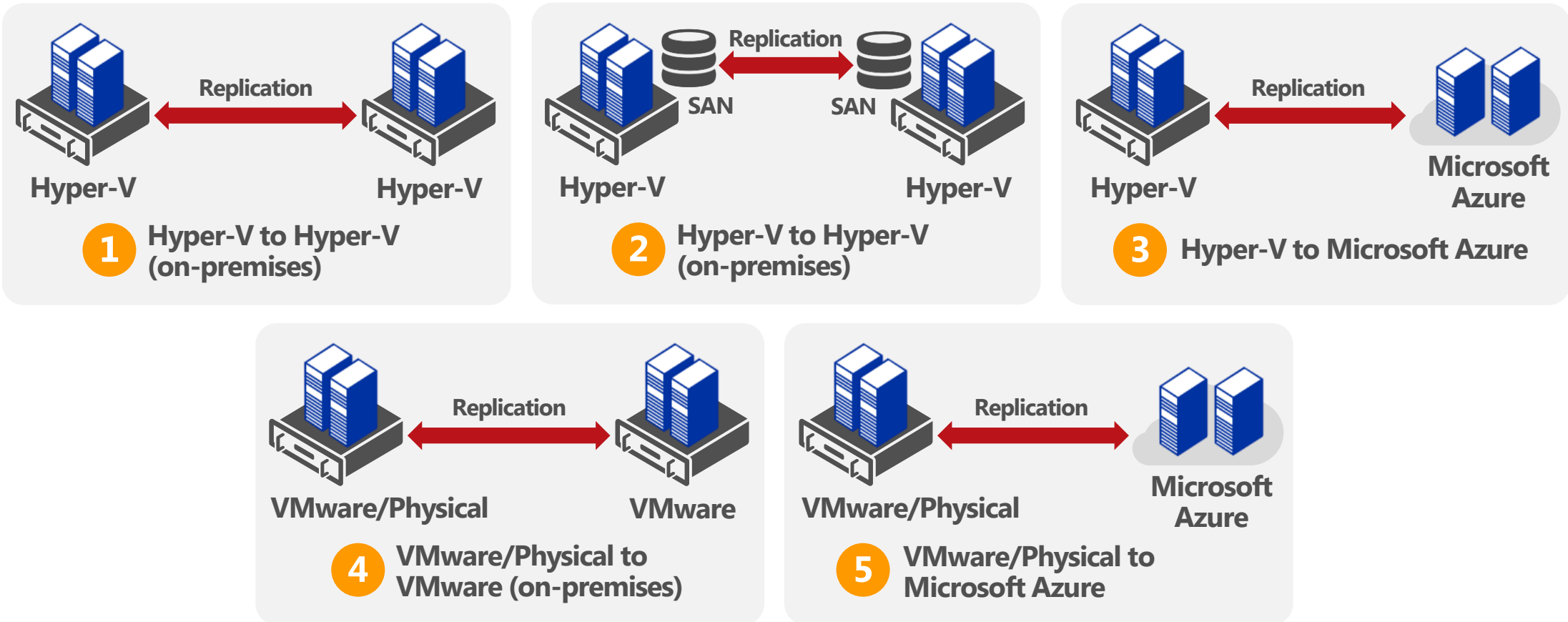
- Between an on-premises VMM site and Azure
- Between two on-premises VMM sites
- Between an on-premises Hyper-V site and Azure
- Between an on-premises site with VMware/physical servers and Azure** NEW
- (Legacy) Between an on-premises site with VMware/physical servers and Azure
- Between two on-premises VMware sites
- Between two on-premises VMM sites with SAN array replication

**PROTECT**

- 1 Prepare On-Premises Components**  
Download and copy the registration key file on the server where you plan to deploy the on-premises Configuration Server and Process Server. The installer will setup the necessary components and will register them with the vault.  
[Download and install On-Premises Components](#) | [Download a registration key](#)  
[Learn how to deploy Configuration Server and Process Server](#)
- 2 Add VMware vCenter Servers**  
[Add VMware vCenter Servers](#)
- 3 Protect Machines**

# Azure Site Recovery

One solution for multiple infrastructures



Protect important applications by coordinating the replication and recovery of private clouds across sites. Protect your applications to your own second site, a HSP's site, or even use Microsoft Azure as your disaster recovery site

# Microsoft Azure Site Recovery

## Orchestrated Recovery using Recovery Plans

### Orchestrated Steps for Recovery

Recovery Plans help automate the orderly recovery in the event of a site outage at the primary datacenter.

Recovery Plans consist of a series of groups that contain a list of protected virtual machines. The order the VMs failover is determined by the group they are within. VMs within a particular group failover in parallel

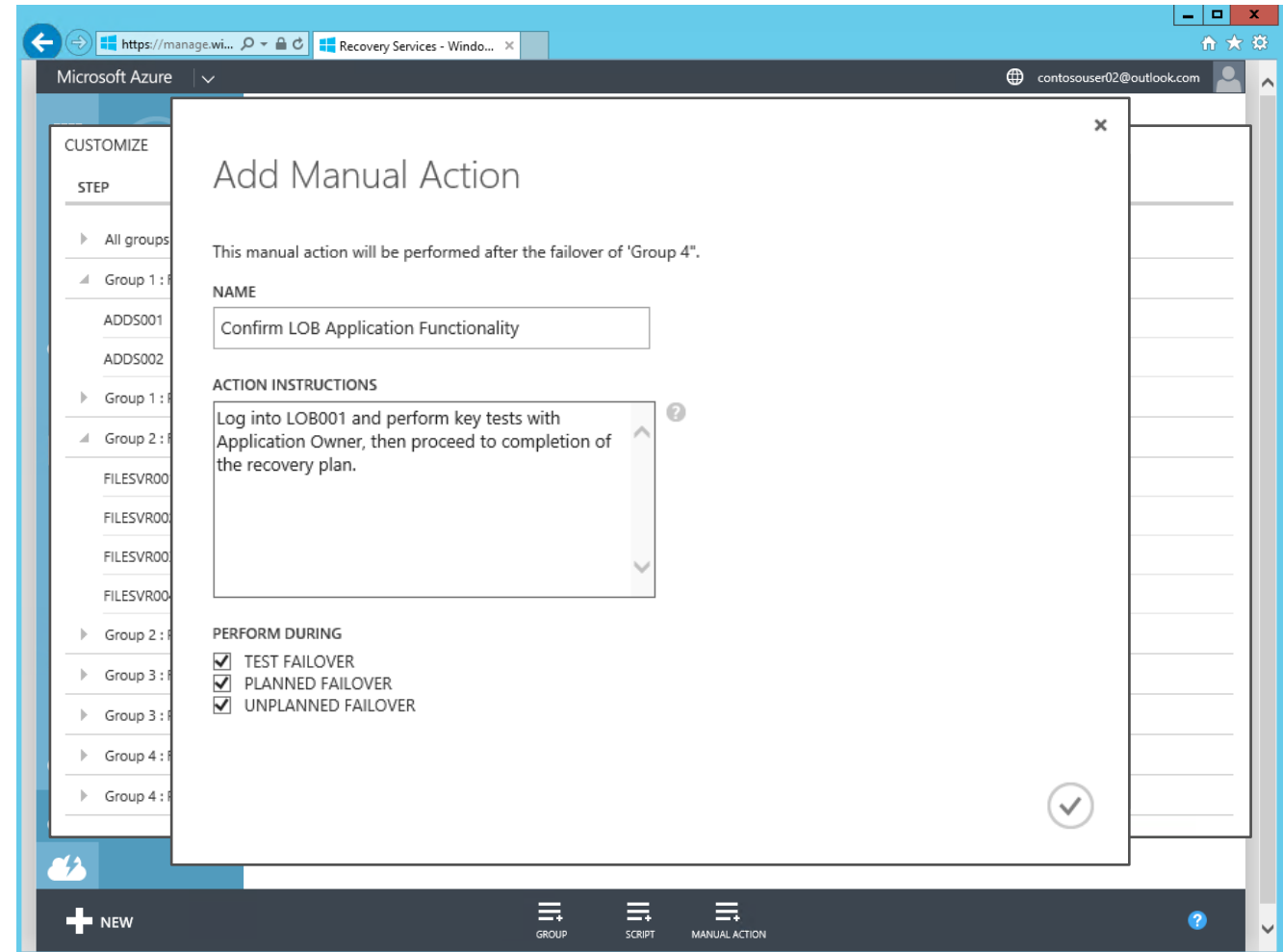
Recovery plans typically model an application that needs to start up, or failover, in a particular order.

### Script Integration

Scripts can be added, to run before or after a specific group in a recovery plan. Scripts could also allow integration with **SQL Server AlwaysOn** failover between sites.

### Manual Actions

Manual actions can also be added, to run before or after a selected group. These require some form of physical interaction by a particular user before recovery plan continues.



# Microsoft Azure Site Recovery

## Executing Recovery Plans

### Test Failover

Useful to verify that your recovery plan and virtual machine failover strategy are working as expected.

Simulates your failover and recovery mechanism into an isolated network(s), that you define, or that can be created automatically.

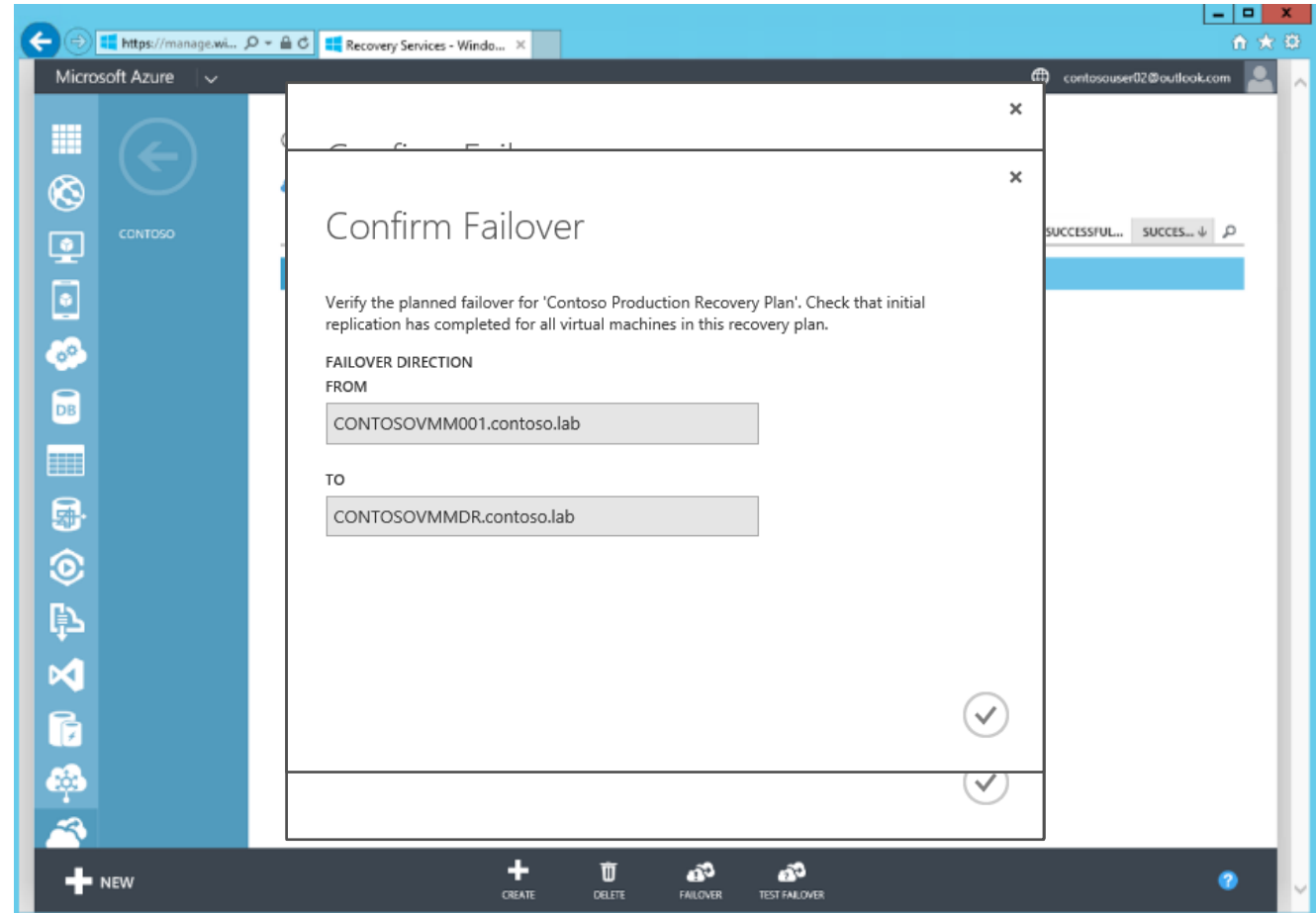
### Unplanned Failover

Run an unplanned failover when a primary site experiences an unexpected incident, such as a power outage.

### Planned Failover

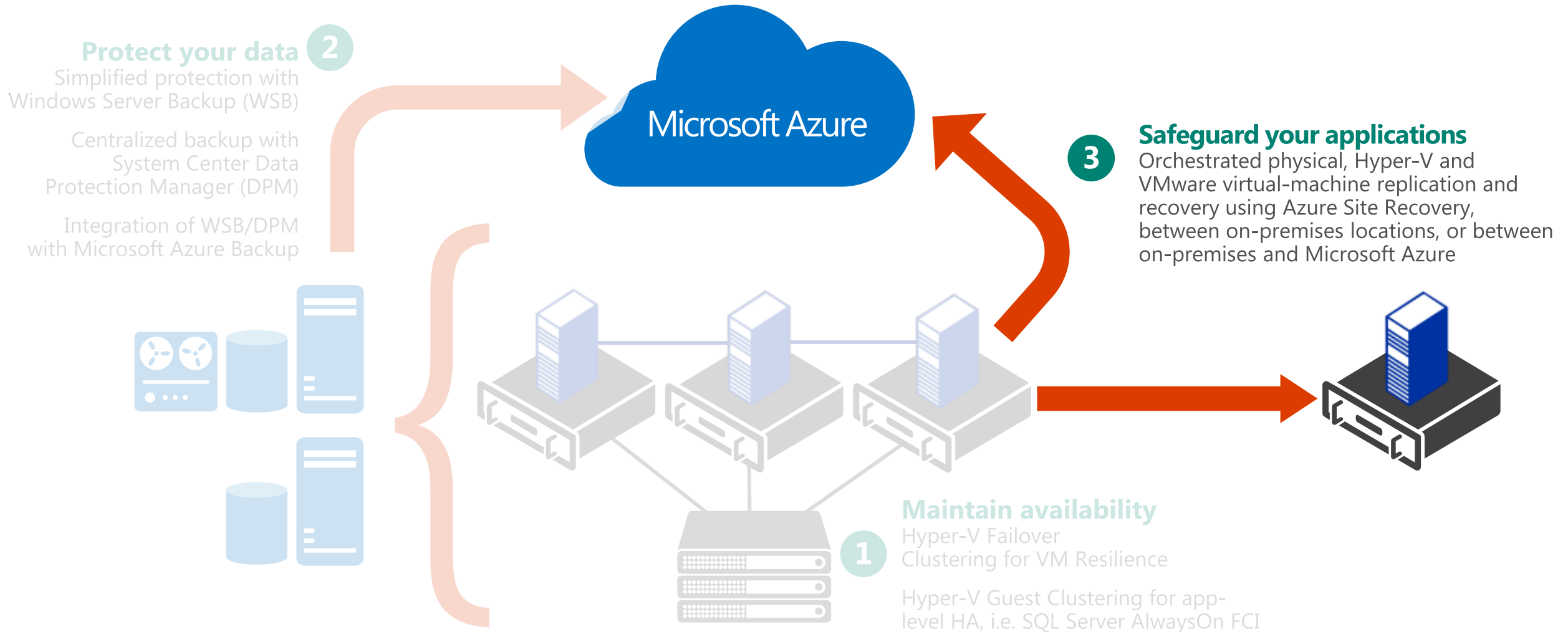
Perform a complete failover and recovery of virtual machines in your recovery plans in a proactive, planned manner.

Non-replicated changes are applied to the replica virtual machine with no data loss before bringing the VM online in the secondary site.



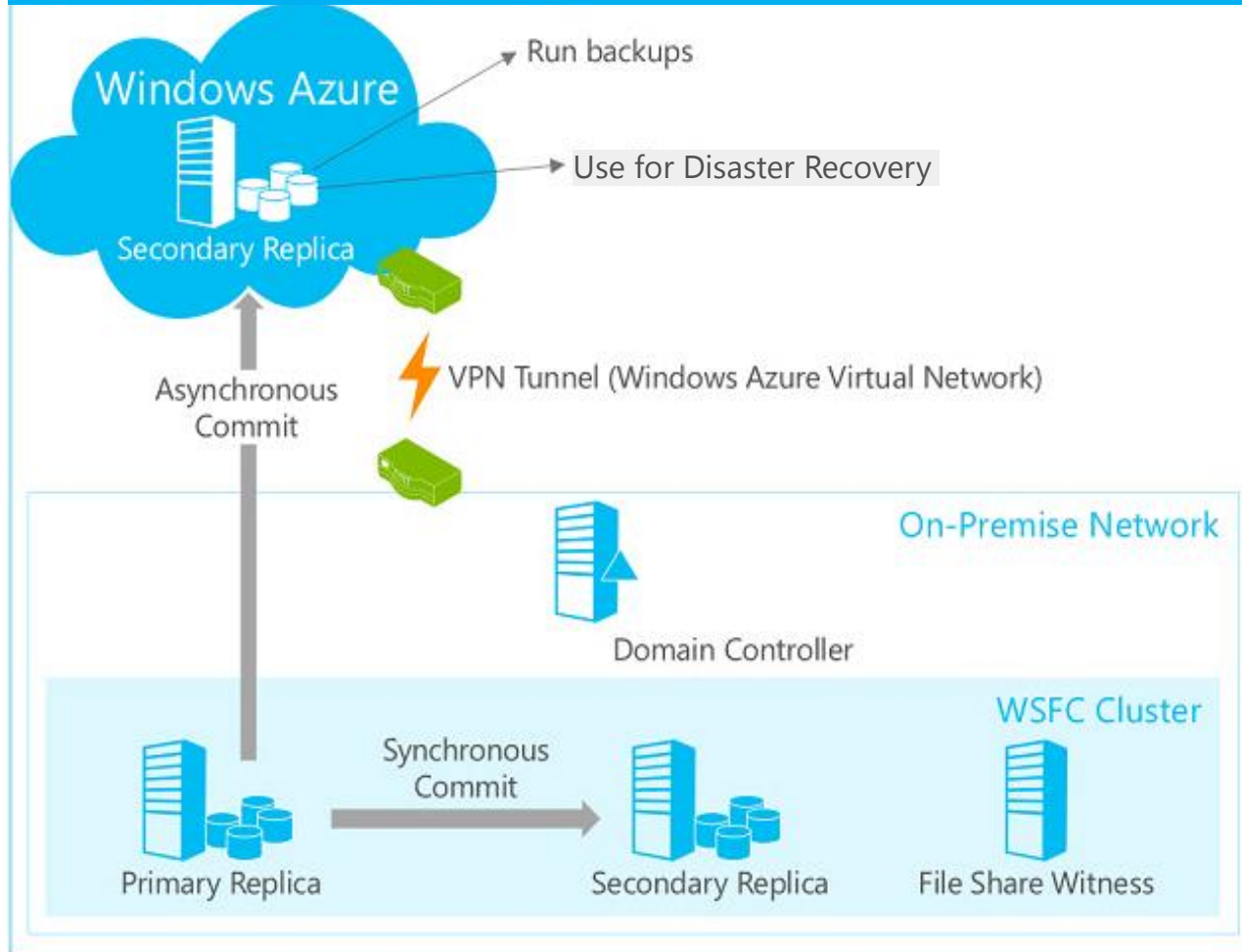
# Microsoft solutions

Breadth and depth solutions for business continuity and disaster recovery

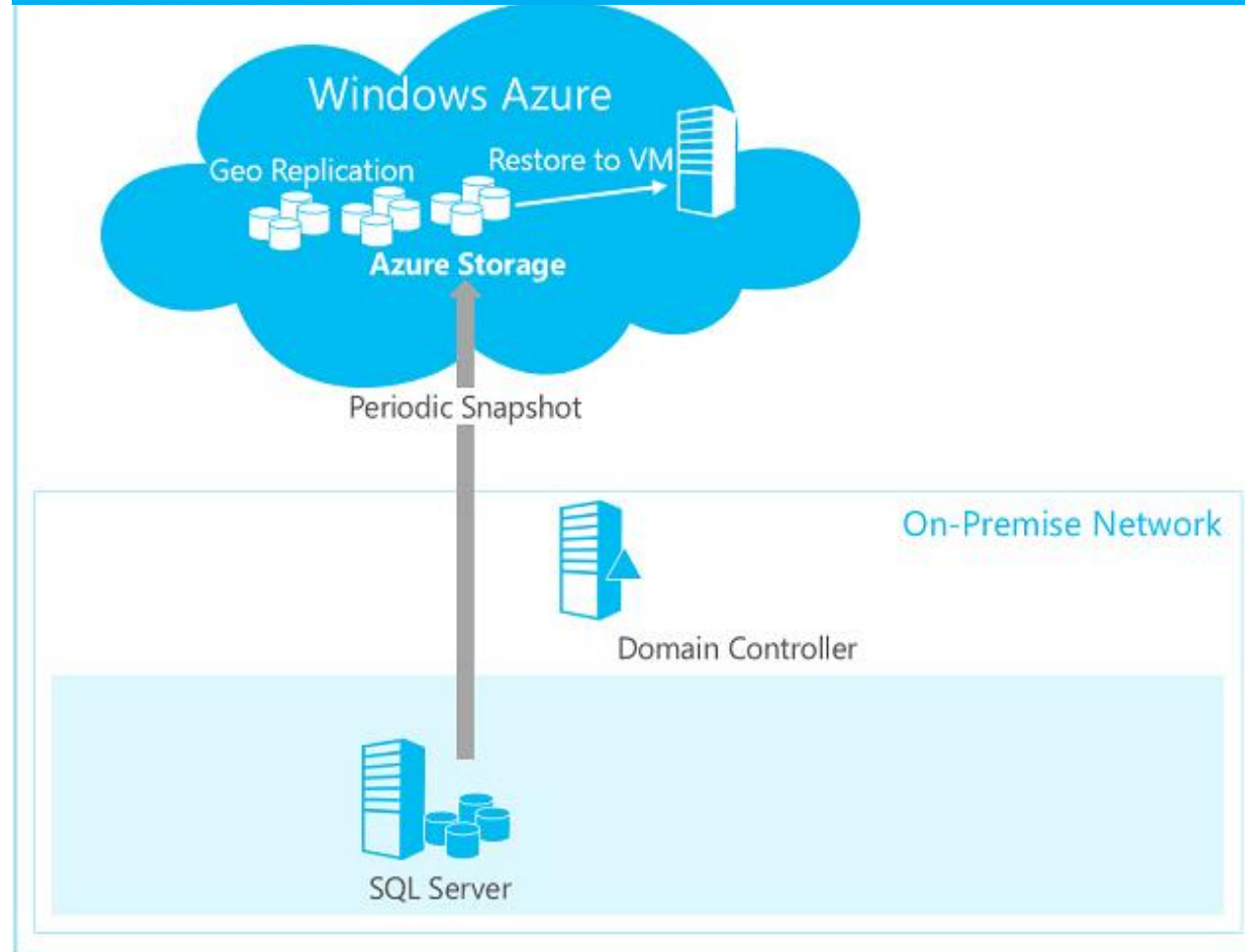


# SQL Server DR/Backup on Windows Azure

## Business Continuity Solution on Windows Azure



## Cloud Backup on Windows Azure



# Benefits of OMS

- control and manage cloud infrastructures: physical or virtual on premise, cloud Azure, Amazon etc.
- extend existing System Center implementations capabilities for missing capabilities: security& best practices assessments, capacity planning, machine protection with Azure Site Recovery, machine backup with Azure Backup
- *assessments about: AD health and security, SQL databases health and security, server infrastructure security and audit*
- lower costs with existing traditional expensive storage infrastructure using Azure Backup
- provides DR solution using Azure Site Recovery and consistent business continuity plan in place
- lower costs with existing management tools
- consistent dashboards and informations about applications

# System Center + OMS

## *Better Together*



Monitoring



Provisioning



Protection

- ✓ Centralized log repository
- ✓ Efficient server discovery and agent deployment
- ✓ Web based alert management
- ✓ VM capacity planning and management
- ✓ Integrated disaster recovery for VM workloads
- ✓ Cloud backup and long-term retention

... & many more to come!

# Introducing Windows Server 2016 licensing



## Standard and Datacenter Editions

- Deliver enhancements to core Windows Server functionality
- Make modern app development features accessible

## Datacenter Edition

- Continues to enable high density virtualization
- Provides advanced software-defined datacenter capabilities

## Cloud inspired value across editions

Standard Edition	Datacenter Edition
Low or non-virtualized scenarios	Highly virtualized private cloud
2 VMs	Unlimited VMs
2 Hyper-V containers*	Unlimited Hyper-V containers
Unlimited Windows Server containers	
Nano Server as deployment option	
	<b>Storage</b> features including: <ul style="list-style-type: none"><li>• Storage Replica</li><li>• Storage Spaces Direct</li></ul>
	<b>New Networking Stack</b>
	<b>Shielded VMs and Host Guardian Service</b>

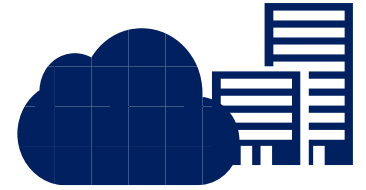
\*Windows Server 2016 Standard Edition entitles up to 2 VMs **or** 2 Hyper-V containers

# Windows Server Licensing

- Customers with processor licenses with Software Assurance (SA) can upgrade to Windows Server 2016 at no additional cost. At end of the SA term, processor licenses will be exchanged for core licenses and customers can renew their SA on core licenses.

	Windows Server 2016 Datacenter Edition	Windows Server 2016 Standard Edition	
VMs & Hyper V containers	Unlimited	2	Server: license all physical cores <ul style="list-style-type: none"> <li>8 core min/proc</li> <li>16 core min / server(device)</li> <li>1 proc 2012 R2 price=8 core 2016 price</li> <li>Incremental cores licensed in packs of two</li> </ul> Standard Edition <ul style="list-style-type: none"> <li>Each coverage of cores entitles 1 instance</li> </ul>
Windows Server containers	Unlimited	Unlimited	
Nano Server install option	✓	✓	
Infrastructure	Software defined datacenter	Base infrastructure services	
	8 cores min/proc	8 cores min/proc	
8 core price WS 2016 is same as 1 proc WS 2012 R2 price			

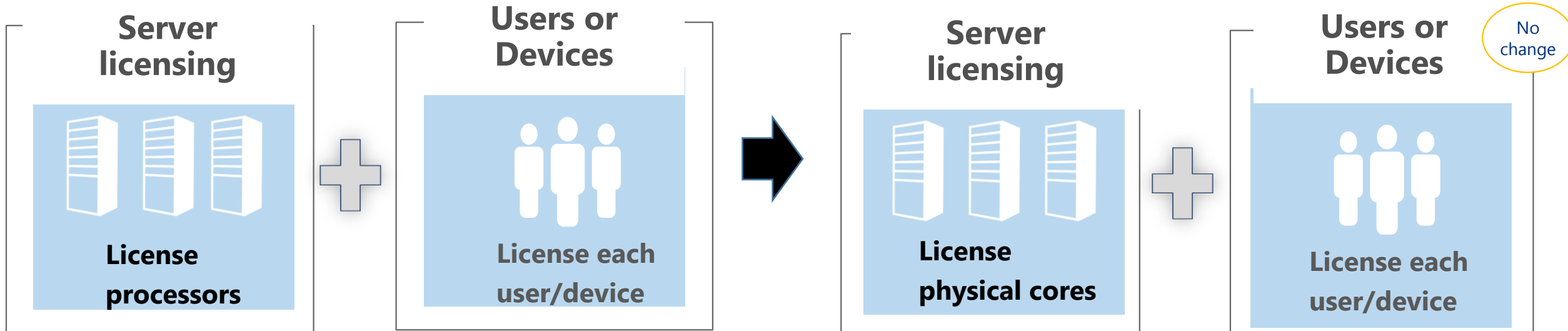
# Introducing Core-based Licensing



**Windows Server 2012 R2**  
**Licensing Model: Processor (Proc) +CAL**



**Windows Server 2016**  
**Licensing Model: Core +CAL**

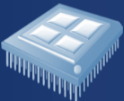
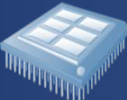

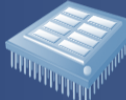


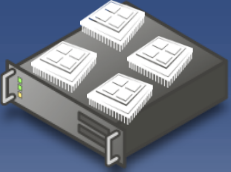


**Server Licensing: The price of a 16 core licence for Windows Server 2016 will be the same as the price for the 2 proc licence for Windows Server 2012 R2**

**Specific services RDS or RMS needs specific additional CAL's: RDS CAL or RMS CAL**  
**External Connector license for external users - licensed per device**

# Windows Server 2016 Datacenter

- *Inventory the number of physical cores per server*
- *Minimum of 8 cores per processor (incremental cores in 2 core packs)*

PHYSICAL CORES PER PROCESSOR							
PHYSICAL PROCESSORS PER SERVER		CORES REQUIRED TO BE LICENSED PER PROC					
	1	8	8	8	10	12	← Purchase additional cores in increments of 2 cores
	2	16	16	16	20	24	
	4	32	32	32	40	48	

# Windows Server 2016 Standard Edition

- Inventory the number of physical cores per server
- Minimum of 8 cores per processor (incremental cores in 2 core packs)
- Full coverage of cores on the server entitles 2 instance/Hyper-V container

PHYSICAL PROCESORS PER SERVER	PHYSICAL CORES PER PROCESSOR					INSTANCES ENTITLED
	4 or less	6	8	10	12	
1	8	8	8	10	12	1
2	16	16	16	20	24	2
4	32	32	32	40	48	4

Need to cover all cores again for 1 more instances

## Can you share details on the available editions of Windows Server 2016?

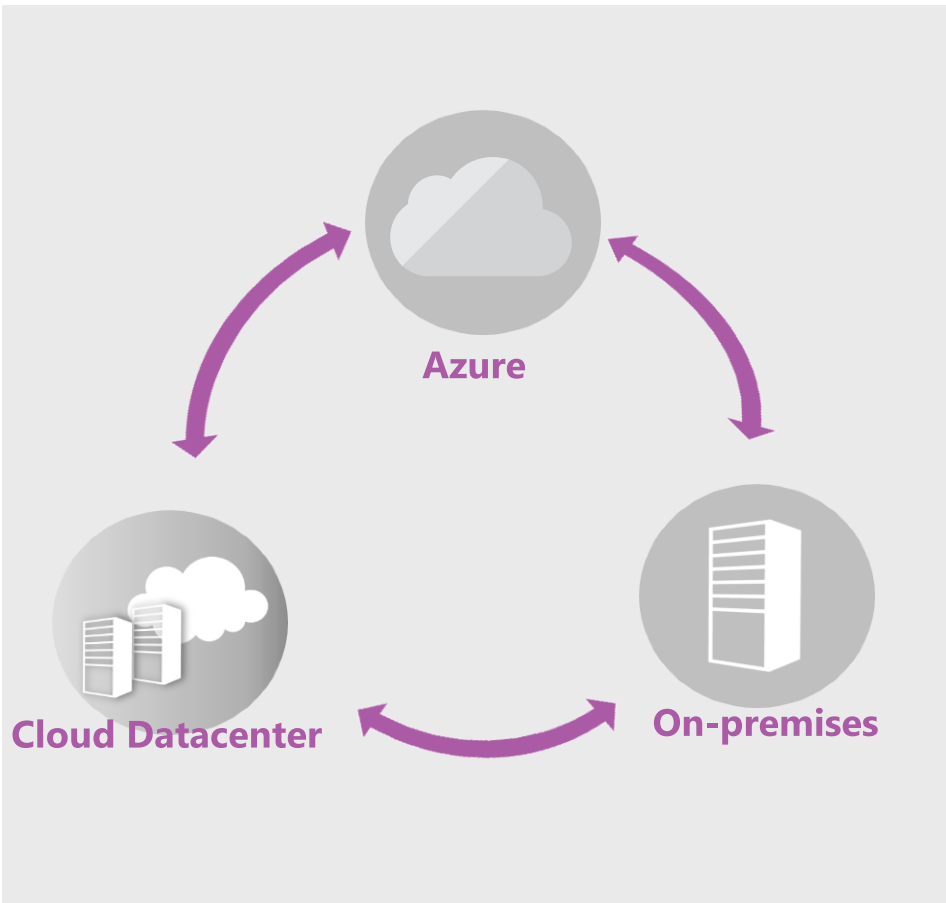
The Windows Server 2016 Editions are:

- **Windows Server 2016 Datacenter:** For highly virtualized datacenter and cloud environments. Includes new datacenter functionality including shielded virtual machines, software-defined networking, storage spaces direct and storage replica
  - **Windows Server 2016 Standard:** For physical or minimally virtualized environments
  - **Windows Server 2016 Essentials:** For small businesses with up to 25 users and 50 devices
  - **Windows Server 2016 MultiPoint Premium Server:** For Volume Licensing customers in Academic segments only
  - **Windows Storage Server 2016:** Standard and Workgroup Editions available in the OEM channel only
- 
- With Windows Server 2016, Windows Server Foundation and Windows Server Essential SKUS will be merged into a single SKU, Microsoft Windows Server 2016 Essentials. The 2016 Essentials Server licensing will continue to be processor based.
  - MultiPoint Server will have a single offering, Windows Server 2016 MultiPoint Premium Server that will have the same features as the current Windows Server 2012 R2 MultiPoint Premium Server.
  - There are no changes to Windows Storage Server from 2012 R2. It will continue to be processor based and available in the OEM channel

# Windows Server cross cloud portability

Align to cores as common compute currency

## Portability

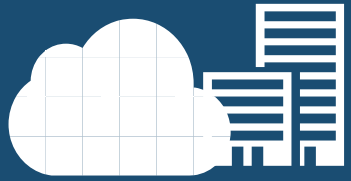


### **Azure Benefit for Windows Server SA** (Oct 2015 announced)

- Bring Windows Server instance to Azure at compute only rates
- Azure benefit extended to Windows SA customers
- Up to 2 instances on up to 8 cores each or 1 instance on up to 16 cores in Azure for each Windows Server Standard or Datacenter 2 proc license with SA.

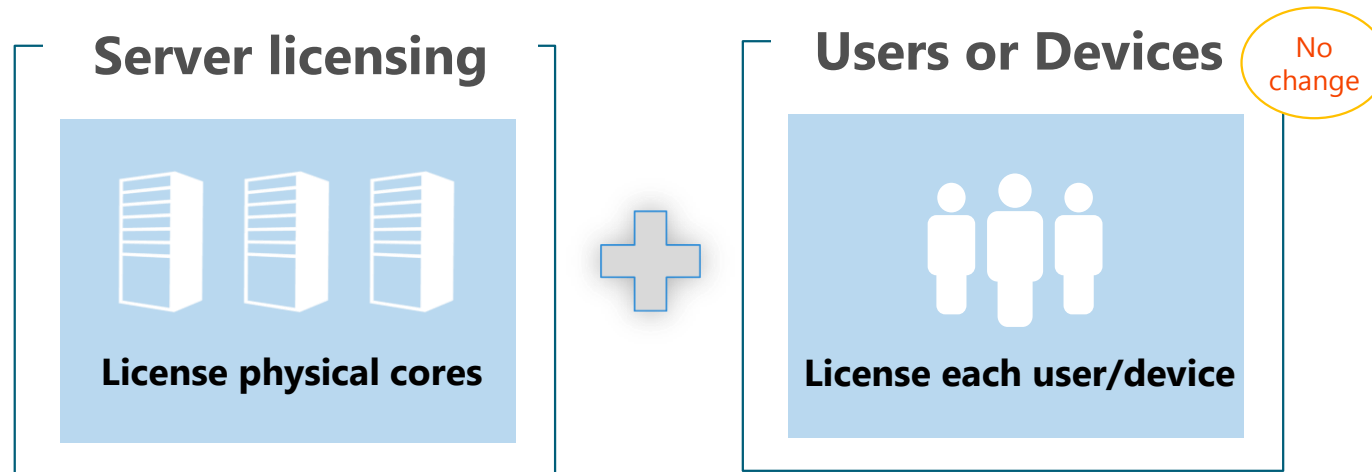
### **Align to cores at Windows Server 2016 GA** (Q3CY2016)

- Common compute currency across all environments
- Consistent hybrid approach as SQL



# Alignment to cores as the consistent cloud currency

## Windows Server and System Center 2016 Standard and Datacenter Editions

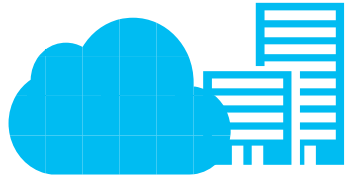


### Server licensing

16 core licenses will be same as 2-proc 2012 R2 price

Customers granted a minimum of 16 core licenses per 2-proc 2012 R2 license with SA at renewal

1:1 ratio of cores for Azure hybrid use rights benefit



# System Center 2016

## Hybrid cloud management

### Standard and Datacenter Editions

- Deliver enhancements in server management from 2012 R2
- Manage instances across platforms
- Support provisioning and monitoring of new Windows Server 2016 capabilities (e.g. Nano Server)

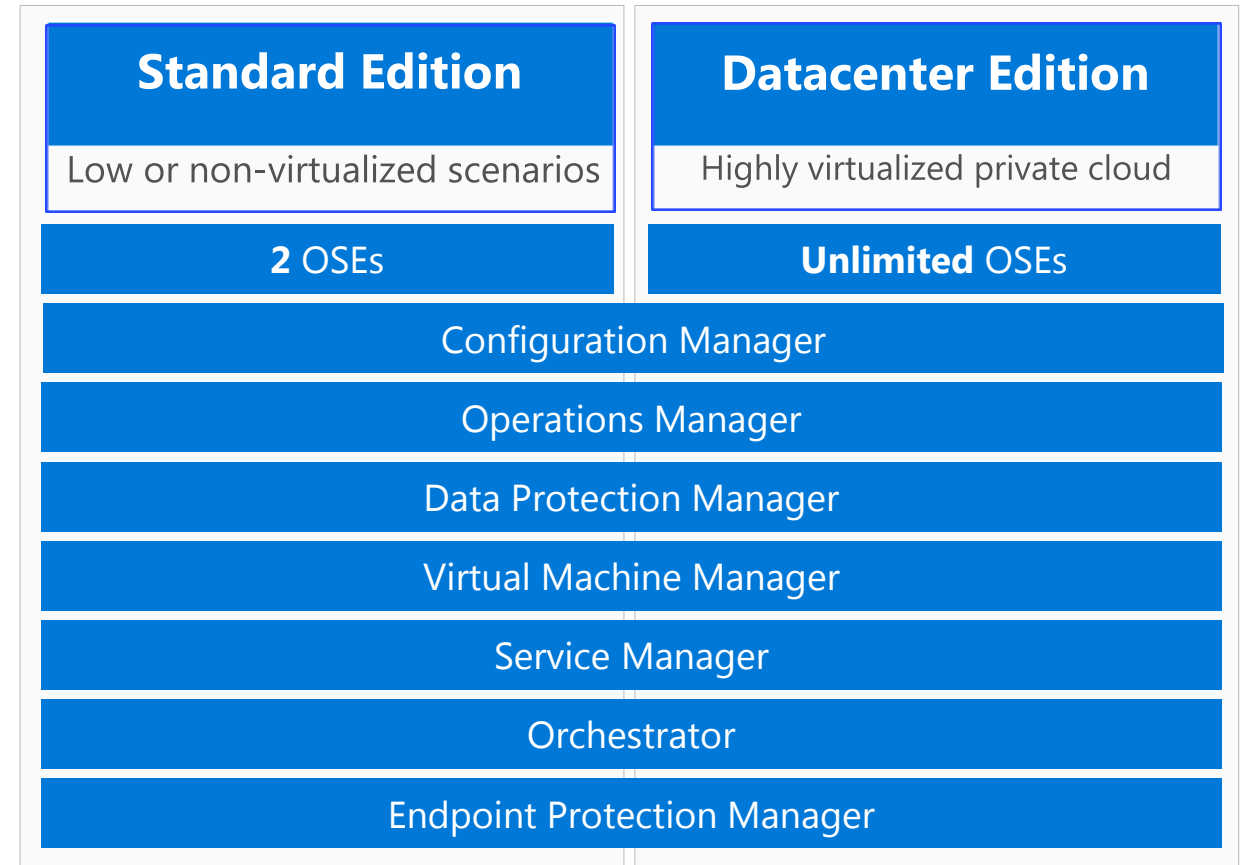
### Datacenter Edition

- Continues to support management of highly virtualized servers

**Management software (management consoles for SCCM, SCOM VMM, DPM, Orchestrator, Service Manager) with SQL**

**Standard Edition license for all System Center products database**





**is included in the System Center Standard/Datacenter/ClientML/ Client Management Suite licenses**



OSE refers to a server operation system environment under management by System Center

# Server and Cloud Enrollment (SCE)





Customer makes an installed base commitment to one or more of the available components

 Core Infrastructure Suite (CIS)	 Application Platform	 Developer Platform	 Windows Azure
<p><b>Products</b> CIS = (Windows Server + System Center)</p> <p><b>Requirements</b> CIS coverage for all Windows Servers</p>	<p><b>Products</b> SQL Server, SharePoint Server &amp; BizTalk Server*</p> <p><b>Requirements</b> Full SA coverage</p>	<p><b>Products</b> Visual Studio Enterprise</p> <p><b>Requirements</b> Full SA coverage</p>	<p><b>Products</b> All Windows Azure cloud services</p> <p><b>Available automatically</b> Can also be licensed standalone</p>
<p><b>+ Access to Windows Azure</b></p>			

\*BizTalk Server and SharePoint Server can also be enrolled as part of the application platform component

# Building your SCE

## Options and minimum requirements for covering your SCE commitment

 <b>Core Infrastructure</b>	 <b>Application Platform</b>	 <b>Developer Platform</b>	 <b>Windows Azure</b>
<p>CIS Datacenter            CIS Standard            CIS Datacenter w/o Windows Server            CIS Datacenter w/o System Center            CIS Standard w/o Windows Server            CIS Standard w/o System Center</p> <p>All licensed Windows Server deployments must be covered with one of the above SKUs.</p>	<p>SQL Server CAL            SQL Server Enterprise per core            SQL Server Business Intelligence Server            SQL Server Standard per core            SQL Server Standard Server            SQL Server Parallel Data Warehouse per core            BizTalk Server Enterprise per core            BizTalk Server Standard per core            BizTalk Server Branch per core            SharePoint Server</p>	<p>Visual Studio Enterprise            Visual Studio Test Professional            Visual Studio Team Foundation Server CAL            MSDN Platforms</p>	<p>All Windows Azure cloud services</p>
<b>Minimum order requirements</b>	<b>Minimum order requirements</b>	<b>Minimum order requirements</b>	<b>Minimum order requirements</b>
<p>50 processors via 25 licenses (each license covers up to 2 physical processors) or more of one or a combination of Core Infrastructure Server Suites Standard or Datacenter</p>	<p>SQL Server: 50 SQL Server per core or 5 SQL Server per server with 250 CALs            SQL Server PDW: 32 cores            BizTalk: 24 cores of any edition            SharePoint Server: 5 servers</p>	<p>20 licenses of Visual Studio Enterprise</p>	<p>Or can be licensed standalone</p>

# Operations Management Suite licensing

- OMS is purchased as standalone or as an add-on to System Center or the Core Infrastructure Suite (CIS)
- **OMS New licensing model from July 2016 – per VM + right to use System Center**
- The two editions of the OMS suite add-on correspond to underlying System Center editions
  - System Center Standard Edition
  - System Center Datacenter Edition
- Total number of add-ons that can be purchased is bound by the number of underlying System Center licenses
- The amount of entitlement included in the Standard add-on is enough to manage 2 VMs while the amount of entitlement included in the Datacenter add-on is enough to manage 10 VMs

*Customers without System Center have to consume each service through separate pay-as-you-go meters and don't get suite discount*

OMS		
	OMS add-on for SC-SE	OMS add-on for SC-DC
Operational Insights <sup>1</sup>	100 GB	500 GB
Automation	10,000 min	50,000 min
Backup	2 VMs	10 VMs
Site Recovery	2 VMs	10 VMs
	+	+
<b>Core Infrastructure Suite or System Center</b>	Standard Edition	Datacenter Edition

<sup>1</sup> OMS suite includes the premium tier of Operational Insights (12 month retention)

# Purchasing the Operations Management Suite

## OMS add-on for System Center

Purchased as an annual commitment available to System Center customers

	OMS SC Standard add-on (2 VM pack)	OMS SC Datacenter add-on (10 VM pack)
Operational Insights	100 GB	500 GB
Process Automation	10,000 min	50,000 min
Desired State Configuration	2 VMs	10 VMs
Backup	2 VMs	10 VMs
Site Recovery (E2E)	2 VMs	10 VMs
	<del>\$717 per year</del>	<del>\$3,585 per year</del>
	<b>\$430 per year</b>	<b>\$2,150 per year</b>

All prices are Open NL

## Standalone

Can be purchased through direct, pay-as-you-go or by consuming Azure monetary commitment

Service	Price
Operational Insights	\$3.5 per GB
Process Automation	\$0.002 per minute
Desired State Configuration	\$6 per VM
Backup	\$10 per VM
Site Recovery to customer sites	\$16 per VM
Site Recovery to Azure	\$54 per VM

\* Monthly prices

