

# Novosti strežnika Windows Server 2019

Slavko Kukrika  
MVP in prijazen fant



**#ntk19**

# Agenda

- ➔ Windows Admin Center
- ➔ Managing hybrid datacenter
- ➔ Hyper-converged infrastructure (HCI)
- ➔ Enhanced security capabilities
- ➔ Faster innovation for applications

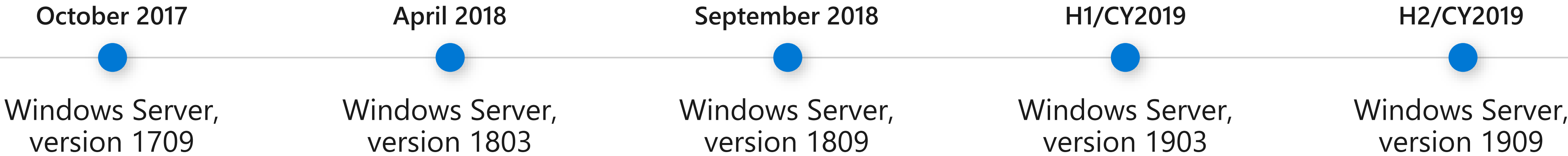
# Windows Server as a Service

## INSIDERS



Every 2 weeks

## SEMI-ANNUAL CHANNEL



Every 6 months

## LONG-TERM SERVICING CHANNEL



# Microsoft Azure

Hybrid Datacenter

Hybrid Cloud

Windows Server/WSSD  
SQL/.NET/Containers

Azure Stack

On-premises

# Microsoft Azure

## Hybrid Datacenter

## Hybrid Cloud

Windows Server/WSSD  
SQL/.NET/Containers

Azure Stack

On-premises



Hybrid  
datacenter



Hyper-converged  
Infrastructure (HCI)



Enhanced  
security



Application  
Innovation

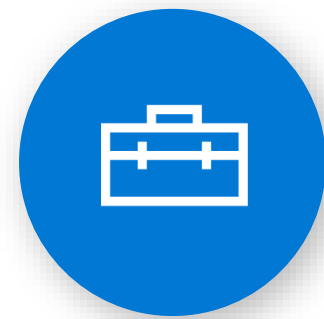
# Windows Admin Center complements existing management solutions



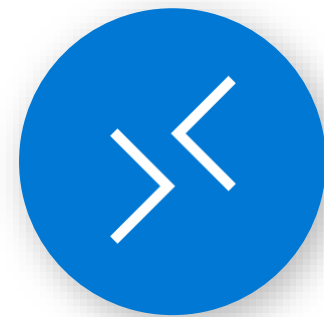
Azure security  
and management



System  
Center



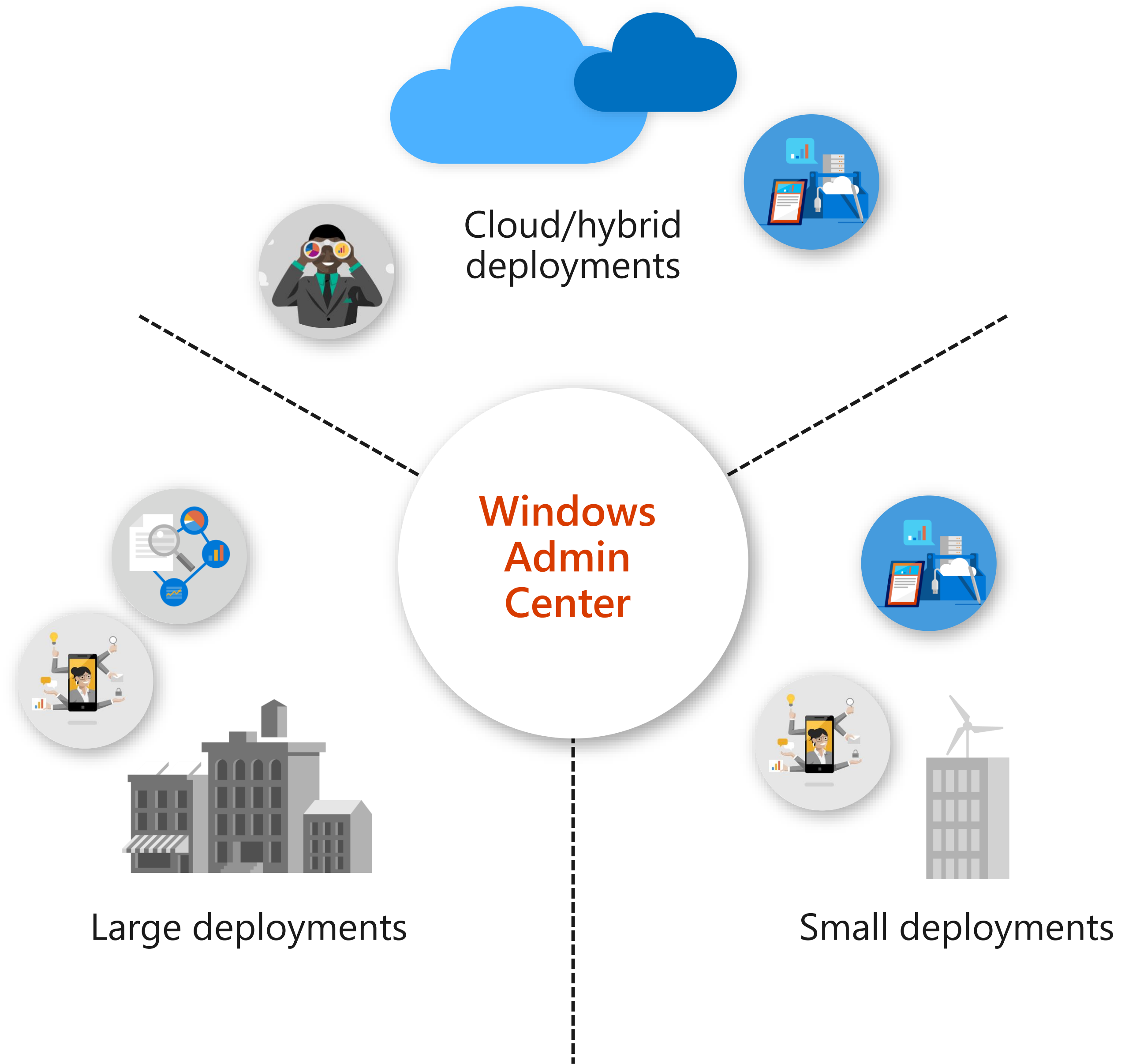
Remote Server  
Administration Tools



Remote Desktop  
+ in-box tools



#ntk19





Tools

Dashboard

COMPUTE

Virtual Machines

Virtual Switches

Servers

STORAGE

Volumes

Drives

TOOLS

Updates

Settings

Virtual machines

Summary Inventory

+ New

Delete

Start

Turn off

Shut down

Save

More

18 items

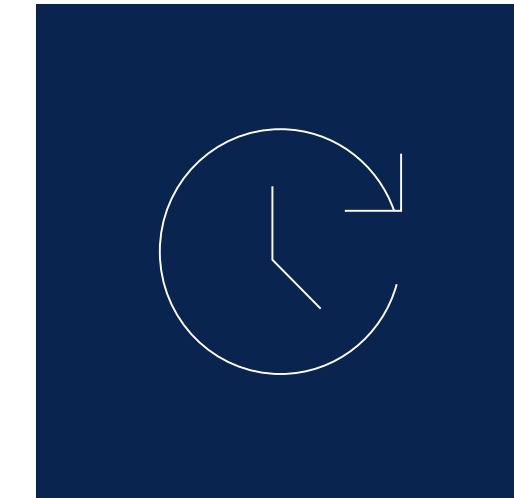
# System Insights



**High-accuracy, predictive capabilities** for Windows Server 2019



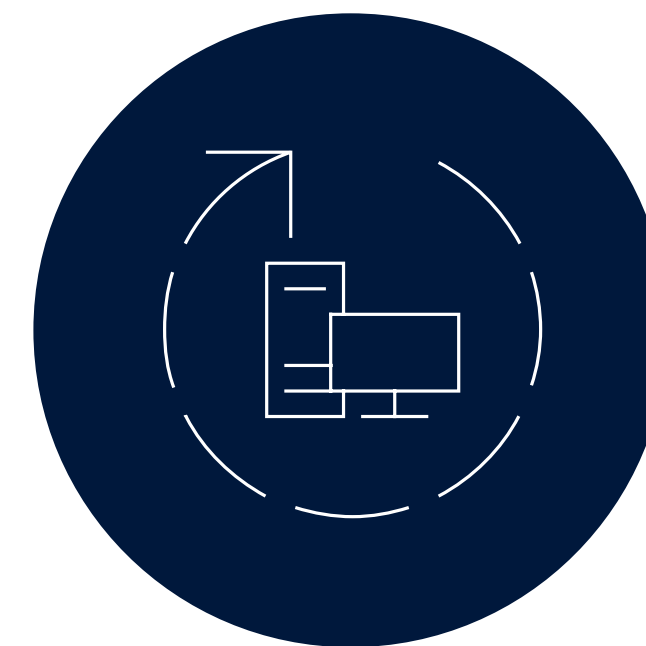
**Predictions analyze system data**, such as performance counters and ETW events.



Transform reactive emergencies of the past to **proactive management experiences**



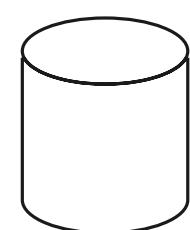
**Natively in Windows Server 2019**



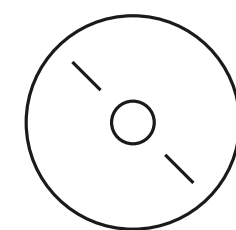
**Node-Local Functionality**



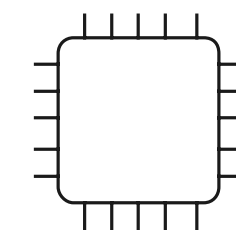
# Predictive Analytics for the consumption usage



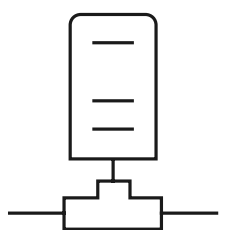
**Volume consumption  
forecasting**



**Total storage consumption  
forecasting**



**CPU capacity  
forecasting**



**Network capacity  
forecasting**

Forecast using daily data, collected for a year

**Estimated data footprint = ~5MB**

$(\text{CPU} + \# \text{ Volumes} + \# \text{ Net. Adapters} + \# \text{ Disks}) * 250\text{KB}$

## Forecasting statuses



**OK**  
Not forecasted to exceed capacity.



**WARNING**  
Forecasted to exceed capacity in the next 30 days.



**CRITICAL**  
Forecasted to exceed capacity in the next 7 days.

≡

Insights server

- 🏠
- Tools
- 🔍 Search
- 📄 Overview

📜 Certificates

🖨️ Devices

📅 Events

📁 Files

🔥 Firewall

💡 Insights

👤 Local Users & Groups

🌐 Networks

🖥️ Processes

📖 Registry

🔧 Roles & Features

⚙️ Services

💾 Storage

📁 Storage Replica

🖥️ Virtual Machines

🔌 Virtual Switches

🔄 Windows Update

Insights

🔄 Invoke

⚙️ Settings

Capability	State	Status	Description	Last Run
Total storage consumption forecasting	Enabled	✓ OK	Not expected to exceed capacity	5/1/18 3:00 AM
Volume consumption forecasting	Enabled	🚨 Alert	One volume expected to exceed capacity in 3 days	5/1/18 3:00 AM
Volume A	-	✓ OK	Not expected to exceed capacity	5/1/18 3:00 AM
Volume B	-	⚠️ Warning	Expected to exceed capacity in 24 days	5/1/18 3:00 AM
Volume C	-	🚨 Alert	Expected to exceed capacity in 3 days	5/1/18 3:00 AM
Volume D	-	✓ OK	Not expected to exceed capacity	5/1/18 3:00 AM
CPU capacity forecasting	Enabled	✓ OK	Not expected to exceed capacity	5/1/18 3:00 AM
Network capacity forecasting	Enabled	✓ OK	Not expected to exceed capacity	5/1/18 3:00 AM

Insights server

Tools

Search

Overview

Certificates

Devices

Events

Files

Firewall

Insights

Local Users & Groups

Networks

Processes

Registry

Roles & Features

Services

Storage

Storage Replica

Virtual Machines

Virtual Switches

Windows Update

Insights > Volume consumption forecasting

Invoke

Settings

Manage disk

Overview

Current status

Critical alert

Forecast

Expected to exceed capacity in 3 days

Last run

5/1/2018 3:00 AM

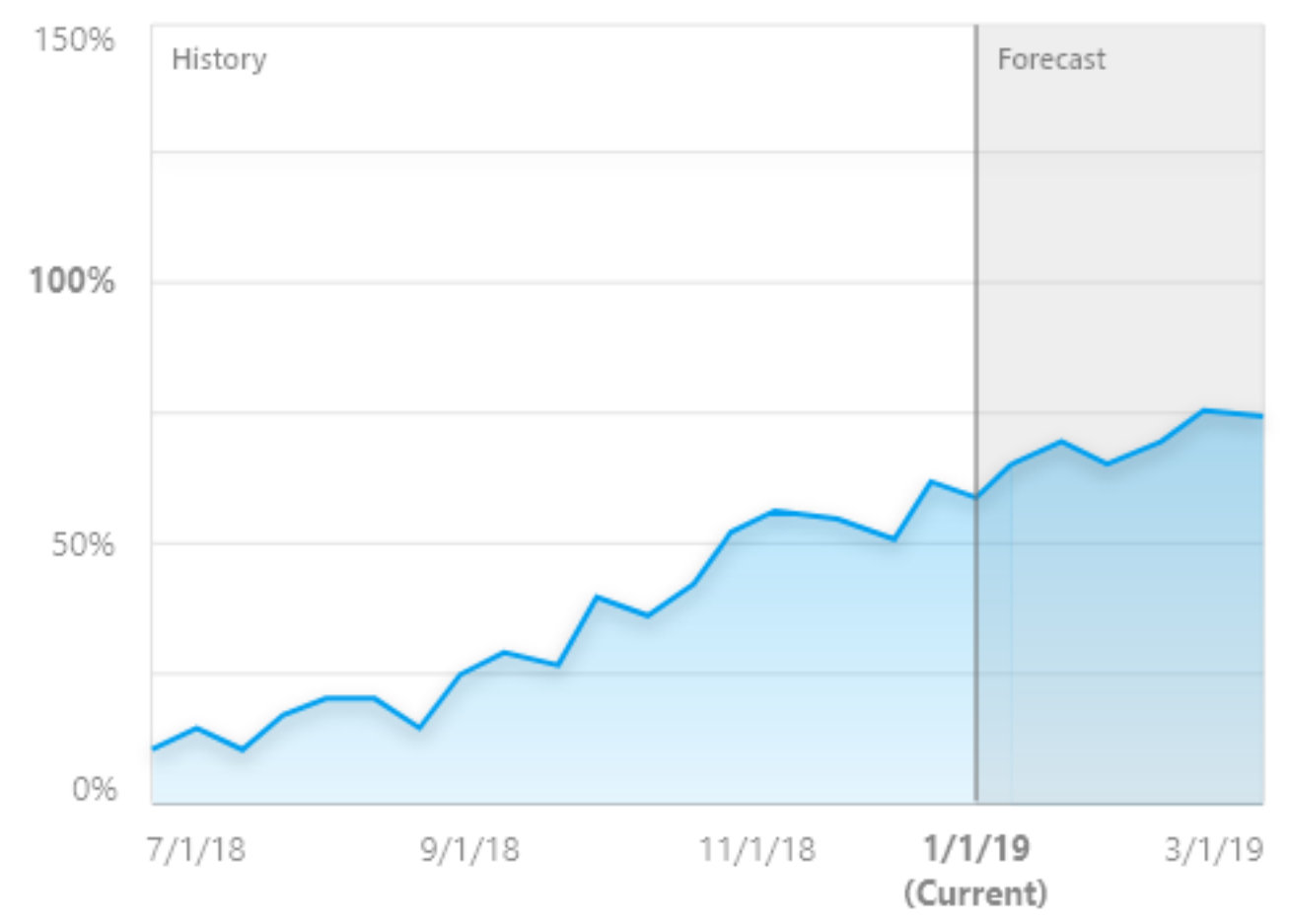
Schedule

Every 3 days

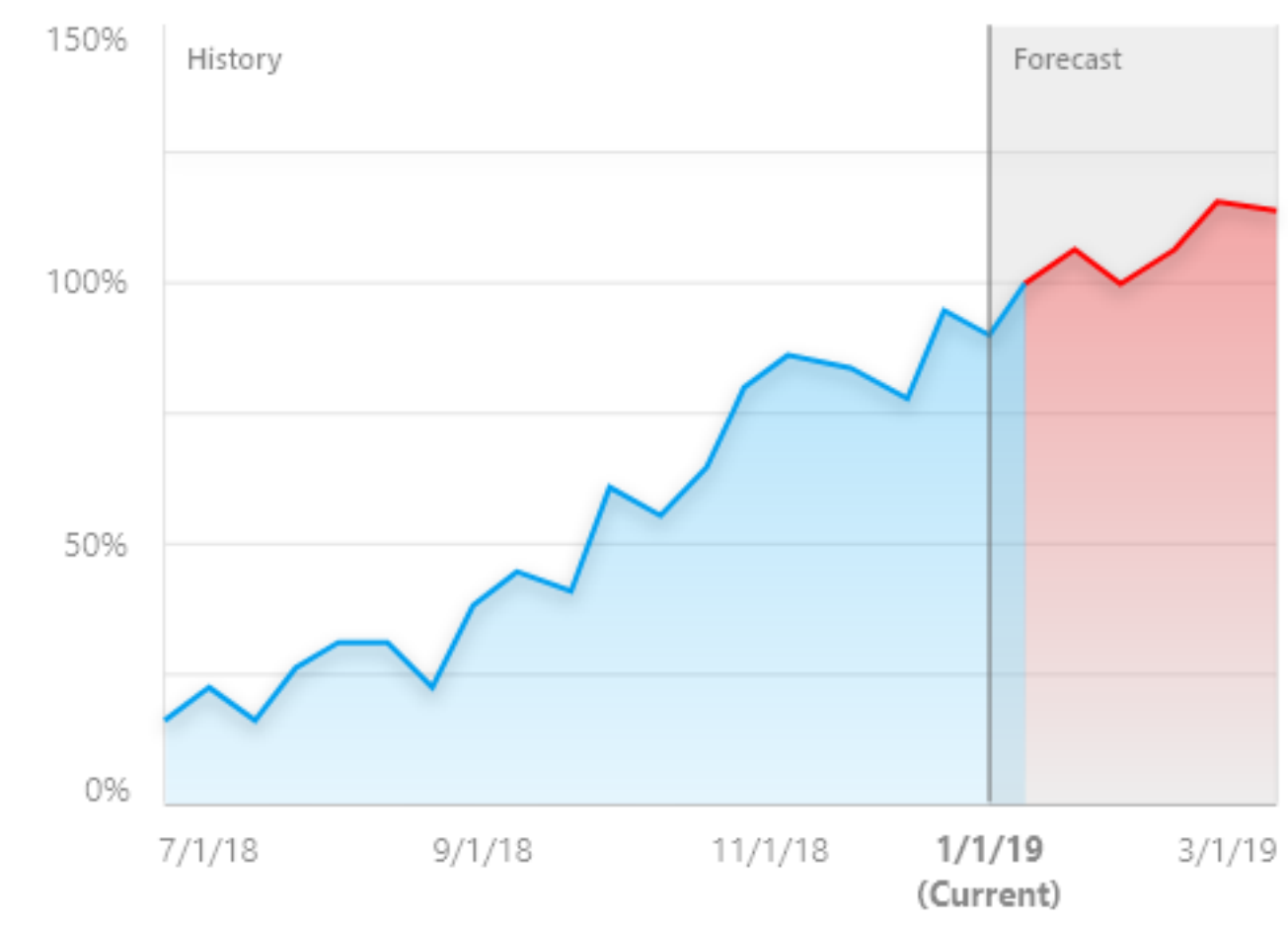
Forecast

All 6 months 3 months 1 month

Volume A



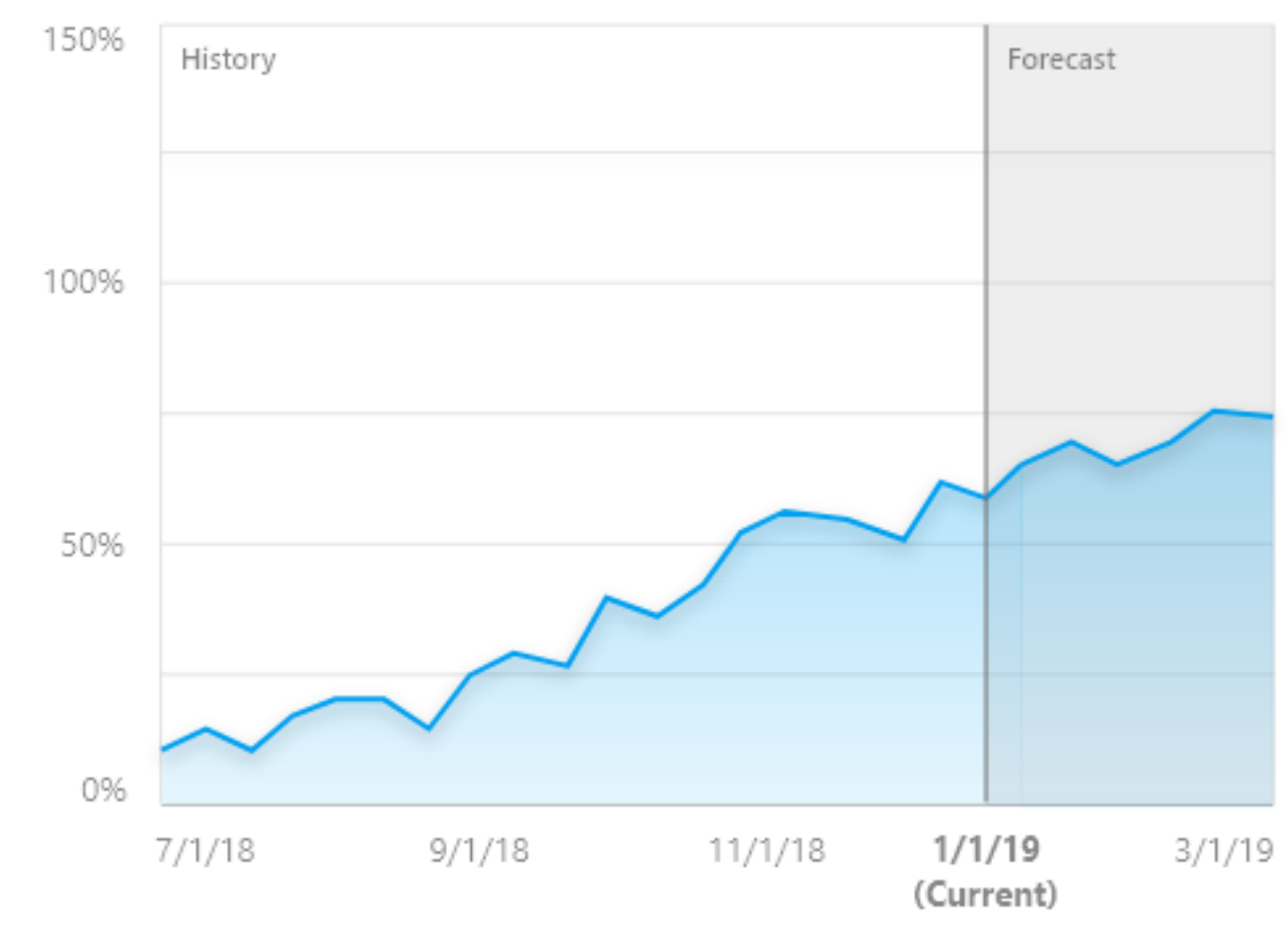
Volume B



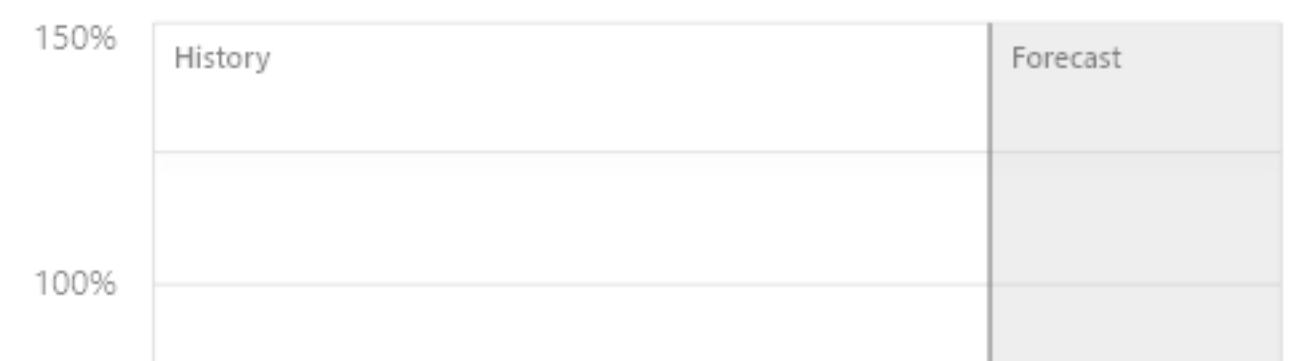
Volume B expected to exceed capacity in 3 days

View 3 suggested actions

Volume C



Volume C



Volume D



Volume B forecast

Volume B is expected to exceed storage capacity in 3 days

All6 months3 months1 month



Suggested actions

Extend volume

Brief description of extend volume and how it works in this scenario.

+ Extend volume

Azure File Sync

Brief description of Azure File Sync and how it works in this scenario.

Azure File Sync

Disk cleanup

Brief description of disk cleanup and how it works in this scenario.

Disk cleanup

# Managing hybrid datacenter

Windows Admin Center: the hub for hybrid

Azure Network Adapter for connection to Azure virtual networks

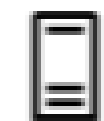
Azure Backup, Azure Site Recovery, Azure File Sync, Azure Update and Storage Replica Azure integration

Storage Migration Services

## Migrate storage in three steps

Transfer file shares and configuration to new servers without affecting existing apps and users.

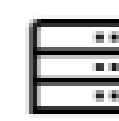
1



**Create a job and inventory your servers**

This gathers the file shares and configuration of one or more servers.

2



**Transfer data from your old servers**

This copies the file shares and configuration to one or more destination

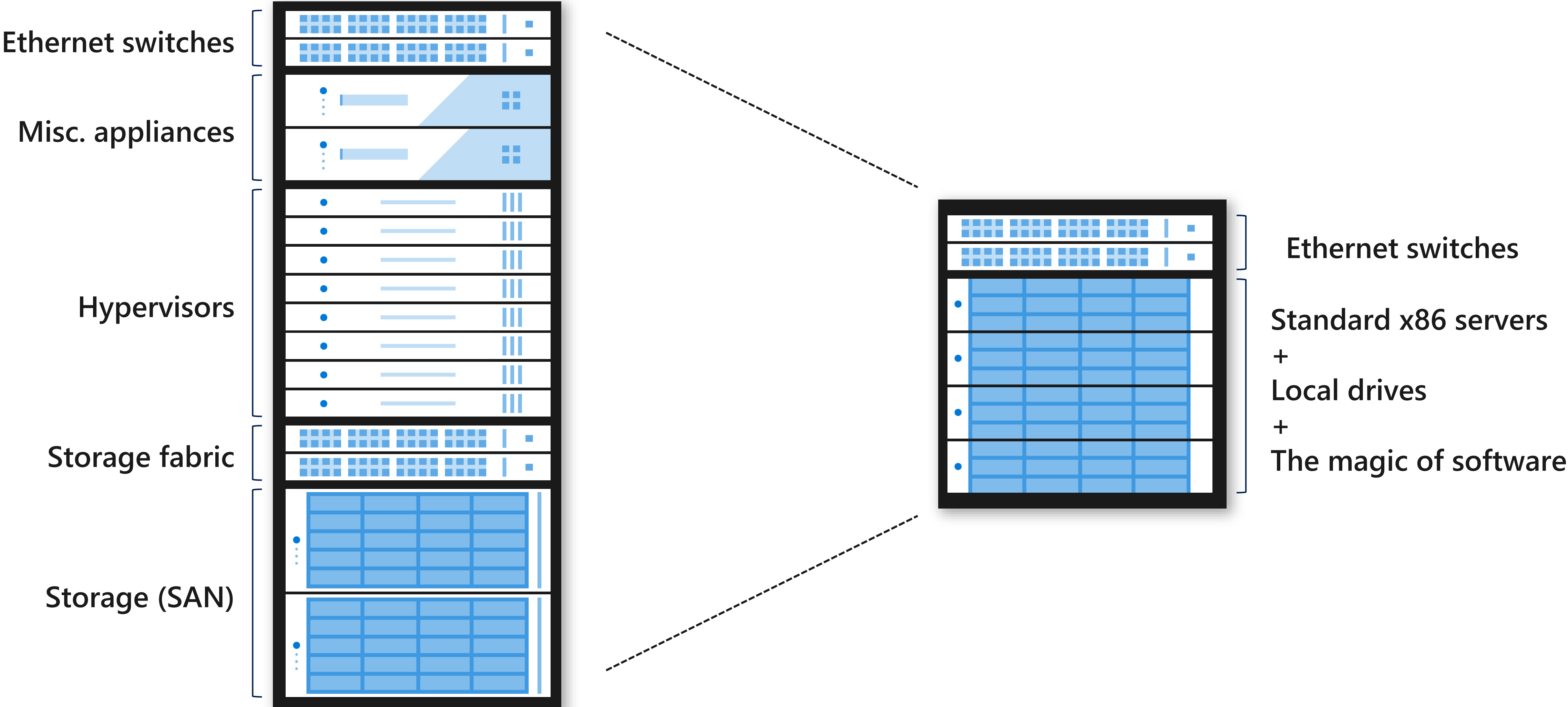
3



**Cut over to the new servers**

The new server takes over the identity of the old, so that apps and users

# Windows Server 2019 hyper-converged infrastructure



Traditional Infrastructure

Hyper-Converged Infrastructure (HCI)



# New for Storage in Windows Server 2019



Admin Center Integration

Storage Migration Service, Storage Replica and Azure



Deduplication with ReFS Volumes

Block based deduplication delivering significant storage and cost savings with the greater resiliency of ReFS.

## Optional features

Deduplication and compression ⓘ

☐ Off

Integrity checksums ⓘ

☐ Off

# New for Storage in Windows Server 2019



Admin Center Integration

Storage Migration Service, Storage Replica and Azure



Deduplication with ReFS Volumes

Block based deduplication delivering significant storage and cost savings with the greater resiliency of ReFS.



Efficiency: Mirror Accelerated Parity

Nested Resiliency (Two-nodes only)

Resiliency

Mirror-accelerated parity

▼

Nested two-way mirror or Nested mirror-accelerated parity

Parity percentage

80% parity, 20% mirror

▼

70% parity, 30% mirror

80% parity, 20% mirror

90% parity, 10% mirror

10

1B

▼

Stay online and accessible even if multiple hardware failures happen at the same time. Inspiration: RAID 5 + 1

**25% to 40% storage efficiency.**

Storage is cheap, downtime is expensive!

# Storage Class Memory Support

Faster



Slower



~ 1  $\mu$ s

1,000 ns

~ 0.1 ms

100,000 ns

~ 0.1 ms

100,000 ns

~ 10 ms

10,000,000 ns

# New for Storage in Windows Server 2019



## Admin Center Integration

Storage Migration Service, Storage Replica and Azure



## Deduplication with ReFS Volumes

Block based deduplication delivering significant storage and cost savings with the greater resiliency of ReFS.



## Efficiency: Mirror Accelerated Parity

Achieve the best combination of storage efficiency and performance



## Storage Class Memory Support

This new type of device brings flash closer to the processor to drastically reduce latency and increase performance.



## Cluster Sets

Create massive scale out clusters with cluster sets.



## Scale: Industry Leading Scale

Windows Server 2019 raises the scalability limits to new heights for Storage Spaces Direct.



# SS2D larger maximum scale

Limit / Recommendation	Windows Server 2016	Windows Server 2019	Increase	
Max <u>servers</u> per cluster	16	16	-	
Max <u>drives</u> per cluster	416	416	-	
Max raw capacity per <u>cluster</u>	1 PB	4 PB	↑	4x
Max raw capacity per <u>server</u>	100 TB	400 TB	↑	4x
Max <u>number</u> of volumes	32	64	↑	2x
Max <u>size</u> per volume	32 TB	64 TB	↑	2x

# New for SDN in Windows Server 2019



## Virtual Network Peering

Traffic between the virtual networks goes through underlying fabric network, no gateway used. Provides high speed connectivity between two virtual networks.



## Encrypted Subnets

**Automatic** DTLS encryption on a per-subnet basis  
Protects against sniffing and tampering of data on the wire



## Egress Bandwidth Metering

You can now meter egress traffic that begins inside of a network and proceeds through its routers to a destination somewhere outside of the network



## IPv6 Support, single and dual-stack

Whether you want SDN that bridges IPv4 and IPv6 or pure IPv6 SDN, Windows Server 2019 provides a present day and future proof solution.



## Fabric ACLs, Firewall Logging

Fabric Access Control Lists provide the flexibility and control you need with integrated logging for forensic analysis.



## Gateway Performance Improvements

Building on learnings from running Azure, Windows Server 2019 delivers dramatic gateway performance improvements (over 6x) for GRE and IPsec connections throughput).



# Enhanced security capabilities

Integrated Windows Defender ATP

Exploit Guard

System Guard Runtime

New features and improvements for Shielded VMs

- Fallback HGS, offline mode

- Troubleshooting improvements

- Linux support

Password protection for on-premises Windows Server Active Directory

# Password protection for on-premises Active Directory

Leverages existing Azure Active Directory banned passwords capabilities

You can configure custom weak password lists

Domain Controllers do NOT require connectivity to the Internet

Handled via proxy agent on domain member(s)

Substrings within passwords are matched against banned tokens

Other checks include Levenshtein distances and scoring of weak tokens vs. overall length

Supports Windows Server 2012 R2 and newer domain controllers

## Custom smart lockout

Lockout threshold ⓘ

Lockout duration in seconds ⓘ

## Custom banned passwords

Enforce custom list ⓘ ☐ Yes ☒ No

Custom banned password list ⓘ

## Password protection for Windows Server Active Directory

Enable password protection on Windows Server Active Directory ⓘ ☒ Yes ☐ No

Mode ⓘ ☐ Enforced ☒ Audit

## Windows Server 2016

Initial launch of containers  
Process and Hyper-V isolation  
Docker EE Basic Included at no additional cost

## Windows Server, version 1709

Optimized container images for Nano Server and Server Core  
Platform level support for Linux containers  
Windows Subsystem for Linux  
Networking enhancements for overlays and SDN

## Windows Server, version 1803

Optimized Server Core image  
App compat improvements  
Native command line tools—curl.exe, tar.exe and SSH  
Enhancements to the Windows Subsystem for Linux  
Networking enhancements for greater density and quicker endpoint creation  
Improved network security with Calico Open source storage plugins for Kubernetes  
Platform functionality required for Kubernetes conformance

## Windows Server 2019

Optimized Server Core image  
App compat improvements  
Enhanced Group Managed Service Account support  
Platform functionality for Kubernetes and Microsoft Service Fabric  
Performance and density improvements  
Platform and open source work on CNI networking plugins such as Calico and Flannel  
Enhancements to the Windows Subsystem for Linux  
...

# Application Innovation

# Faster Innovations for Applications

Windows Admin Center for managing and monitoring containers

Optimized Images for Server Core and Nano Server

Windows Subsystem for Linux

Linux Containers on Windows host

Service Fabric and Kubernetes for container orchestration

Server Core app compatibility feature on demand

# Server Core app compatibility feature on demand

Server Core does not include graphical environment

- Smaller disk footprint, more secure

- Servers should be administered remotely, not locally

- Server Core cannot be converted to Desktop Experience

FoD includes subset of binaries and packages from Desktop Experience

- Without adding the Windows Server Desktop Experience graphical environment

- Improved support for existing apps

- Improved support for troubleshooting and debugging tools

Server Core app compatibility FoD is available as separate ISO

- Available through Windows Update, on Evaluation Center or VLSC

# Server Core + FoD: Apps / OS components

## Apps

Exchange Server 2019

(Server Core Recommended. FOD not needed)

SQL DB Engine

(Server Core Recommended. FOD not needed)

SQL Server Management Studio

SQL 16, 17

TFS Server

More to come ...

## OS components

Microsoft Management Console

Event Viewer (Eventvwr.msc)

Performance Monitor (PerfMon.exe)

Resource Monitor (Resmon.exe)

Device Manager (Devmgmt.msc)

File Explorer (Explorer.exe)

Windows PowerShell ISE

Failover Cluster Manager

Internet Explorer - optional



Windows Admin Center

VM Connect - Virtual M

←→↺🏠

https://localhost:6516/servermanager/connections/server/silver-node2.ntdev.corp.microsoft.com/tools/virtualmachines/vmconnect/vmid/a5ee1845-3505-420d-bb26-ed540c007b37/vmname/File-Server-2019

🔍📖☆

☆ Windows Admin Cen📺 MSNBC Live Audio📺 MSW Home Page📺 MSTravel Portal Hom🌟 Learning📺 WinServer vNext Lau

Windows Admin CenterServer Manager

Microsoft

⌵🔔⚙️?

silver-node2.ntdev.corp.microsoft.com

Tools

Search Tools

Overview

Backup

Certificates

Devices

Events

Files

Firewall

Installed Apps

Local Users & Groups

Network

PowerShell

Processes

Registry

Remote Desktop

Roles & Features

Scheduled Tasks

Services

Storage

Storage Migration Service

Storage Replica

System Insights

Updates

Virtual Machines

Virtual Switches

Settings

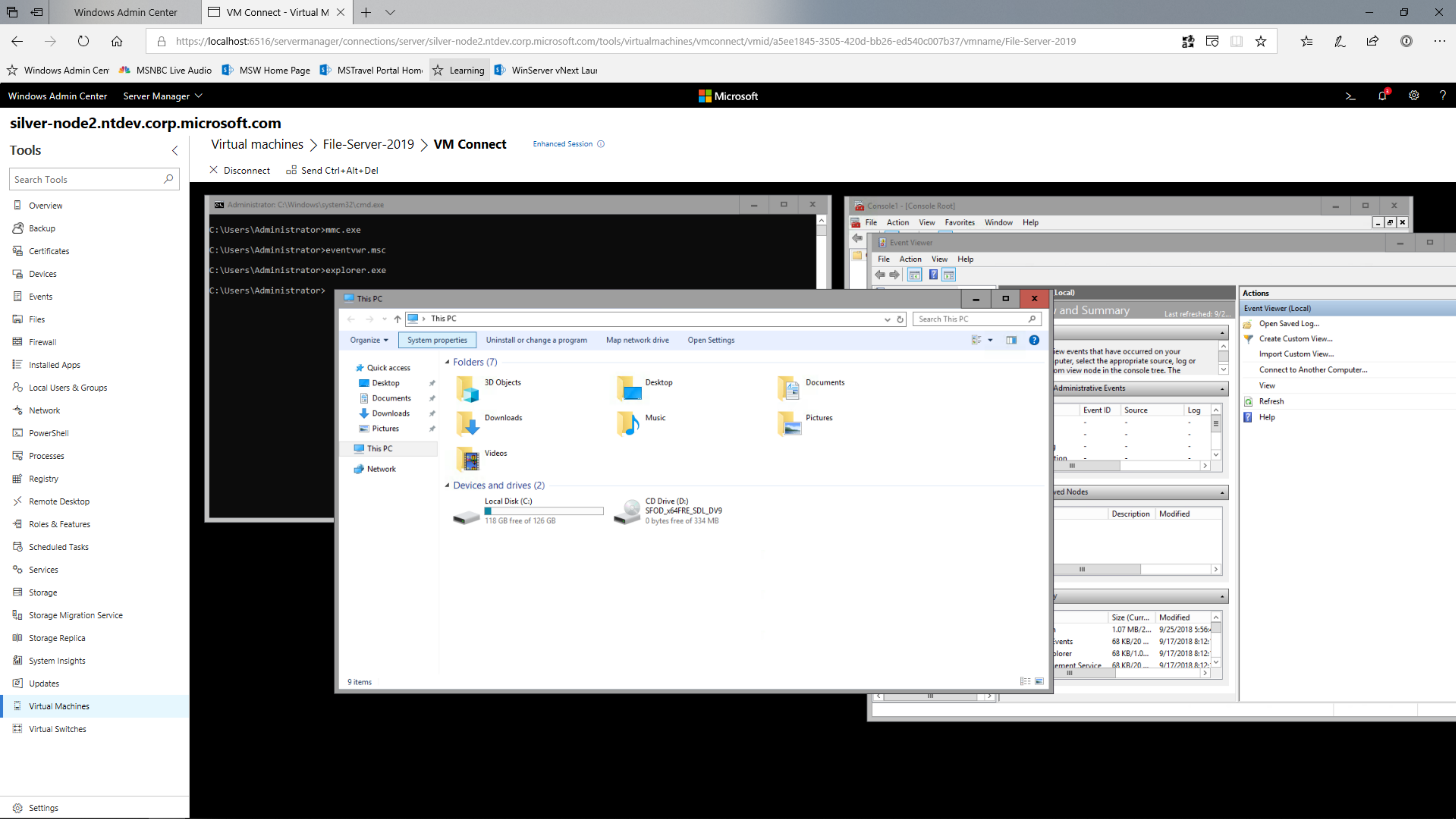
Virtual machines > File-Server-2019 > VM Connect

Enhanced Session

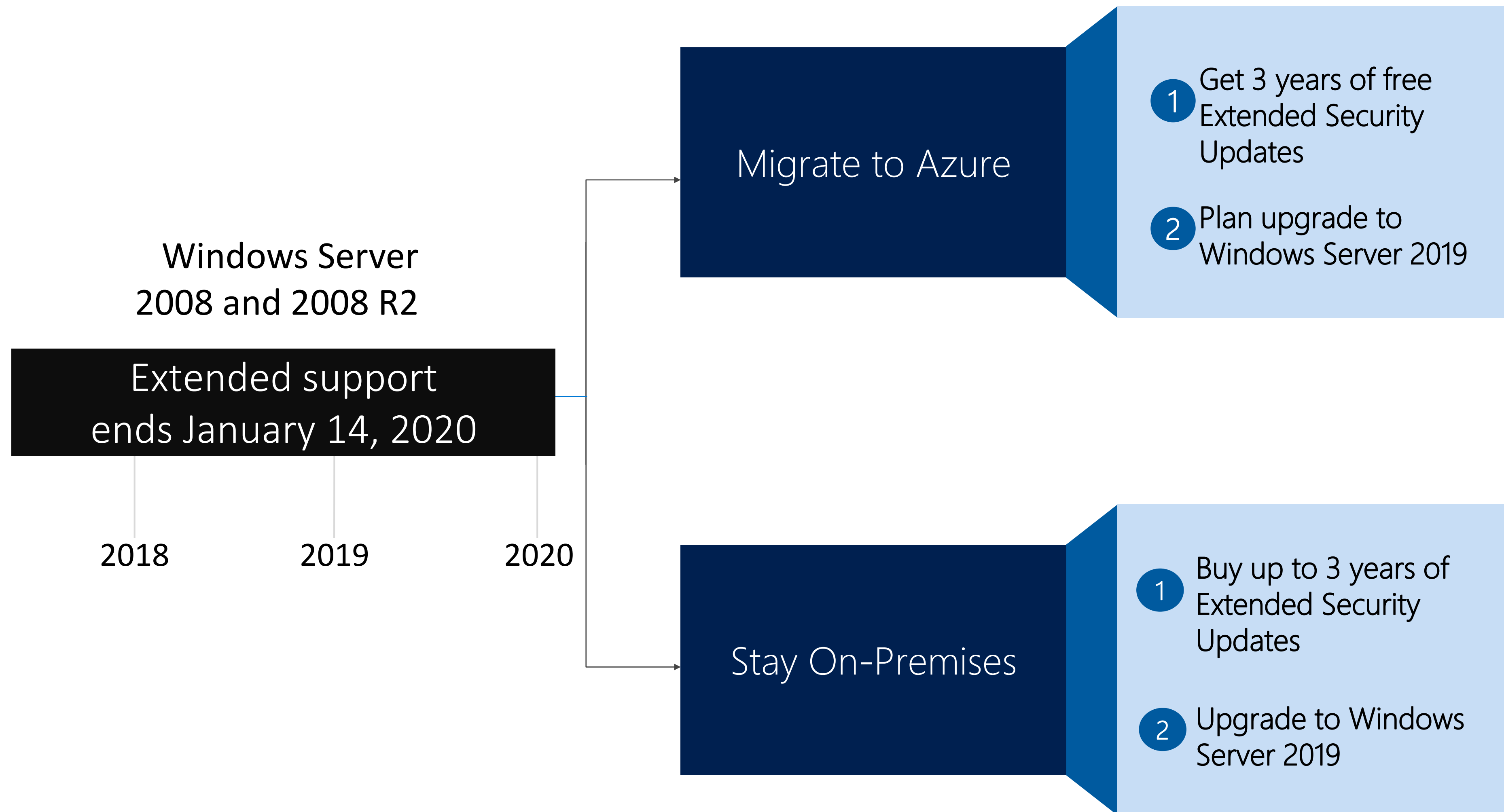
✕ Disconnect📄 Send Ctrl+Alt+Del

Administrator: C:\Windows\system32\cmd.exe - DISM /Online /Add-Capability /CapabilityName:ServerCore.Appcompatibility~0.0.1.0 ...

C:\Users\Administrator>mmc.exe  
'mmc.exe' is not recognized as an internal or external command,  
operable program or batch file.  
  
C:\Users\Administrator>Eventvwr.msc  
'Eventvwr.msc' is not recognized as an internal or external command,  
operable program or batch file.  
  
C:\Users\Administrator>Explorer.exe  
'Explorer.exe' is not recognized as an internal or external command,  
operable program or batch file.  
  
C:\Users\Administrator>DISM /Online /Add-Capability /CapabilityName:ServerCore.Appcompatibility~0.0.1.0 /Source:D: /LimitAccess  
  
Deployment Image Servicing and Management tool  
Version: 10.0.17763.1  
  
Image Version: 10.0.17763.1  
  
[=====100.0%=====]  
The operation completed successfully.  
Restart Windows to complete this operation.  
Do you want to restart the computer now? (Y/N) \_



# Options for 2008 End of Support



# Summary

Windows Server 2019 is evolution of Windows Server

Windows Server as a Service

Windows Server 2019 is optimized for on-premises and for the cloud

Windows Admin Center manages Windows Server 2012 and newer

Main investments in Windows Server 2019 are in four areas:

- Managing hybrid datacenter

- Using Hyper-converged infrastructure (HCI)

- Enhanced security capabilities

- Faster innovation for applications



# Additional information

## What's new in Windows Server 2019

<https://docs.microsoft.com/en-us/windows-server/get-started-19/whats-new-19>

## Windows Server 2019 deep dive

<https://myignite.techcommunity.microsoft.com/sessions/65977>

## All Windows Server sessions at Ignite 2018

<https://cloudblogs.microsoft.com/windowsserver/2018/09/20/windows-server-at-ignite-2018/>

## Windows Server Blog

<https://cloudblogs.microsoft.com/windowsserver/>