

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 & Al **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

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

Please Microsoft, we <u>need</u> 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

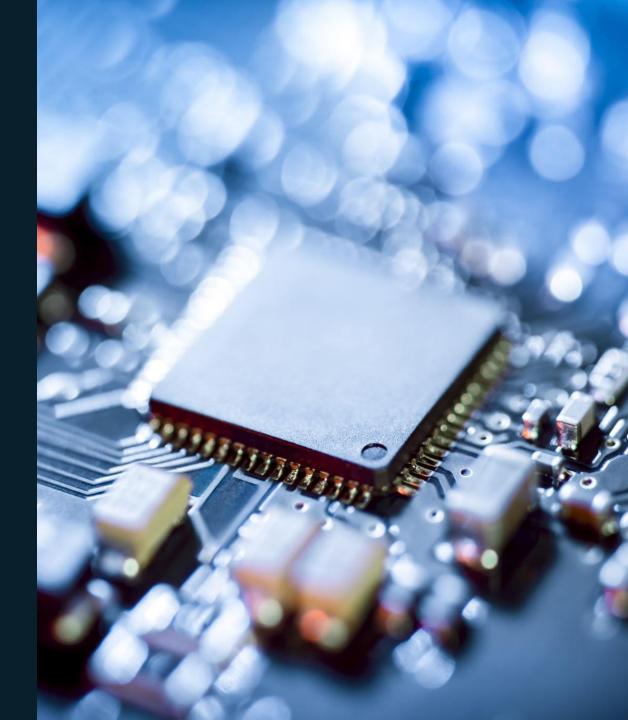


Moving to 32k database pages is done on a **forest-wide basis** and requires that **all Domain Controllers** in the forest have a 32k page capable database

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.





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.



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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.

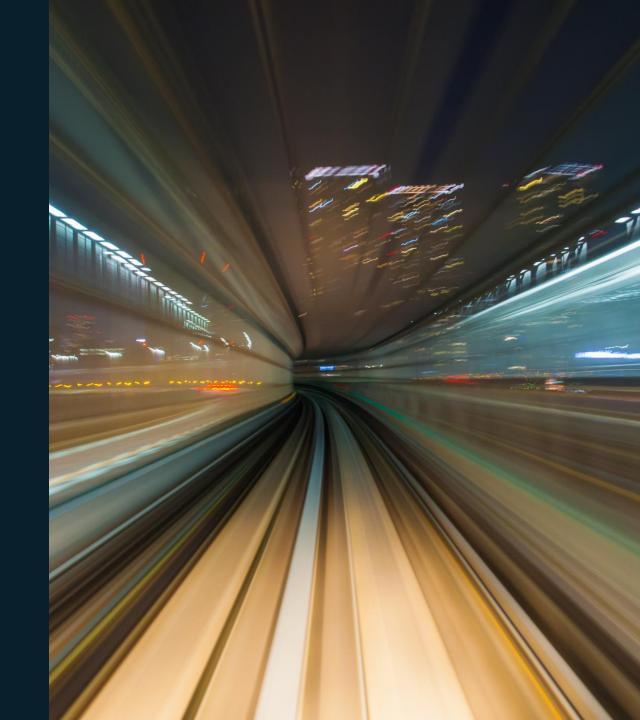
Active Directory Replication Priority Boost

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

C:\WINNT\system32\cmd.exe

C:∖>net send 2500-L' The message was suc	78HXMF1 Hello boss, how are you? Shall we go to t cessfully sent to 2500-L78HXMF1.	he bar?
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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

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New Forest and Domain Functional Levels

New functional level required for new features

There are no plans to backport these features.

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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.

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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! <u>https://aka.ms/ntlm</u>



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

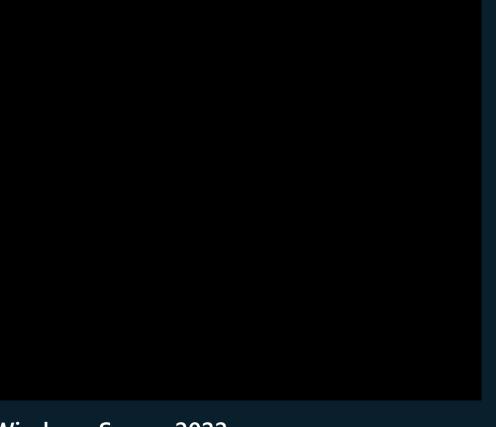
Windows Server vNext **1.86M** IOPs

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

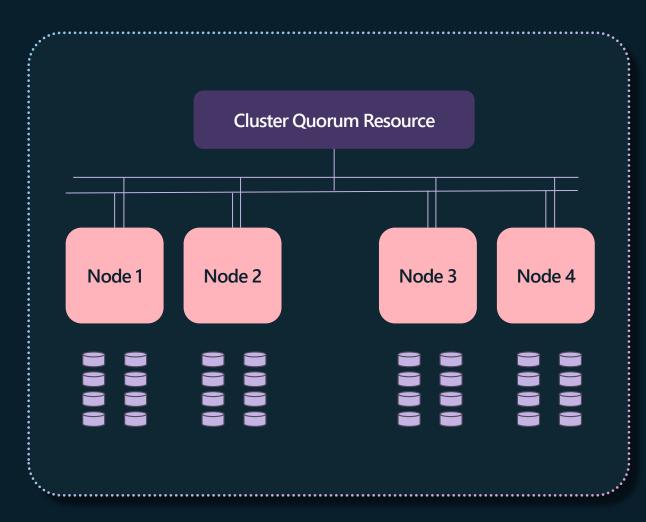
File Servers: Save ~60% of storage VHD/ISO/Backups: Save ~90% of storage

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



Azure Hypervisor System 1,792 Virtual Processors - 29.7 Terabytes of RAM

Hyper-V & AI

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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





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Windows Server 2025 GPU-P Support

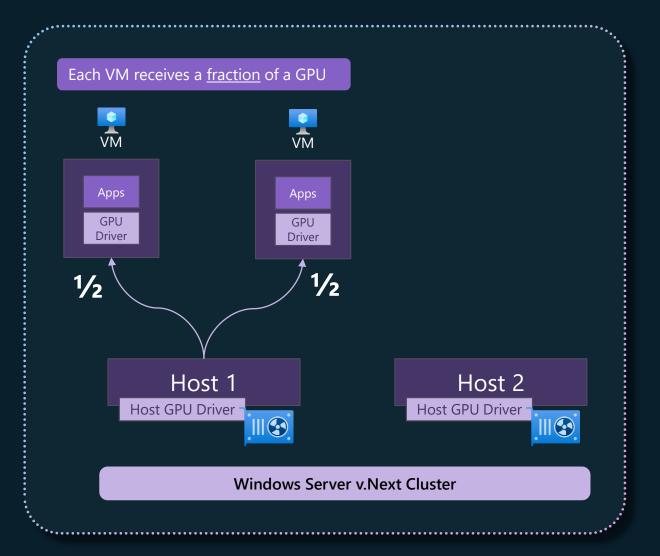
GPU Partitioning (GPU-P)

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



GPU-P – Hardware & Live Migration

GPU-P Server Requirements

- \cdot SR-IOV required
- $\cdot\,$ AMD Milan or later
- Intel Sapphire Rapids or later

GPU Requirements

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

GPU-P

• Both Live Migration & High Availability Supported

Live Migration Scenarios for GPU-P

- $\cdot\,$ 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

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\Xi Virtual switches	E050674C-82DE-4					14.0 00
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Azure Monitor			should have the same size, manufacture	er and model number. Ensure that homoge	neous GPUs have the same number of partition	<u></u>
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Assign partition Cancel

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SDN Infrastructure	✓ NVIDIA A2	4	1/4		14.8 GB			
🗮 Virtual switches	E050674C-82DE-40DA-A5F1-042428C2E869			Ubuntu VM	3.56 GB			
	✓ TK5-3WP03R0915			demo_vm2 ①				
Tools	✓ NVIDIA A2	4	1/4		14.8 GB			
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Windows Server 2025 GPU with DDA HA Support

GPU Pools

Group GPUs for high availability



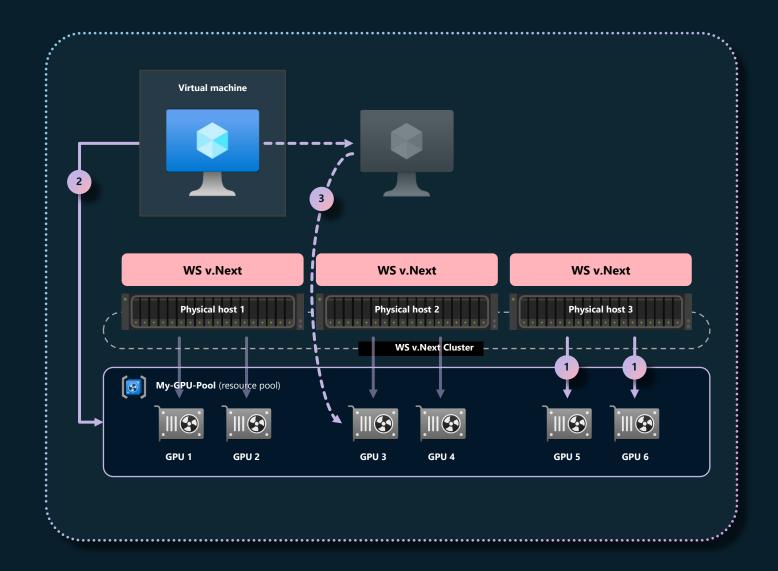
On every node, create PCI Express resource pool with same name and add GPUs to the pool



Assign VM to GPU pool instead of individual GPU



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



Same Windows Server v.Next cluster

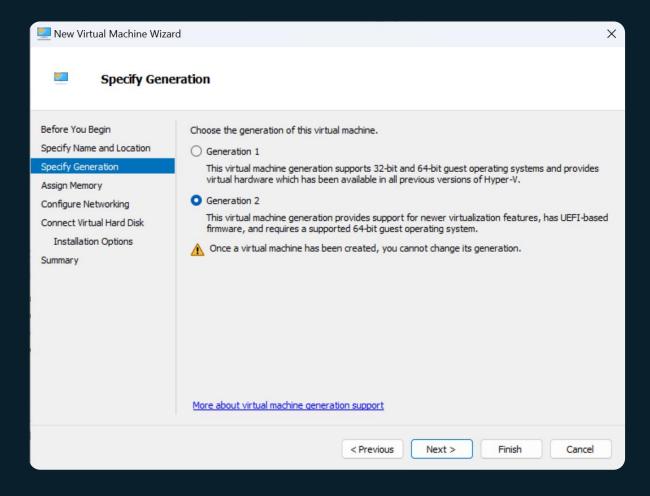
Embrace Generation 2 VMs

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

12.1

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

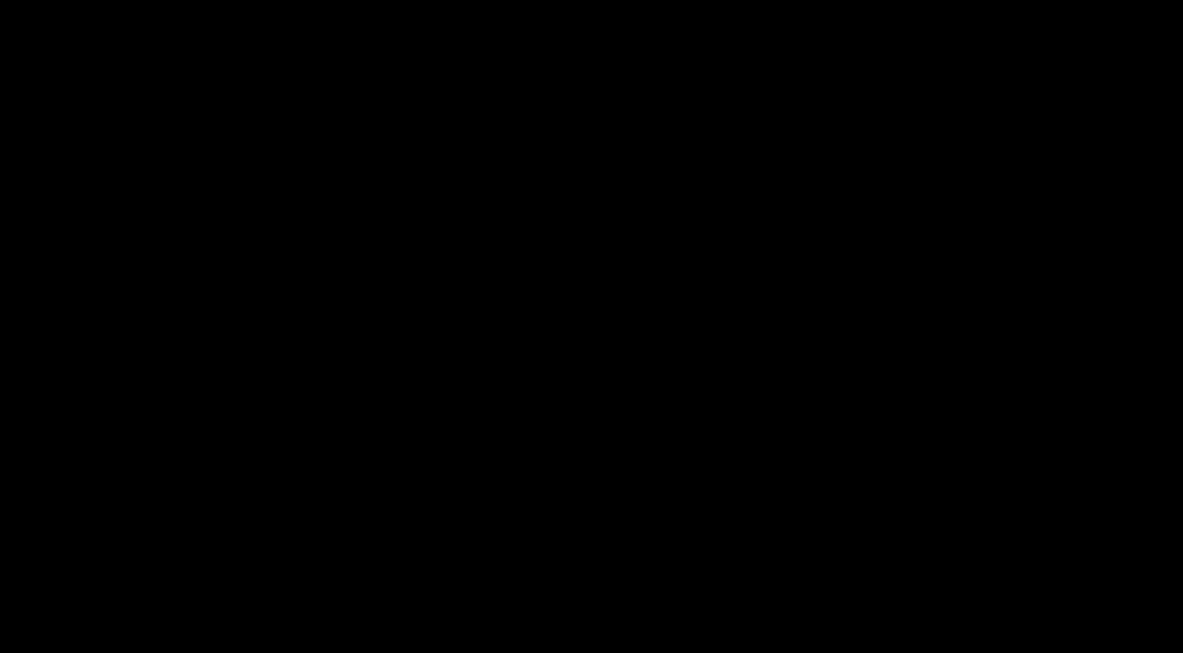


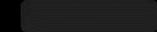
Next Generation File Services 10

"SMB over QUIC is a game changing feature. Our mobile sales team can securely access corporate file servers without a VPN. We <u>need</u> 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



File Action View Help		
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Group Policy: Mandate Minimum...

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Mandate the minimum version of SMB Previous Setting Next Setting	
O Not Configured Comment:	
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O Disabled	<u> </u>
Supported on: At least Windows Server 2022, Windows 11	
Options: Help:	tting State
Select SMB version: This policy controls the minimum version of SMB protocol	Cipher suite order Not configured Disable SMB compression Not configured
Version: SMB 2.0.2 Version: SMB 2.0.2	Request traffic compression for all shares Not configured
SMB 2.0.2 component is still installed and enabled.	Hash Publication for BranchCache Not configured Hash Version support for BranchCache Not configured
SMB 2.1.0 SMB 3.0.0	Honor cipher suite order Not configured
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Select SMB version: Version: SMB 2.0.2 SMB 2.0.2 SMB 2.1.0 SMB 3.0.0 SMB 3.0.2 SMB 3.1.1	2 2	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.	A	Setting Cipher suite order Disable SMB compression Request traffic compression for all shares Hash Publication for BranchCache Hash Version support for BranchCache Honor cipher suite order Mandate the maximum version of SMB Mandate the minimum version of SMB	State Not configured Not configured Not configured Not configured Not configured Not configured Not configured	
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SMB Firewall Rule Hardening

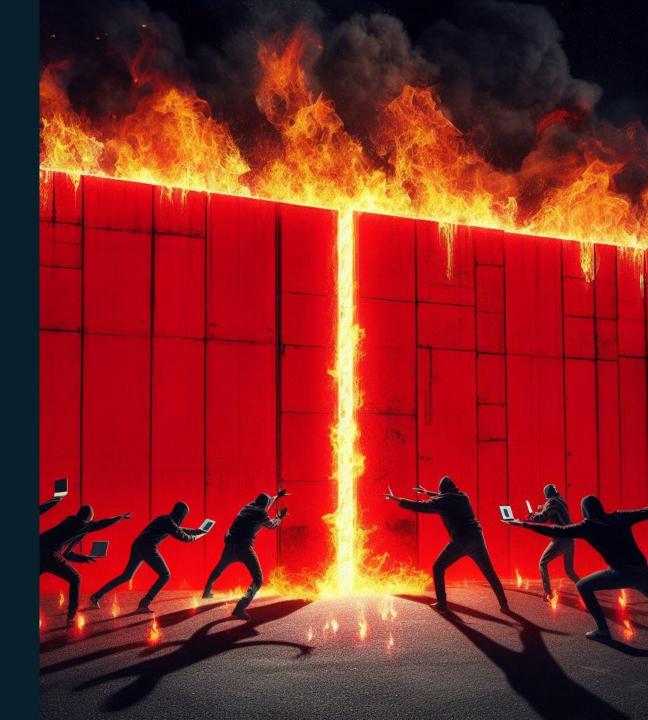
Secure by default

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



Inbound Rules Outbound Rules Connection Security Rules Monitoring Name Group Profile Enabled Inbound Rules Connection Security Rules File and Printer Sharing (Echo Requet - ICMPA-In) File and Printer Sharing Private No File and Printer Sharing (Echo Requet - ICMPA-In) File and Printer Sharing Domain No File and Printer Sharing (Echo Requet - ICMPA-In) File and Printer Sharing Private No File and Printer Sharing (ILMMR-UDP-In) File and Printer Sharing Private No File and Printer Sharing (ILMMR-UDP-In) File and Printer Sharing Private No File and Printer Sharing (ILMMR-UDP-In) File and Printer Sharing Private No File and Printer Sharing (ILMMR-UDP-In) File and Printer Sharing Domain No File and Printer Sharing (ILMMR-UDP-In) File and Printer Sharing Domain No File and Printer Sharing (INB-Datagram-In) File and Printer Sharing Domain No File and Printer Sharing (INB-In) File and Printer Sharing Domain No File and Printer Sharing (Spooler Service - RPC) File and Printer Sharing Domain No File and Printer Sharing (Restrictive) Ch	> 🖄 📰 🗟 🚺 📷 ndows Defender Firewall with	Inbound Rules		_		
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34		File and Printer Sharing (Restrictive) (Spooler Service - RPC)	File and Printer Sharing (Restrictive)	Private	No	
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Q Search

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Easiest Upgrades EVER!!

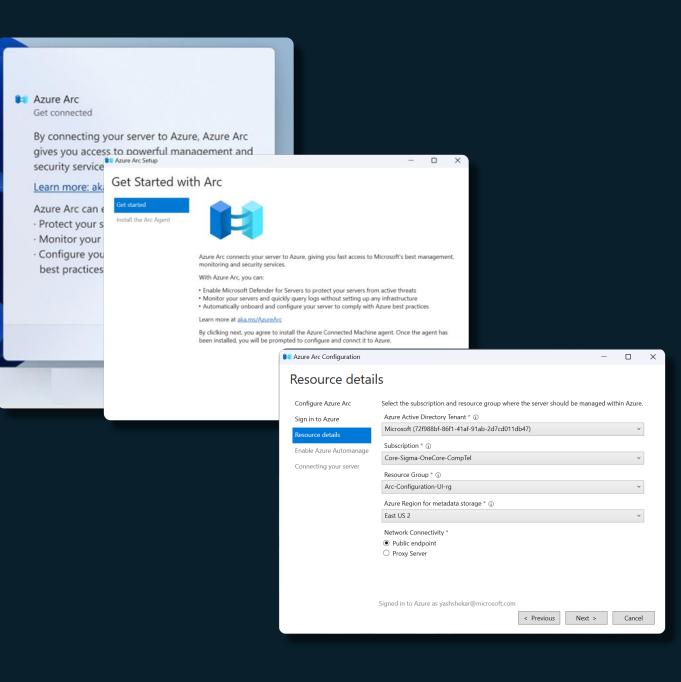
- · Upgrade from Windows Server 2022 to 2025 with Windows Update
 - Same great experience you are used to on Windows 11
- Makes Upgrading to Windows Server 2025 simple!

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€ Home	Windows Update *Some settings are managed by your organization (View policies)		€ Home	Windows Update "Some settings are managed by your organization (View policies)	
Update & Security	Updates available Last checked: Today, 4:43 PM	Looking for info on the latest updates? Learn more	Update & Security	Restart required This update is ready to install! We need your help deciding when to restart so we can finish up.	Looking for info on the latest updates? Learn more
${\mathcal C}$ Windows Update	Security Intelligence Update for Microsoft Defender Antivirus - KB2267602 (Version 1.391.4159.0) Status: Installing - 0%	Related links	C Windows Update	UUP8VT7 Optional update - build 10.3.15003.0.3 Status: Pending restart	Related links Check Storage
凹 Delivery Optimization	UUPBVT7 Optional update - build 10.3.15003.0.3		변 Delivery Optimization	Restart now Schedule the restart	
Windows Security	The next version of Windows is here with new features and security improvements. Select "Downloa and install", and the update will begin after other updates in your queue have completed. Your devic may need to restart.		Windows Security	*We'll automatically download and install updates, except on metered connections (where charges may apply). In that case, we'll automatically download only those updates required to keep Windows running smoothly.	OS build info
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요 Recovery ② Activation	"We'll automatically download and install updates, except on metered connections (where charges n apply). In that case, we'll automatically download only those updates required to keep Windows running smoothly.	may	Activation	Pause updates for 7 days Visit Advanced options to change the pause period	
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	interface -	lows Server 2022 Datacenter operating system and its user are protected by trademark and other pending or existing a) property rights in the United States and other (regions.		update With new fea little longer t	stall the newest Windows feature tures and apps, this one could take a han other updates. Not now? Select
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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
- \cdot 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

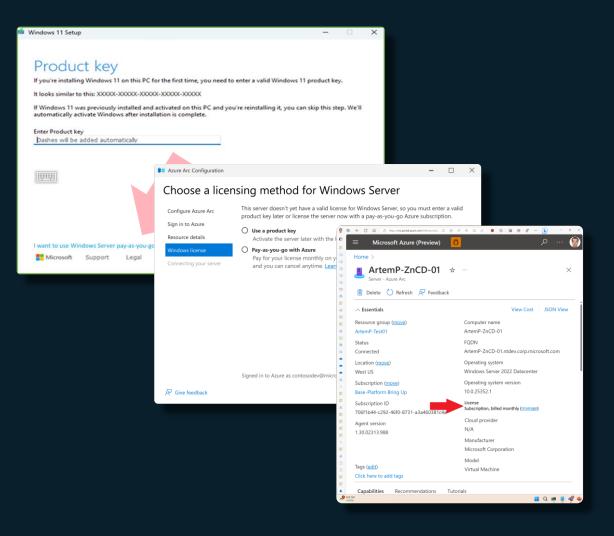
- Simple in-box experience to license Windows Server
- Consistent acquisition experience for Windows Server: on-prem, Azure, or anywhere

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 Hoster 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: <u>Windows Server 2022 Microsoft Lifecycle | Microsoft Learn</u>
 - 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

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	Windows Server Insiders	680 Discussions 🗢 Follow
	Pinned Posts	^
	Subject	Post time
	Announcing Windows Server Preview Build 25987 Stacer, Clements.(@Stacer,CLEM)	Nov 01 2023
	Announcing Windows Server Annual Channel for Containers Preview Build 25987 Sacey Clements (@StaceyCL.JM)	Nov 01 2023
	✓ Start a New Discussion Q Search this space Latest Blog	Posts
	Feed () T1 Newest Repty V V Advanced Filters	
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We would love your feedback on Windows Server vNext !!!



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)

