



What's new in Windows Server 2025

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Agenda

Your Top Request

Next Generation Active Directory & SMB

Mission Critical Data & Storage

Hyper-V & AI

Container Flexibility

Another Top Request

Modern Server Experience



Windows Server 2025
Prepping the next LTSC for takeoff

Mission Critical: Hotpatching with Windows & SQL Server

Xbox Footprint (partial)

- 1000 Servers running 18 different services
- Each services running between 2-120 SQL Servers;
Some workloads running for 15+ years
- Workloads used to be physical, now Azure VMs

Before Hotpatching

3 weeks every month to roll out updates without downtime;
12 times a year.

With Hotpatching

**1000 servers patched in <48 hours without
downtime**



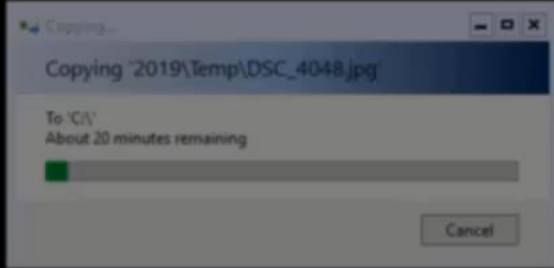
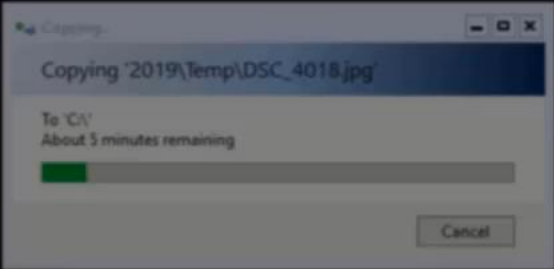
Hotpatching Demo

00:00:00.00

```
Test5-9B-BL on MININT-288B5K0 - Virtual Machine Connection
File Action Media View Help
Administrator: C:\windows\system32\cmd.exe
C:\Users\Administrator>dism /online /add-package /packagepath:"c:\temp\package\For Demo\12B-CP\Windows10.0-KB4592441-x64.cab"
```

```
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File Action Media View Help
Administrator: C:\windows\system32\cmd.exe
C:\Users\Administrator>dism /online /add-package /packagepath:"c:\temp\package\For Demo\11B-HP\Windows10.0-KB4587857-Hotpatch-x64.cab"
```

Hotpatch Demo



Hotpatch POC Windows Server 2022 Azure Edition (Desktop Experience)

The screenshot shows the Windows Settings application. The 'About' page is open, displaying 'Windows specifications' with the following details:

Edition	Windows Server 2022 Datacenter Azure Edition
Version	21H2
Installed on	6/29/2022
OS build	20348.887

Below the settings, a green callout bubble contains the text 'Hotpatch'. At the bottom, a Command Prompt window shows the following commands and output:

```
C:\Users\localadminuser>ver
Microsoft Windows [Version 10.0.20348.887]

C:\Users\localadminuser>Hotpatch\scripts\hplload.exe -q
0 loaded patches

Success!

C:\Users\localadminuser>dism /online /add-package /packagepath:"c:\Hotpatch\98 Hotpatch\Windows10.0-KB5017392-x64.cab"
Deployment Image Servicing and Management tool
Version: 10.0.20348.681
Image Version: 10.0.20348.887
Processing 1 of 1 - Adding package Package_for_HotpatchTestUpdate~31bf3856ad364e35~amd64~~20348.10006
[=====100.0%=====]
The operation completed successfully.

C:\Users\localadminuser>
```

A green callout bubble at the bottom right of the Command Prompt window contains the text 'Complete!'.

The screenshot shows the Windows Settings application, specifically the 'Update & Security' section. The 'Windows Update' page is open, displaying the following information:

- Restart required:** Your device will restart outside of...
- 2022-09 Cumulative Update Preview for .NET Framework 3.5, 4.8 and 4.8.1 for Microsoft server operating system version 21H2 for x64 (KB5017860)**
Status: Pending restart
- 2022-09 Cumulative Update for Microsoft server operating system version 21H2 for x64-based Systems (KB5017316)**
Status: Pending restart
- Restart now** **Schedule the restart**
- Optional quality update available**
2022-09 Cumulative Update for Microsoft server operating system version 21H2 for x64-based Systems (KB5017381)
Download and install
- *Your organization has turned off automatic updates**

Blue callout bubbles are overlaid on the screenshot:

- A large blue bubble at the top right contains the text 'Cumulative Update'.
- A blue bubble pointing to the 'Restart required' icon contains the text 'Needs to restart'.

“Hotpatching is a game changing feature. No reboots. No downtime.

Please Microsoft, we need hotpatching EVERYWHERE including VMware and other clouds.”



Introducing
Arc-enabled Windows Server 2025 Hotpatching

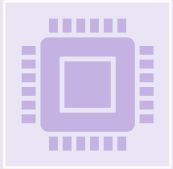
Arc-enabled Hotpatching Everywhere

- Arc-enable your Windows Server
 - Standard or Datacenter Edition
 - Physical, Virtual, other clouds
- Enable Hotpatching via Azure Portal
 - Monthly subscription
- Hotpatching on Azure/Azure Stack properties included at no additional cost when using Windows Server Azure Edition

Next Generation Active Directory



Active Directory 32k DB Page Sizes: New/Upgrades



A **new domain controller** is installed with a 32k page database and uses 64-bit Long Value IDs (LIDs) and runs in an "8k page mode" for compatibility with previous versions



An **upgraded Domain Controller** continues to use its current database format and 8k pages

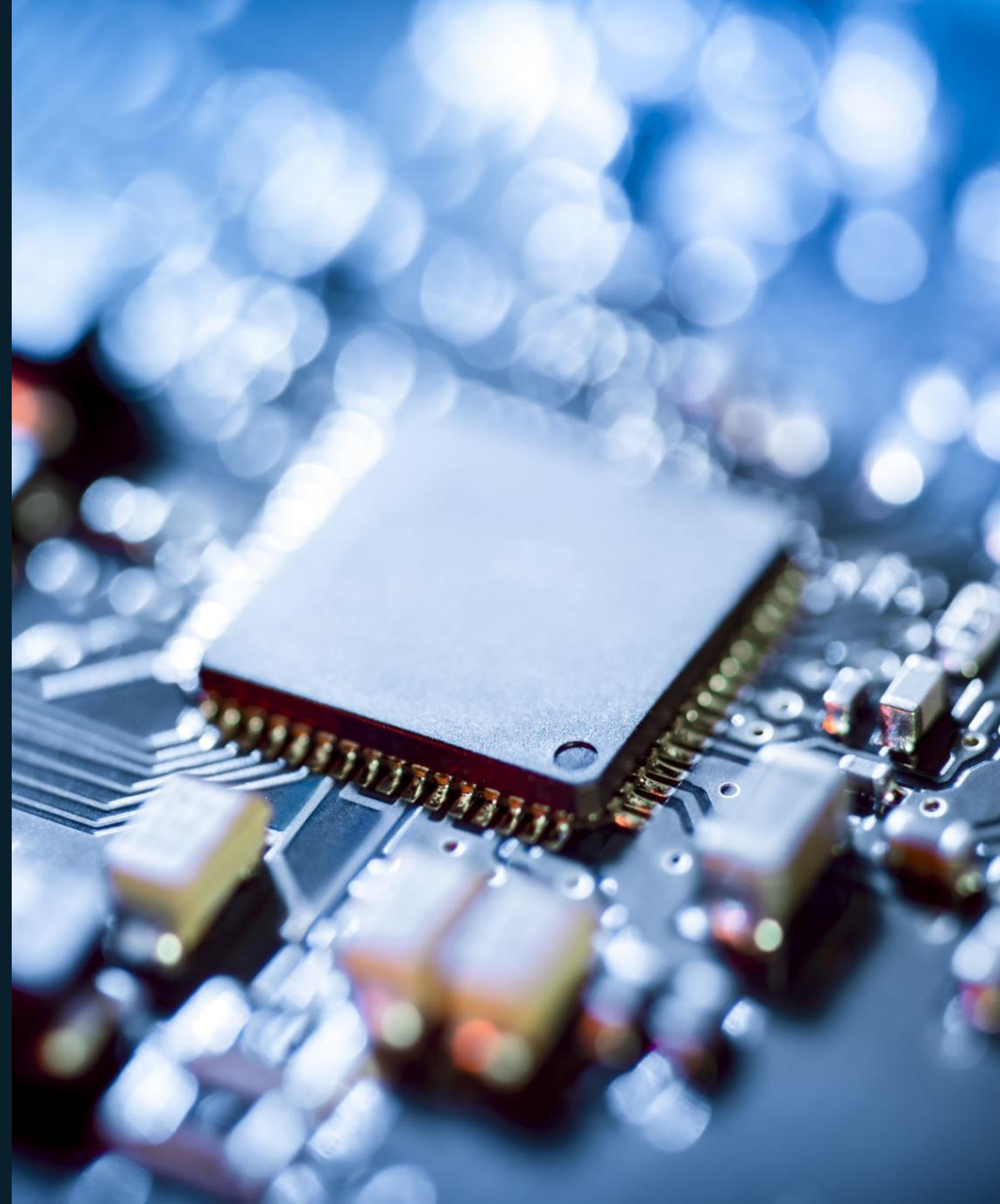


Moving to 32k database pages is done on a **forest-wide basis** and requires that **all Domain Controllers** in the forest have a 32k page capable database

More Active Directory Perf & Scale Improvements

AD DS now takes advantage of NUMA capable hardware by utilizing CPUs in all processor groups

Additional Performance Monitor counters and updated Active Directory Diagnostic Data Collector Set



Active Directory Security Enhancements

LDAP support for TLS 1.3



LDAP uses the latest SCHANNEL implementation and supports TLS 1.3 for LDAP over TLS connections

Improved security for confidential attributes



Domain controllers and AD LDS instances only allow LDAP add, search, modify operations involving confidential attributes when the connection is encrypted.

LDAP prefers encryption by default



All LDAP client communication after a Simple Authentication and Security Layer (SASL) bind prefers LDAP sealing by default.

Kerberos support for AES SHA256/384



The Kerberos protocol updated to support stronger encryption and signing mechanisms by adding SHA-256 and SHA-384. Cryptographic agility has been added to allow for supporting more algorithms. AES is the default for symmetric encryption RC4 has been moved to the do-not-use cipher list and is not used by default.

Changes to default behavior of legacy SAM RPC password change methods



On Domain Controllers, the latest SAM RPC password change method SamrUnicodeChangePasswordUser4 using AES is accepted by default when called remotely.

Kerberos & PKINT support cryptographic agility



Added SHA-2 support for PKINT
The Kerberos Public Key Cryptography for Initial Authentication in Kerberos (PKINIT) protocol implementation has also been updated to allow for cryptographic agility and has added SHA-256 and SHA-384 support.

Active Directory Replication Priority Boost

Initial replication to a new domain controller takes time

Issues on the source replica (reboots, network connectivity) may require re-replication of the entire replica, often from a different source

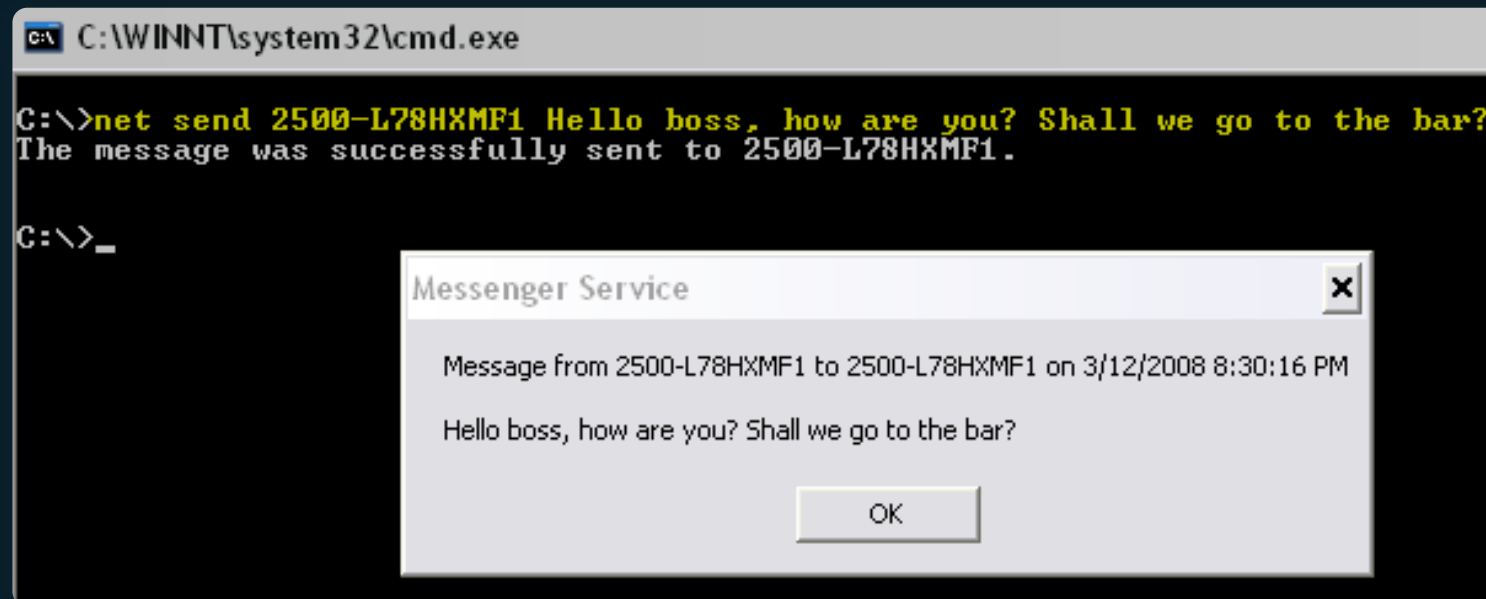
Added a RootDSE mod to set priority on specific replication links

Boosted replication links get replication queue priority



Security Hardening - Mailslots

Mailslots disabled by default by AD & SMB



Remote mailslots now deprecated and no longer used for DC location

The DC discovery algorithm improved, automatically maps NetBIOS-style domain names to DNS-style domain names

Active Directory Functional Levels

New Forest and Domain
Functional Levels

New functional level
required for new features

There are no plans to
backport these features.

The screenshot shows the 'Active Directory Domain Services Configuration Wizard' window. The title bar reads 'Active Directory Domain Services Configuration Wizard'. The main title is 'Domain Controller Options' and the target server is 'TARGET SERVER LTABDC1'. The left sidebar contains a list of steps: 'Deployment Configuration', 'Domain Controller Options' (highlighted), 'Additional Options', 'Paths', 'Review Options', 'Prerequisites Check', 'Installation', and 'Results'. The main content area is titled 'Select functional level of the new forest and root domain'. It includes two dropdown menus: 'Forest functional level:' and 'Domain functional level:', both set to 'Windows Server vNEXT'. Below this is the section 'Specify domain controller capabilities' with three checkboxes: 'Domain Name System (DNS) server' (checked), 'Global Catalog (GC)' (checked), and 'Read only domain controller (RODC)' (unchecked). The next section is 'Type the Directory Services Restore Mode (DSRM) password', with two text boxes labeled 'Password:' and 'Confirm password:'. At the bottom right, there are four buttons: '< Previous', 'Next >', 'Install', and 'Cancel'. A link 'More about domain controller options' is located at the bottom left of the main content area.

Upgrading from Older Active Directory

New AD forests or AD LDS configuration sets are required to have a functional level of Windows Server 2016 or greater.

Promotion of an AD or AD LDS replica requires that the existing domain or config set is already running with a functional level of Windows Server 2016 or greater.

The screenshot shows the 'Active Directory Domain Services Configuration Wizard' window. The title bar reads 'Active Directory Domain Services Configuration Wizard'. The main title is 'Domain Controller Options' and the target server is 'LTDABDC1'. The left sidebar contains a list of steps: 'Deployment Configuration', 'Domain Controller Options' (highlighted), 'Additional Options', 'Paths', 'Review Options', 'Prerequisites Check', 'Installation', and 'Results'. The main content area is titled 'Select functional level of the new forest and root domain'. It includes two dropdown menus: 'Forest functional level:' and 'Domain functional level:', both set to 'Windows Server vNEXT'. Below this is the section 'Specify domain controller capabilities' with three checkboxes: 'Domain Name System (DNS) server' (checked), 'Global Catalog (GC)' (checked), and 'Read only domain controller (RODC)' (unchecked). The next section is 'Type the Directory Services Restore Mode (DSRM) password', with two empty text boxes for 'Password:' and 'Confirm password:'. At the bottom right, there are four buttons: '< Previous', 'Next >', 'Install', and 'Cancel'. A link 'More about domain controller options' is located at the bottom left of the main content area.

Not AD: Local KDC & IAKerb

Local KDC – Kerberos Key Distribution Service now being *built-into Windows*, not just DCs. Kerberos auth for local user accounts

IAKerb – More Kerberos negotiation. Classic AD, IP addresses, no SPNs, local KDC, proxied auth – all now work

NTLM is on its way to deprecation & eventual removal! <https://aka.ms/ntlm>



Windows Server 2025 Storage

Accelerate Mission Critical Workloads

Optimize for NVMe storage

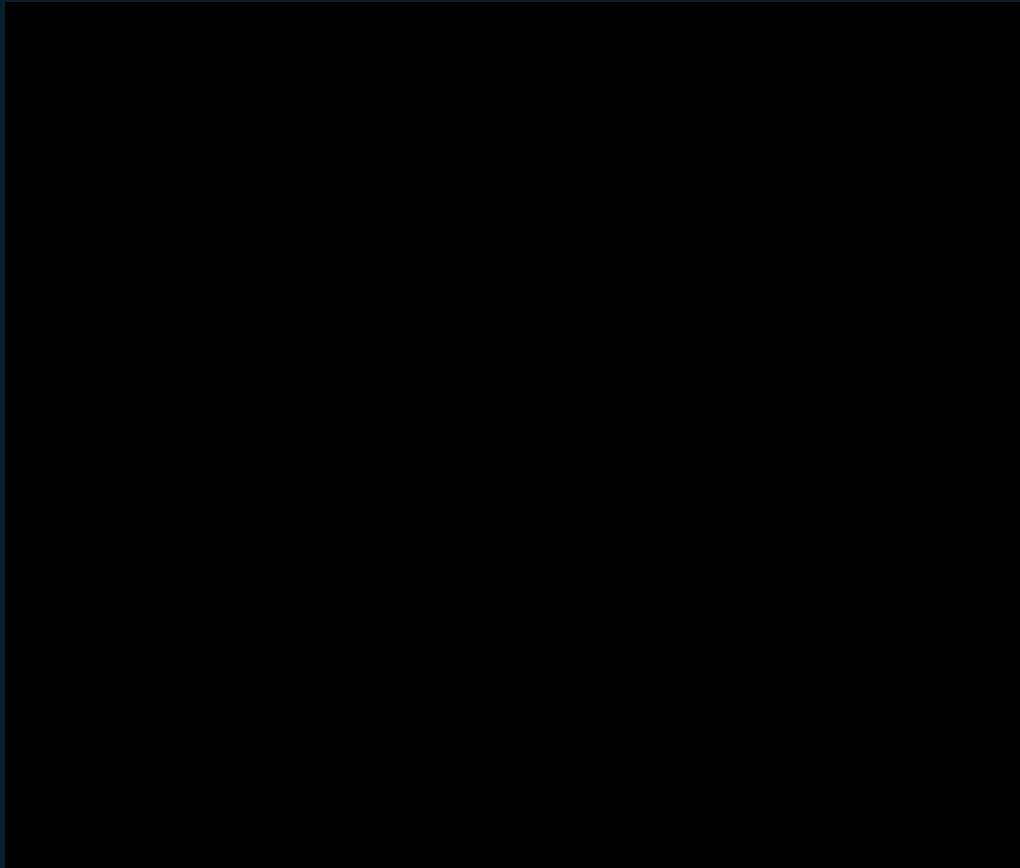
Improve performance

Lower CPU utilization

Reduce Storage Costs

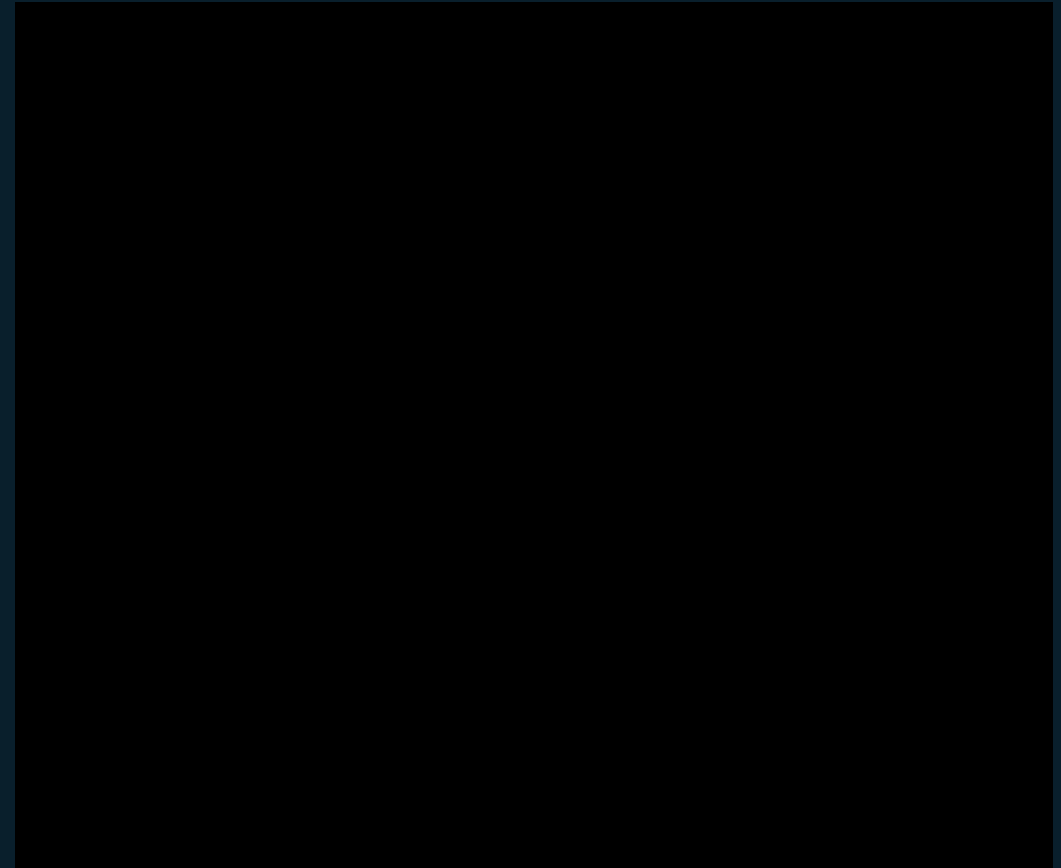


Windows Server 2025 delivers 70% more IOPs on NVMe SSDs



Windows Server 2022

1.1M IOPs



Windows Server vNext

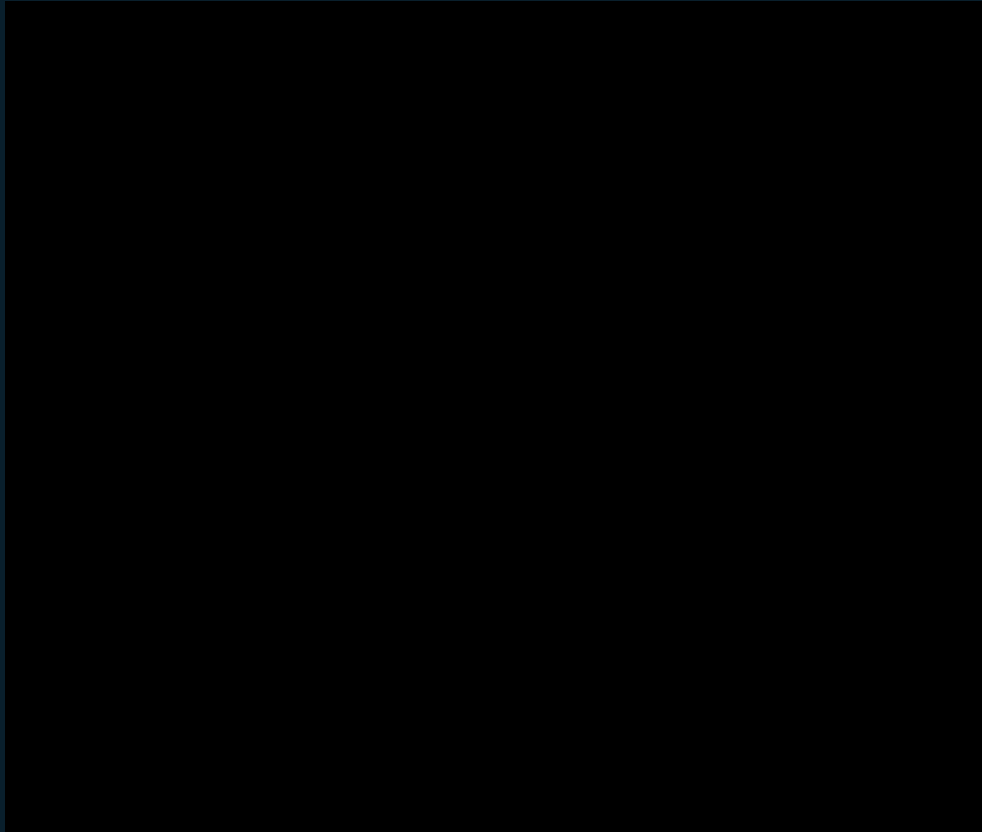
1.86M IOPs

Single device, running a synthetic IO workload with 8 threads, queue depth 64.

Windows Server 2025 delivers 90% more IOPs on NVMe SSDs

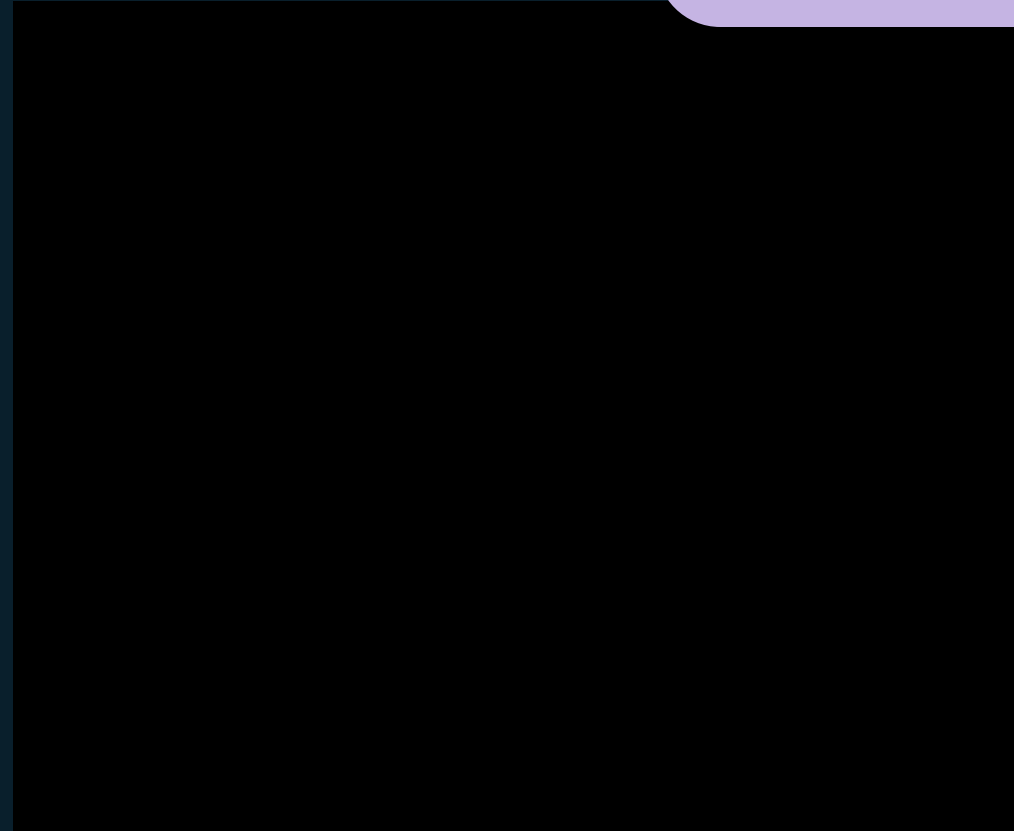
with future Native NVMe enhancements

Preview coming



Windows Server 2022

1.1M IOPs



Windows Server vNext

2.1M IOPs

Single device, running a synthetic IO workload with 8 threads, queue depth 64.

Preview coming

NVMe-oF TCP Initiator

Enabling modern SAN connectivity

Infrastructure to increase IO performance and reduce latency for remote storage

Inbox NVMe-oF TCP Initiator based on the NVMe 2.0 Specification

Surface remote NVMe namespaces as SCSI disks on a host/guest



Further Storage Enhancements



Storage Replica

Performance enhancements with enhanced log

SR compression now available in all editions of Windows Server



ReFS

ReFS Native Deduplication and Compression

File Servers: Save ~60% of storage

VHD/ISO/Backups: Save ~90% of storage



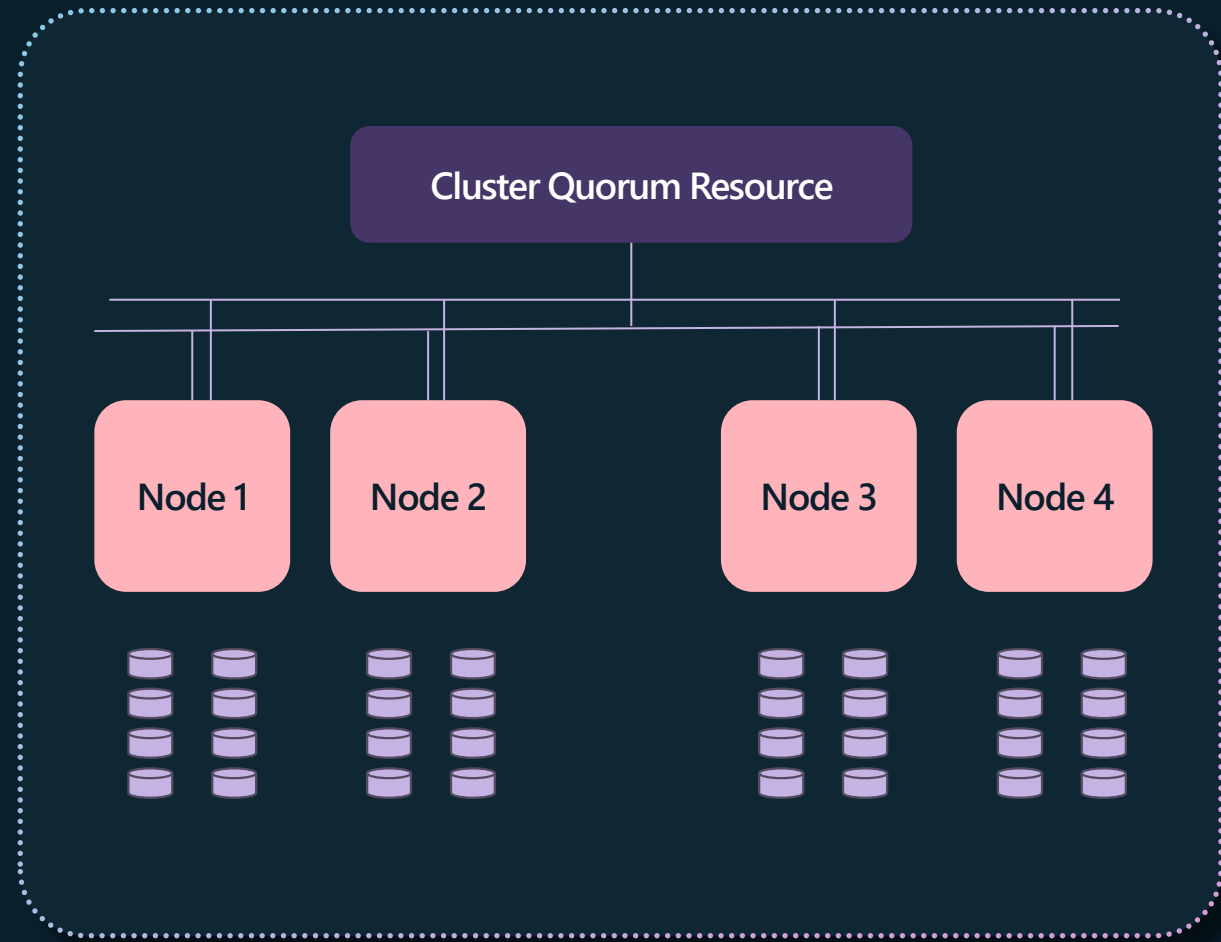
Storage Spaces

Thinly Provisioned Storage Spaces

Stretch Cluster Support

Failover Clustering in Windows Server 2025

- AD-Less Clusters
 - Cert-based VM Live Migration
- Stretch Storage Spaces Direct (S2D) clusters between two sites
 - Improved Storage Replica (SR) performance
- Cluster-Aware Updating reliability and performance improvements



Hyper-V: Robust hardware-based virtualization and isolation

Azure Hypervisor System

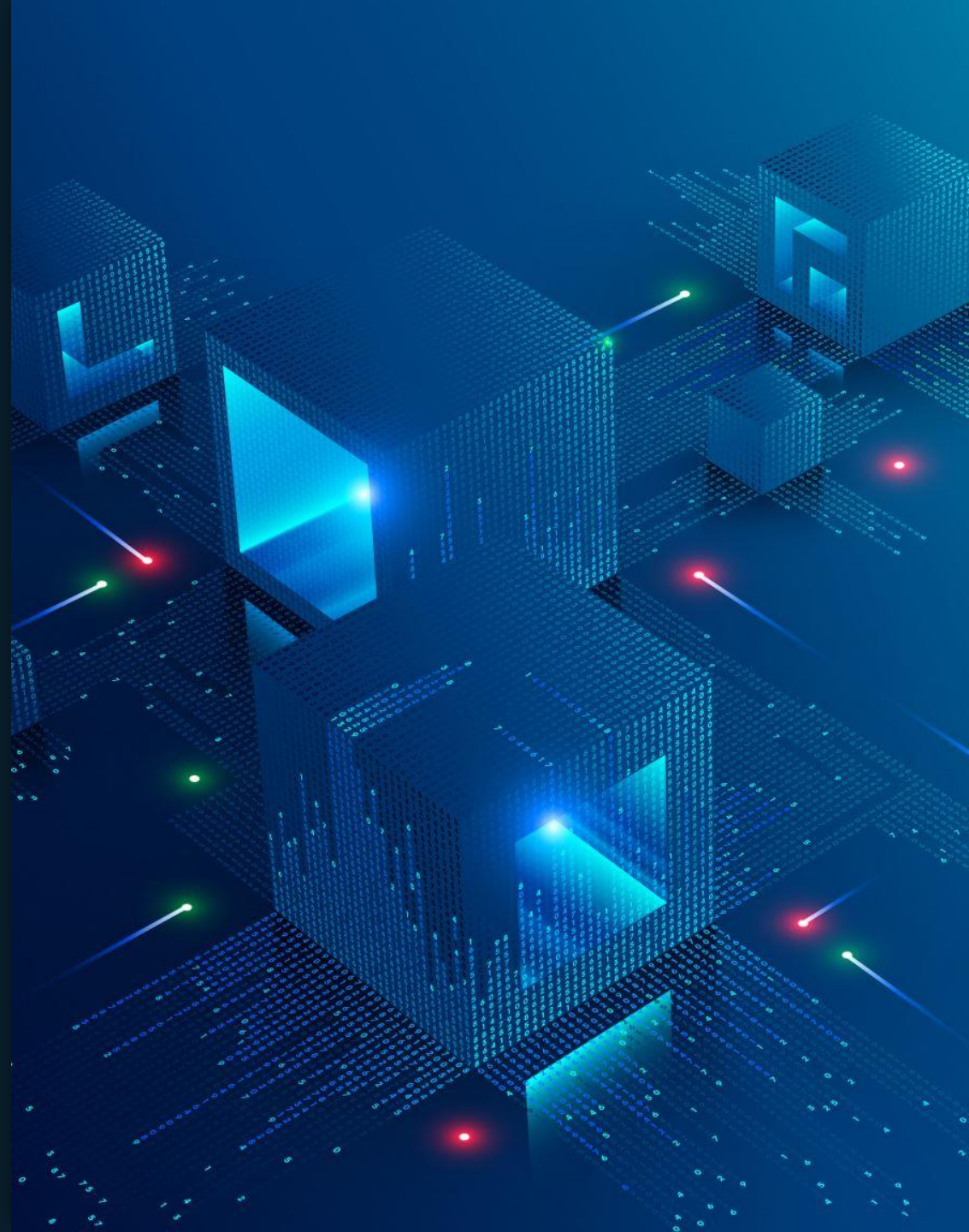
Azure Stack Family

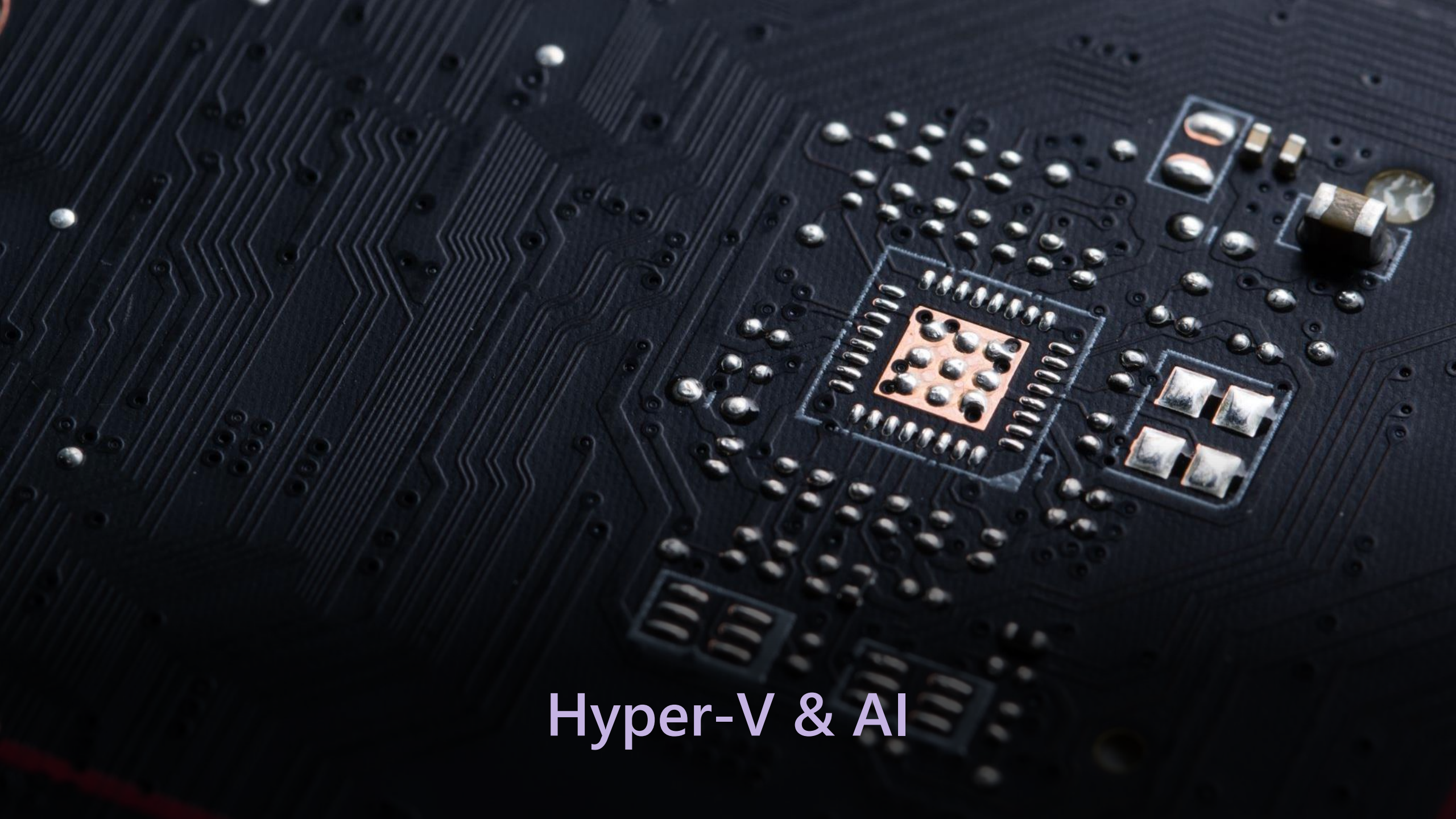
Windows Server/Windows

Containers with Hyper-V Isolation

Platform Security

Xbox



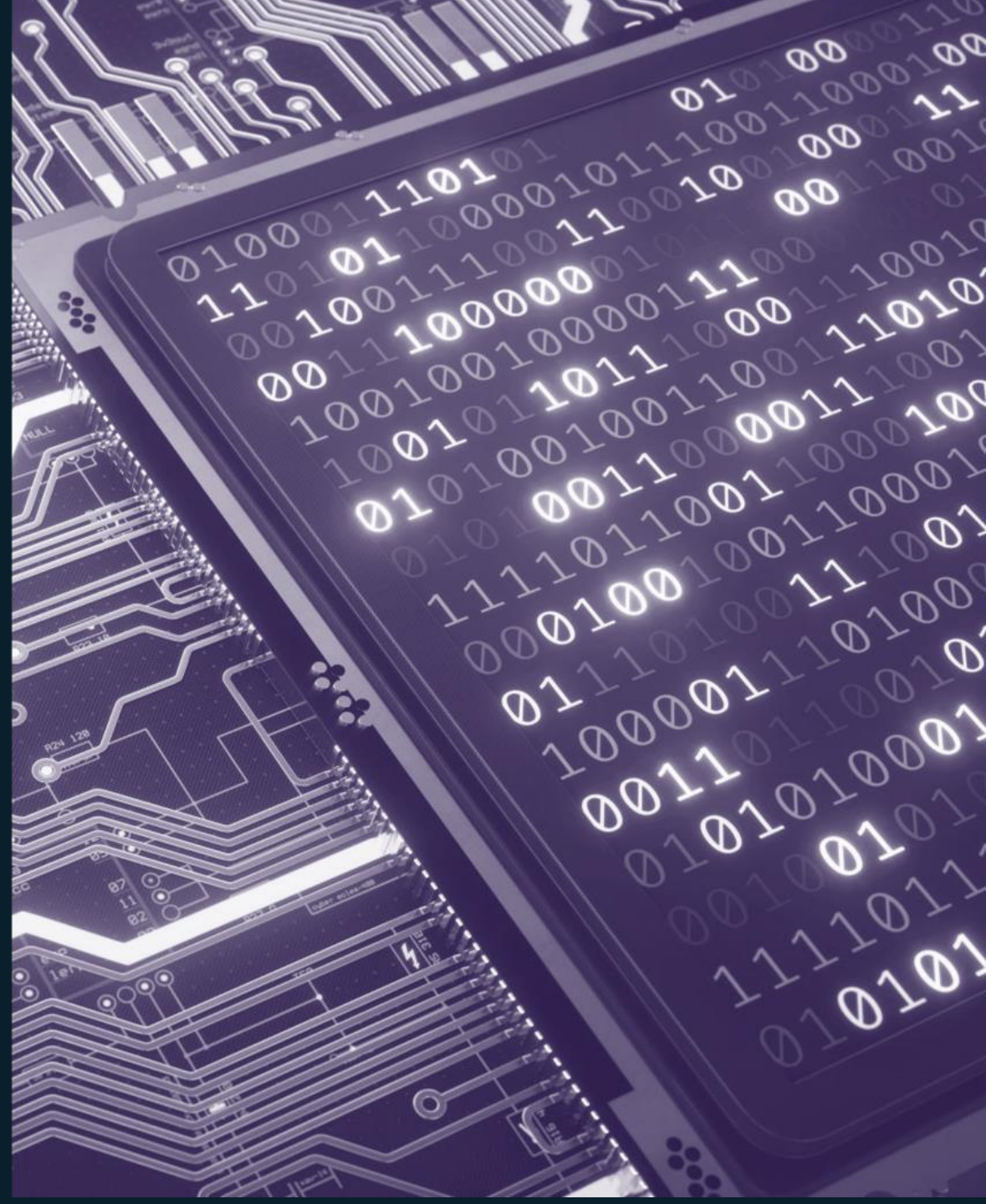


Hyper-V & AI

Windows Server 2022 GPU Support

Windows Server 2022: GPU with Discrete Device Assignment

- Assigns a full GPU to a VM
(No sharing a GPU between multiple VMs)
- Great for workloads that will consume an entire GPU
- No Failover Clustering
- No Live Migration
- No Sharing



New

Windows Server 2025 GPU-P Support

GPU Partitioning (GPU-P)

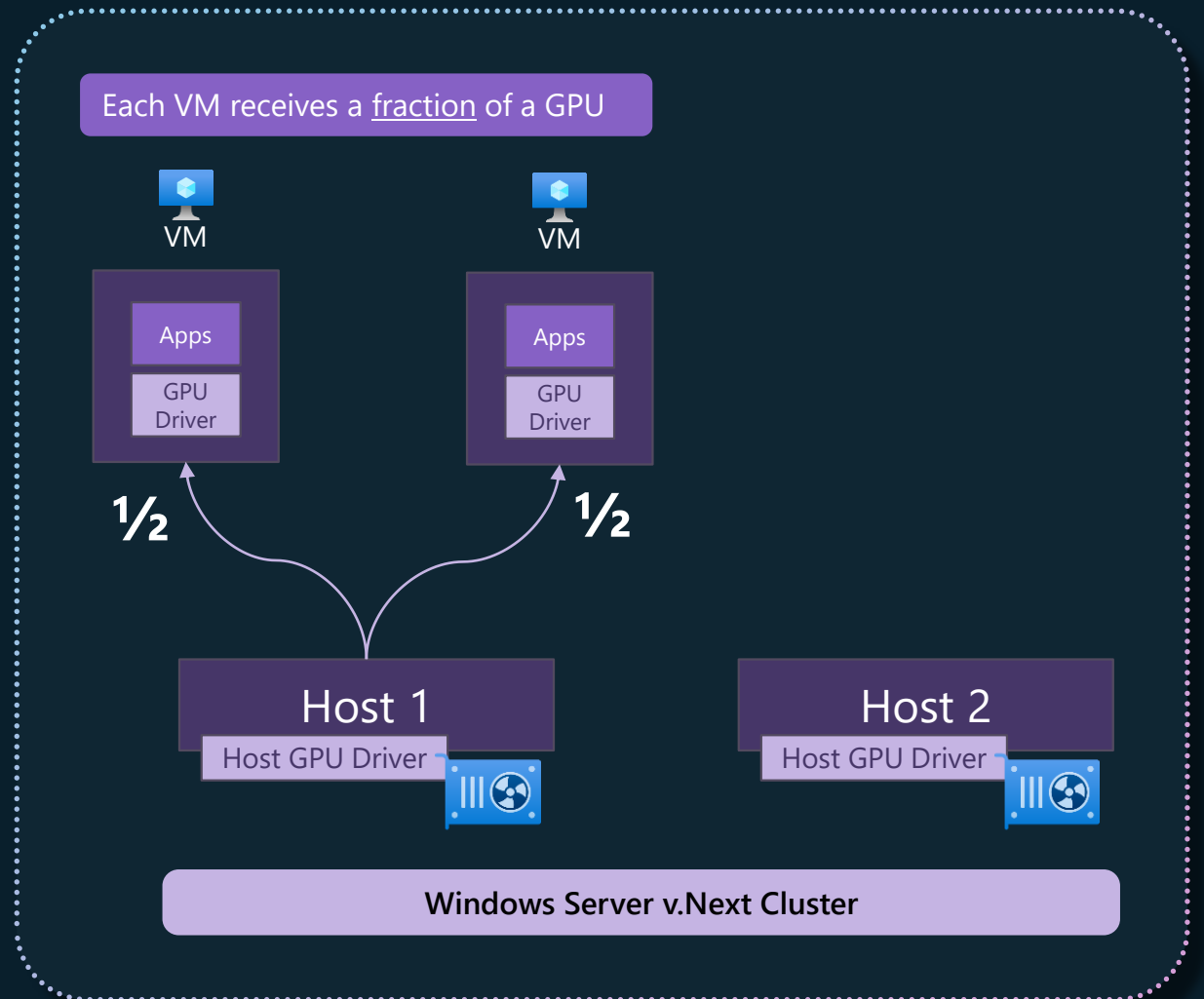
Share a GPU across multiple VMs

- Create GPU Partitions
- Assign each partition to a VM that supports a set of users (multi-session)
- PS or WAC management

Support for Live Migration and failover clustering

Learn more:

<https://learn.microsoft.com/azure-stack/hci/manage/partition-gpu>



GPU-P – Hardware & Live Migration

GPU-P Server Requirements

- SR-IOV required
- AMD Milan or later
- Intel Sapphire Rapids or later

GPU Requirements

- nVidia A2, A10, A16, A40 GPUs (Symmetric)
- <https://docs.nvidia.com/grid/15.0/grid-vgpu-release-notes-microsoft-azure-stack-hci/>

GPU-P

- Both Live Migration & High Availability Supported

Live Migration Scenarios for GPU-P

- Works in a clustered environment
- Works with standalone servers (outside of a cluster)
 - Live migrate from one standalone host to another standalone host

Supported Guests

- Windows 10/11
- Windows Server 2019/2022
- Linux Ubuntu 18.04 LTS, 20.04 LTS

GPU-P Demo

Tools

Search Tools

- Updates
- Diagnostics
- Performance Monitor
- Security
- Extensions
 - GPUs

GPU PREVIEW

GPUs GPU pools **GPU partitions**

Configure partition count + Assign partition - Unassign partition 0 items

Host	Partition ID	Partition count	Assignment status	Virtual machine	Size					
Host	TK5-3WP03R0819									
	NVIDIA A2	4	4/4		14.8 GB					
	CDDCEF46-CC30-499F-93D8-D63E9BA58FB6			guest-p4	3.56 GB					
	9A04A45C-1E1C-4F72-B130-E89C2611F761			guest-p3	3.56 GB					
	F21D3496-1D29-4569-95E1-D86CC45CB827			guest-p2	3.56 GB					
Host	TK5-3WP03R0827	NVIDIA A2	16	0/16	14.8 GB					
						CBE94D85-EDF3-486F-A0A9-DAECD31AFF00	guest-p1	3.56 GB		
						TK5-3WP03R0913				
						NVIDIA A2	4	1/4		14.8 GB
						E050674C-82DE-40DA-A5F1-042428C2E869			Ubuntu VM	3.56 GB
Host	TK5-3WP03R0915	NVIDIA A2	4	0/4	14.8 GB					
							demo_vm2			

Selected item details

Select a GPU or a partition to find out more info.

Tools

GPU PREVIEW

Search Tools

GPUs GPU pools GPU partitions

Configure partition count Assign partition Unassign partition

Partition ID	Partition count	Assignment status	Virtual machine	Size
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F21D3496-1D29-4569-95E1-D86CC45CB827			guest-p2	3.56 GB
CBE94D85-EDF3-486F-A0A9-DAECD31AFF00			guest-p1	3.56 GB
TK5-3WP03R0827				
NVIDIA A2	16	0/16		14.8 GB
TK5-3WP03R0913				
NVIDIA A2	4	1/4		14.8 GB
E050674C-82DE-40DA-A5F1-042428C2E869			Ubuntu VM	3.56 GB
TK5-3WP03R0915				
NVIDIA A2	4	0/4	demo_vm2	14.8 GB

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GPU PREVIEW

GPUs GPU pool

Configure partit

Partition ID

- TK5-3WP03R0819
 - NVIDIA A2
 - CDDCEF46-CC30-4...
 - 9A04A45C-1E1C-4...
 - F21D3496-1D29-4...
 - CBE94D85-EDF3-4...
- TK5-3WP03R0827
 - NVIDIA A2
- TK5-3WP03R0913
 - NVIDIA A2
 - E050674C-82DE-4...
- TK5-3WP03R0915
 - NVIDIA A2

Selected item

Select a GPU or a par

Configure partition count on GPUs

1. Prerequisite

Ensure GPU-P driver from the vendor is installed on all nodes.

2. Choose a set of homogeneous GPUs

Choose a set of homogeneous GPUs (same size, manufacturer and model number).

Name	Status	Manufacturer	Number of partitions	Total VRAM
tk5-3wp03r0819				
NVIDIA A2	OK	NVIDIA	4	14.8 GB
tk5-3wp03r0827				
NVIDIA A2	OK	NVIDIA	16	14.8 GB
tk5-3wp03r0913				
NVIDIA A2	OK	NVIDIA	4	14.8 GB

⚠ Not all GPUs have been selected. This may result in different partition counts which is not recommended.

ℹ Note that homogeneous GPUs should have the same size, manufacturer and model number. Ensure that homogeneous GPUs have the same number of partitions.

3. Select number of partitions

Number of Partitions

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GPU PREVIEW

GPUs GPU pool

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NVIDIA A2
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CBE94D85-EDF3-4
TK5-3WP03R0827
NVIDIA A2
TK5-3WP03R0913
NVIDIA A2
E050674C-82DE-4
TK5-3WP03R0915
NVIDIA A2

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3. Select number of partitions

Number of Partitions

16

8

4

2

1

Configure partition count Cancel

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GPU PREVIEW

GPUs GPU pool

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- TK5-3WP03R0819
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 - F21D3496-1D29-4...
 - CBE94D85-EDF3-4...
- TK5-3WP03R0827
 - NVIDIA A2
- TK5-3WP03R0913
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tk5-3wp03r0913	OK	NVIDIA A2	4	14.8 GB

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3. Select number of partitions

Number of Partitions:

ℹ Each partition will have 3.71 GB of VRAM.

[Configure partition count](#) [Cancel](#)

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NVIDIA A2	4	0/4	demo_vm2	14.8 GB

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GPU PREVIEW

GPUs GPU pool

Configure partiti

Partition ID
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TK5-3WP03R0827
NVIDIA A2
TK5-3WP03R0913
NVIDIA A2
E050674C-82DE-4
TK5-3WP03R0915
NVIDIA A2

Selected item
Select a GPU or a par

Assign GPU partition to VM

GPU partitions enable software running in VMs to access the GPU hardware connected to the host.
For security reasons, Microsoft recommends installing a device mitigation driver from your GPUs' vendors.

Choose the server * tk5-3wp03r0915.cfdev.nttest.microsoft.com

Choose virtual machine to assign GPU * demo-vm1 partition

Available VRAM options *

To complete your VM's configura machines.

Configure offline action to force shutdown

- Select All
- demo_vm2 - Max number of partition reached
- demo-vm1

Virtual machines will be turned off before the operation. Ensure you save your workload before assigning partitions.

Assign partition Cancel

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GPU PREVIEW

GPUs GPU pool

Configure partition

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 - NVIDIA A2
 - CDDCEF46-CC30-
 - 9A04A45C-1E1C-
 - F21D3496-1D29-
 - CBE94D85-EDF3-
- TK5-3WP03R0827
 - NVIDIA A2
- TK5-3WP03R0913
 - NVIDIA A2
 - E050674C-82DE-4
- TK5-3WP03R0915
 - NVIDIA A2

Selected item

Select a GPU or a partition

Assign GPU partition to VM

GPU partitions enable software running in VMs to access the GPU hardware connected to the host.

For security reasons, Microsoft recommends installing a device mitigation driver from your GPUs' vendors.

Choose the server * tk5-3wp03r0915.cfdev.nttest.microsoft.com

Choose virtual machine to assign GPU partition * demo-vm1

Available VRAM options * 3.56 GB

i To complete your VM's configuration, you must install guest drivers and configure licensing on your virtual machines.

Configure offline action to force shutdown

Virtual machines will be turned off before the operation. Ensure you save your workload before assigning partitions.

Assign partition Cancel

- Tools
- Virtual machines
- Servers
- Azure Kubernetes Service
- Storage
 - Volumes
 - Drives
 - Storage Replica
- Networking
 - SDN Infrastructure
 - Virtual switches
- Tools
 - Azure Monitor
 - Updates
 - Diagnostics
 - Performance Monitor
 - Security
- Extensions
 - GPUs
 - Settings

GPU PREVIEW

- GPUs
- GPU pools
- GPU partitions**

Configure partition count Assign partition Unassign partition 0 items

Partition ID	Partition count	Assignment status	Virtual machine	Size
TK5-3WP03R0819				
NVIDIA A2	4	4/4		14.8 GB
CDDCEF46-CC30-499F-93D8-D63E9BA58FB6			guest-p4	3.56 GB
9A04A45C-1E1C-4F72-B130-E89C2611F761			guest-p3	3.56 GB
F21D3496-1D29-4569-95E1-D86CC45CB827			guest-p2	3.56 GB
C8E94D85-EDF3-486F-A0A9-DAECD31AFF00			guest-p1	3.56 GB
TK5-3WP03R0827				
NVIDIA A2	4	0/4		14.8 GB
TK5-3WP03R0913				
NVIDIA A2	4	1/4		14.8 GB
E050674C-82DE-40DA-A5F1-042428C2E869			Ubuntu VM	3.56 GB
TK5-3WP03R0915				
NVIDIA A2	4	1/4	demo_vm2	14.8 GB
B0A2DE9F-F9CC-4599-83E8-944D1E63B2CE			demo-vm1	3.56 GB

Selected item details

Select a GPU or a partition to find out more info.

- Tools
- Virtual machines
- Servers
- Azure Kubernetes Service
- Storage
 - Volumes
 - Drives
 - Storage Replica
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GPU PREVIEW

- GPUs
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F21D3496-1D29-4569-95E1-D86CC45CB827			guest-p2	3.56 GB
CBE94D85-EDF3-486F-A0A9-DAECD31AFF00			guest-p1	3.56 GB
TK5-3WP03R0827				
NVIDIA A2	4	0/4		14.8 GB
TK5-3WP03R0913				
NVIDIA A2	4	1/4		14.8 GB
E050674C-82DE-40DA-A5F1-042428C2E869			Ubuntu VM	3.56 GB
TK5-3WP03R0915			demo_vm2	
NVIDIA A2	4	1/4		14.8 GB
B0A2DE9F-F9CC-4599-83E8-944D1E63B2CE			demo-vm1	3.56 GB

Selected item details

Selected item details

Select a GPU or a partition to find out more info.

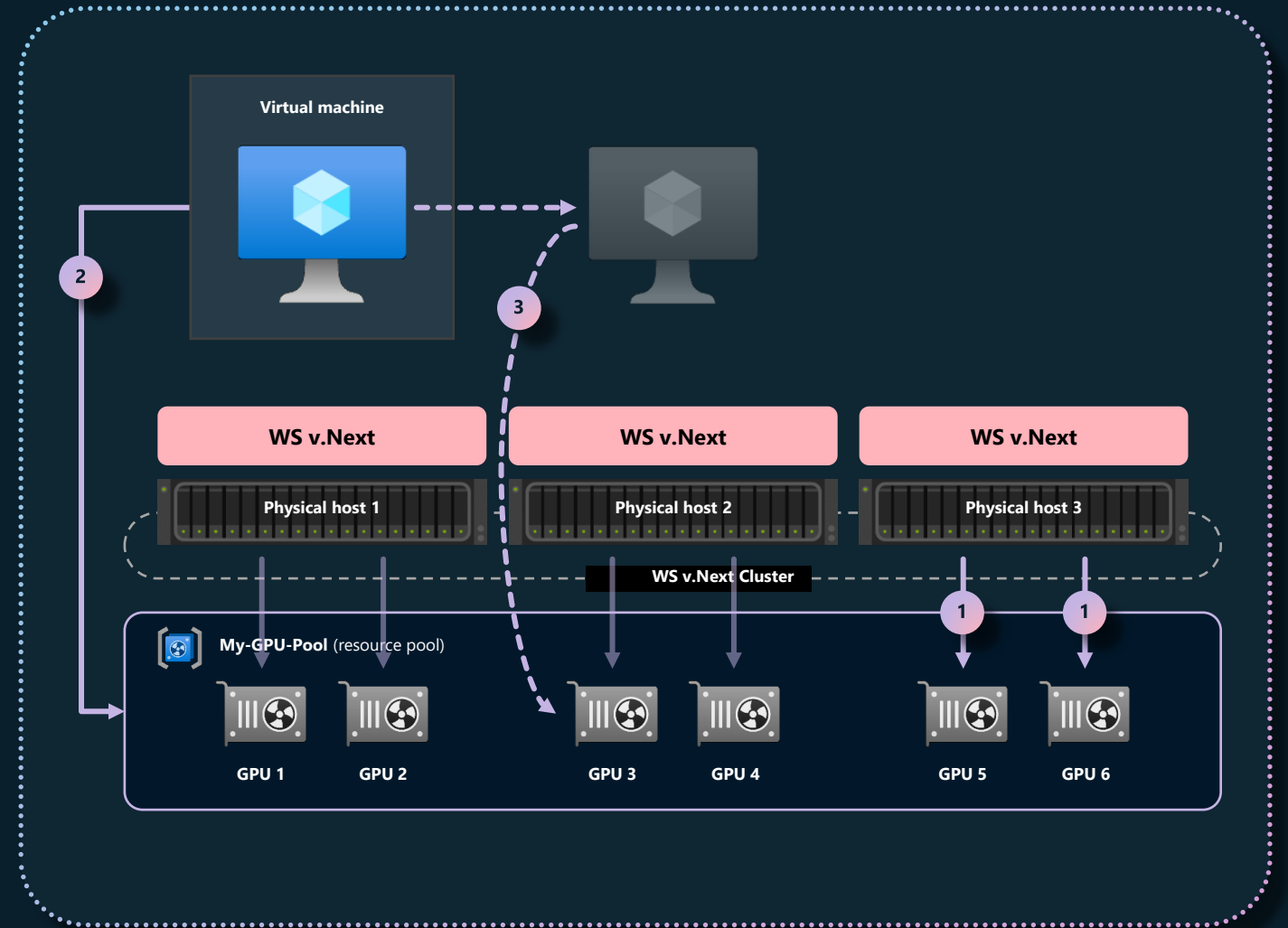
New

Windows Server 2025 GPU with DDA HA Support

GPU Pools

Group GPUs for high availability

- 1 On every node, create PCI Express resource pool with same name and add GPUs to the pool
- 2 Assign VM to GPU pool instead of individual GPU
- 3 During failover or move, cluster will start VM on another host if there are GPUs available in the pool





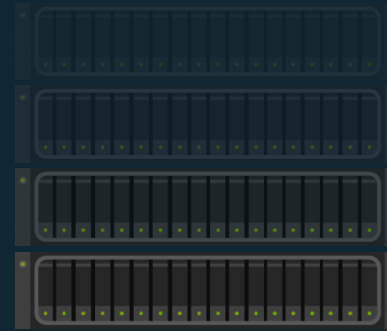
Dynamic Processor Compatibility

Scale out with confidence

No need to order last-gen hardware for compatibility



+



3rd Gen
Intel® Xeon® Scalable
processors

4th Gen
Intel® Xeon® Scalable
processors

← Same Windows Server v.Next cluster →

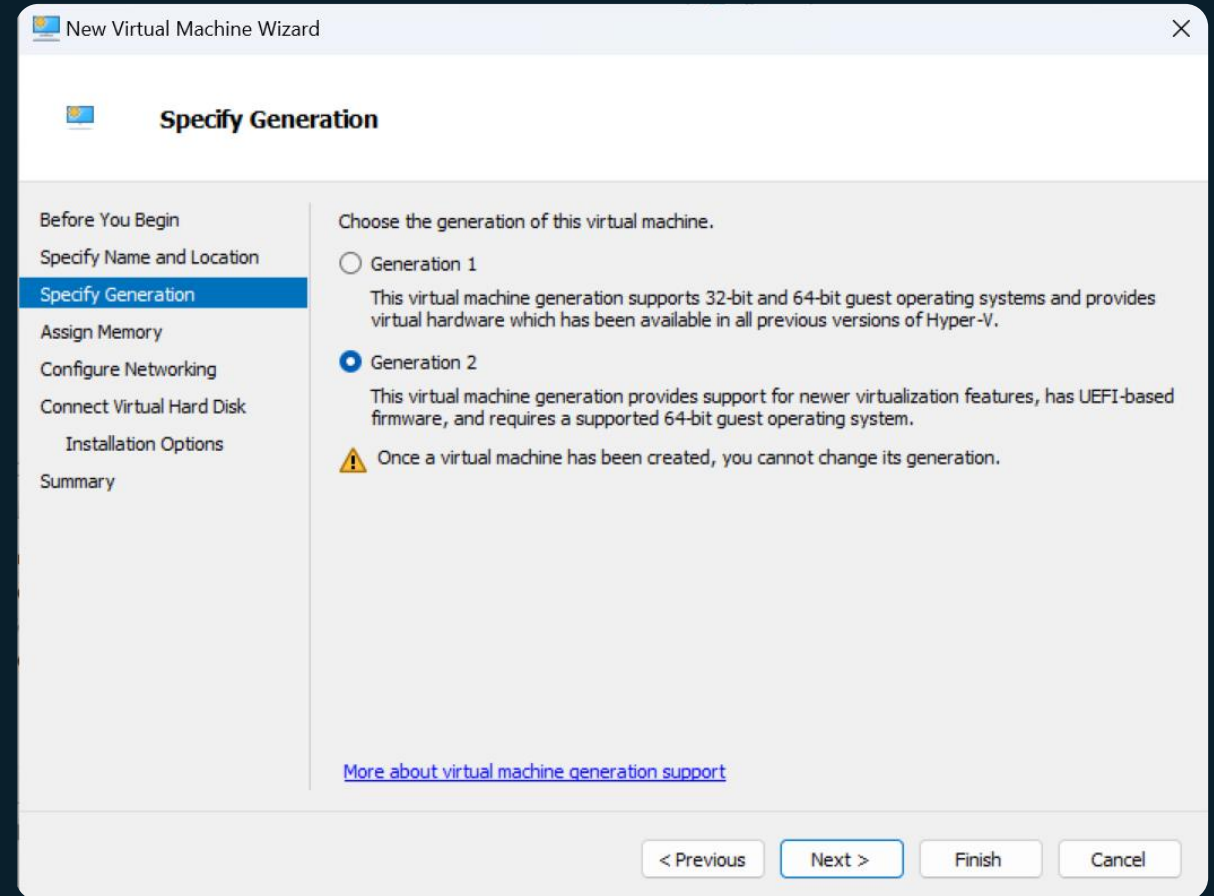
Embrace Generation 2 VMs

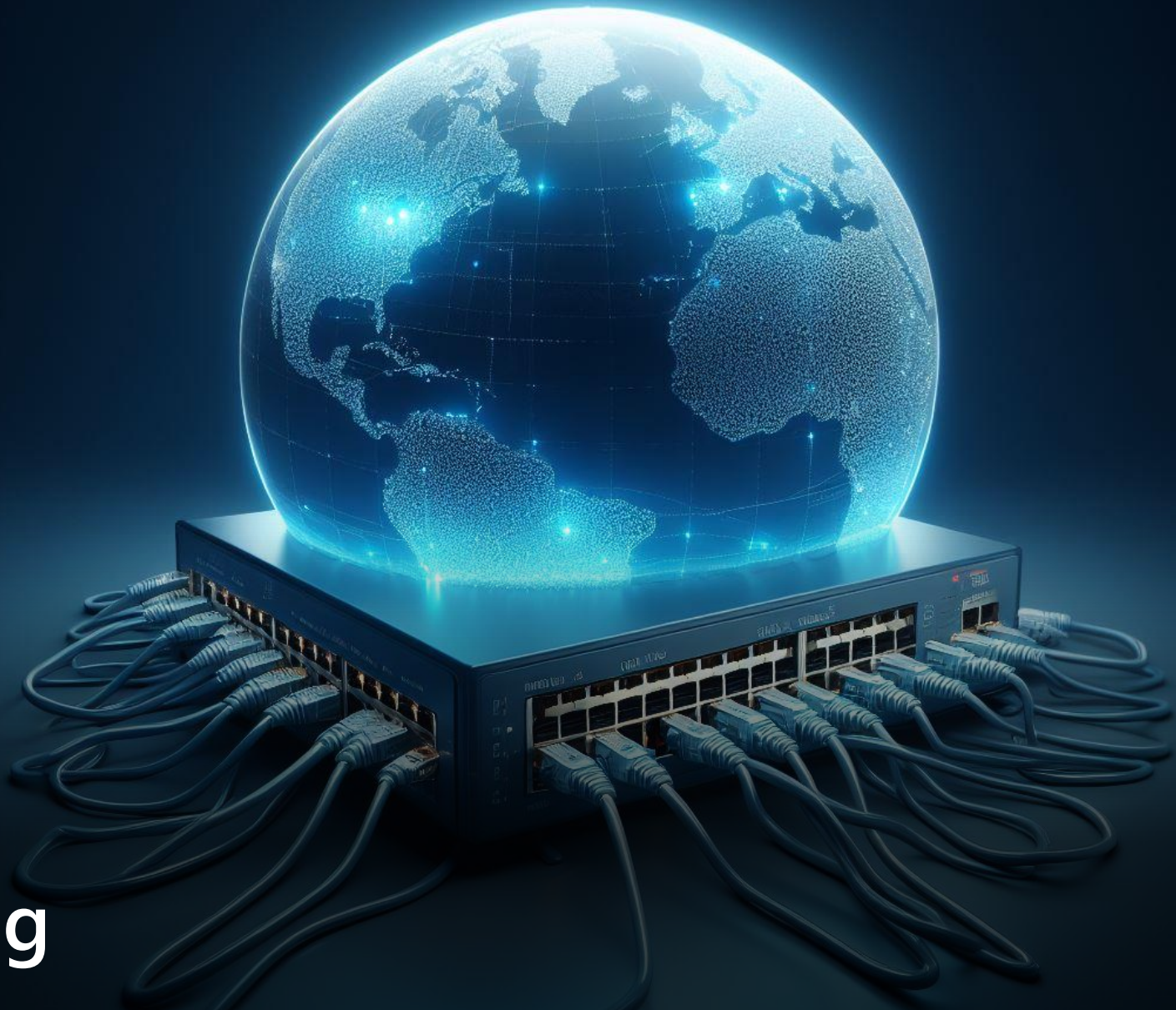
Use Generation 2 VMs at this point

Generation 2 VM advantages:

- **Better performance**
 - Supports more VPs (240 vs 64)
- **Improved Security**
 - Secure Boot & TPM support
 - UEFI FW support
- **Dynamic Features**
 - Hot Add/Remove vNICs

GUI's now default to Generation 2 VMs
Azure Marketplace images will be Generation 2





Networking

Networking



Network ATC

One-click deployment and drift remediation of host network configuration across the cluster



Network HUD

Always-on alerting and remediation of operational network issues and inefficiencies



SDN Multisite

Native L2 & L3 Connectivity for workloads in multiple locations.. Parity with stretch clusters

Unified network policy management for these workloads.

Eliminates need to update policies when workloads move across locations



SDN Gateway Performance Improvements

20%-50% performance improvements with lower CPU utilization



Empowering Modern AKS Applications

Secure, scalable & Adaptive SDN infrastructure for Hybrid AKS

Hybrid AKS workloads can now be put on SDN networks for Windows Server

Enforce customer network policies & routing rules for microservices & applications



Containers

Container Flexibility

Container base image portability ABI – you can run WS2022 container on WS 2025 without upgrading the base image.

Windows Server Annual Channel for Containers to suit the needs of customers requiring agility and increased innovation cycles.

Reduced image size with smaller delta layers.

Improved app compat coverage for WS vNext Nano Server

Networking control path performance improvements





Next Generation File Services

“SMB over QUIC is a game changing feature. Our mobile sales team can securely access corporate file servers without a VPN. We need this technology at the edge and in other clouds.”



**Introducing
SMB over QUIC in Windows Server 2025**

SMB Over QUIC Demo

SMB over QUIC Client Access Control

Trusted clients not just trusted server

Clients now must provide cert for QUIC server from trusted issuer

- Assign with signature on client (most secure)
- Assign with trusted issuer (easier)

Increases difficulty by adding another layer

SMB NTLM Disable Option

Stop emitting NTLM secrets

Remote NTLM only

- But remember that Local KDC + IAKerb slide!
-

Control with Powershell, Group Policy, mapping tools

- `Set-SmbClientConfiguration -DisableNTLM $true`
- Exception list in group policy



Brute Force Attacks: Old, yet Effective



Simple brute force attacks

Dictionary attacks

Hybrid brute force attacks

Reverse brute force attacks

Credential stuffing

Rainbow table attack

SMB Auth Rate Limiter: Brute Force Attack Prevention

Throttle bad NTLM passwords

- 2-second delay between each fail (default)

On by default in Windows Server & Windows Client

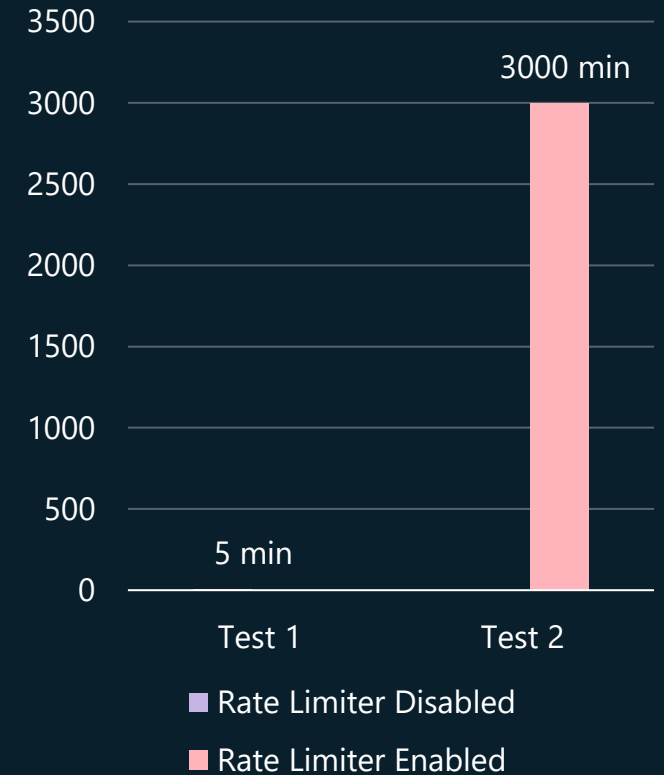
Control with PowerShell

- `Set-SmbServerConfiguration -InvalidAuthenticationDelayTimeInMs n`

Test

- 300 brute force attempt/sec for 5 minutes = 90,000 PW
- Now take 50 hours

90,000 Password Brute Force Attack Time



SMB Signing

Secure by default

Signing required by default now

- Previously required only for connecting to domain controller

Now SMB client signing required

- Windows Enterprise, Education, Pro + Windows Server editions (i.e. all but Home)
- SMB server signing also required on client editions

Stop relay, attacker-in-the-middle, phishing

Control with Powershell, Group Policy



SMB Dialect Control

Improved manageability

Allow/Refuse a range of SMB 2 & 3

Better security control in modern environments

Match SMB client option introduced in Win10

Group Policy & PowerShell

- `Set-SmbClientConfiguration -Smb2DialectMax -Smb2DialectMin`
- `Set-SmbServerConfiguration -Smb2DialectMax -Smb2DialectMin`





The screenshot shows the Local Group Policy Editor window. The left pane displays a tree view of network-related policies, with 'Mandate the minimum version of SMB' selected. The right pane shows a list of settings, with the selected policy highlighted. The status of the policy is 'Not configured'.

Setting	State
Cipher suite order	Not configured
Disable SMB compression	Not configured
Request traffic compression for all shares	Not configured
Hash Publication for BranchCache	Not configured
Hash Version support for BranchCache	Not configured
Honor cipher suite order	Not configured
Mandate the maximum version of SMB	Not configured
Mandate the minimum version of SMB	Not configured

Group Policy: Mandate Minimum...



Mandate the minimum version of SMB

Previous Setting Next Setting

Not Configured Comment:

Enabled

Disabled

Supported on: At least Windows Server 2022, Windows 11

Options: Help:

Select SMB version:

Version:

- SMB 2.0.2
- SMB 2.1.0
- SMB 3.0.0
- SMB 3.0.2
- SMB 3.1.1

This policy controls the minimum version of SMB protocol

Note: This group policy does not prevent use of SMB 1 if that component is still installed and enabled.

OK Cancel Apply

Setting	State
Cipher suite order	Not configured
Disable SMB compression	Not configured
Request traffic compression for all shares	Not configured
Hash Publication for BranchCache	Not configured
Hash Version support for BranchCache	Not configured
Honor cipher suite order	Not configured
Mandate the maximum version of SMB	Enabled
Mandate the minimum version of SMB	Not configured

8 setting(s)

Group Policy: Mandate Minimum...



Mandate the maximum version of SMB

Previous Setting Next Setting

Not Configured Comment:

Enabled

Disabled

Supported on: At least Windows Server 2022, Windows 11

Options: Help:

Select SMB version:

Version:

- SMB 2.0.2
- SMB 2.1.0
- SMB 3.0.0
- SMB 3.0.2
- SMB 3.1.1

This policy controls the maximum version of SMB protocol

Note: This group policy does not prevent use of SMB 1 if that component is still installed and enabled.

OK Cancel Apply

Setting	State
Cipher suite order	Not configured
Disable SMB compression	Not configured
Request traffic compression for all shares	Not configured
Hash Publication for BranchCache	Not configured
Hash Version support for BranchCache	Not configured
Honor cipher suite order	Not configured
Mandate the maximum version of SMB	Not configured
Mandate the minimum version of SMB	Not configured

8 setting(s)

Group Policy: Mandate Maximum...

SMB Firewall Rule Hardening

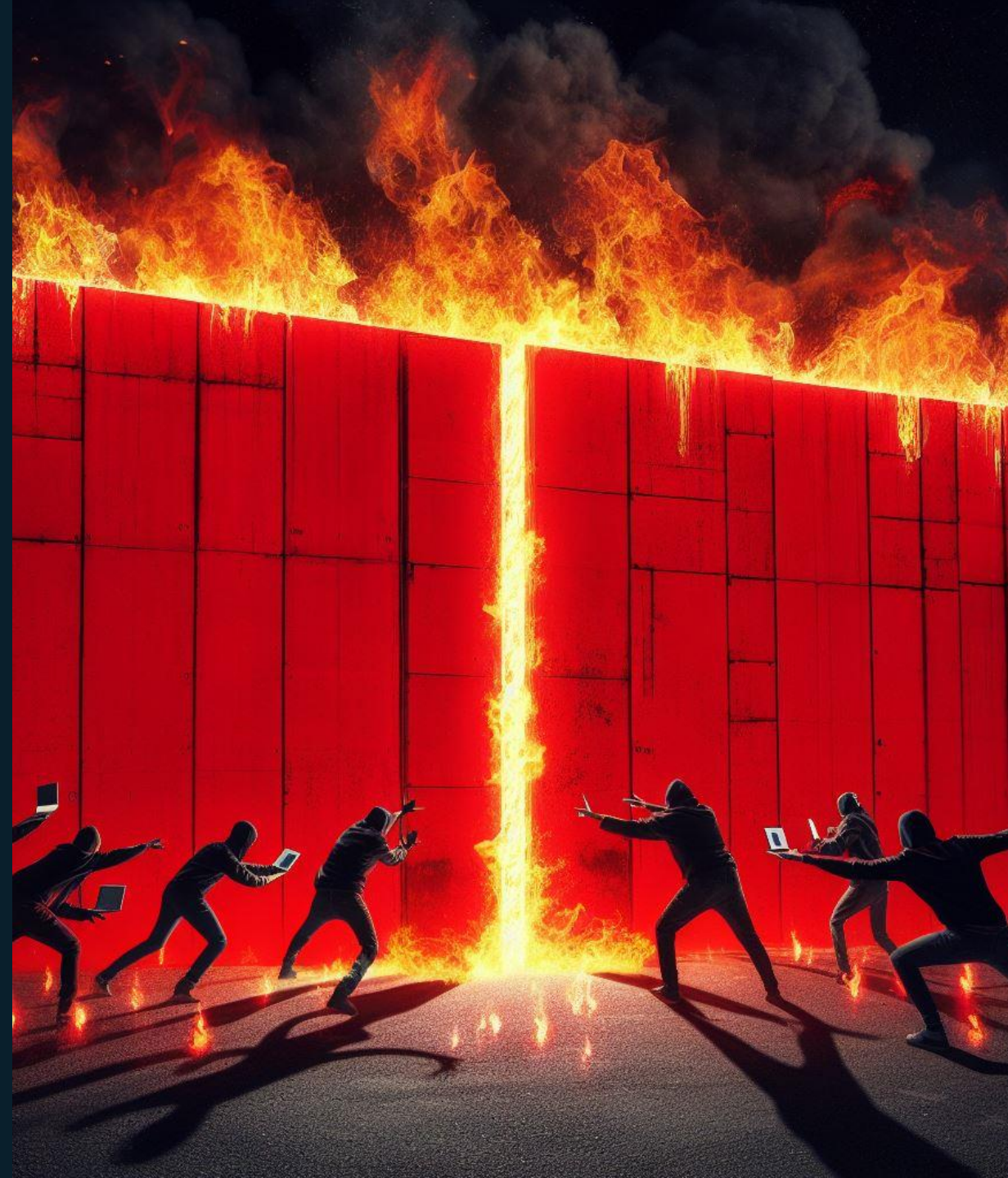
Secure by default

End legacy firewall rules

- Installing File Server role opens SMB 445/5445, WMI, DCOM

Now:

- Creating a share no longer opens NetBIOS ports
- Not the end: we will keep cutting down the port list in Insiders



Windows Defender Firewall with Advanced Security

File Action View Help

Windows Defender Firewall with Advanced Security

- Inbound Rules
- Outbound Rules
- Connection Security Rules
- Monitoring

Name	Group	Profile	Enabled
File and Printer Sharing (Echo Request - ICMPv4-In)	File and Printer Sharing	Private...	No
File and Printer Sharing (Echo Request - ICMPv4-In)	File and Printer Sharing	Domain	No
File and Printer Sharing (Echo Request - ICMPv6-In)	File and Printer Sharing	Domain	No
File and Printer Sharing (Echo Request - ICMPv6-In)	File and Printer Sharing	Private...	No
File and Printer Sharing (LLMNR-UDP-In)	File and Printer Sharing	All	No
File and Printer Sharing (NB-Datagram-In)	File and Printer Sharing	Private...	No
File and Printer Sharing (NB-Datagram-In)	File and Printer Sharing	Domain	No
File and Printer Sharing (NB-Name-In)	File and Printer Sharing	Domain	No
File and Printer Sharing (NB-Name-In)	File and Printer Sharing	Private...	No
File and Printer Sharing (NB-Session-In)	File and Printer Sharing	Private...	No
File and Printer Sharing (NB-Session-In)	File and Printer Sharing	Domain	No
File and Printer Sharing (SMB-In)	File and Printer Sharing	Private...	No
File and Printer Sharing (SMB-In)	File and Printer Sharing	Domain	No
File and Printer Sharing (Spooler Service - RPC)	File and Printer Sharing	Domain	No
File and Printer Sharing (Spooler Service - RPC)	File and Printer Sharing	Private...	No
File and Printer Sharing (Spooler Service - RPC-EPMAP)	File and Printer Sharing	Domain	No
File and Printer Sharing (Spooler Service - RPC-EPMAP)	File and Printer Sharing	Private...	No
File and Printer Sharing (Restrictive) (Echo Request - ICMPv4-In)	File and Printer Sharing (Restrictive)	Private	No
File and Printer Sharing (Restrictive) (Echo Request - ICMPv4-In)	File and Printer Sharing (Restrictive)	Public	No
✓ File and Printer Sharing (Restrictive) (Echo Request - ICMPv4-In)	File and Printer Sharing (Restrictive)	Domain	Yes
✓ File and Printer Sharing (Restrictive) (Echo Request - ICMPv6-In)	File and Printer Sharing (Restrictive)	Domain	Yes
File and Printer Sharing (Restrictive) (Echo Request - ICMPv6-In)	File and Printer Sharing (Restrictive)	Public	No
File and Printer Sharing (Restrictive) (Echo Request - ICMPv6-In)	File and Printer Sharing (Restrictive)	Private	No
File and Printer Sharing (Restrictive) (LLMNR-UDP-In)	File and Printer Sharing (Restrictive)	Private	No
✓ File and Printer Sharing (Restrictive) (LLMNR-UDP-In)	File and Printer Sharing (Restrictive)	Domain	Yes
File and Printer Sharing (Restrictive) (LLMNR-UDP-In)	File and Printer Sharing (Restrictive)	Public	No
✓ File and Printer Sharing (Restrictive) (SMB-In)	File and Printer Sharing (Restrictive)	Domain	Yes
File and Printer Sharing (Restrictive) (SMB-In)	File and Printer Sharing (Restrictive)	Private	No
File and Printer Sharing (Restrictive) (SMB-In)	File and Printer Sharing (Restrictive)	Public	No
File and Printer Sharing (Restrictive) (Spooler Service - RPC)	File and Printer Sharing (Restrictive)	Public	No
✓ File and Printer Sharing (Restrictive) (Spooler Service - RPC)	File and Printer Sharing (Restrictive)	Domain	Yes
File and Printer Sharing (Restrictive) (Spooler Service - RPC)	File and Printer Sharing (Restrictive)	Private	No
File and Printer Sharing (Restrictive) (Spooler Service - RPC-EPMAP)	File and Printer Sharing (Restrictive)	Private	No
File and Printer Sharing (Restrictive) (Spooler Service - RPC-EPMAP)	File and Printer Sharing (Restrictive)	Public	No
✓ File and Printer Sharing (Restrictive) (Spooler Service - RPC-EPMAP)	File and Printer Sharing (Restrictive)	Domain	Yes

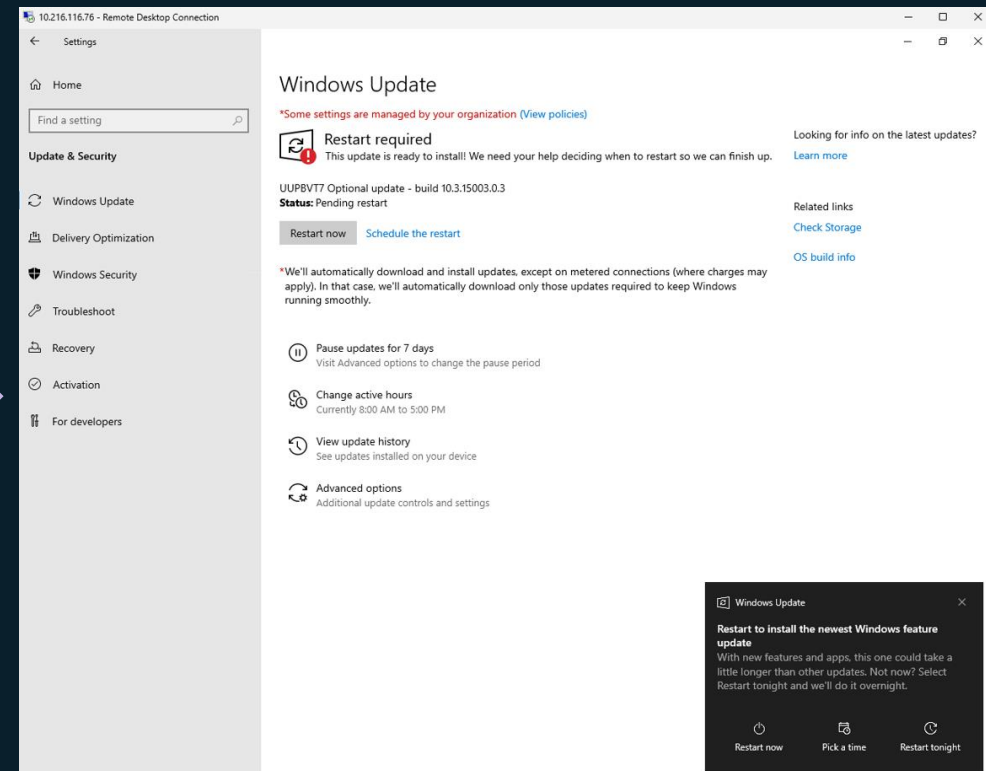
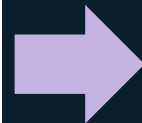
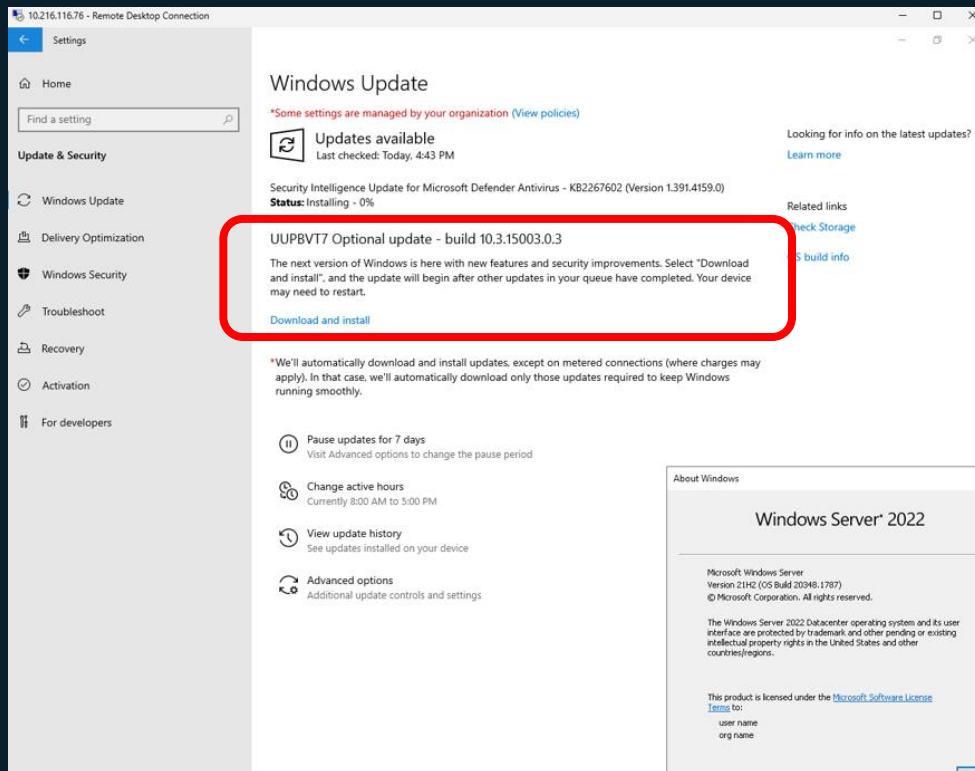
Actions

- Inbound Rules
- New Rule...
- Filter by Profile
- Filter by State
- Filter by Group
- View
- Refresh
- Export List...
- Help

SMB Firewall Rule Hardening

Easiest Upgrades EVER!!

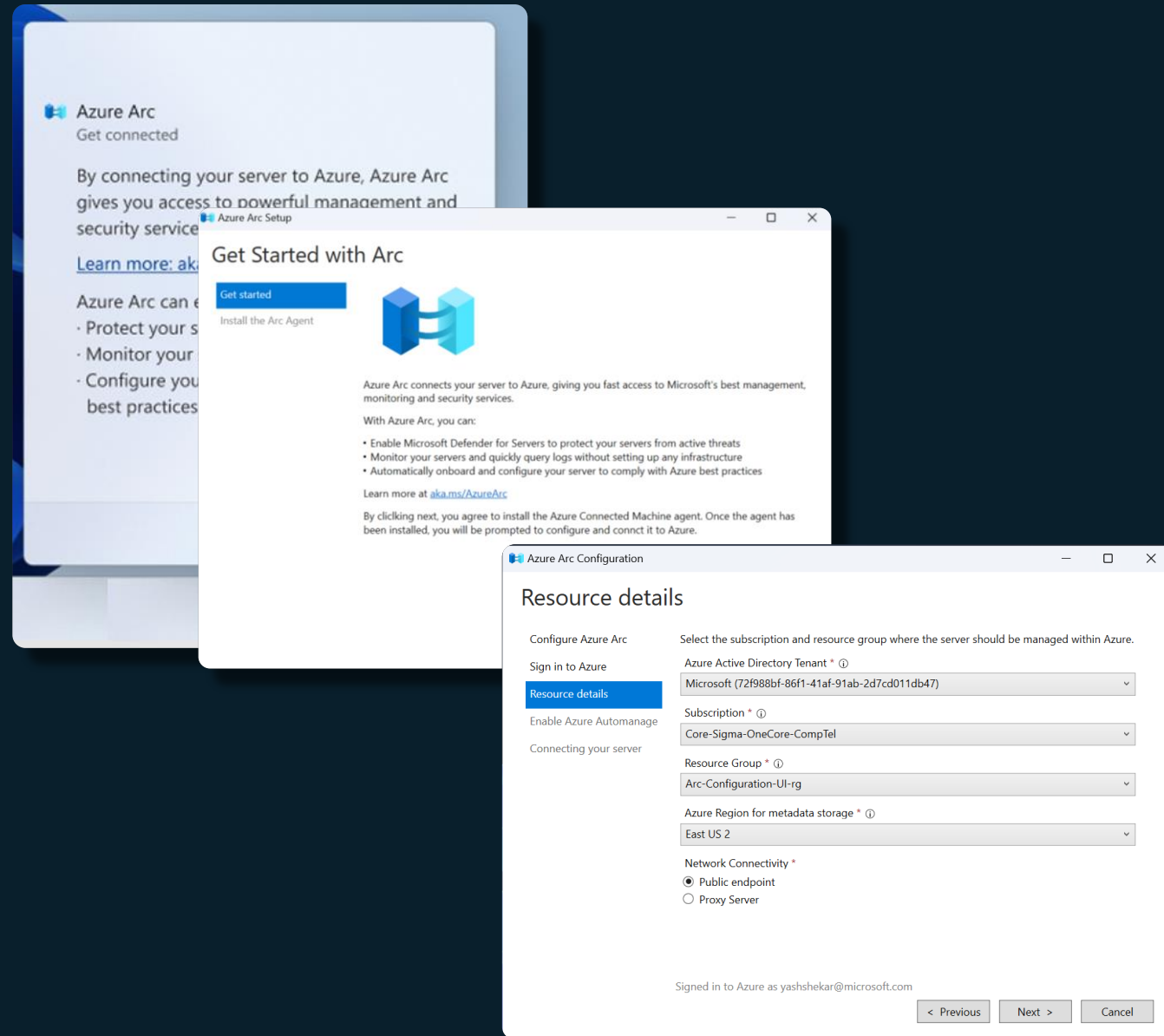
- Upgrade from Windows Server 2022 to 2025 with Windows Update
 - Same great experience you are used to on Windows 11
- Makes Upgrading to Windows Server 2025 simple!



Get Hybrid Fast-n-Easy

Azure Arc installer wizard
makes Arc enabling a breeze

Simple wizard removes all the
complexity to unlock the power
of Azure in your datacenter



Wi-Fi Support

- **Windows Server 2025**
 - Enabling more edge scenarios
- **Behavior**
 - Windows Server with Desktop Experience
 - Component enabled Out of the Box
 - Turned off by default



New Subscription based Purchasing Model

Windows Server Pay-as-you-Go (PayGo)

Simplify purchasing Windows Server

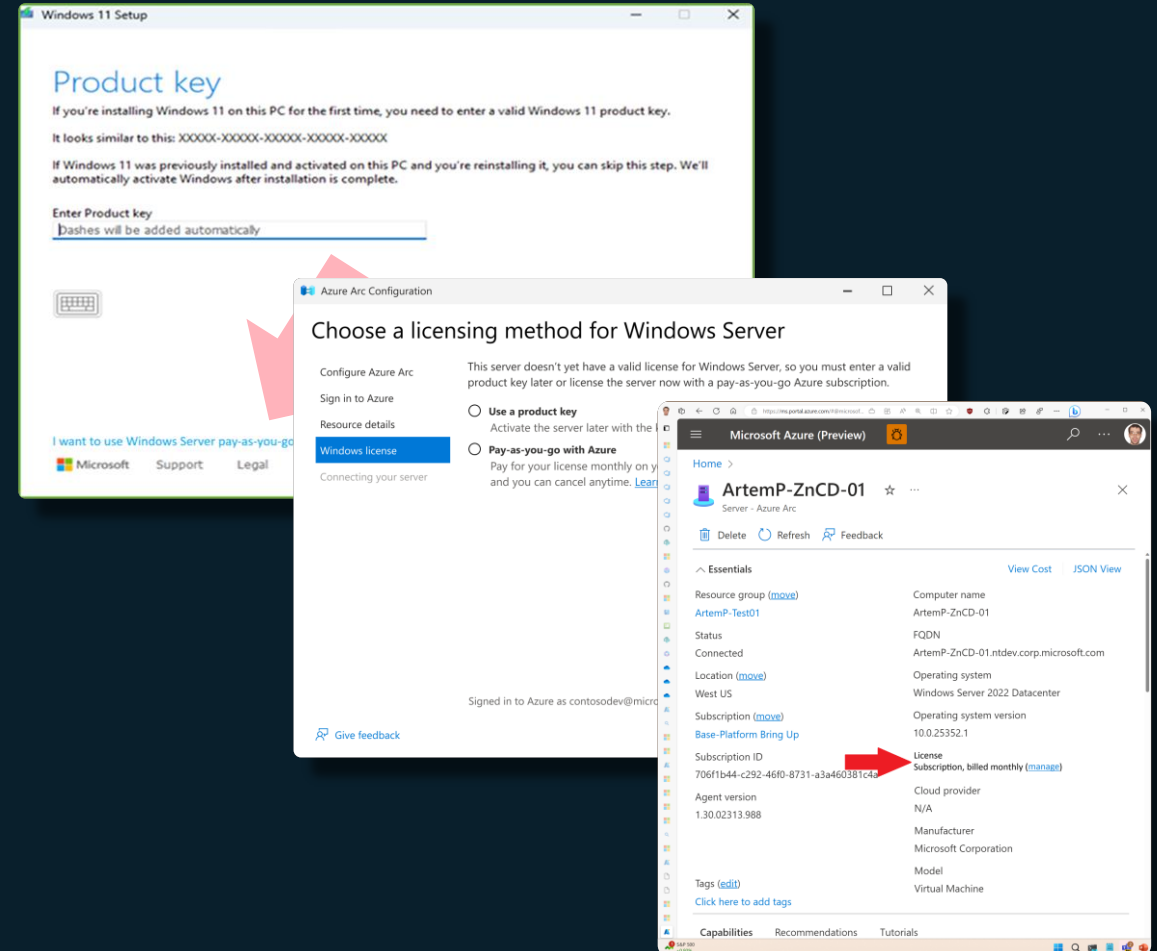
- Simple in-box experience to license Windows Server
- Consistent acquisition experience for Windows Server: on-prem, Azure, or anywhere

Subscription model like Azure Stack HCI and SQL Server 2022

- Billed through Azure commerce

Scenarios

- Burst or if you need one more VM license on Windows Server Standard
- Simplifies Hosted licensing



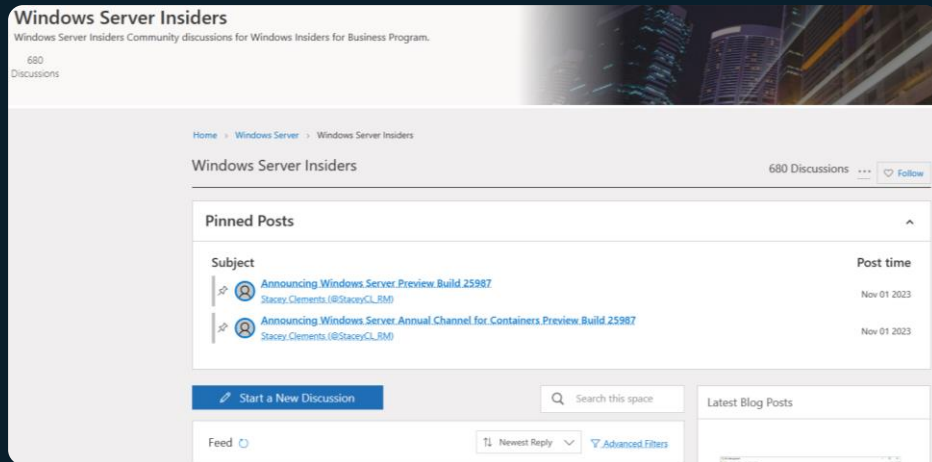
M365 apps Support on Windows Server

Enabling Remote Desktop Services (RDS) deployments

- Microsoft 365 Apps are supported on Windows Server during Mainstream Support period
 - Windows Server 2022: [Windows Server 2022 - Microsoft Lifecycle | Microsoft Learn](#)
 - Windows Server 2025, the same consistent way
- *Stay Current | Stay Secure | Stay Supported*
 - M365 support for the first 5-years with Windows Server releases every 2-3 years
- Learn more:
 - [Windows Server end of support and Microsoft 365 Apps - Deploy Office | Microsoft Learn](#)

Call to Action:

Download Windows Server 2025 from Windows Server Insiders



1

We would love your feedback on Windows Server vNext !!!

2

We are planning on releasing a new preview build every two weeks!

Are we missing any features or hardware support?

Do you like the new Desktop Experience?

Do Applications / LOB Apps work as expected?

Do your VMs run as expected?

[Windows Server Insiders Community \(microsoft.com\)](https://microsoft.com/windows-server-insiders)

