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Microsoft

#POWERCON2024

What's new in Windows Server 2025

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Agenda

- Installation
- Hotpatching
- Storage
- Hyper-V
- Networking
- Containers
- File Services
- Modern Server Experience

Installation

Hardware requirements

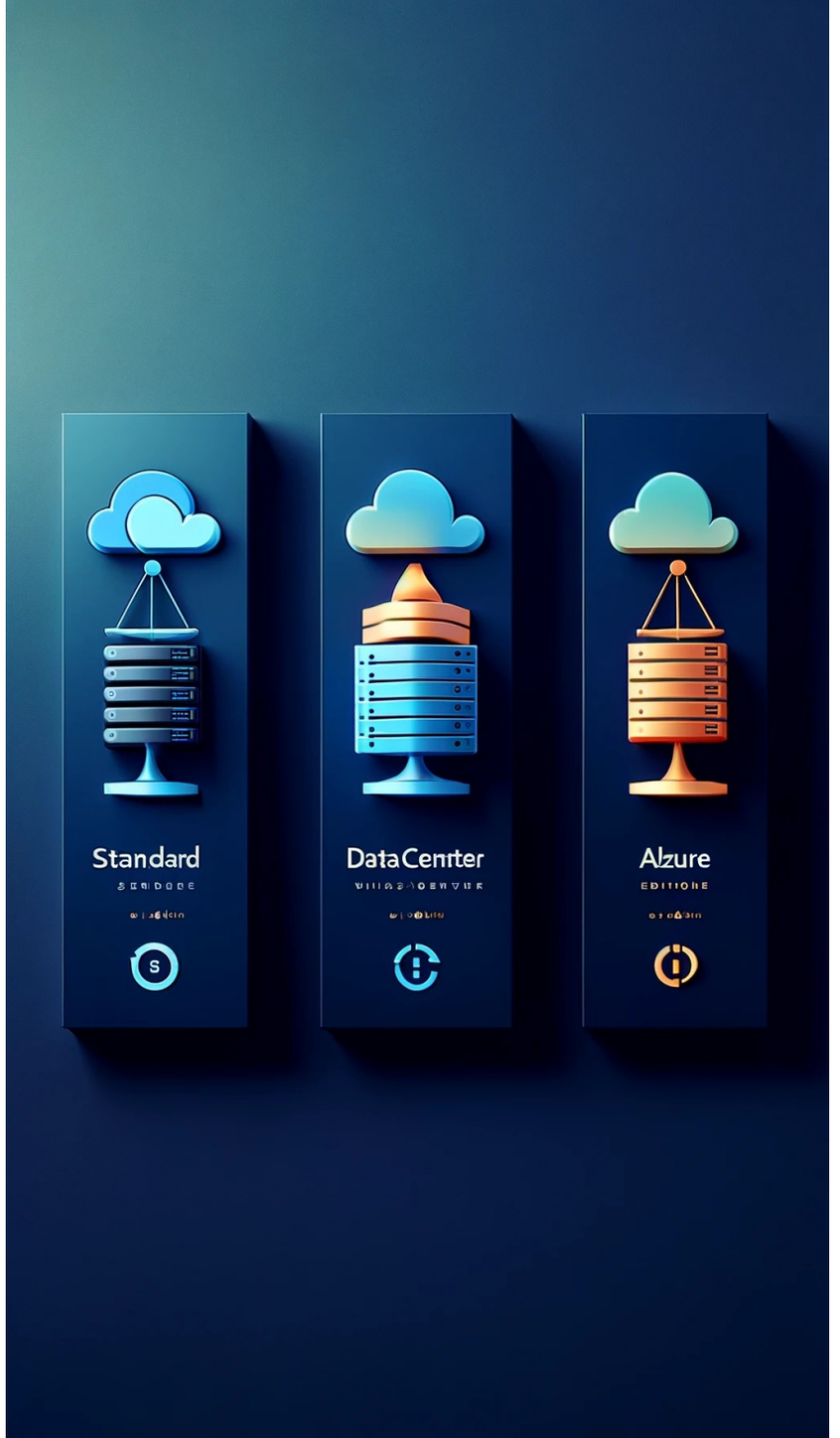
Requirements	Description
Processor	1.4 GHz 64-bit processor Compatible with x64 instruction set Supports NX and DEP, CMPXCHG16b, LAHF/SAHF, and PrefetchW
Memory/RAM	512 MB (2 GB for Server with Desktop Experience installation option) ECC (Error Correcting Code) type or similar technology, for physical host deployments
Disk Space	Minimum 32 GB (Windows Server 2025 using the Server Core installation option)
Network Requirements	An Ethernet adapter capable of at least 1 gigabit per second throughput Compliant with the PCI Express architecture specification
Additional	UEFI 2.3.1c-based system and firmware that supports secure boot Trusted Platform Module Graphics device and monitor capable of Super VGA (1024 x 768) or higher-resolution

Installation options and versions

- Server Core: This is the recommended installation option. It's a smaller installation that includes the core components of Windows Server and supports all server roles but does not include a local graphical user interface (GUI). It is used for deployments that are remotely managed with Windows Admin Center, PowerShell or other server management tools.

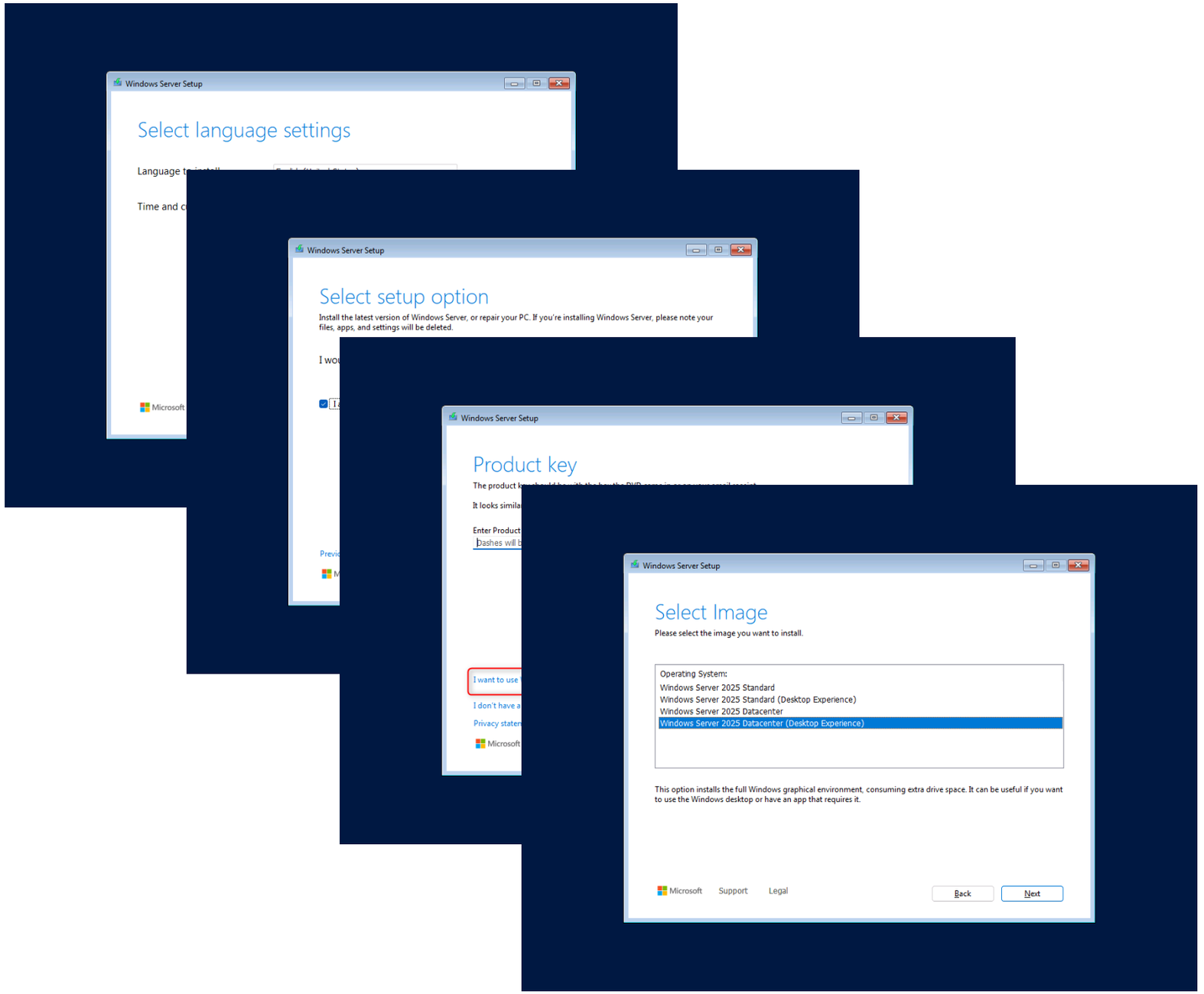
- Server with Desktop Experience: This is the complete installation and includes a full GUI. This option has a larger footprint than server core and is most preferred by organizations.

- Same versions as Windows Server 2022: Windows Server Standard, Windows Server Datacenter, Windows Server Datacenter: Azure Edition



Installation

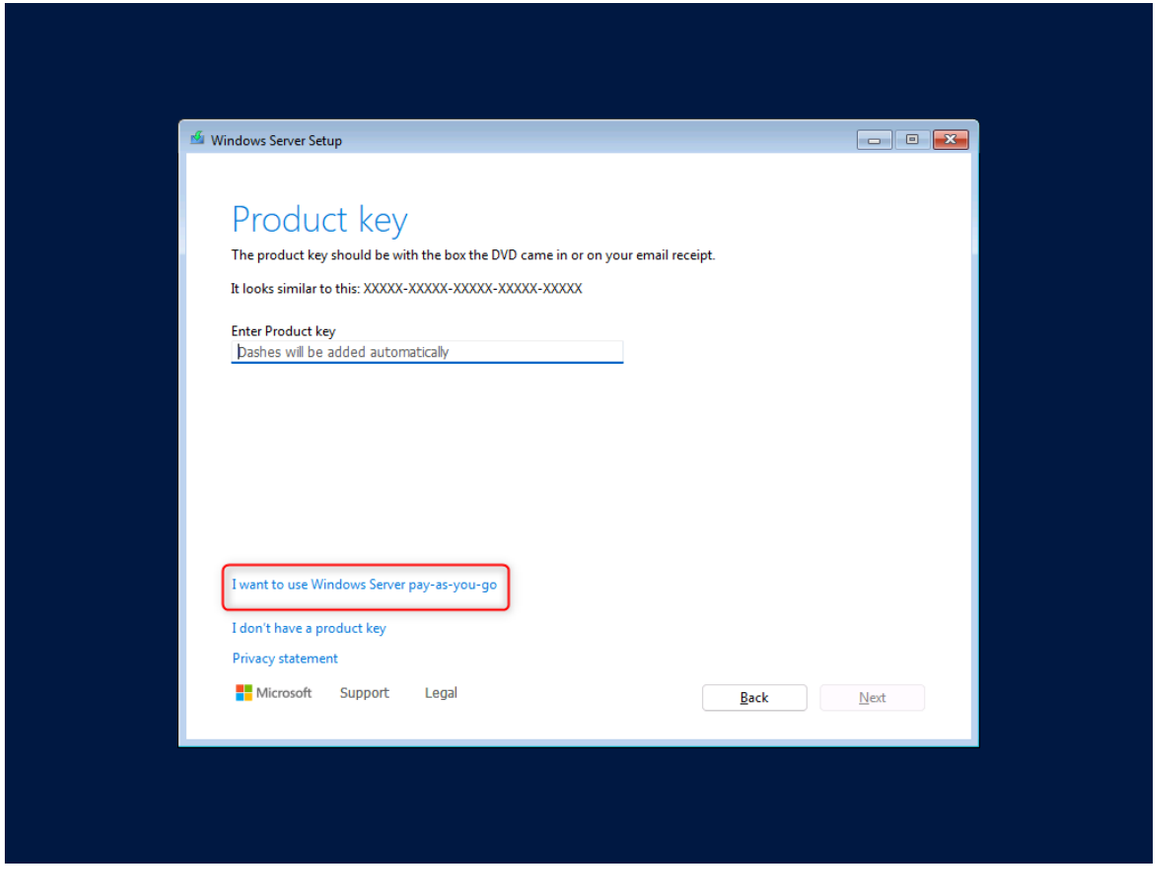
New installation wizard

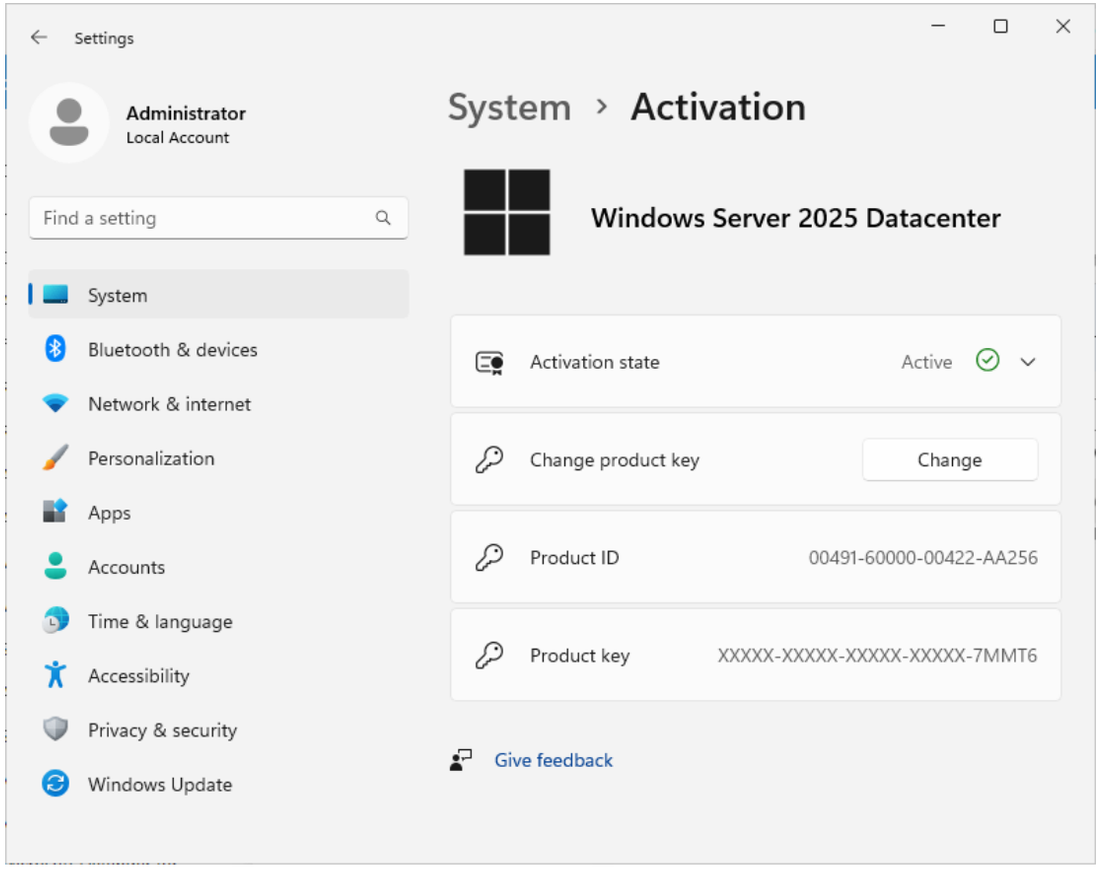


Subscription based purchasing model

Simplify purchasing Windows Server:

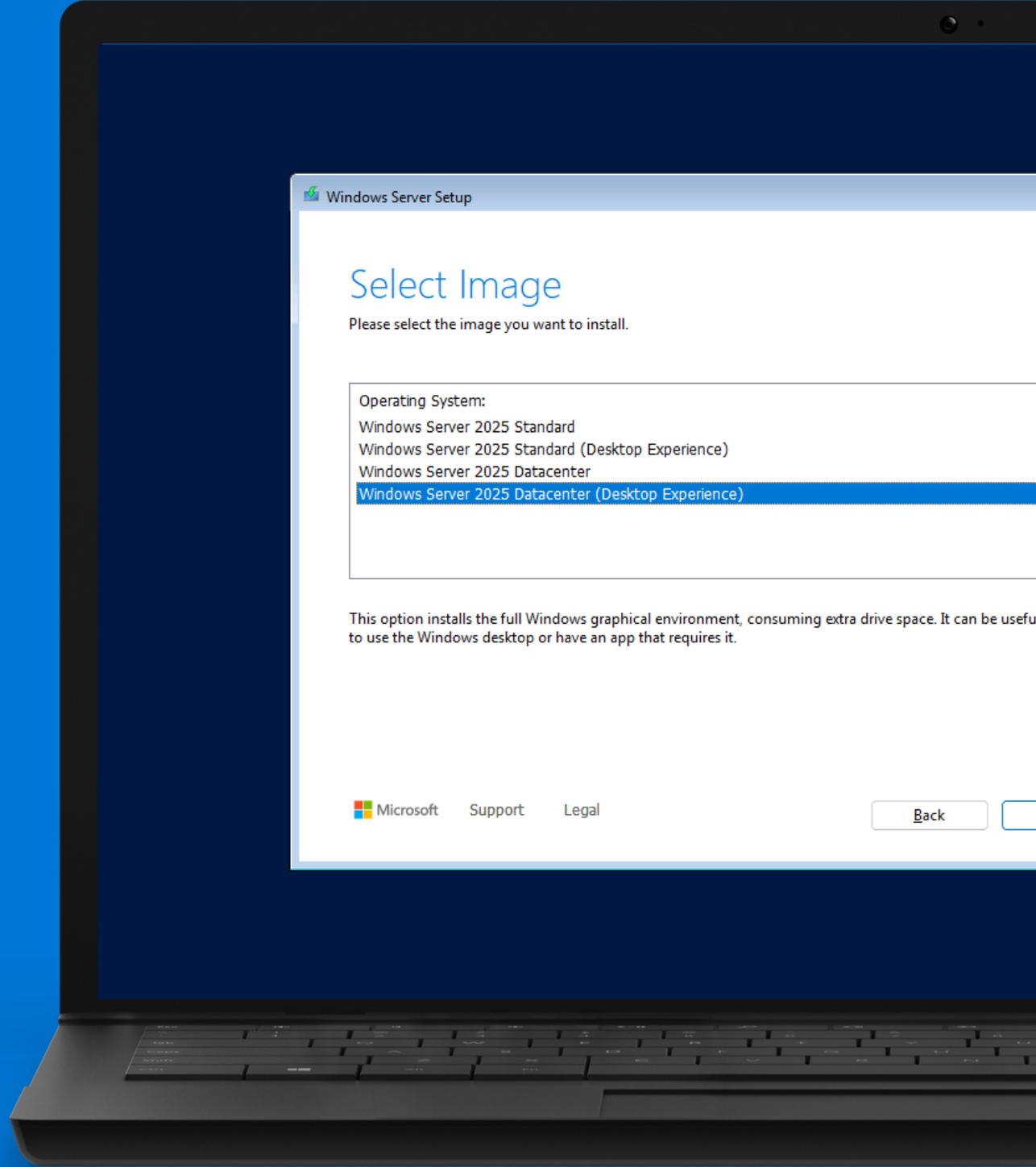
- Simple experience to license Windows Server
- Billed through Azure Commerce (like Azure Stack HCI or SQL Server 2022)





DEMO

Installation



Hotpatching

Hotpatching

Install security patches without a reboot

Accomplished by modifying in-memory code without restarting the process

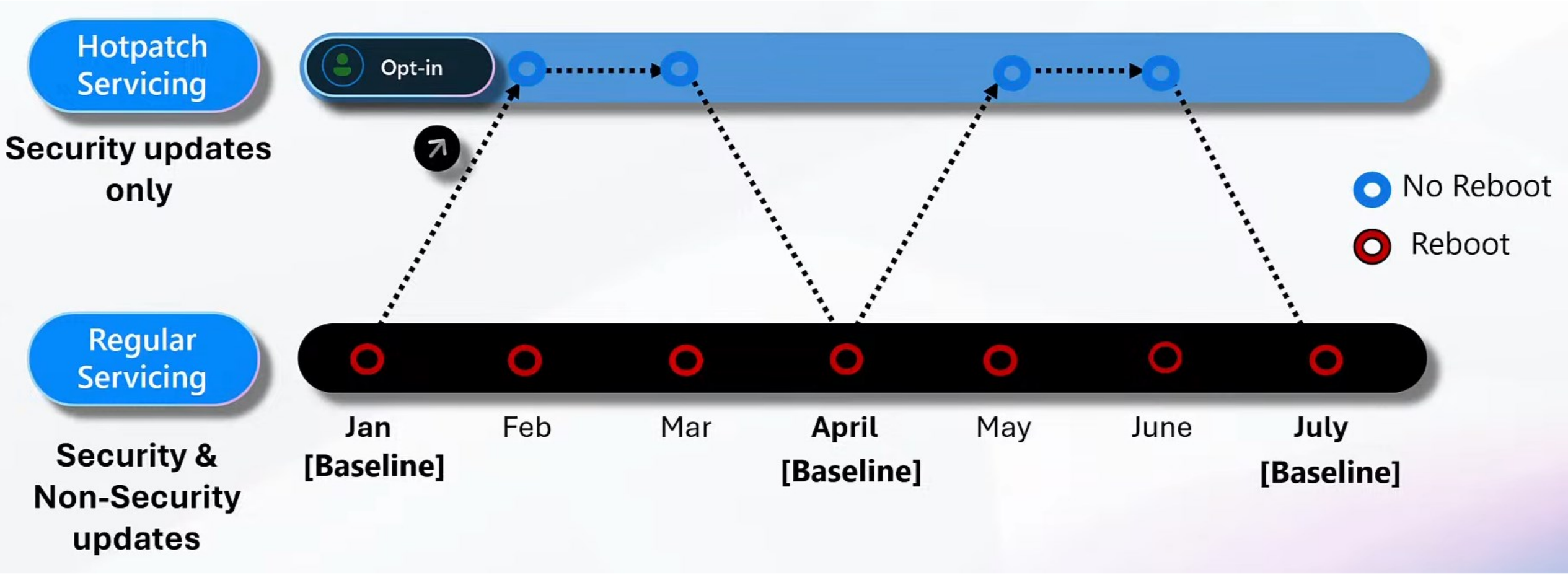
Accelerate Security

Improve Productivity

Reduce Costs

[Hotpatch per Windows Server 2022 Azure Edition con Desktop Experience - ICT Power]

Quarterly Release Cycle



Active Directory improvements

Security enhancements

LDAP support for TLS 1.3

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

LDAP encryption by default

All LDAP client communication utilizes LDAP sealing by default

Kerberos AES SHA256 and SHA384

The Kerberos protocol implementation is updated to support stronger encryption and signing mechanisms

Kerberos PKINIT support for cryptographic agility

Implementation is updated to supporting more algorithms

Improved security for confidential attributes

LDAP add, search, and modify operations involving confidential attributes when the connection is encrypted

Legacy SAM RPC password change behavior

Kerberos is the preferred way to change domain user passwords

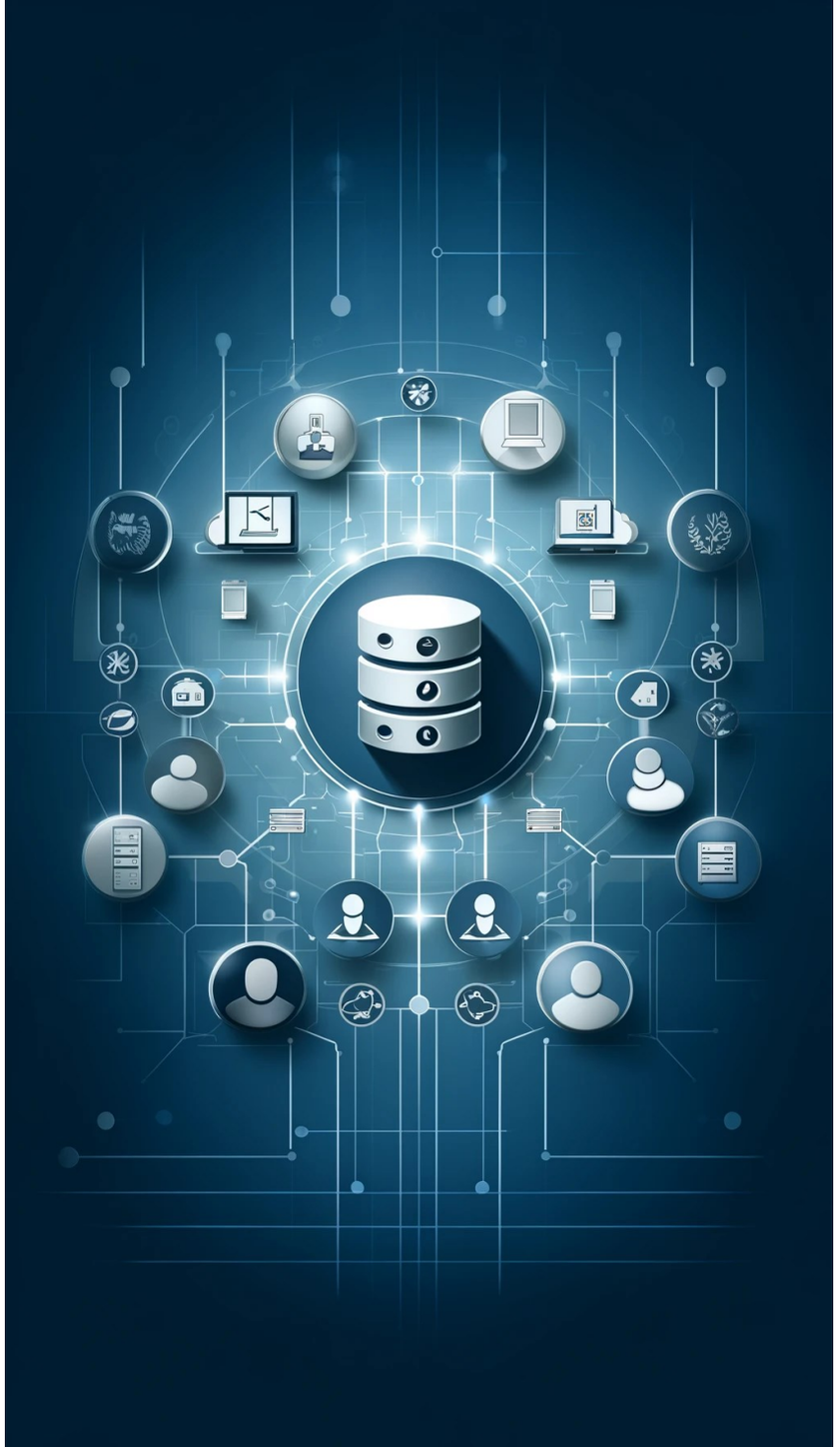
32k database page size optional feature

AD uses an Extensible Storage Engine (ESE) database since its introduction in Windows 2000 that uses an 8k database page size. The 8k architectural design decision resulted in limitations throughout AD

Moving to a 32k database page format offers a huge improvement in areas affected by legacy restrictions, including multi-valued attributes are now able to hold up to ~3,200 values

New DCs can be installed with a 32k page database and runs in an "8k page mode" for compatibility with previous versions. An upgraded DC continues to use its current database format and 8k pages.

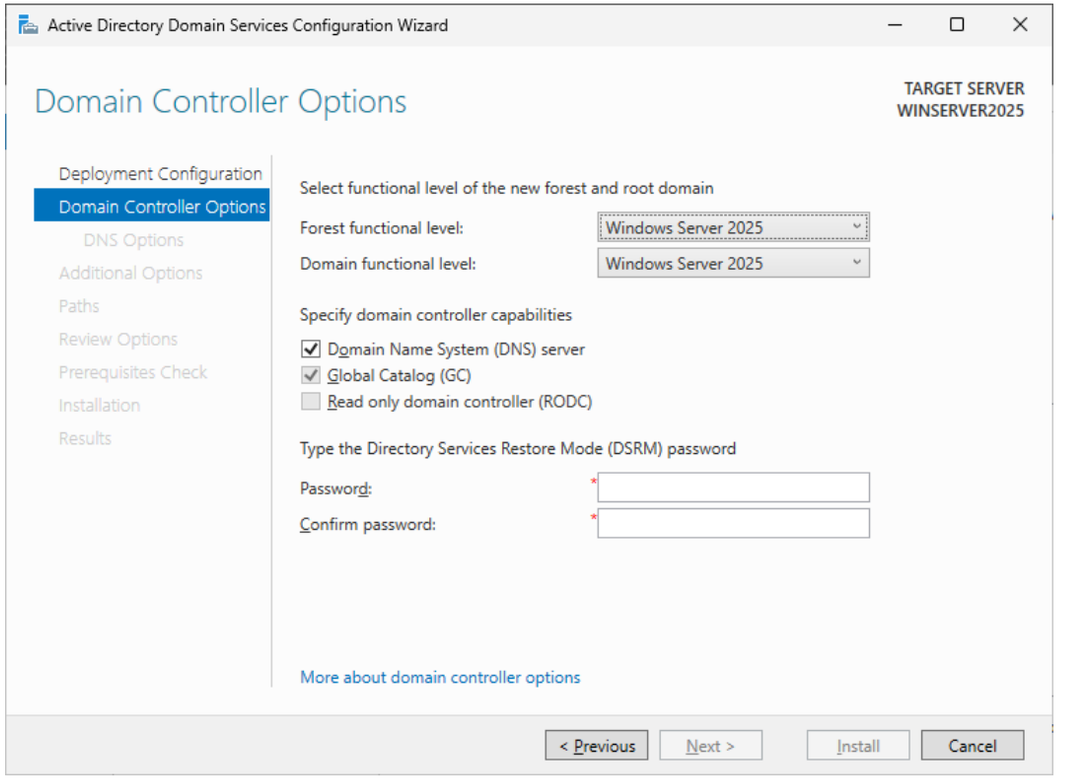
Moving to 32k database pages is done on a forest-wide basis and requires that all DCs in the forest have a 32k page capable database.

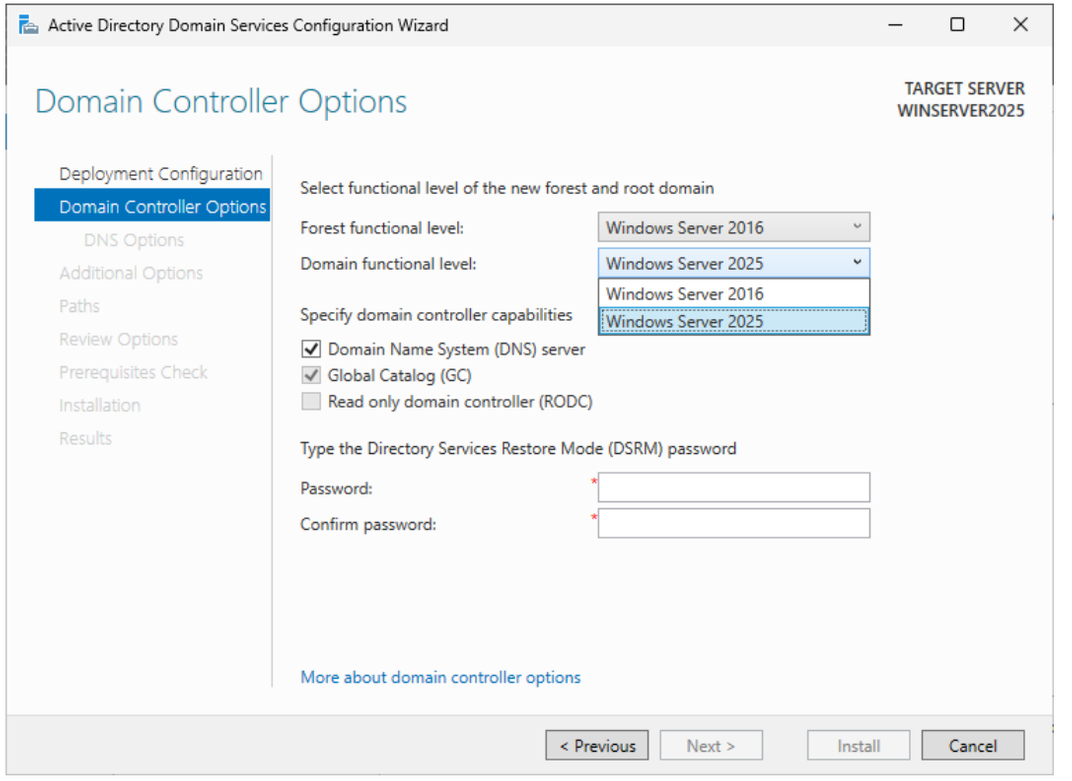


Forest and Domain Functional Levels

The new functional level is used for general supportability and is required for the new 32K database page size feature.

Microsoft has no plans to retrofit functional levels for Windows Server 2019 and Windows Server 2022.





[Livelli funzionali di Active Directory: a cosa servono ed implicazioni sulla sicurezza - ICT Power]

Secure Kerberos authentication

Kerberos for more scenarios:

- **Local KDC –** Kerberos Key Distribution Service now begin built-into Windows, not just Domain Controllers.
  A local KDC for Kerberos adds Kerberos support to local accounts.

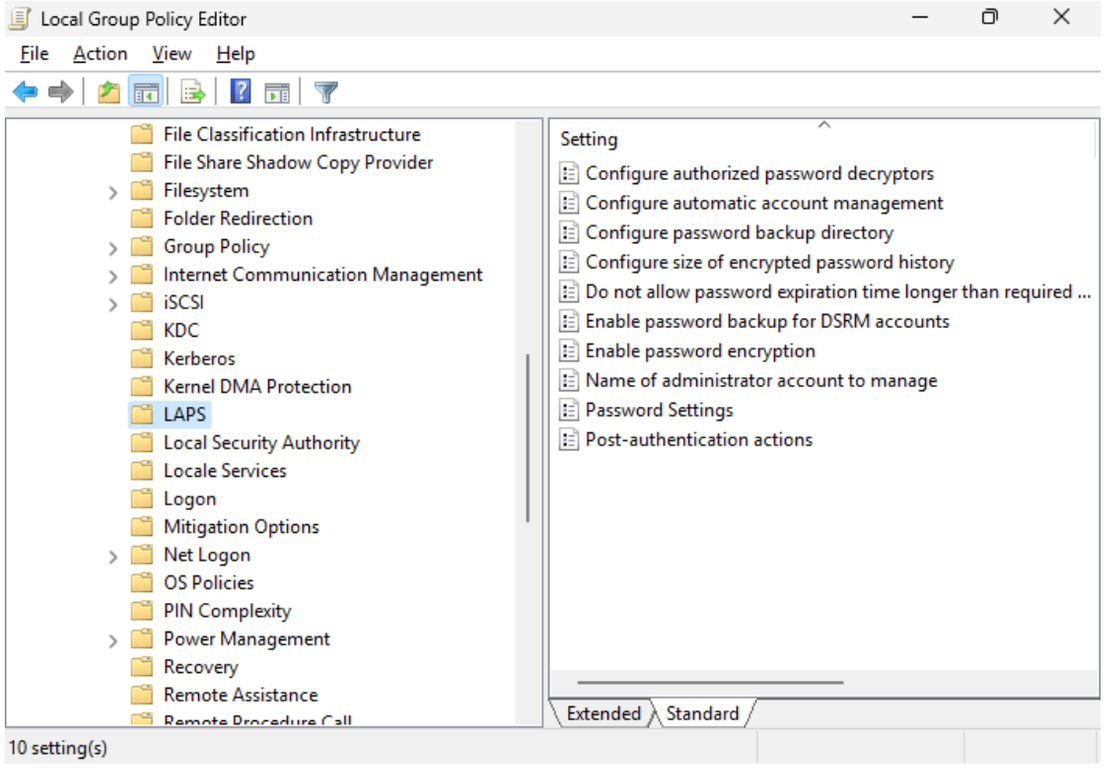
- **IAKerb** - a public extension to the industry standard Kerberos protocol that allows a client without line-of-sight to a Domain Controller to authenticate through a server that does have line-of-sight.

[The evolution of Windows authentication | Windows IT Pro Blog]

Windows Local Administrator Password Solution (LAPS)

Several features are introduced to Microsoft LAPS that bring the following improvements:

- New automatic account management feature
- New image rollback detection feature
- New passphrase feature
- Improved readability password dictionary

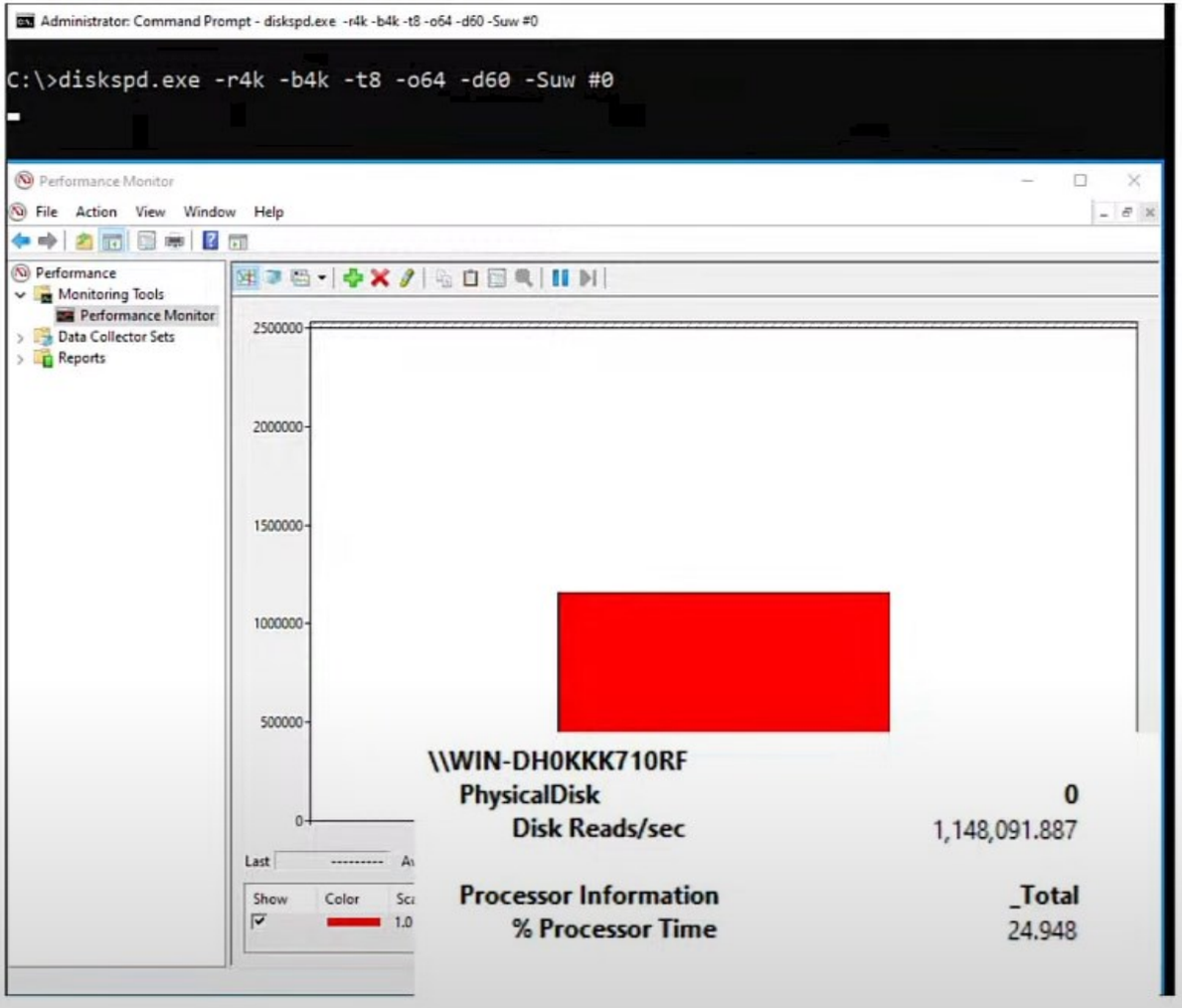


Note: Windows LAPS doesn't allow for customization of the built-in word lists nor the use of customer-configured word lists.

[#POWERCON2023 – evento online del 14 luglio – Ermanno Goletto e Roberto Massa – Implementare e gestire Windows LAPS - ICT Power]

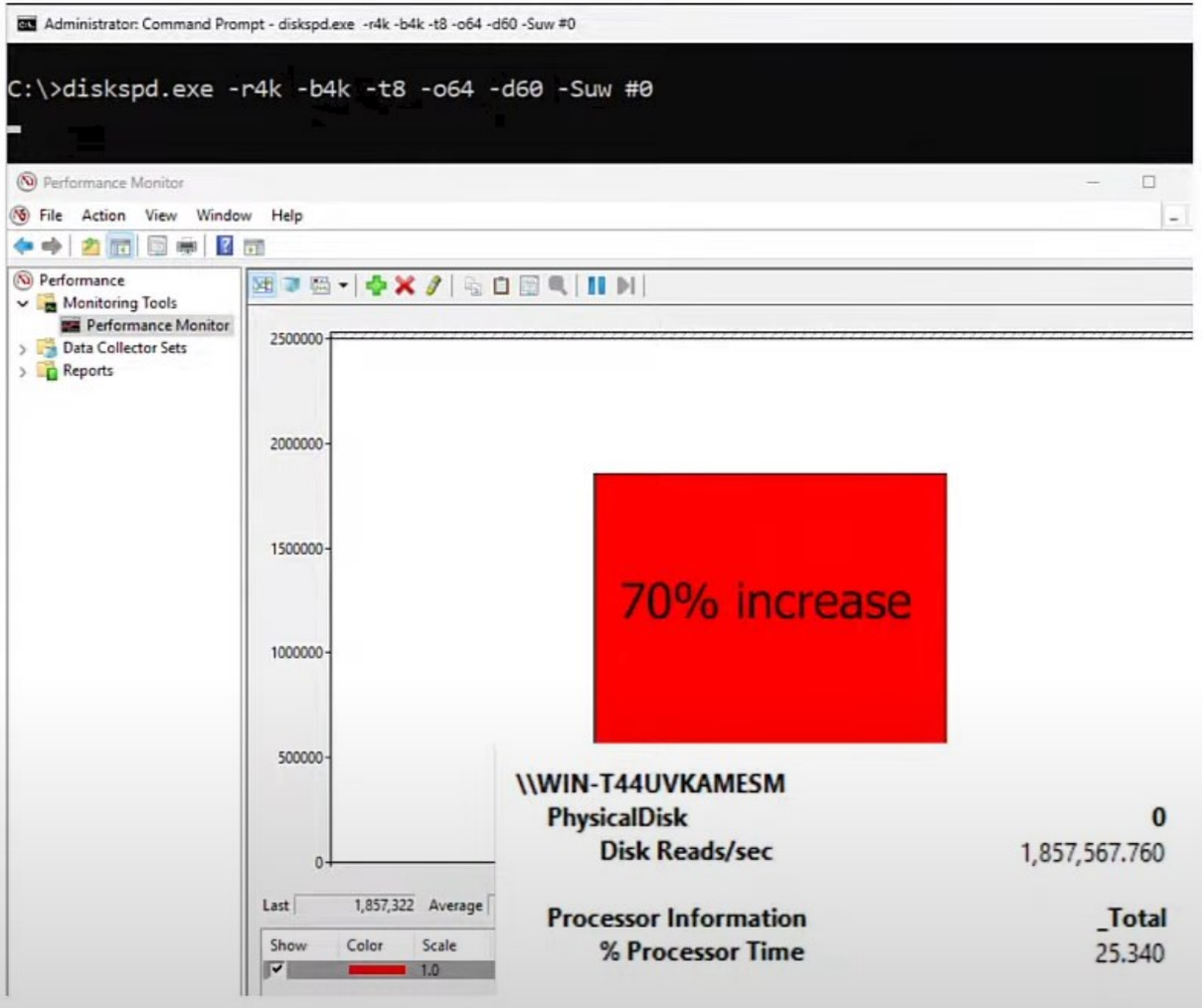
Storage

NVMe improvements



Windows Server 2022

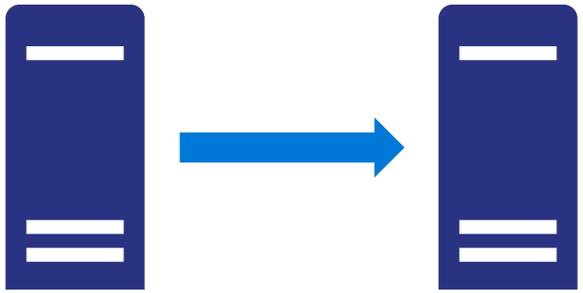
1.1M IOPs



Windows Server 2025

1.86M IOPs

Software-defined Storage enhancements
from Azure Stack HCI



Storage Replica

Performance enhancements with enhanced logs

SR compression available in all Windows Server editions

ReFS

ReFS optmized Deduplication and Compression

Works great with VMs

~60% of saved space for File Server

~90% of saved space for VHD/ISO/backups

Storage Spaces

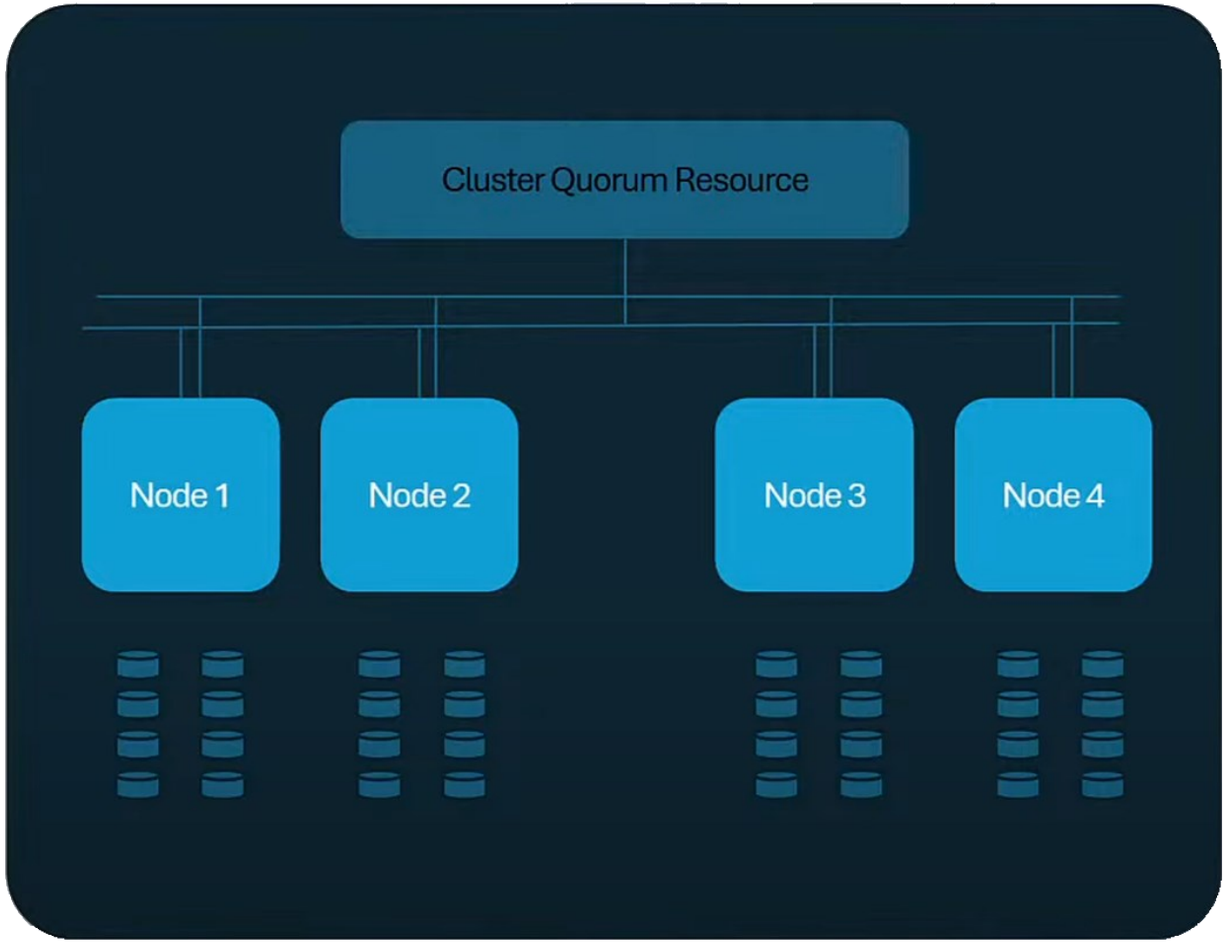
Thinly provisioned storage spaces

Stretch Cluster support

Failover Clustering

Failover Clustering

- Cluster-aware Updating
  - Raliability and performance improvements
  - Upgrade form WS 2022 to WS 2025 with no downtime
- Workgroup cluster
  - Certificate-based VM Live Migration
- GPU-P VM Live Migration on a Failover Cluster
- Storage Spaces Direct (S2D) stretch clusters between two sites
  - Improved Storage Replica perfomance



Hyper-V

Hyper-V

Robust hardware-based virtualization and isolation

Hyper-V is the foundation of:

- Azure
- Azure Stack family
- Windows Server / Windows Client
- Containers with Hyper-V isolation
- Platform Security

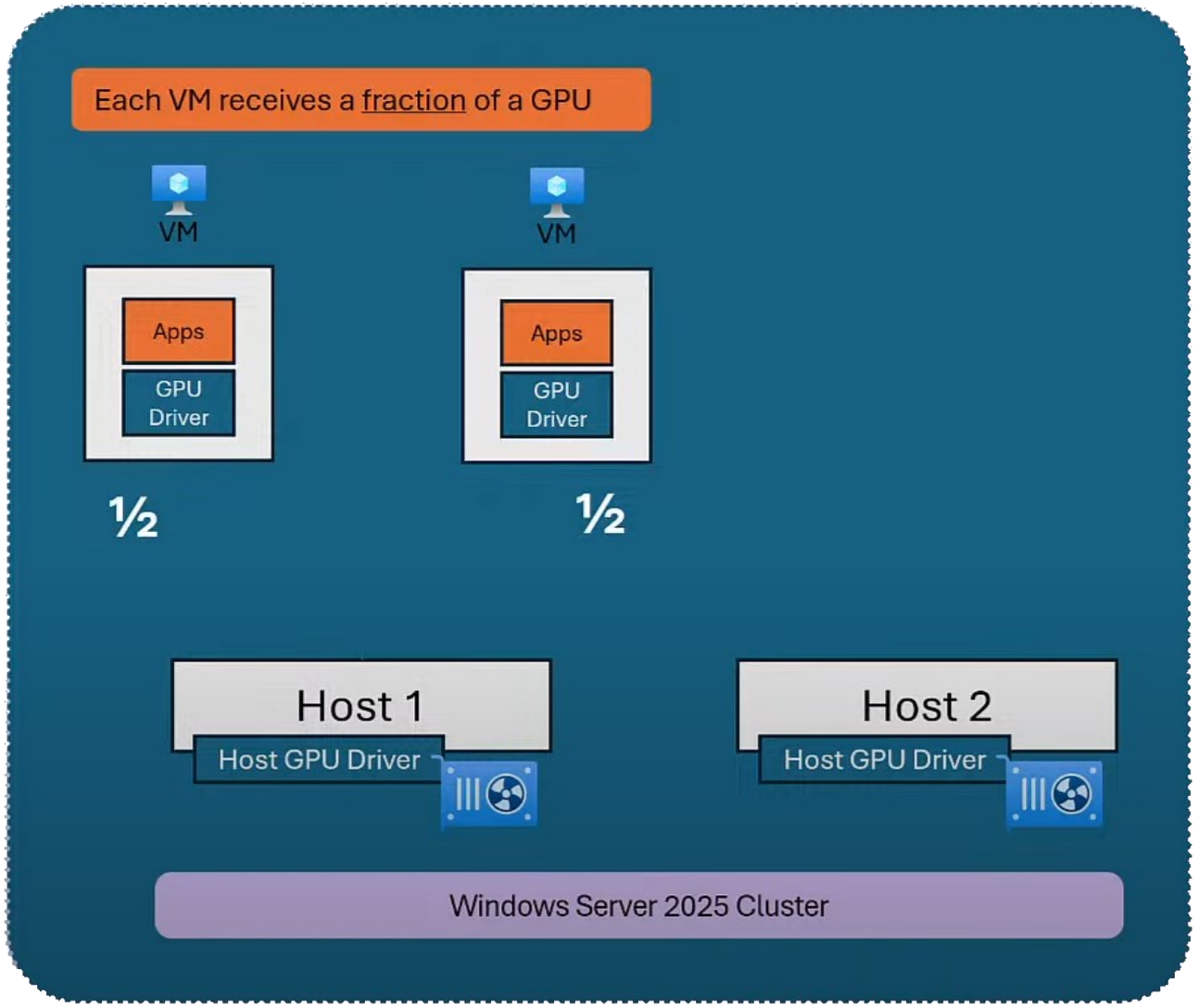
[Hyper-V - ICT Power]

GPU Partitioning (GPU-P)

Share a GPU across multiple VMs

- Create GPU patritions
- Assign each partition to a VM that supports a set of users (multi-session)
- Management over PS and WAC

Support for Live Migration and Failover Clustering



Partition and share GPUs with virtual machines on Hyper-V | Microsoft Learn

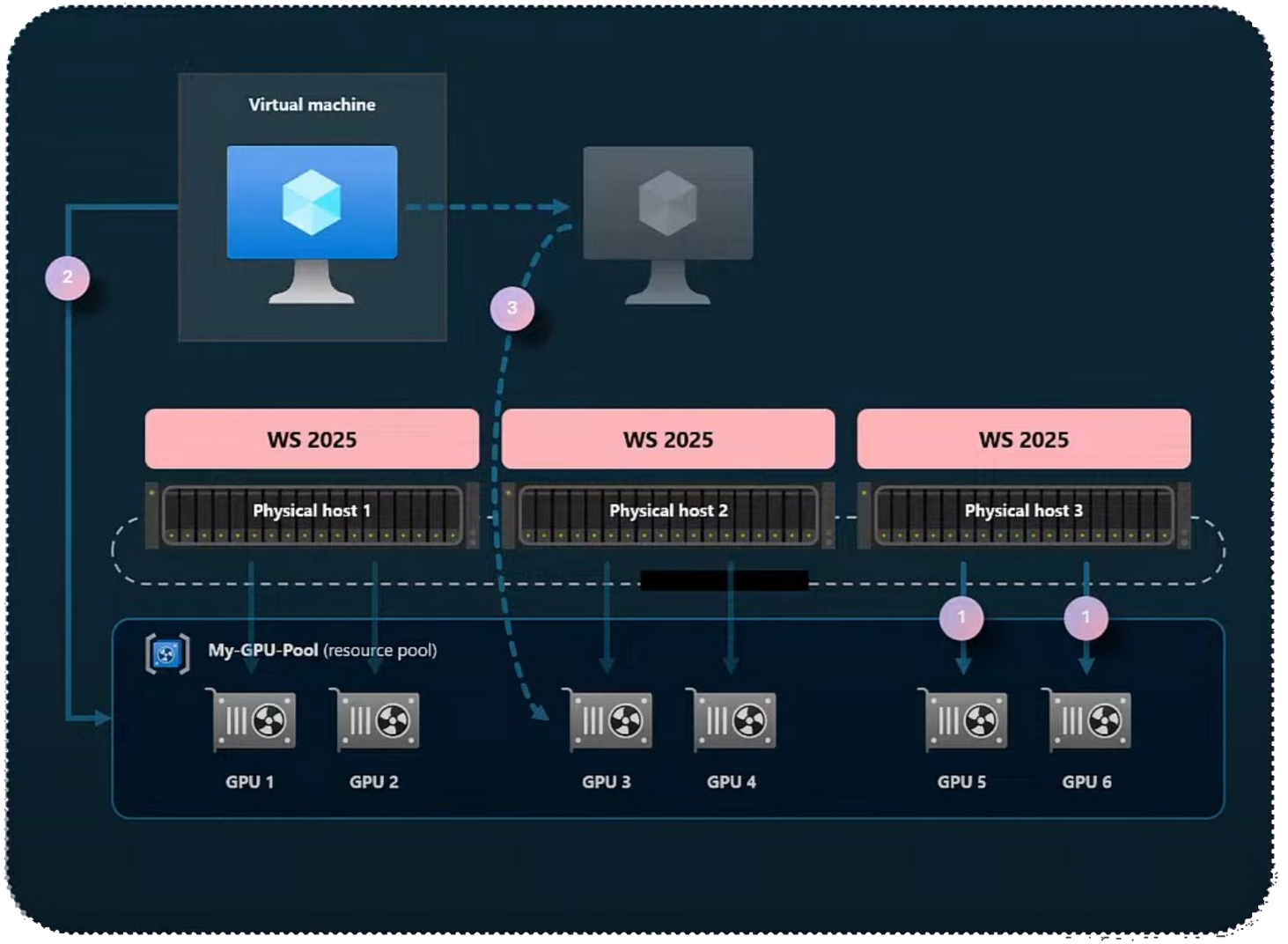
GPU Pools

GPU acceleration is provided via Discrete Device Assignment (DDA), which allows you to dedicate one or more physical GPUs to a VM.

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

2. Assing 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



Use GPUs with clustered VMs on Hyper-V | Microsoft Learn

Dynamic Processor Compatibility

Improved in Windows Server 2025

Live migrating between servers with different processor capabilities

- Improved performance
- Increased granularity on processor compatibility
- Enhanced dynamic capabilities on SLAT capable processors

No need to order last-gen hardware for compatibility

< -------- Same Windows Server 2025 cluster -------- >

Processor compatibility mode in Hyper-V | Microsoft Learn

Increased Scalability

Maximums for virtual machines

- 240 TB RAM for generation 2 VM
- 1 TB RAM for generation 1 VM
- 2048 vCPU for generation 2 VM
- 64 vCPU for generation 1 VM

Maximums for Hyper-V hosts

- 4 PB for hosts that support 5-level paging
- 256 TB for hosts that support 4-level paging
- 2048 logical processors per host

[Plan for Hyper-V scalability in Windows Server]

Networking

Networking

Network ATC

Adaptive Traffic Control is a feature designed to simplify and streamline the deployment and management of host networking

Reduce deployment time, complexity and errors

SDN Multisite

Native L2 & L3 connectivity for workloads in multiple locations

This update simplifies unified network policy management, making it easier to handle complex network setups in a hybrid environment

Network HUD

Head-Up Display enhances the visibility and management of network operations

It provides real-time analysis of network issues and offers prescriptive alerts or automatic remediation when possible.

Increase stability and optimize network performance for workloads

[Windows Server hybrid and cloud: Software Defined Networking]

Containers

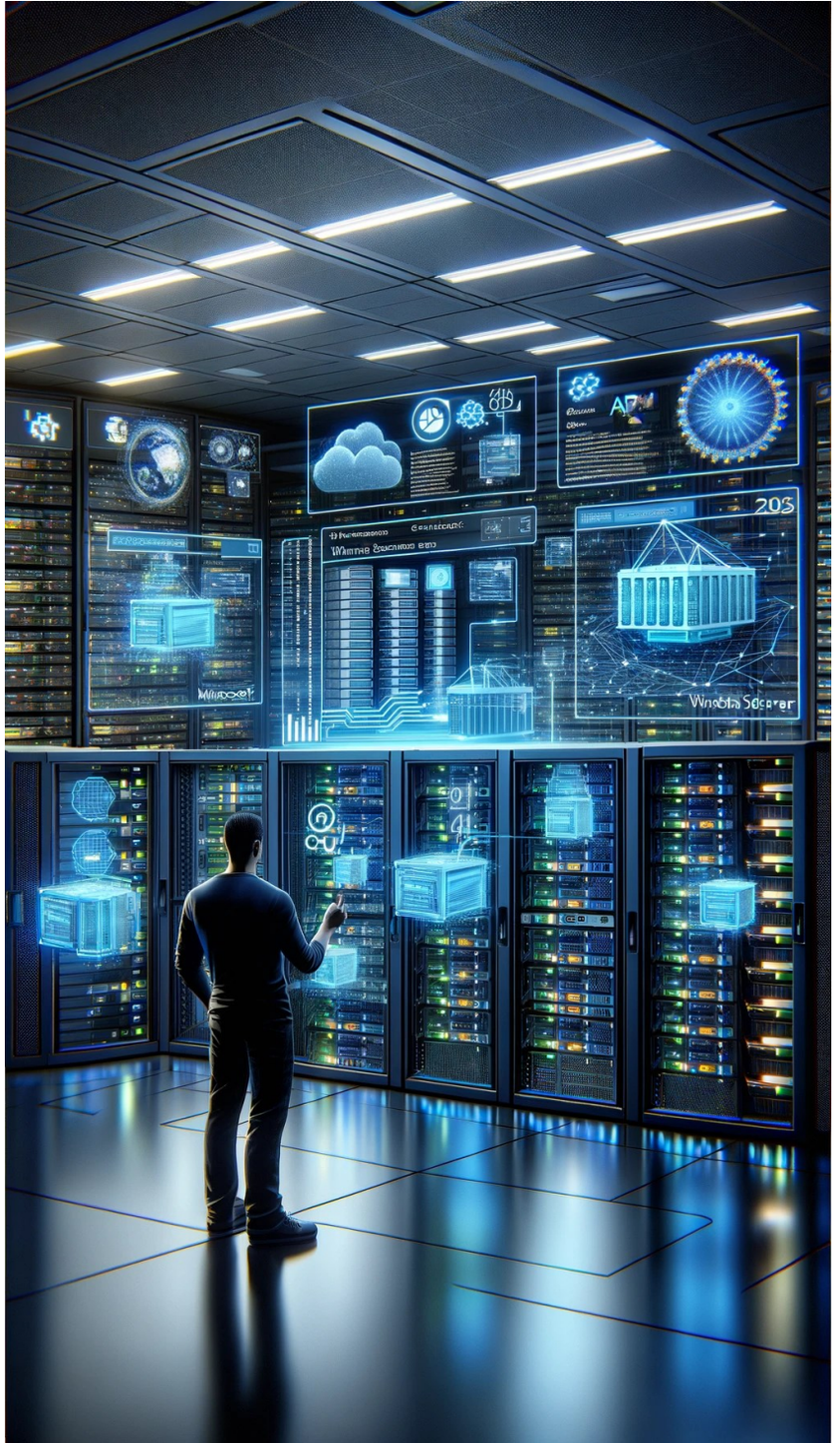
Container flexibility

Windows Server 2025 enhances container support with better application **compatibility** and **performance**.

This includes more **flexibility** with **GPU configurations** and support for AI workloads, making it ideal for handling large-scale data processing tasks.

Portability is a feature of Windows Server Annual Channel for container hosts that allows users to move container images, and their associated data, between different hosts or environments without requiring any modifications.

[Windows Server, versione 23H2 – La versione Annual Channel di Windows Server]



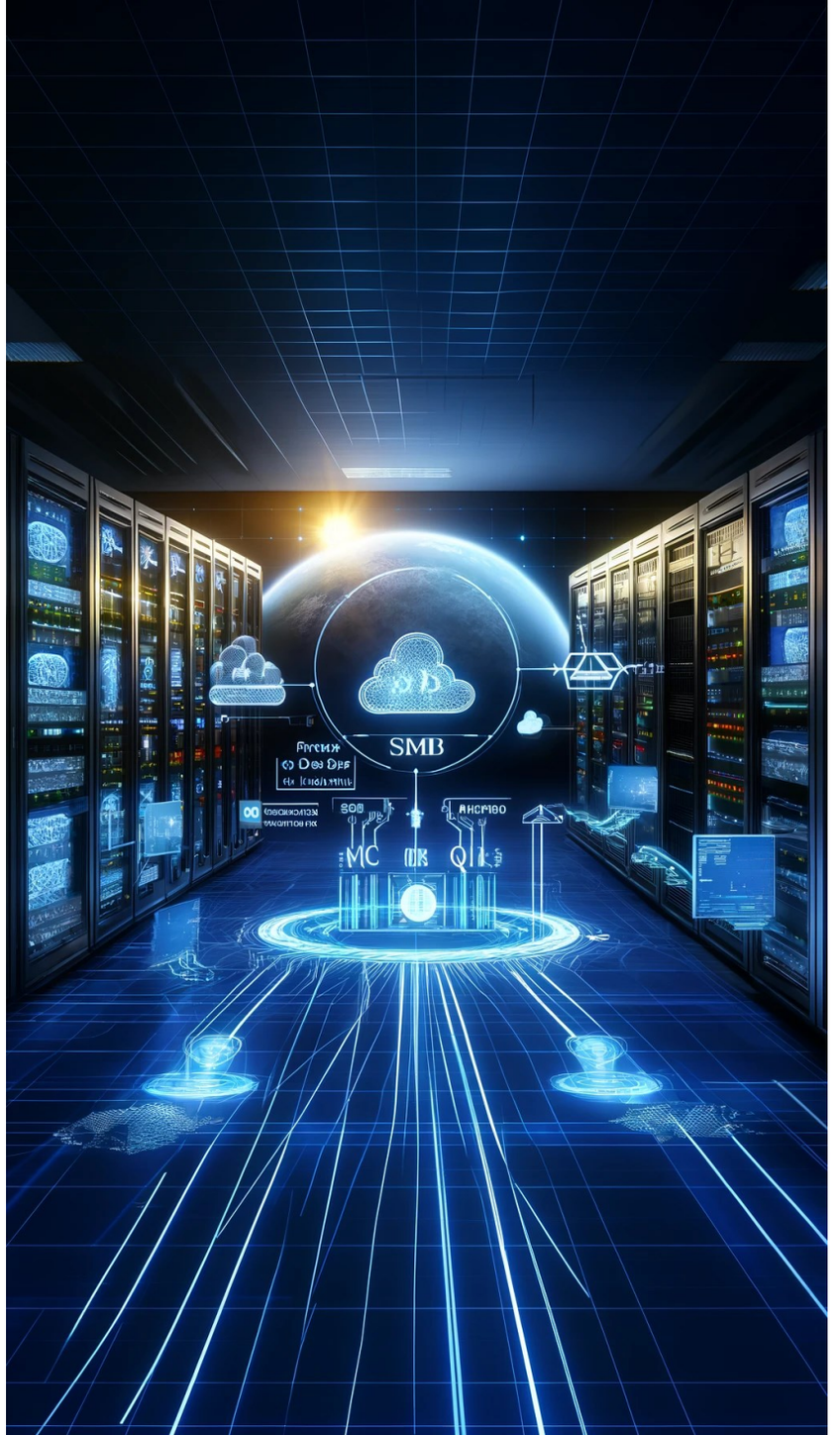
SMB

SMB over QUIC

SMB (Server Message Block) over QUIC (Quick UDP Internet Connections) is a significant feature introduced in Windows Server 2025. This technology combines the traditional SMB protocol with the QUIC protocol to enhance security and performance for remote file sharing (over the Internet!).

- **Encryption**: Uses TLS 1.3 for secure connections
- **Low Latency**: Reduces latency for faster file transfers
- **Resilience**: Maintains connections effectively over network changes
- **Reduced Attack Surface**: Operates over UDP, reducing vulnerability to attacks
- **Remote Work**: Ideal for secure, remote file access
- **Mobile and edge devices**: Suitable for unpredictable network conditions
- **Configuration**: Managed through Group Policy and PowerShell
- **Event logging**: Detailed logging for monitoring and troubleshooting
- **Performance improvements**: Optimized for high-latency networks
- **Enhanced security**: Prevents identity theft and man-in-the-middle attacks
- **Available in all editions**: Standard, Datacenter, Azure Edition

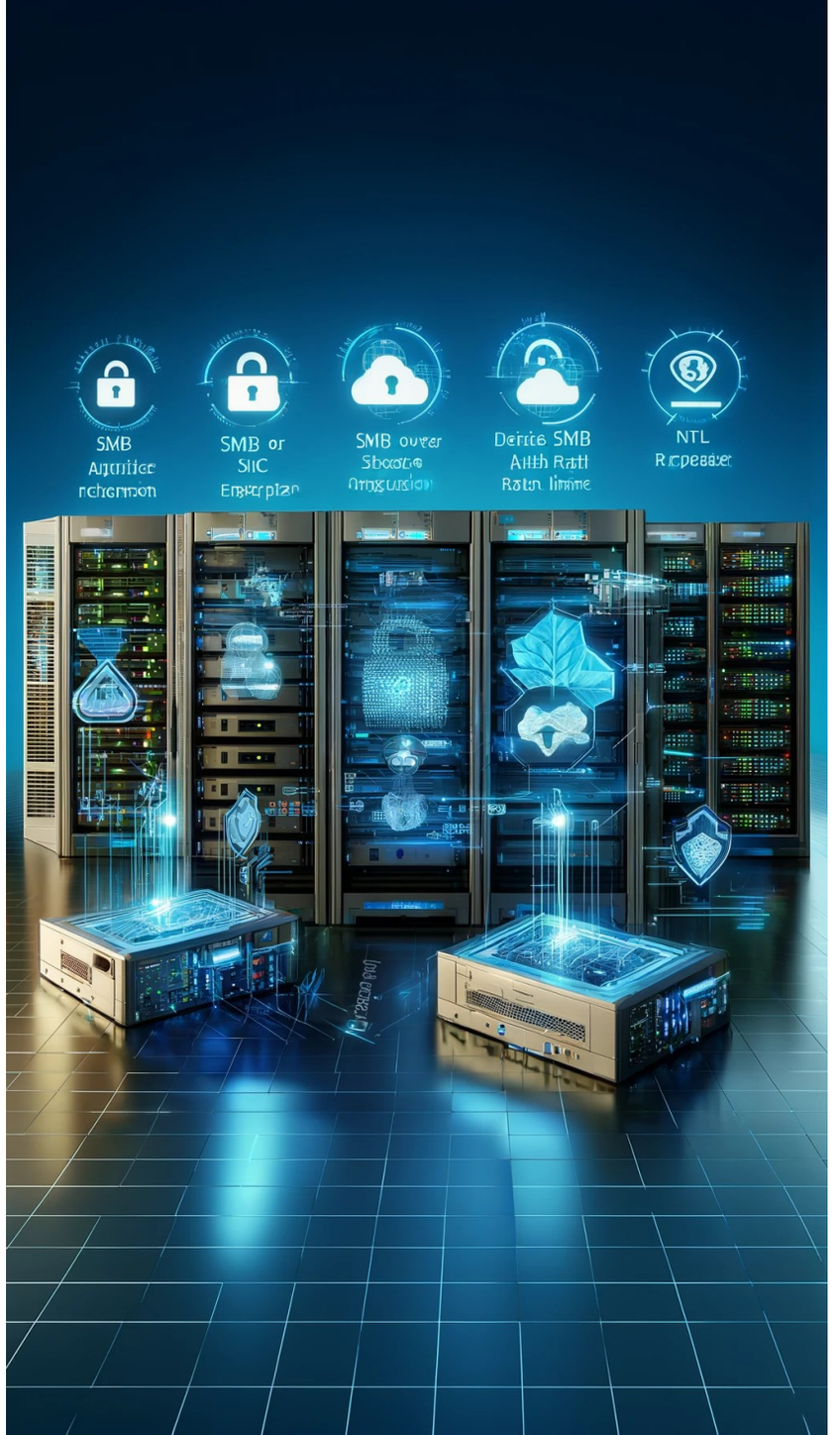
[SMB over QUIC in Windows | Microsoft Learn]



SMB Security improvements

Secure by default

- **SMB signing**
  - Signing required by default
  - Stop relay, attacker-in-the-middle, phishing
- **Auth rate Limiter**
  - Throttles bad NTLM password by default
  - Brute force attack prevention
- **SMB firewall rule hardening**
  - No longer opens NetBIOS ports
- **SMB NTLM disable option**
  - Granular control of remote NTLM
- **SMB Dialect Control**
  - Allow/refuse a range of SMB 2 & 3



Modernizing Windows Server Experience

Winget

Winget enables users to:

- Discover, install and upgrade applications
- Remove unwanted applications
- Configure installed applications
- It acts as the client interface to the Windows Package Manager service

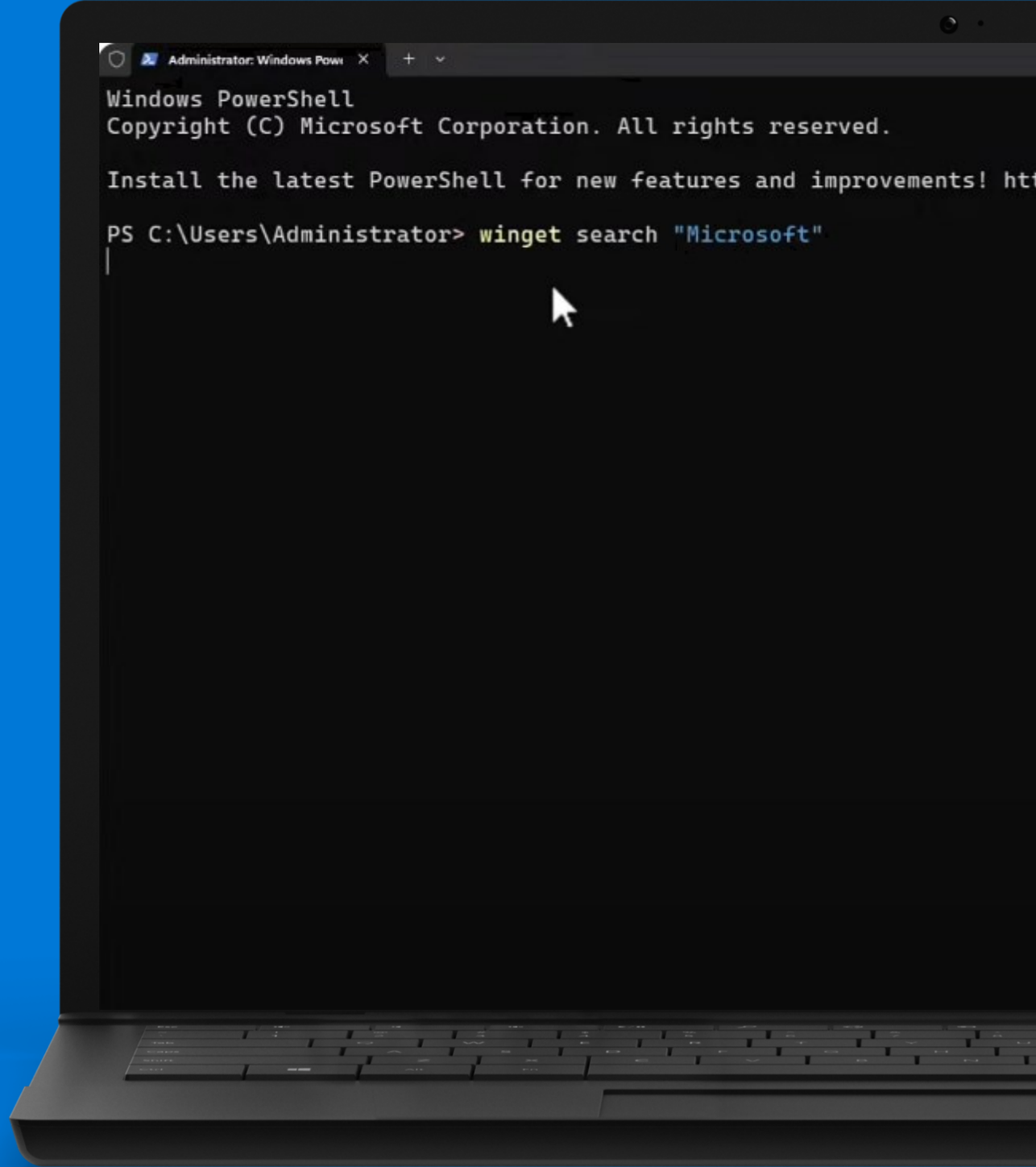
Key features:

- Package management: Winget simplifies software management
- Command-Line interface: Use command prompt or PowerShell
- Open source: Winget is free and open-source

[NicolaFerrini.it - Windows Package Manager: Installazioni semplificate delle applicazioni In Windows 10 e in Windows 11]

DEMO

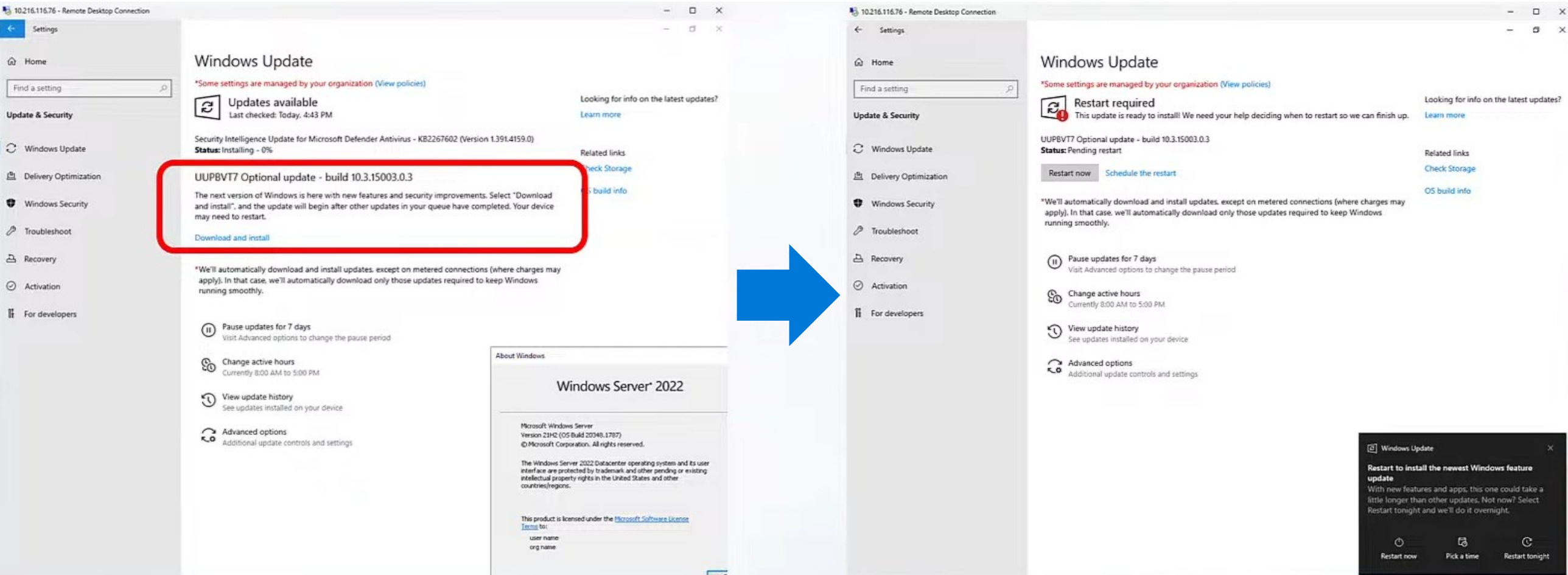
WINGET


Administrator: Windows Pow
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.
Install the latest PowerShell for new features and improvements! htt
PS C:\Users\Administrator> winget search "Microsoft"

OS upgrade using Windows Update

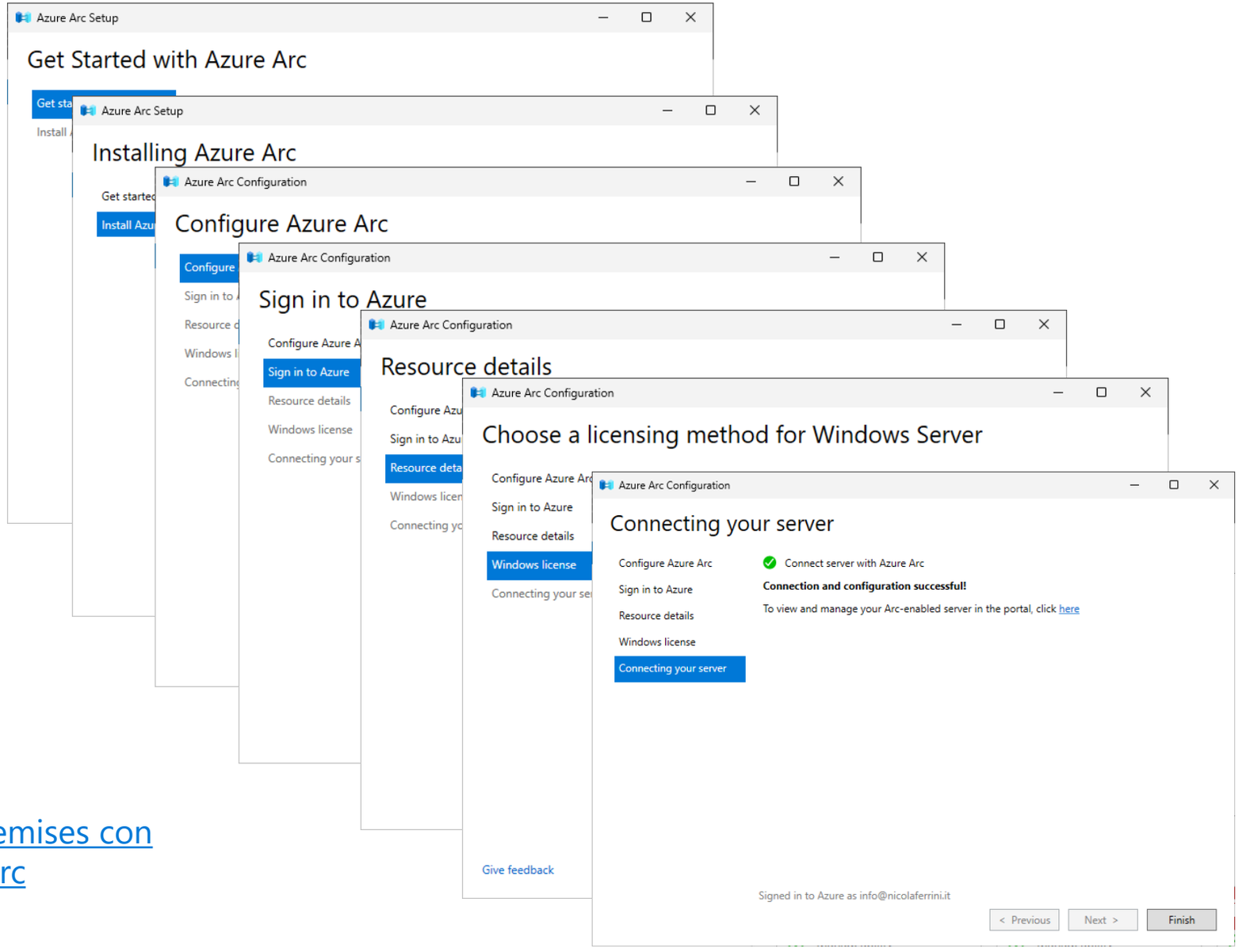
Upgrade from Windows Server 2022 to 2025 with Windows Update

- Same experience like Windows 11
- Makes upgrading to Windows Server 2025 very simple!



Get Hybrid with Azure Arc

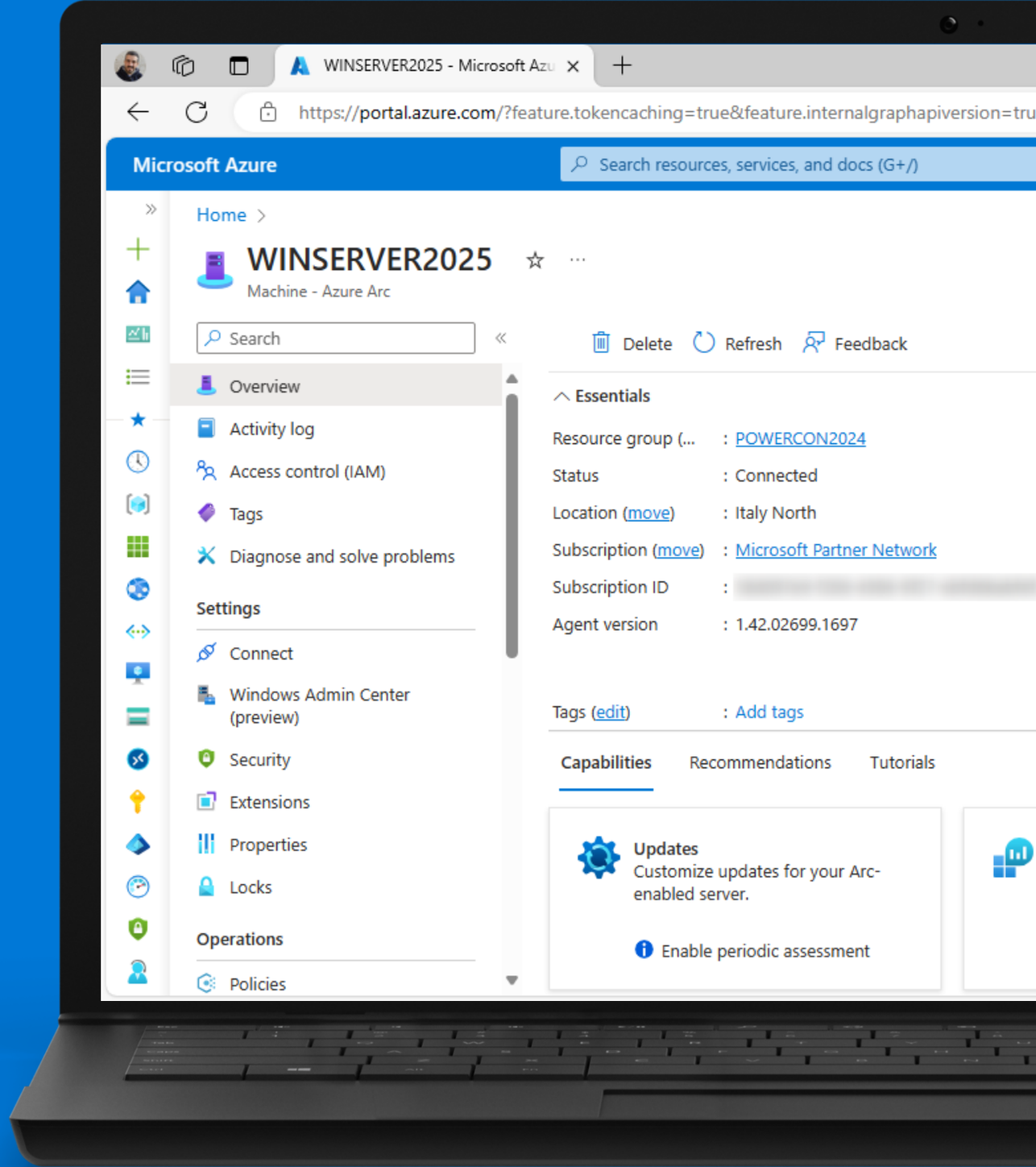
Windows Server 2025 brings closer integration with Azure services, particularly through Azure Arc. This makes it easier to manage hybrid and multicloud environments, extending Azure's capabilities to on-premises data centers



[Proteggere e gestire le macchine on-premises con Microsoft Defender for Cloud e Azure Arc]

DEMO

Azure Arc
&
Windows Admin Center

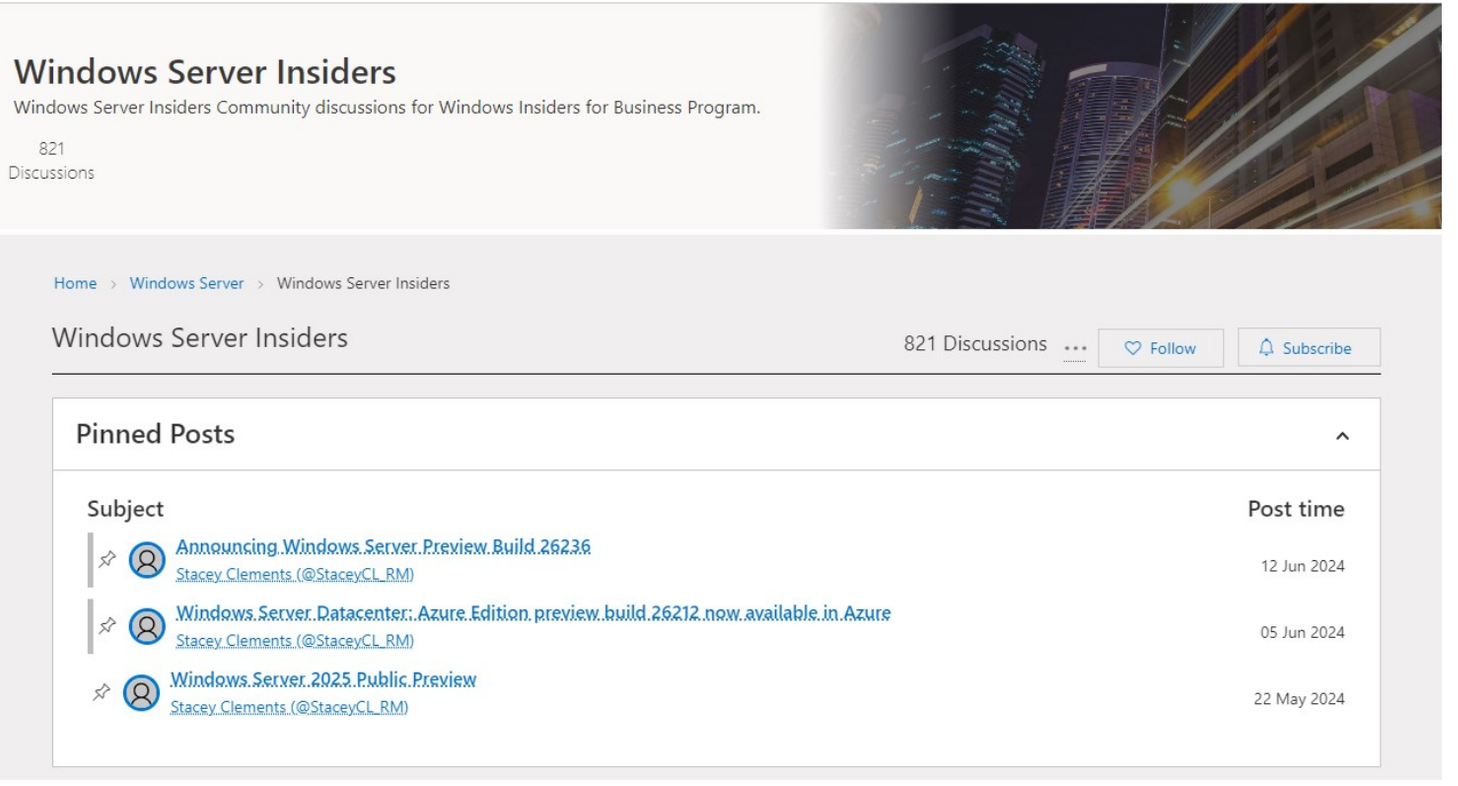


Windows Server Insiders

Try Windows Server 2025

Planning on releasing a new preview build every two weeks!

Post your feedback!



[Windows Server Insiders Community]

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