Microsoft

Windows Server 2016

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Agenda

What's new in Windows Server 2016
Value prop, features, differences

Change to Core +CAL licensing
What is it, why, impacts

Hybrid, hybrid, hybrid
Why hybrid, key scenarios, offers

Resources and next steps
Sales, marketing, training and go-dos

What's new in Windows Server 2016

IT is being pulled in two directions

Support business agility and innovation

Provide secure, controlled IT resources

By 2017, 50% of total IT spending will be spent outside of the formal IT organization*

*Source: Gartner Group, 2016

Windows Server 2016 feature differentiation

Standard and Datacenter editions

Delivers enhancements to core Windows Server functionality.

Makes modern app development features accessible.

Datacenter Edition

Continues to enable high density virtualization.

Adds advanced software-defined datacenter capabilities, new networking stack and Shielded Virtual Machines.

	Datacenter Edition	Standard Edition
Core Windows Server functionality	•	•
OSEs*/Hyper-V containers	Unlimited	2
Windows Server containers	Unlimited	Unlimited
Nano Server**	•	•
Host Guardian Service	•	•
Storage features including Storage Spaces Direct and Storage Replica	•	
Shielded Virtual Machines	•	
Networking stack	•	

*OSE refers to a server Operating System Environment. Windows Server Standard Edition license permits two OSEs or VMs when all physical cores are licensed.

**Software Assurance is required to deploy and operate Nano Server in production.

10 reasons you'll love Windows Server 2016

1. Privileged identity
2. Security
3. Compute
4. Storage
5. Network
6. Remote Desktop Services (RDS)
7. Nano Server
8. Containers
9. PowerShell
10. Server management tools

Windows Server 2016 Value Prop

Windows Server 2016 is the cloud ready operating system that delivers new layers of security and Azure-inspired innovation for the applications and infrastructure that power your business.

New Layers of Security	**Software-defined Datacenter**	**Cloud-ready Application Platform**
Privileged Identity protection Breach resistance Secure virtualization platform	Built-in SDDC capabilities Affordable and enterprise ready Azure-inspired infrastructure	Traditional + Cloud-native apps Containers/microservices Azure Hybrid Use Benefit
 Security threats	 Datacenter efficiency	 Supporting innovation

Better security starts at the OS

Security threats

1) Add built-in layers of security

2) Protect identity

3) Help secure virtual machines

1) Add built-in layers of security

Help protect the OS and apps – on premises or in any cloud

Device Guard

Ensure that only permitted binaries can be executed from the moment the OS is booted.

Windows Defender

Actively protects from known malware without impacting workloads.

Control Flow Guard

Protects against unknown vulnerabilities by helping prevent memory corruption attacks.

2) Protect identity

Protecting privileged credentials

Credential Guard

Prevents Pass-the-Hash and Pass-the-Ticket attacks by protecting stored credentials through virtualization-based security.

Remote Credential Guard

Works in conjunction with Credential Guard for RDP sessions to deliver Single Sign-On (SSO), eliminating the need to pass credentials to the RDP host.

Just Enough Administration

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

Just-in-Time Administration

Provides privileged access through a workflow that is audited and limited in time.

Just Enough and **Just in Time** administration

3) Help secure virtual machines

Extend protection on physical servers to virtual machines

Shielded Virtual Machines

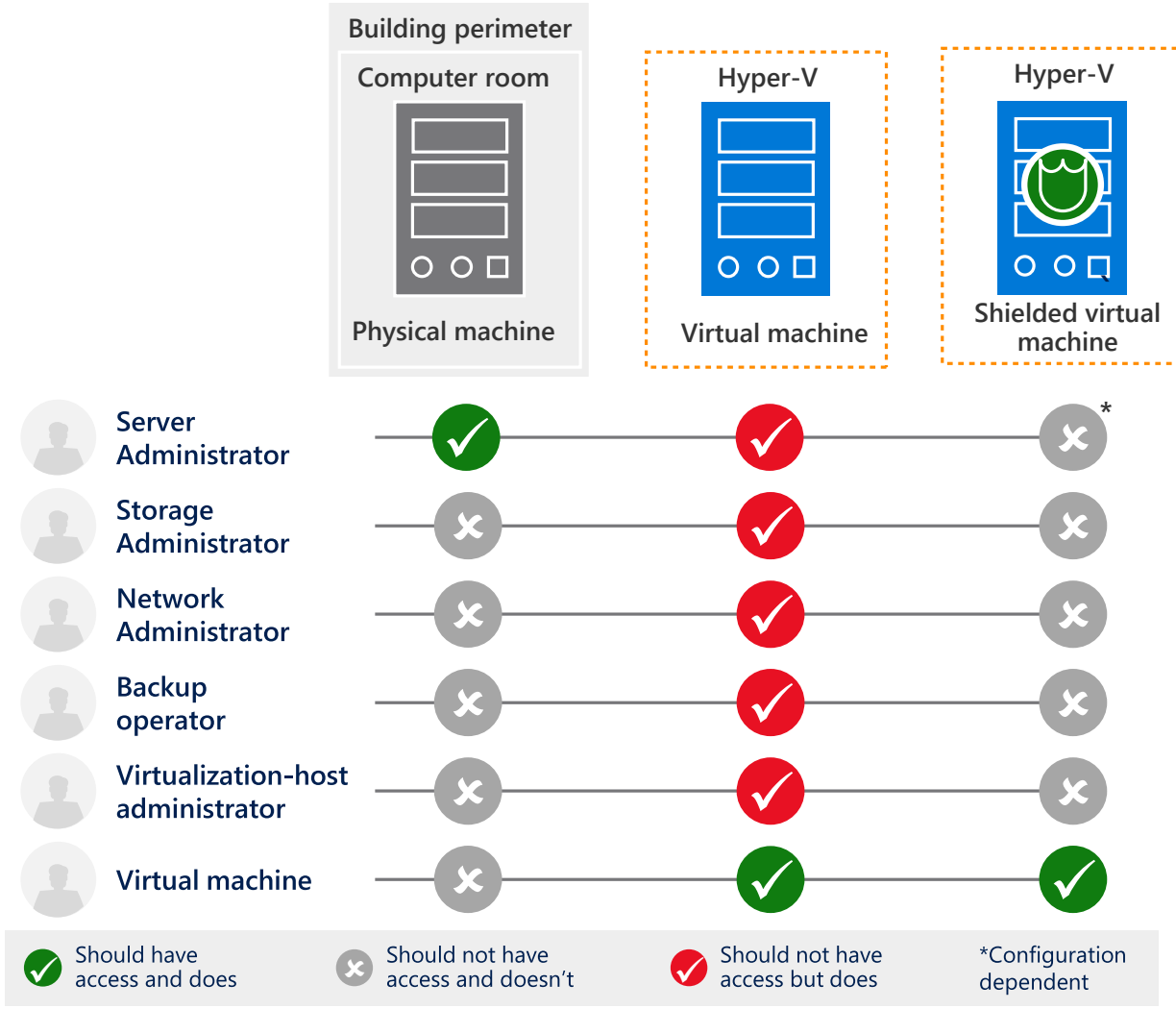
Use BitLocker to encrypt the disk and state of virtual machines protecting secrets from compromised admins and malware.

Host Guardian Service

Attests to host health releasing the keys required to boot or migrate a Shielded VM only to healthy hosts.

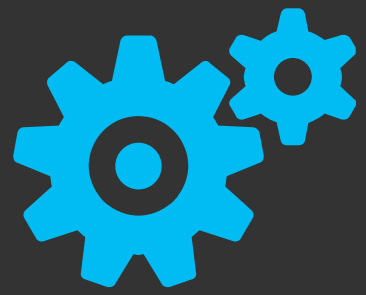
Generation 2 VMs

Supports virtualized equivalents of hardware security technologies (e.g., TPMs) enabling BitLocker encryption for Shielded Virtual Machines.



Transforming the datacenter

Datacenter efficiency



1) Resilient **compute**

2) Software-defined **storage**

3) Azure-inspired **networking**

1) Resilient compute

Microsoft is a leader in all six Gartner magic quadrants

- x86 Server Virtualization[1]
- Public Cloud Storage Services[2]
- Cloud Infrastructure as a Service[3]
- Disaster Recovery as a Service[4]
- Enterprise Application Platform as a Service[5]
- Identity and Access Management as a Service[6]

Gartner's magic quadrant-x86

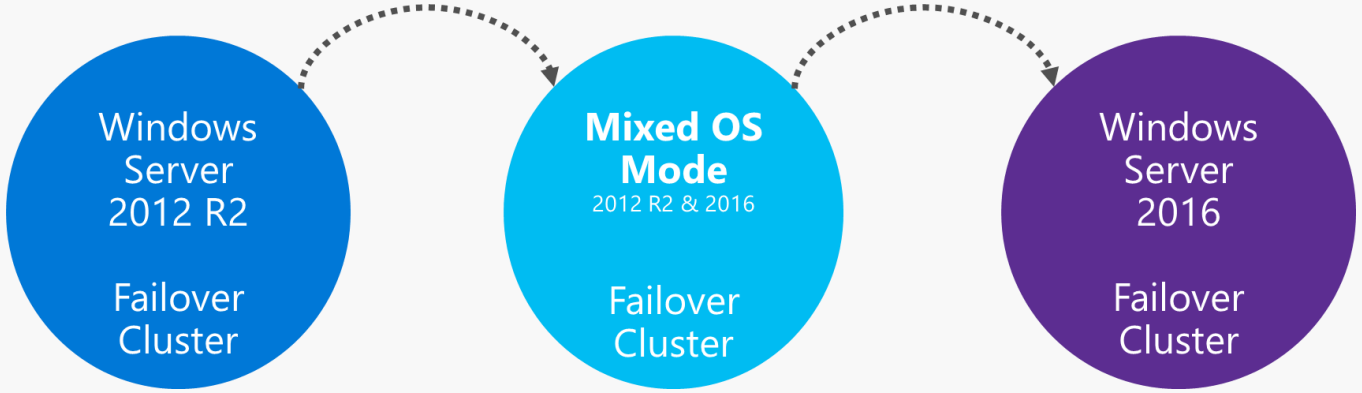
[1] Gartner "Magic Quadrant for x86 Server Virtualization Infrastructure," by Thomas J. Bittman, Philip Dawson, Michael Warrilow, August 3, 2016; [2] Gartner "Magic Quadrant fro Public Cloud Storage Services," by Raj Bala, Arun Chandrasekaran, July 26, 2016; [3] Gartner "Magic Quadrant for Cloud Infrastructure as a Service," by Lydia Leong, Gregor Petri, Bob Gill, Mike Dorosh, August 3, 2016; [4] Gartner "Magic Quadrant for Disaster Recovery as a Service," by John Morency, Christine Tenneson, Ron Blair, June 16, 2016; [5] Gartner "Magic Quadrant for Enterprise Application Platform as a Service," by Paul Vincent, Yefim V. Natis, Kimihiko Iijima, Rob Dunie, Anne Thomas, Mark Driver, March 24, 2016; and [6] Gartner "Magic Quadrant for Identity and Access Management as a Service," by Greg Kreizman, Neil Wynne, June 6, 2016.

1) Resilient compute

Confidently virtualize anything

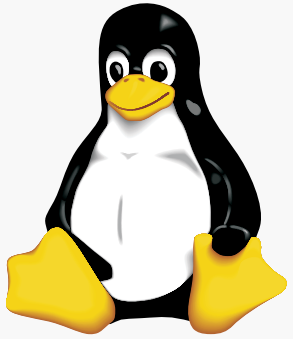
Rolling Cluster Upgrades

Upgrade your fabric to Windows Server 2016, without downtime to workloads running on Hyper-V virtual machines.



Linux support

Deploy applications on multiple platforms with best-in-class support



redhat.

CANONICAL

SUSE

ORACLE LINUX

Hot-add and remove

Make changes in Network, Memory and Storage without downtime to workload

2) Software-defined storage

High performance storage solutions, fraction of the cost

Storage Spaces Direct

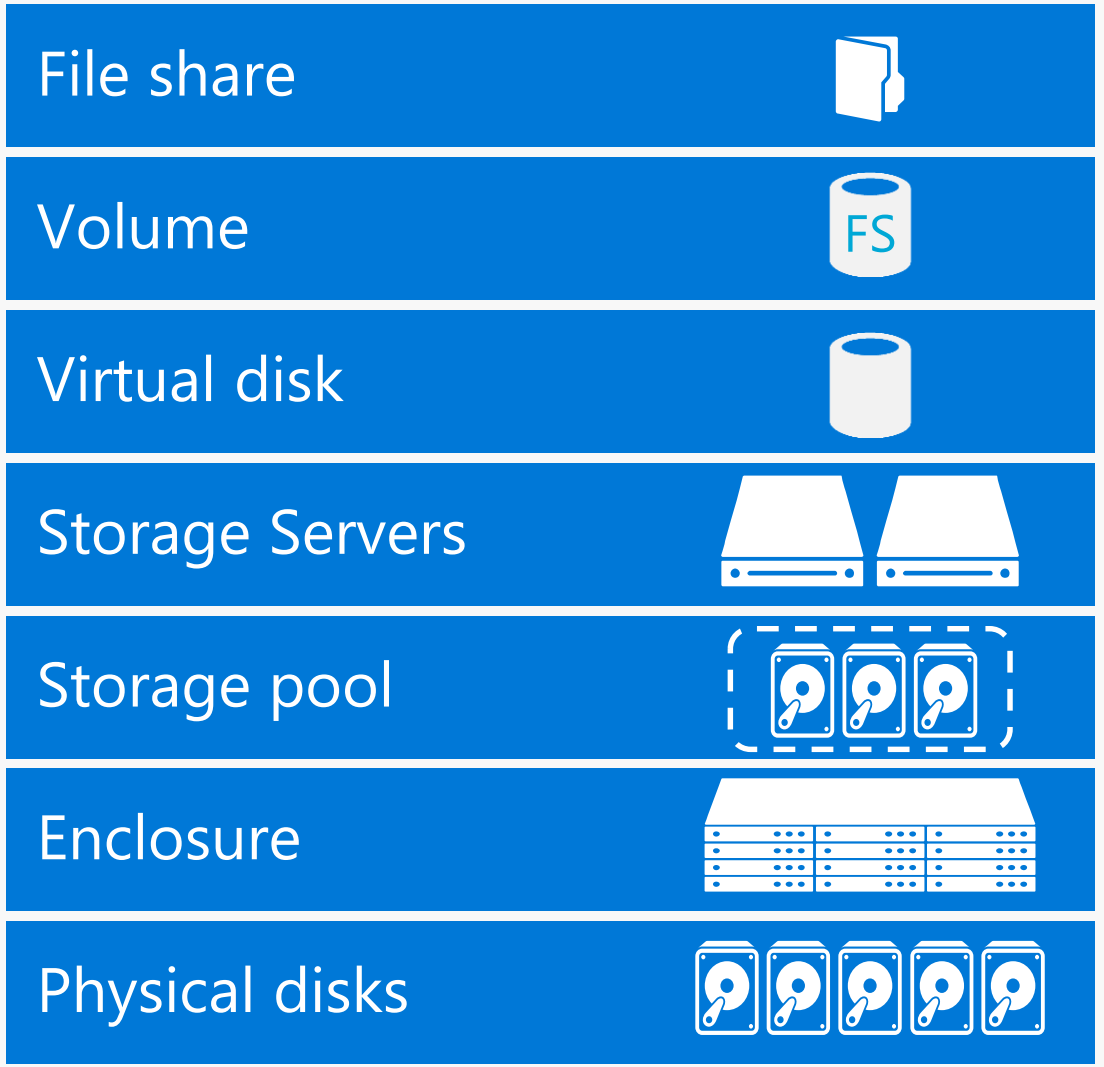
Use standard servers with local storage to build highly available and scalable software-defined storage

Storage Replica

Create affordable business continuity and disaster recovery among datacenters

Storage Quality of Service

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



3) Azure-inspired networking

Networking agility to support workload mobility

Network Controller

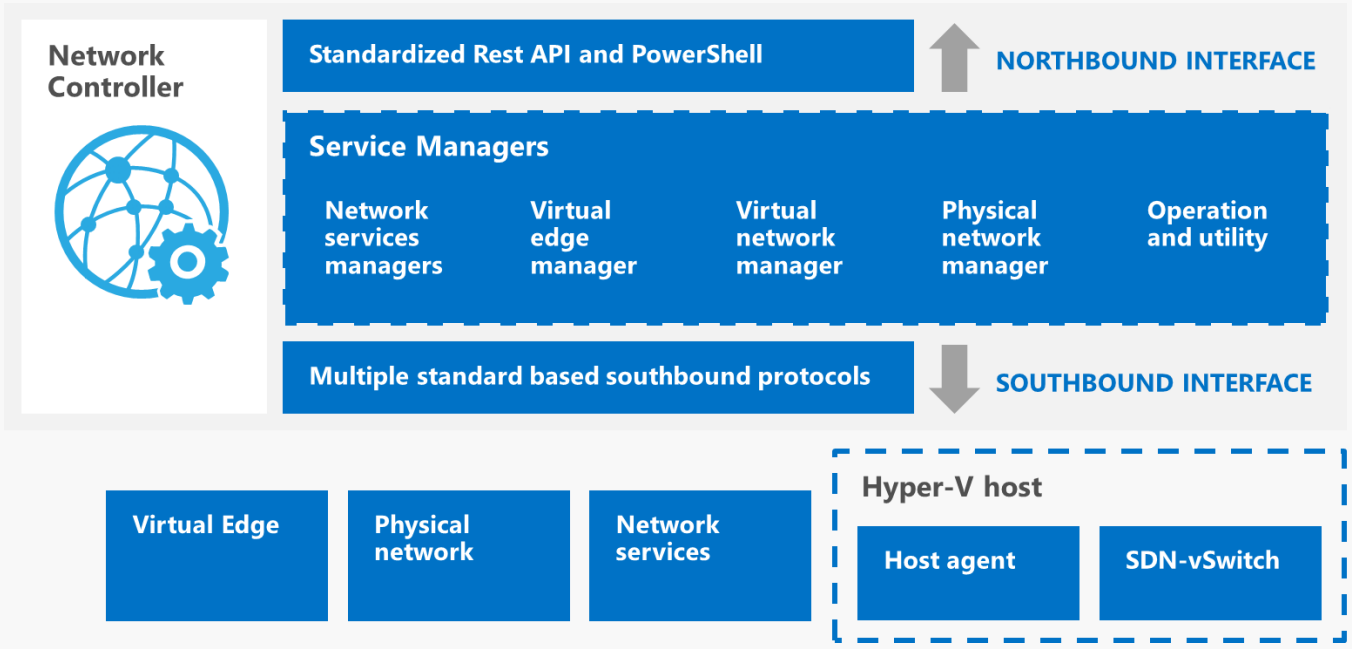
Improve network management with centralized control of network policies using the same network controller found in Microsoft Azure

Distributed Firewall

Control network flows in the fabric with access control lists structured around application connectivity needs, not workload placement

Load Balancer

Make applications highly available and responsive with a built-in load balancer made from the technology that runs Azure



Accelerating business agility

Supporting innovation

1) Run existing apps with more security

2) Evolve existing apps with new technologies

3) Create innovative cloud-native apps

1) Run existing apps with more security

Key Windows Server 2016 RDS improvements

Better graphics experience
Increased performance and app compatibility

Enhanced connection broker
Scale management, shared SQL connections

More efficient cloud deployment
Reduced number of VMs needed

Support for cloud-managed domain services

2) Evolve existing apps with new technologies

Modernize existing apps or build new apps

Existing apps

New apps

Secure fabric for existing VMs

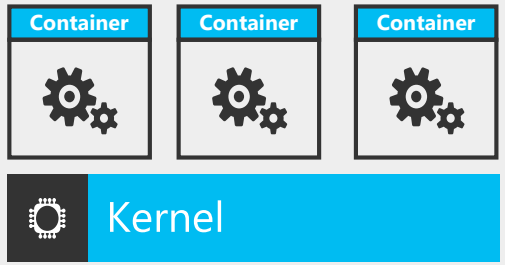
Containerize existing apps

Create cloud-native apps

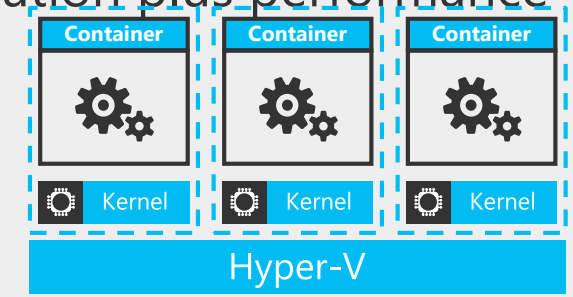
"By containerizing legacy applications using Windows Server containers, we gain better consistency and control between developers, testers, and deployment teams-a full DevOps environment-without changing the application."

Matthew Roberts
Principle Software Engineer, Tyco International

Windows Server containers
Maximum speed and density



Hyper-V containers
Isolation plus performance



3) Create innovative cloud-native apps

Nano Server installation option – Just enough OS

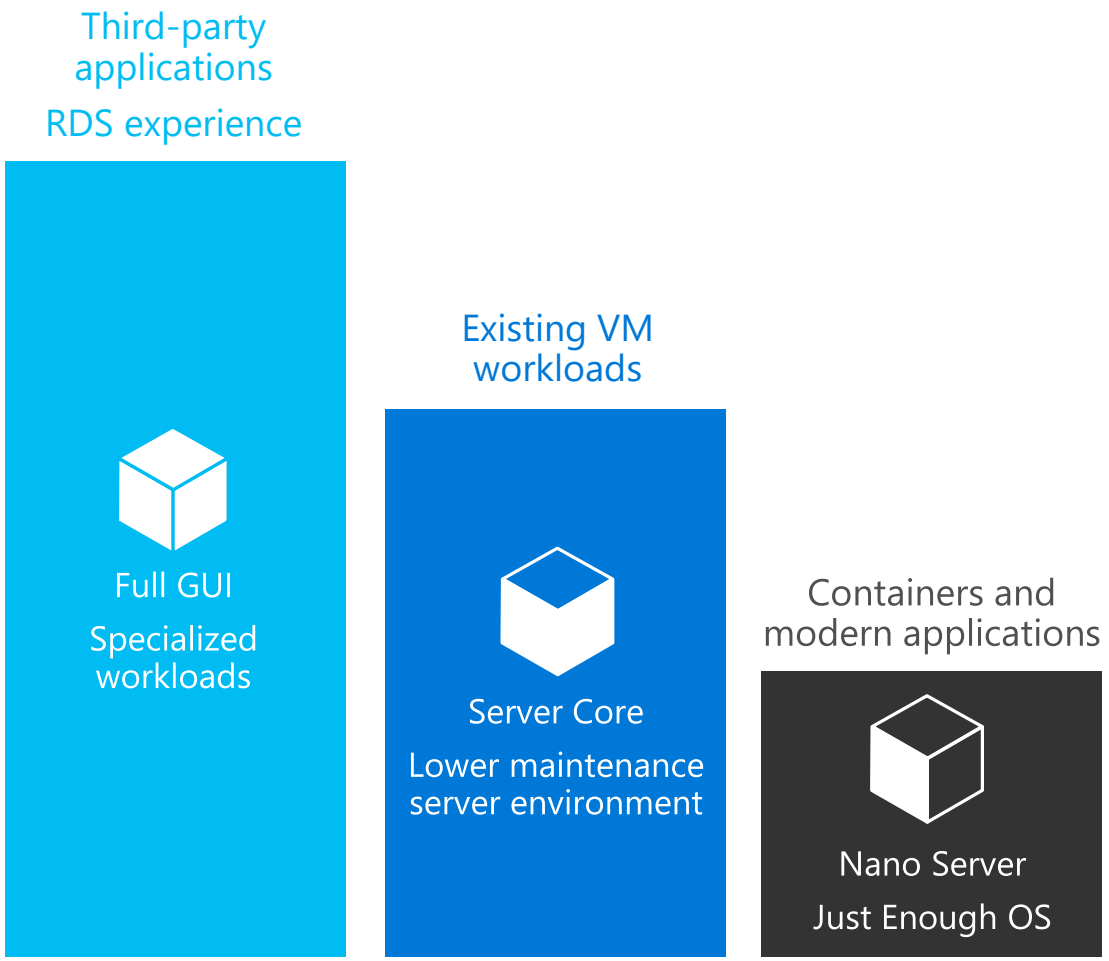
Provides higher density, reduced attack surface and servicing requirements

Ideal for reducing datacenter footprint

- Smaller image size, smaller attack surface, faster boot time

Ideal for next generation app development

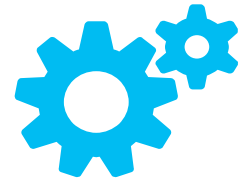
- Built for containers and cloud-native apps
- Full developer experience with Windows SDK and Visual Studio



Feature comparison

Scenario	Feature Description	Windows Server 2008 R2	Windows Server 2012 R2	Windows Server 2016
Security	**Shielded Virtual Machines:** Uses BitLocker to encrypt disk and state of virtual machines.	○	○	●
	Host Guardian Service: Ensures Hyper-V hosts running Shielded Virtual Machines are allowed and healthy hosts.	○	○	●
	Windows Defender: Automatically protects machines from malware while allowing legitimate applications to run.	◑	◑	●
	Control Flow Guard: Natively configured to block common vectors of attack.	○	○	●
	Generation 2 virtual machines: Allows VMs to use hardware-based security to leverage Secure Boot, BitLocker, etc.	○	◑	●
Software-Defined Datacenter	**Cluster OS Rolling Upgrade:** Enables you to upgrade your server clusters from Windows Server 2012 R2 to Windows Server 2016 while continuing to provide service to your users.	○	○	●
	Linux support: New support for Linux Integration Services (LIS) and FreeBSD Integration Services (BIS) provides increased performance, management and access to Hyper-V features.	◑	◑	●
	Converged Networking: Provides ability to converge both RDMA and Ethernet traffic using a single network adaptor.	○	◑	●
	Nano Server installation option: New remote-administered option for private clouds and datacenters.	○	○	●
Cloud-Ready Application Platform	**Windows Server containers:** Creates an isolated application environment (kernel, system drivers, etc.), in which you can run an application without fear of changes due to applications or configuration.	○	○	●
	Hyper-V containers: Provides a highly isolated environment in which to operate, where the host operating system cannot be affected in any way by any other running container.	○	○	●

○ Not Supported ◑ Limited Support ● Fully Supported

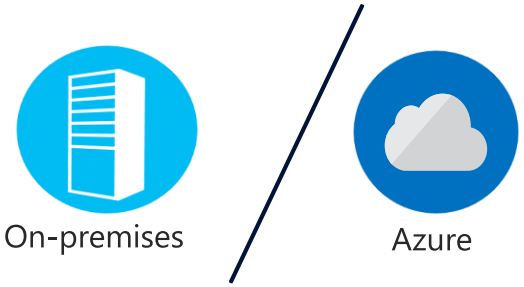


Core +CAL based licensing

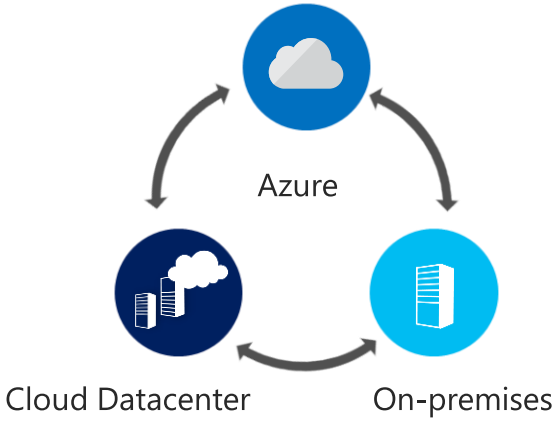
Windows Server business model transformation

Today…

- Customers run workloads on-premises and in the cloud.
- Licensing model is processor-based when on-premises and core-based in the cloud.
- This dual currency creates complexity for our customers.



A new approach is needed to enable consistency across environments



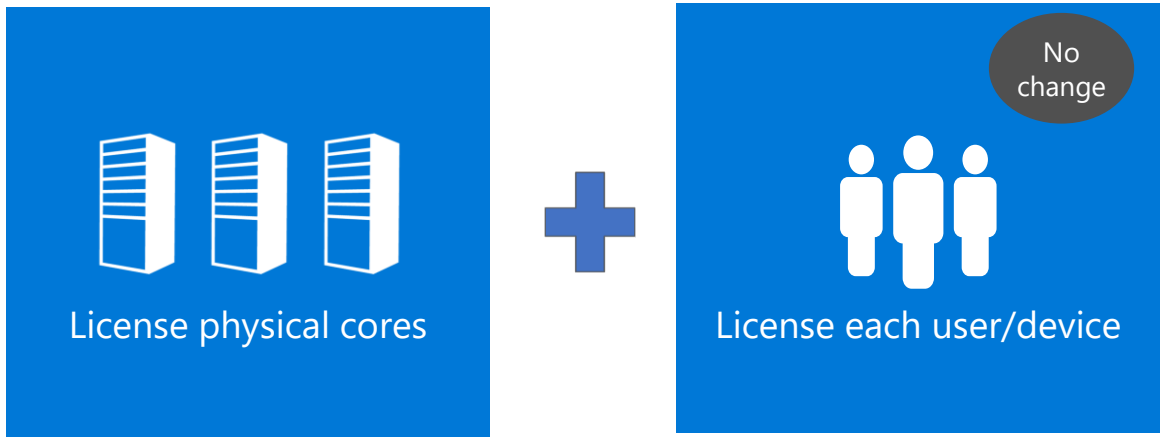
Align to a common currency of cores

- Offer consistent approach across environments.
- Enable multi-cloud scenarios.
- Improve workload portability for Windows Server though benefits such as Azure Hybrid Use Benefit (AHUB).
- Remove friction from different licensing models.

Windows Server 2016 licensing

Transitioning from processor to core

Windows Server Standard and Datacenter editions



Server licensing
(Transitions from processor to core)

Users or Devices
(No change in CALs)

- Servers are licensed based on the number of processor cores in the physical server.
- To license a physical server, all physical cores must be covered.
- A minimum of 16 core licenses is required for each server.
- A minimum of 8 core licenses is required for each physical processor.
- The price for 16 core licenses of Windows Server 2016 is the same as the 2 processor license of Windows Server 2012 R2.
- Existing customers' servers under SA will be granted additional cores as needed, with documentation.

Processor to core-based licensing

Two processors per server

Physical Cores Per Processor	 2	4	8	10	12	14	16
Number of 2-core packs needed with Windows Server 2016	8	8	8	10	12	14	16

- A minimum of 16 core licenses required for each server.
- Licenses are available in 2-core packs.
- The price for eight 2-core pack licenses of Windows Server 2016 is equivalent to one 2-processor license of Windows Server 2012 R2.

Hybrid, hybrid, hybrid

Modernise and extend the datacenter

Large install base of customers still running Windows Server 2008 and older!

The cloud is about instantly expanding IT capabilities

The cloud is ideal for:

- Get apps up and running fast
- Scale instantly
- Pay only for what you use
- Leverage enterprise-level security

With Microsoft, you can offer your customer the right combination that's right for their business

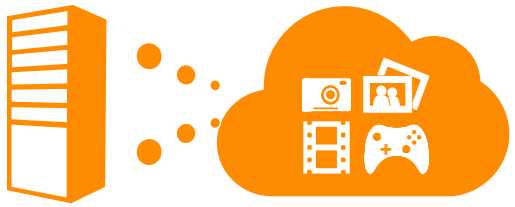
Physical Server

Virtualization

Cloud

Key Azure scenarios for small & midsize customers

Data
Backup and DR

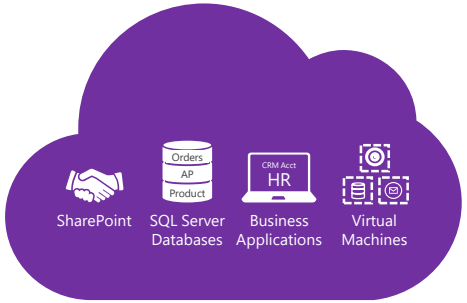


Offer peace of mind with scalable data backup and ongoing DR services in the cloud.

Host
Websites and Apps

Grow your business helping customers move their websites and web apps to the cloud

Deployment in VMs



Quickly deploy and manage customer applications in the cloud

Identity

Synchronise and manage identities and offer single sign-on to SaaS applications

Introducing the Azure Hybrid Use Benefit

Benefits

Use Windows Server licenses in Azure datacenters when covered by Software Assurance.

In Azure, pay only for the base virtual machine service utilization.

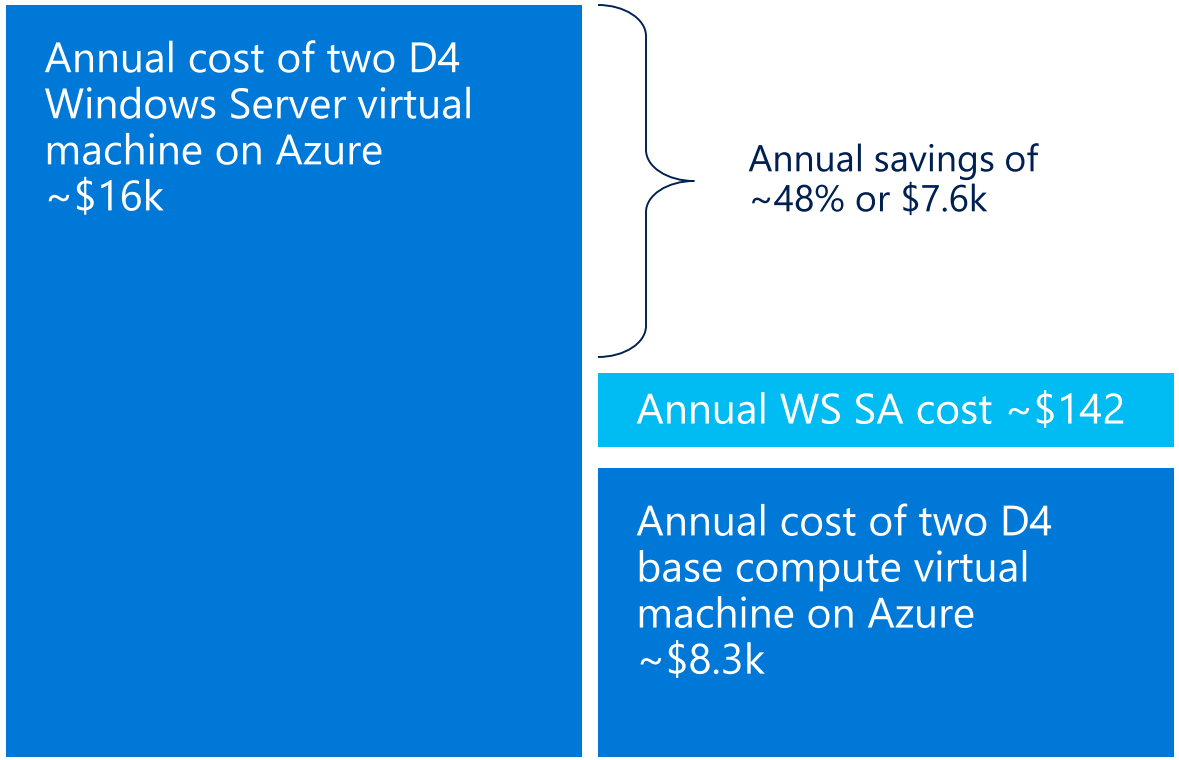
Datacenter edition can be run in Azure and on-premises simultaneously.

Significantly reduce costs compared to running Windows Server in other public clouds.

Details

Licenses required to have Software Assurance.

Each 2-processor Windows Server Datacenter or Standard edition allows up to two Windows Server VMs on Azure at 8 cores each.



Note: D4 Virtual Machine = 8 cores, 28GB RAM, 400GB Disk.
Pricing comparison assumes EA Level D pricing.

Azure Hybrid Use Benefit datasheet
www.azure.com/ahub

Faster, cheaper, better (you've heard it before)

We made it real replacing 84% of datacenter technology

Upgraded in Nov. 2015

- SANs became hosts for Storage Spaces Direct (S2D).
- VMware and Hyper-V hosts became Nano Server hosts.
- Protected accounting, HR, and secured customer with Shielded Virtual Machines and Host Guardian Services.
- Traditional third party networking infrastructure shifted to a Windows 2016 software-defined networking (SDN) Infrastructure.
- Traditional third party RDS hosts and Windows Server 2012R2 VDI became Windows Server 2016 hosts and Windows Server 2016 VDI.
- All System Center 2012 components became System Center 2016 components.
- Tightly integrated on-premises environment with Azure.

Results!

- Dramatically lower resource utilization, reduced attack profile, increased ease of management at scale
- 50% decrease in SAN storage costs.
- Shrunk datacenter processes from 2-3 days to less than 8-minutes
- Passed a full Security Assessment on our highly secured content. (Certified for 18 months.)
- Delivered a hybrid cloud environment

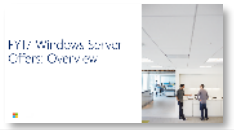
convergent COMPUTING CCO.COM

Resources and next steps

Server 2016 Launch: Campaign Bill of Materials

Internal Readiness			
Name	*Image*	*Description*	*Link*
Windows Server 2016 L100 Presentation		Level 100 deck detailing the top IT priorities today and a complete overview of Server 2016 and how it leading the way in dealing with these challenges.	http://download.microsoft.com/documents/uk/partner/server/Windows_Server_2016_L100_Presentation.pptx
Windows Server 2016 L100 Licensing Presentation		Level 100 deck providing a licensing and pricing overview of Volume License changes to Windows Server and System Center 2016	http://download.microsoft.com/documents/uk/partner/server/Windows_Server_2016_Licensing_Deck_L100.pptx
Windows Server 2016 L200 Licensing Presentation		Level 200 deck providing a more detailed licensing overview of Windows Server and System Center 2016 including licensing scenarios.	http://download.microsoft.com/documents/uk/partner/server/Windows_Server_2016_Licensing_Deck_L200.pptx
10 Reasons You'll love Windows Server 2016		On demand webinar	https://info.microsoft.com/10-reasons-youll-love-Windows-Server-2016.html?ls=Website
Microsoft Virtual Academy training		In this helpful course, get the details about the features and functionality that have been added to this new version of Windows Server, along with those that were modified from previous versions	https://mva.microsoft.com/en-US/training-courses/what-s-new-in-windows-server-2016-16457?l=wqkdk5sXC_206218965

Server 2016 Launch: Campaign Bill of Materials

To Customer Material: Sales	Image	Description	Link
Windows Server Offers for FY17		Presentation on Azure Hybrid Use benefit and Datacenter step-up offer	http://download.microsoft.com/documents/uk/partner/server/Windows_Server_FY17_Offers.pptx
Windows Server 2016 Customer brochure		Customer brochure which includes: 10 reasons you'll love Windows Server 2016, feature differentiation and core-based pricing, processor to core conversion, comparison summary.	http://download.microsoft.com/documents/uk/partner/server/Windows_Server_2016_Launch_Brochure.pdf
Windows Server 2016 Security to Customer Presentation		To customer presentation - ideal for sales and webinars, includes speaker notes.	http://download.microsoft.com/documents/uk/partner/server/Windows_Server_2016_Security.pptx
To Customer launch email		To customer email launching Server 2016	Run your business with confidence using Windows Server 2016.msg

Server 2016 Launch: Campaign Bill of Materials

To Customer Material: Technical			
Windows Server 2016 Datasheet		Customer facing Windows Server 2016 datasheet that can be included on your website	http://download.microsoft.com/documents/uk/partner/server/Windows_Server_2016_Datasheet.pdf
System Center 2016 Datasheet		Customer facing System Center 2016 datasheet that can be included on your website	http://download.microsoft.com/documents/uk/partner/server/System_Center_2016_Datasheet.pdf
Windows Server **Technical** Feature Comparison Guide		This guide shows the comparison of technical features of Windows Server 2016 vs 2012 R2 and 2008 R2. A great tool for persuading customers to upgrade to 2016.	http://download.microsoft.com/documents/uk/partner/server/Windows_Server_2016_Technical_Feature_Comparison_Guide.pdf
Windows Server 2016 and SQL 2016 Better Together Technical Whitepaper		Windows Server and Microsoft SQL Server teams are collaborating closely to ensure that the combination of these products is greater than the sum of their parts. This whitepaper can be used as gated content to capture customer details.	http://download.microsoft.com/documents/uk/partner/server/SQL_Server_2016_and_Windows_Server_2016_Better_Together_White_Paper.pdf

Next steps

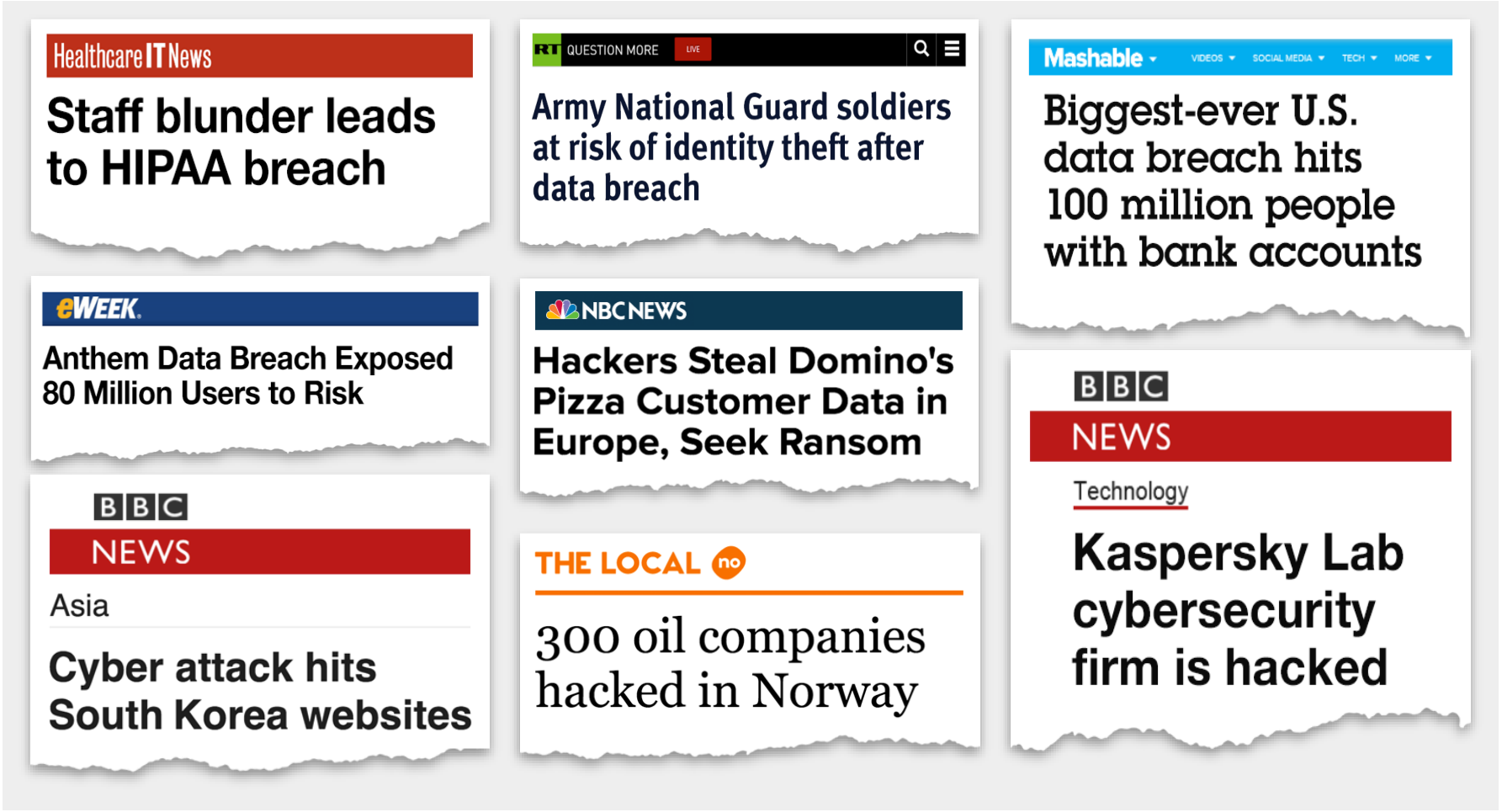
Get ready	Offers	Opportunity

• Explore the training resources provided in this deck
• Lots of on-demand content from **Ignite** event
• Visit the refreshed Windows Server webpage:
  • www.microsoft.com/ws2016
	• Understand offers available
	  • Azure Hybrid Use Benefit
	  • Step up to Datacenter
		• SMB fastest growing segment
		• Security top priority
		• Huge legacy install base
		• Modernisation & hybrid
		• More reasons than ever to upgrade to Datacenter

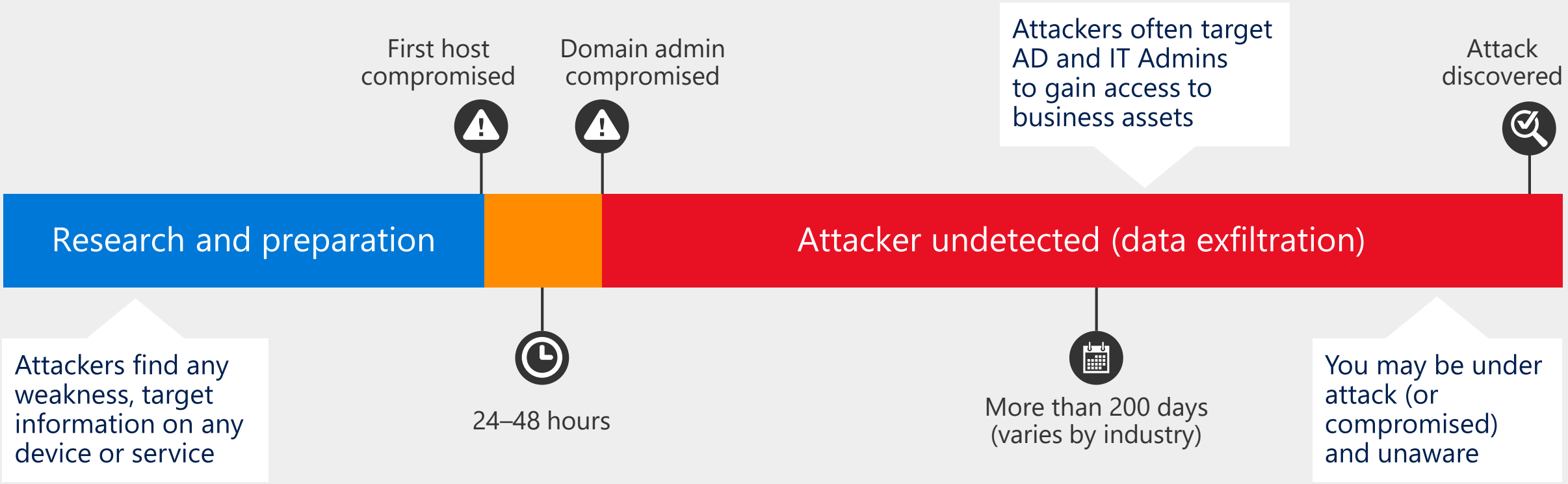
Appendix

Why security is a top IT priority

- Increasing incidents
- Multiple motivations
- Bigger risk



Attack timeline



Built-in security

Shielded Virtual Machines

Host Guardian Service

Secure Boot for Windows and Linux

Nano Server Hyper-V Host

Virtualization-based Security (VBS)

Hyper-V containers

Containers in Shielded VMs

Credential Guard

Just-in-Time Administration

Just Enough Administration

Control Flow Guard

Device Guard

Windows Defender

Enhanced auditing for threat detection

Software-defined compute, storage, network

Storage Spaces Direct

Storage Spaces Replica

ReFS

Stretched Clusters

Storage QoS

Storage health monitoring

Rolling Cluster Upgrade

PowerShell 5.1

Mixed OS Mode cluster

Hot add and remove

Linux support

Guest Clustering

Azure Witness for cluster

StorSimple

VM Storage Resiliency

Server management tools

Azure Consistent Storage

Network Controller

Azure-based data plane

Load balancer

Distributed firewall

Hybrid SDN gateway

NVGRE, VXLAN, OVSDB

Cloud-ready application platform

Windows Server containers

Hyper-V containers

Docker integration and support

PowerShell 5.1

PowerShell DSC

Internet Information Services 10

Azure Service Fabric for Windows Server

Visual Studio Core

.NET Core

Nano Server deployment option

Windows Server 2016 editions

Editions	Description	Licensing model	CAL requirements
Windows Server 2016 Datacenter	For highly virtualized datacenter and cloud environments.	Core based	WS CAL
Windows Server 2016 Standard	For physical or minimally virtualized environments.	Core based	WS CAL
Windows Server 2016 Essentials	For small businesses with up to 25 users and 50 devices. Essentials is a good option for customers using the Foundation edition, which is not available for Windows Server 2016.	Processor based	No CAL required
Windows Server 2016 MultiPoint Premium Server*	Enables multiple users to access one computer; available only for Academic licensing.	Processor based	WS CAL+RDS CAL
Windows Storage Server 2016	For dedicated OEM storage solutions. Available in Standard and Workgroup editions through the OEM channel.	Processor based	No CAL required
Microsoft Hyper-V Server 2016	Free hypervisor download.	NA	NA

*Corporate customers can use the Windows MultiPoint Premium Server role that will be available in Standard and Datacenter editions. Windows Server CALs and RDS CALs are required for Multipoint Server.