Microsoft

What's New in Server 2022

- Mike Nelson

- November 2021

Windows Server 2022

Run business critical workloads in Azure, on-premises and at the edge

Advanced multi-layered security

Hybrid capabilities with Azure

Flexible application platform

Azure innovation for Windows Server

Editions

Windows Server 2022 Editions

$501

$1069

$6155

Windows Server 2022 Essentials Edition	Windows Server 2022 Standard Edition	Windows Server 2022 Datacenter Editions
is ideal for small businesses with up to 25 users and 50 devices	is ideal for customers with physical or minimally virtualized environments	is ideal highly virtualized and software defined datacenter environments.
25 users/**50** devices CALs are included	**Unlimited**, based on CALs	**Unlimited**, based on CALs
1 physical or virtual[1]	**2** VMs	**Unlimited** VMs
Must be root of domain	**2** Hyper-V containers[2]	**Unlimited** Hyper-V containers
Available in ROK and OEM	Available in COEM, ROK, and OEM	Available in COEM, ROK, and OEM

Editions

Windows Server 2022 Datacenter: Azure Edition

Latest hybrid and compute features

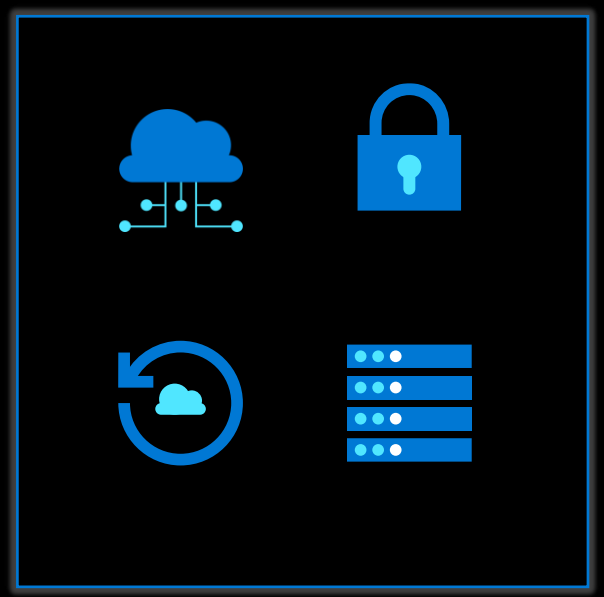
Runs on Azure cloud & Azure Stack HCI 21H2

Best Windows Server VM with Automanage

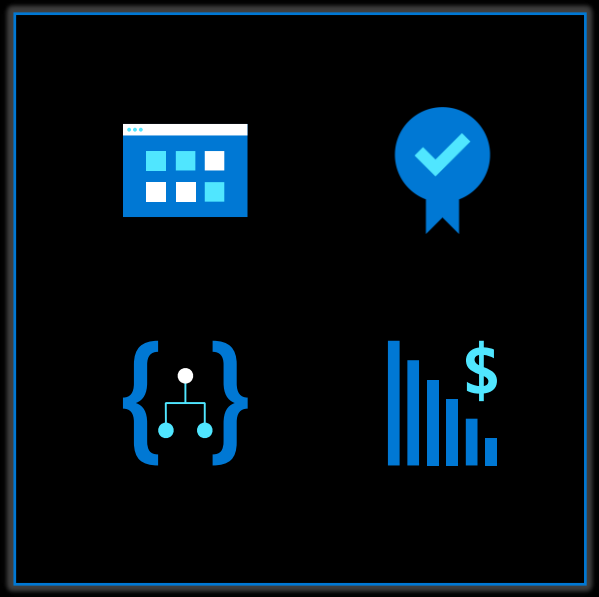
Windows Server 2022 Datacenter: Azure Edition

Windows Server 2022 Datacenter: Azure Edition

Latest hybrid and compute features



Runs on Azure cloud & Azure Stack HCI 21H2



Best Windows Server VM with Automanage

Windows Server 2022 Datacenter: Azure Edition

Hotpatch with Azure Automanage (Preview)

SMB over QUIC

Azure Extended Networking

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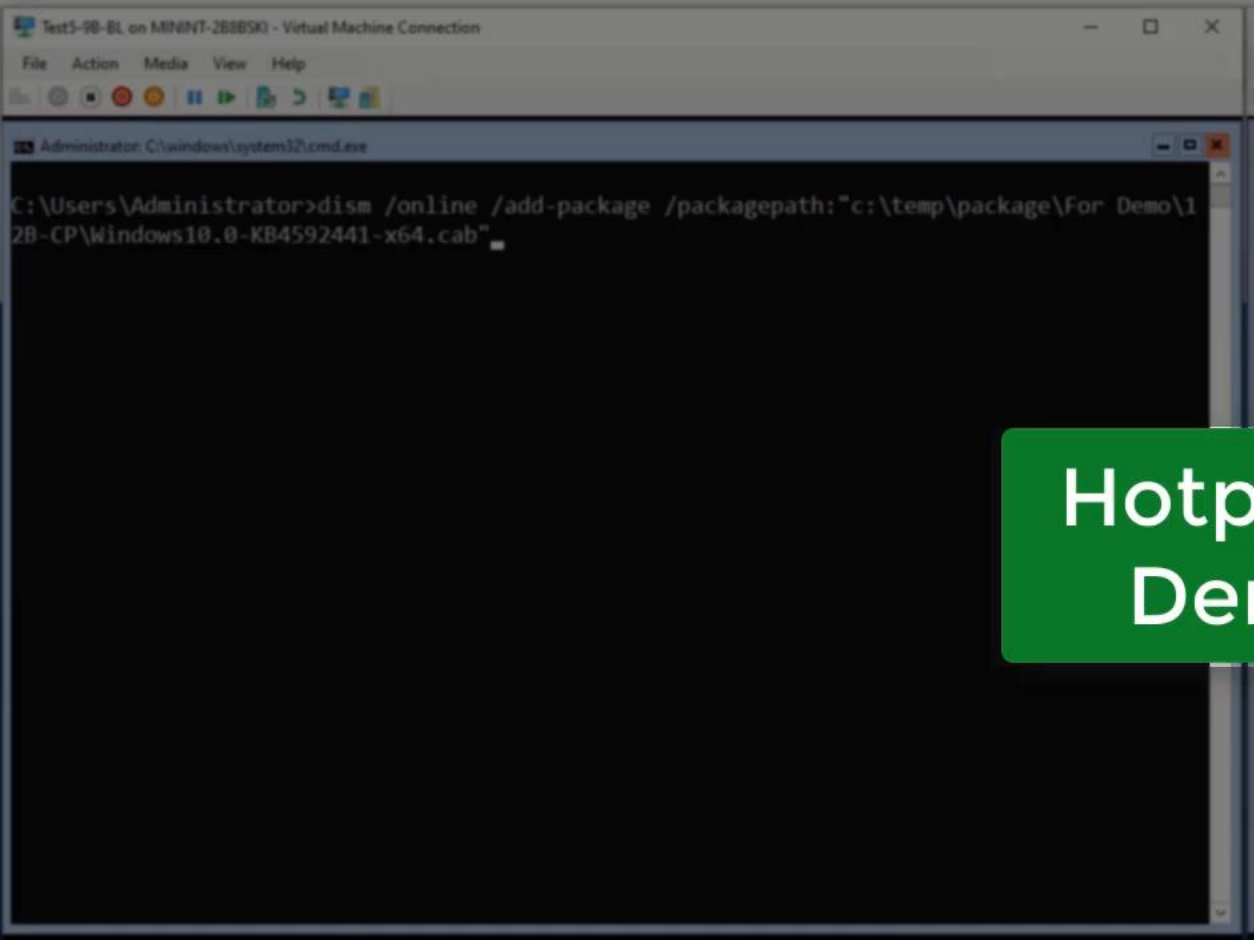
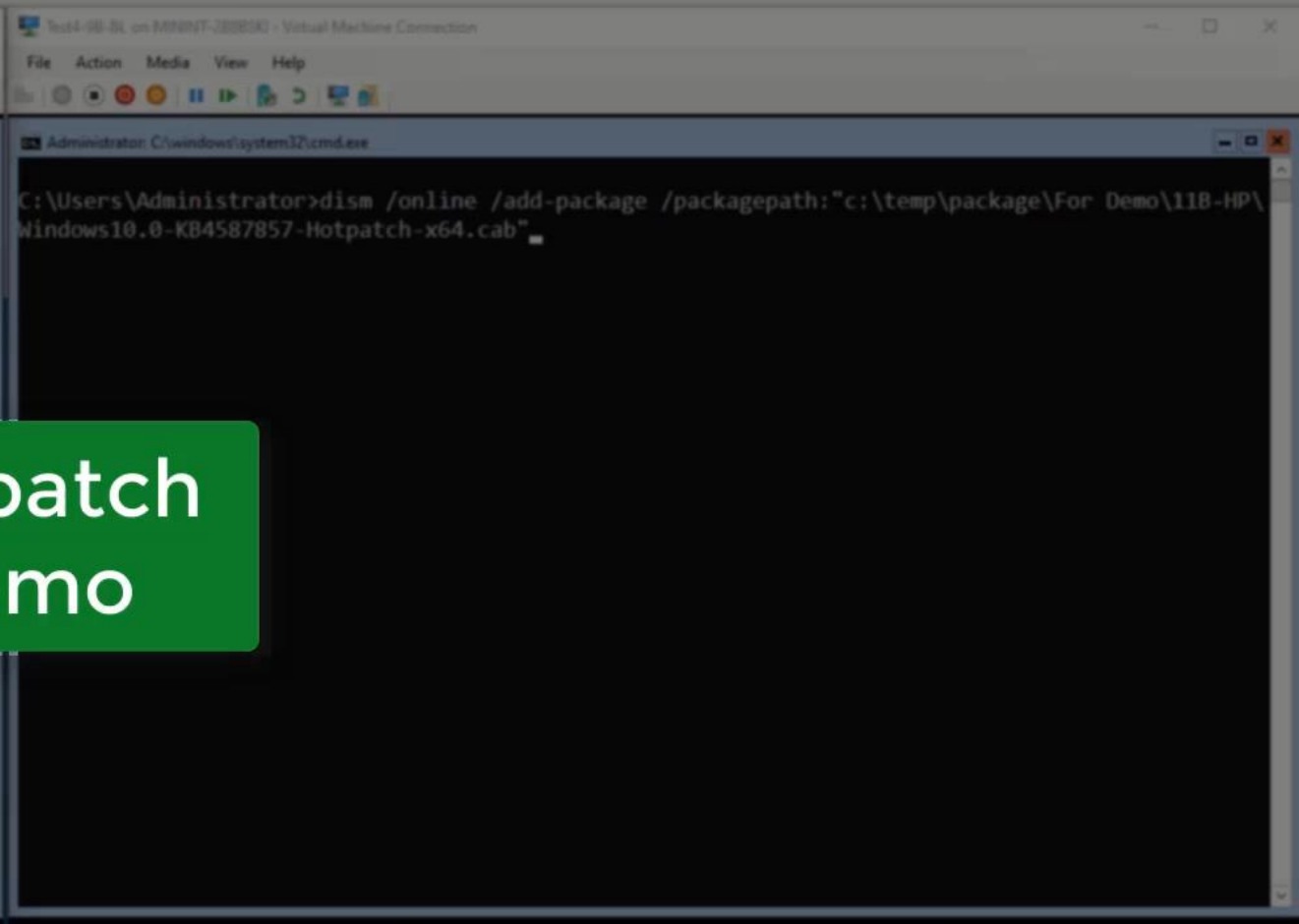
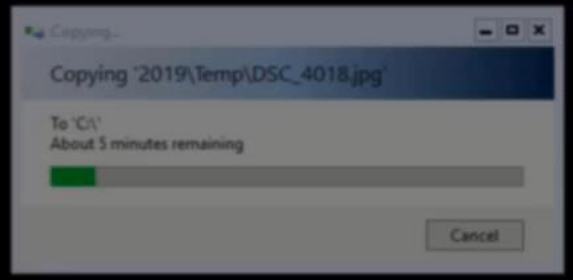
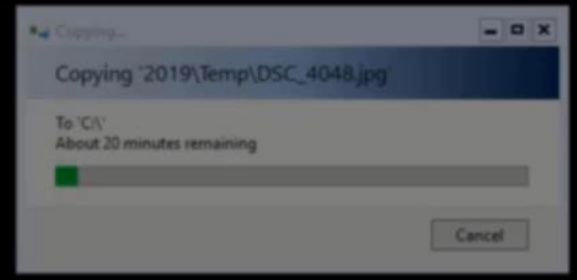




Hotpatch Demo





Dozens of hospitals and clinics in West Virginia and Ohio are canceling surgeries and diverting ambulances following a ransomware attack that knocked out staff access to IT systems across virtually all of their operations.

CRITICAL CONDITION —

Hospitals hamstrung by ransomware are turning away patients

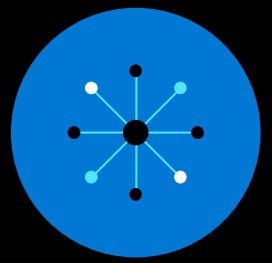
The ransomware epidemic continues to grow.

DAN GOODIN - 8/16/2021, 12:26 PM

Security threats are constant and costly

$3.62M

Average total cost of a data breach

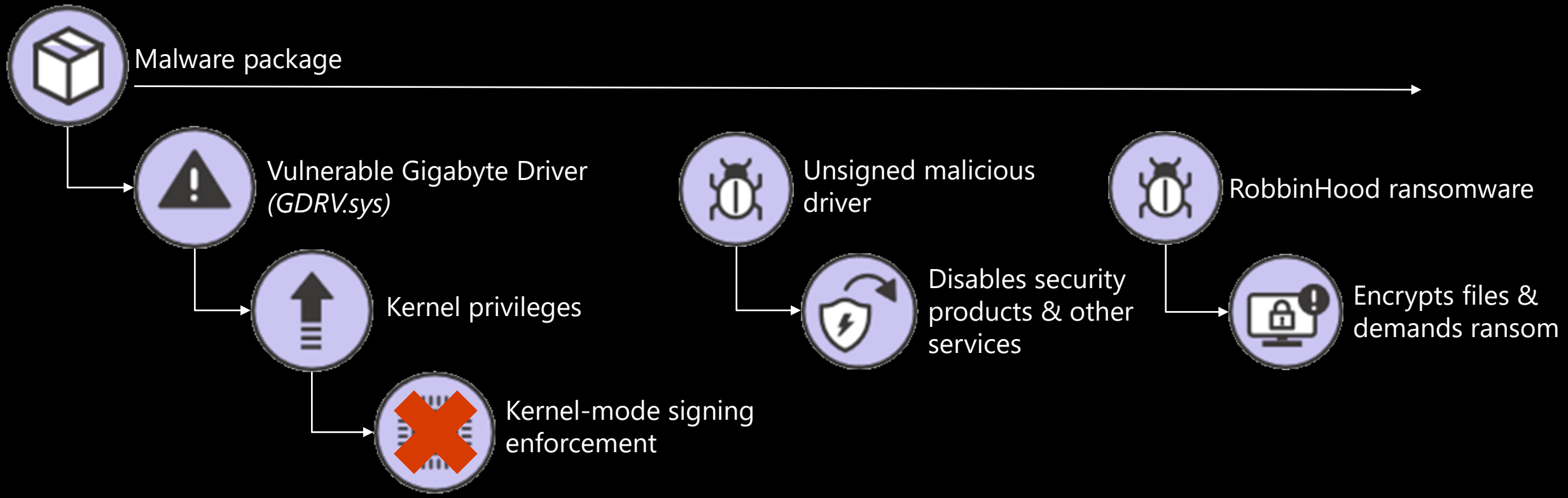


Protect

Defend

Prevent

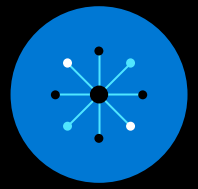
Anatomy of a ransomware attack



Firmware Protection

Secured-core server

Secure hardware, firmware and OS capabilities to help protect against threats



Protect

at boot-up with hardware root of trust

- Trusted Platform Module 2.0
- Secure cryptographic capabilities to better protect sensitive keys and measurements

Defend

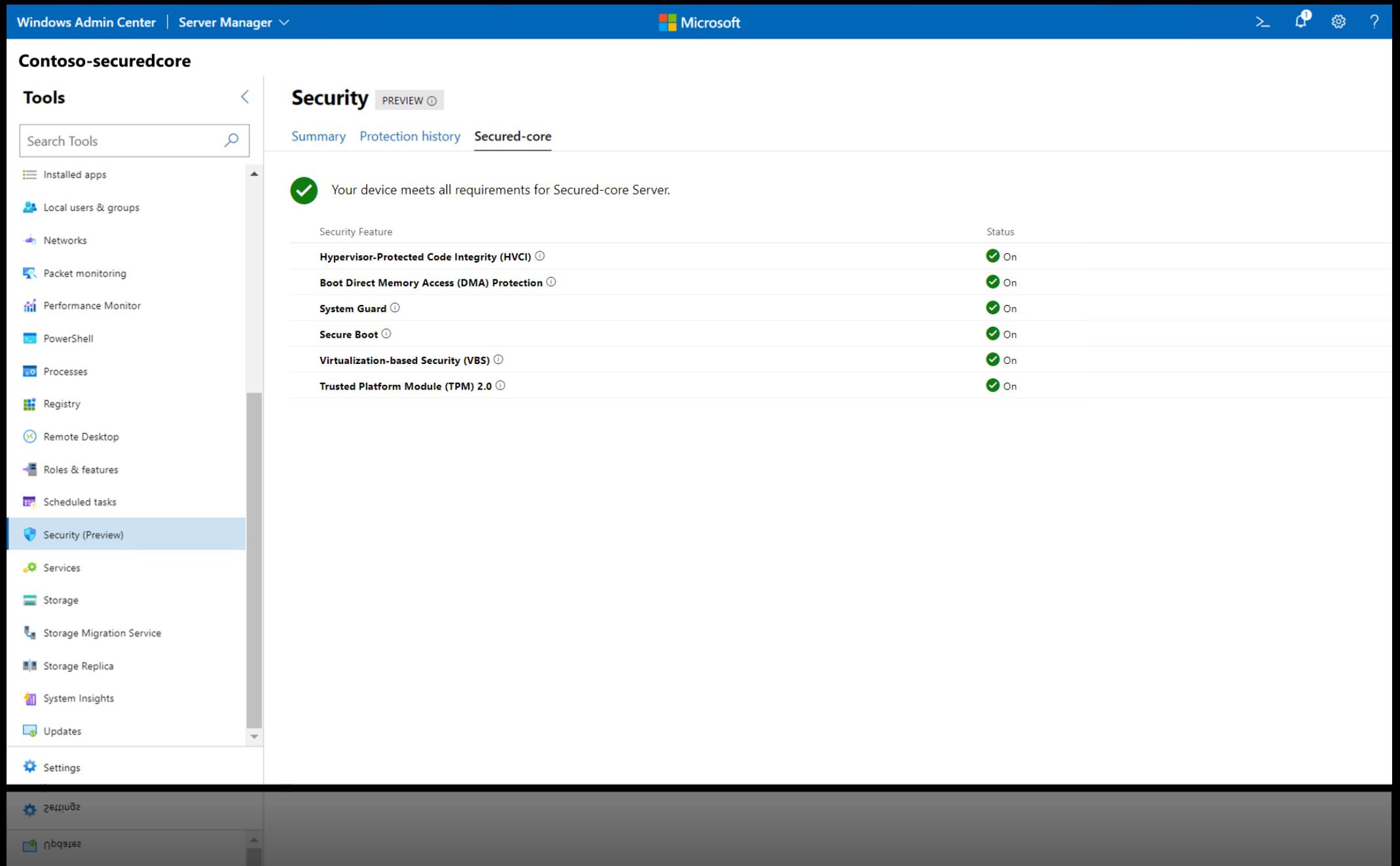
against firmware level attack with validated system integrity

- Windows Defender System Guard to protect, maintain, and validate system integrity
- Dynamic root of trust of measurement (DRTM) to boot up securely and minimize firmware vulnerabilities

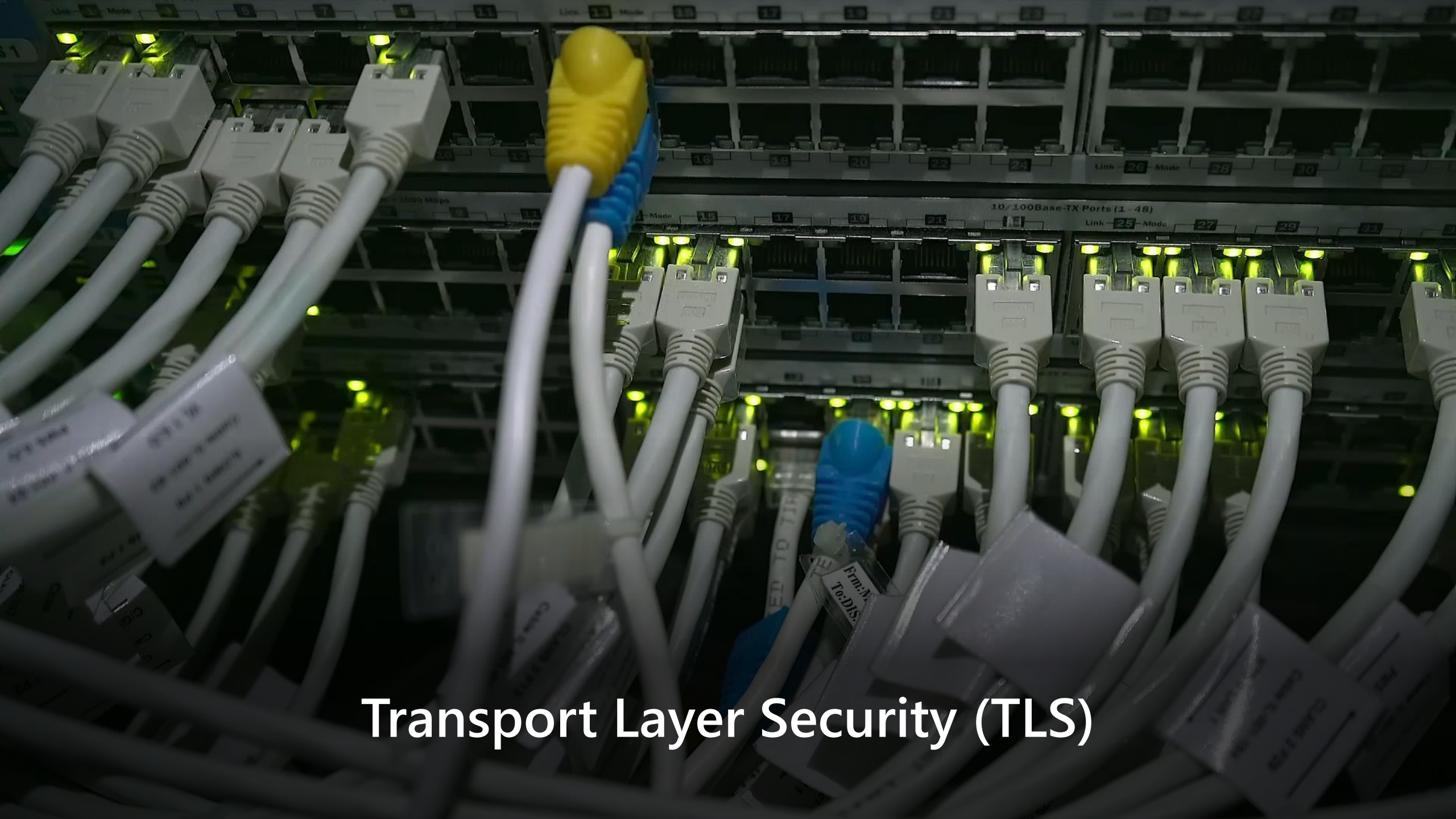
Prevent

access to unverified code with Virtualization-based security

- Hypervisor protected code integrity (HVCI) protects from unverified code execution
- Virtualization-based security supports features like Credential Guard to protect enterprise domain credentials


Windows Admin Center | Server Manager
Microsoft
Contoso-securedcore
Tools
Search Tools
Installed apps
Local users & groups
Networks
Packet monitoring
Performance Monitor
PowerShell
Processes
Registry
Remote Desktop
Roles & features
Scheduled tasks
Security (Preview)
Services
Storage
Storage Migration Service
Storage Replica
System Insights
Updates
Settings
Security
PREVIEW
Summary
Protection history
Secured-core
Your device meets all requirements for Secured-core Server.
Security Feature
Status
Hypervisor-Protected Code Integrity (HVCI)
On
Boot Direct Memory Access (DMA) Protection
On
System Guard
On
Secure Boot
On
Virtualization-based Security (VBS)
On
Trusted Platform Module (TPM) 2.0
On

Network Protection



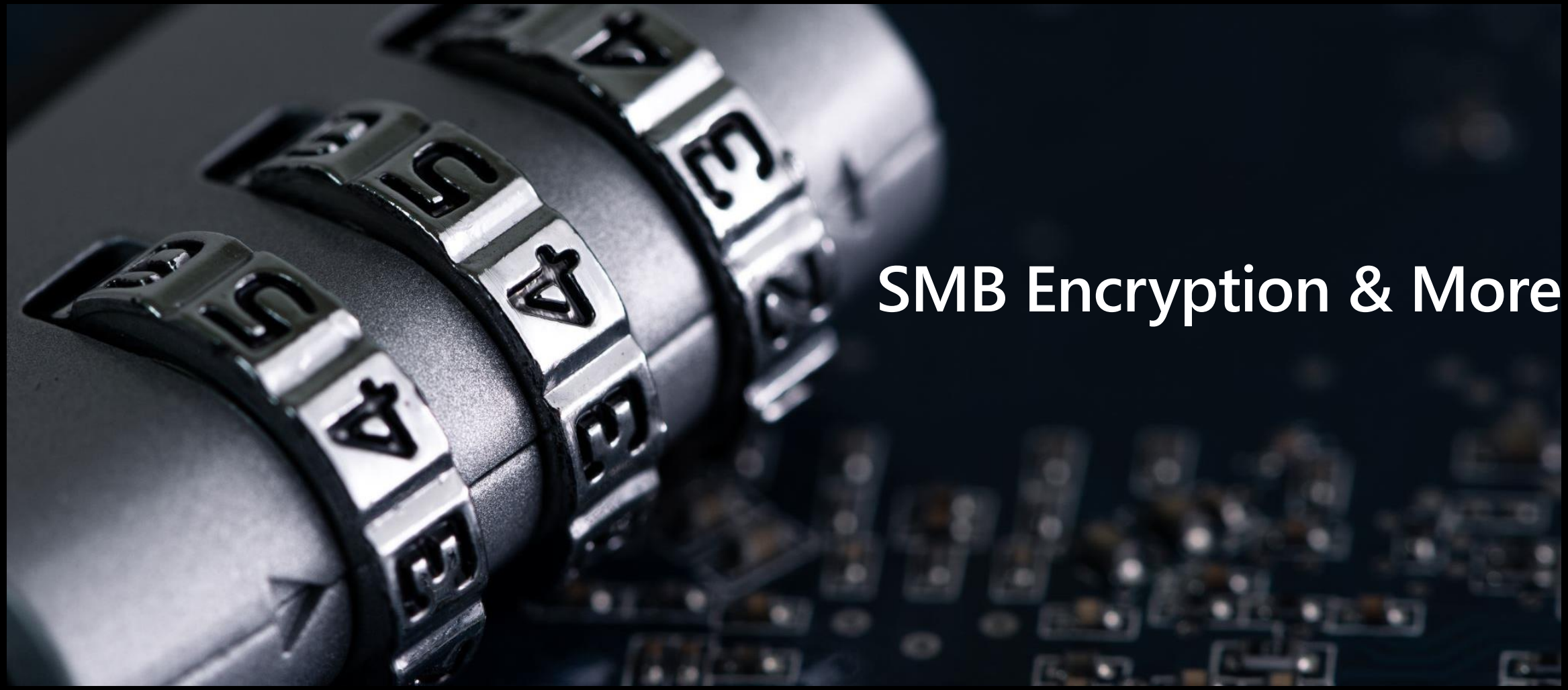
Transport Layer Security (TLS)

TLS 1.3 - More Secure

- Many of the major vulnerabilities in TLS 1.2 had to do with older cryptographic algorithms that were still supported
- TLS 1.3 drops support for vulnerable cryptographic algorithms such as:
  - RSA key transport: Doesn’t provide forward secrecy
  - CBC mode ciphers: BEAST and Lucky 13 attacks
  - RC4 stream cipher: Not secure for use in HTTPS
  - Arbitrary Diffie-Hellman groups: CVE-2016-0701
  - Export ciphers: FREAK and LogJam attacks

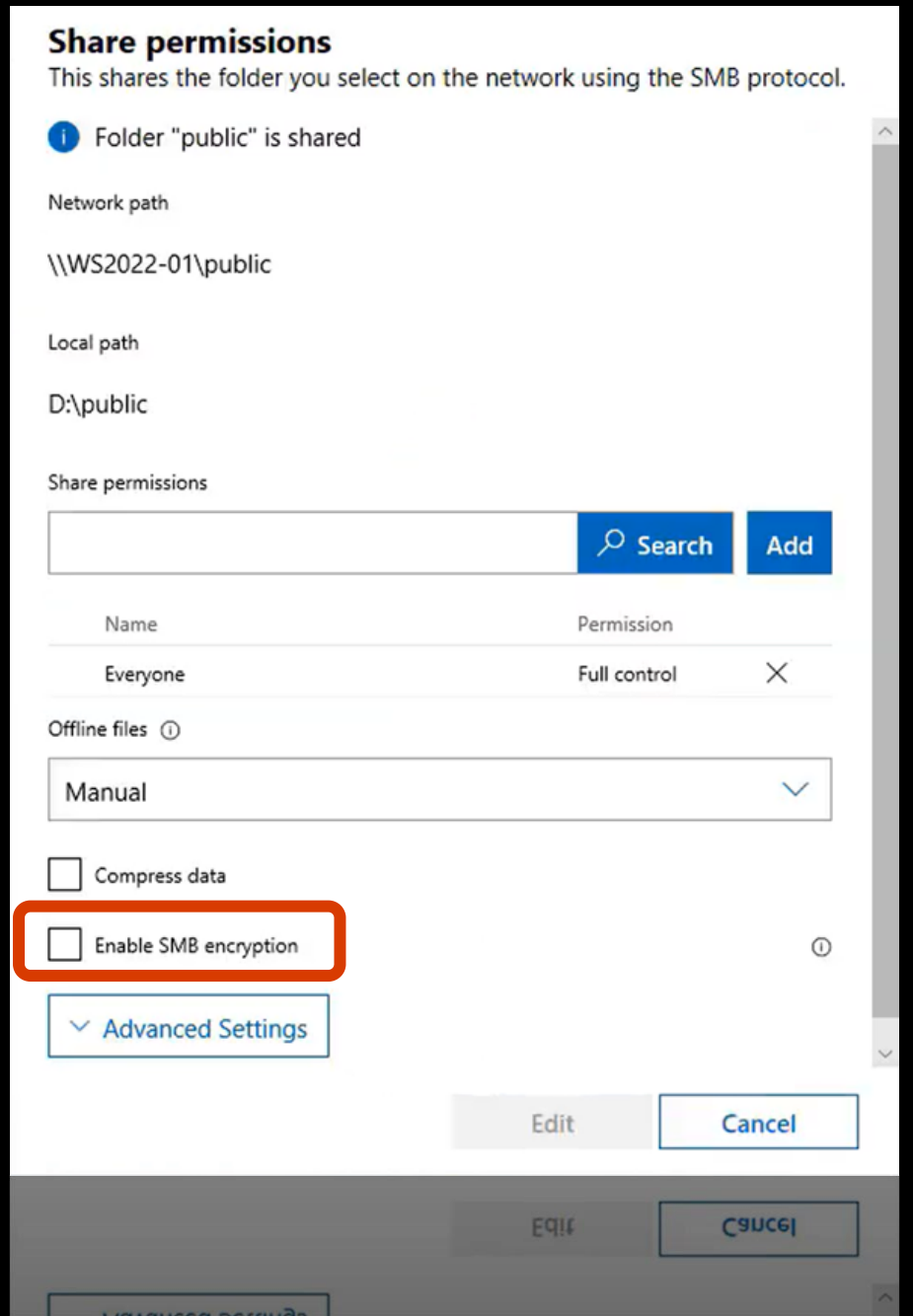
TLS 1.3 - Faster

- TLS handshakes in TLS 1.3 only require one round trip (or back-and-forth communication) instead of two, shortening the process by a few milliseconds
- In cases when the client has connected to a website before, the TLS handshake will have zero round trips. This makes HTTPS connections faster, cutting down latency and improving the overall user experience.


SMB Encryption & More

SMB Encryption

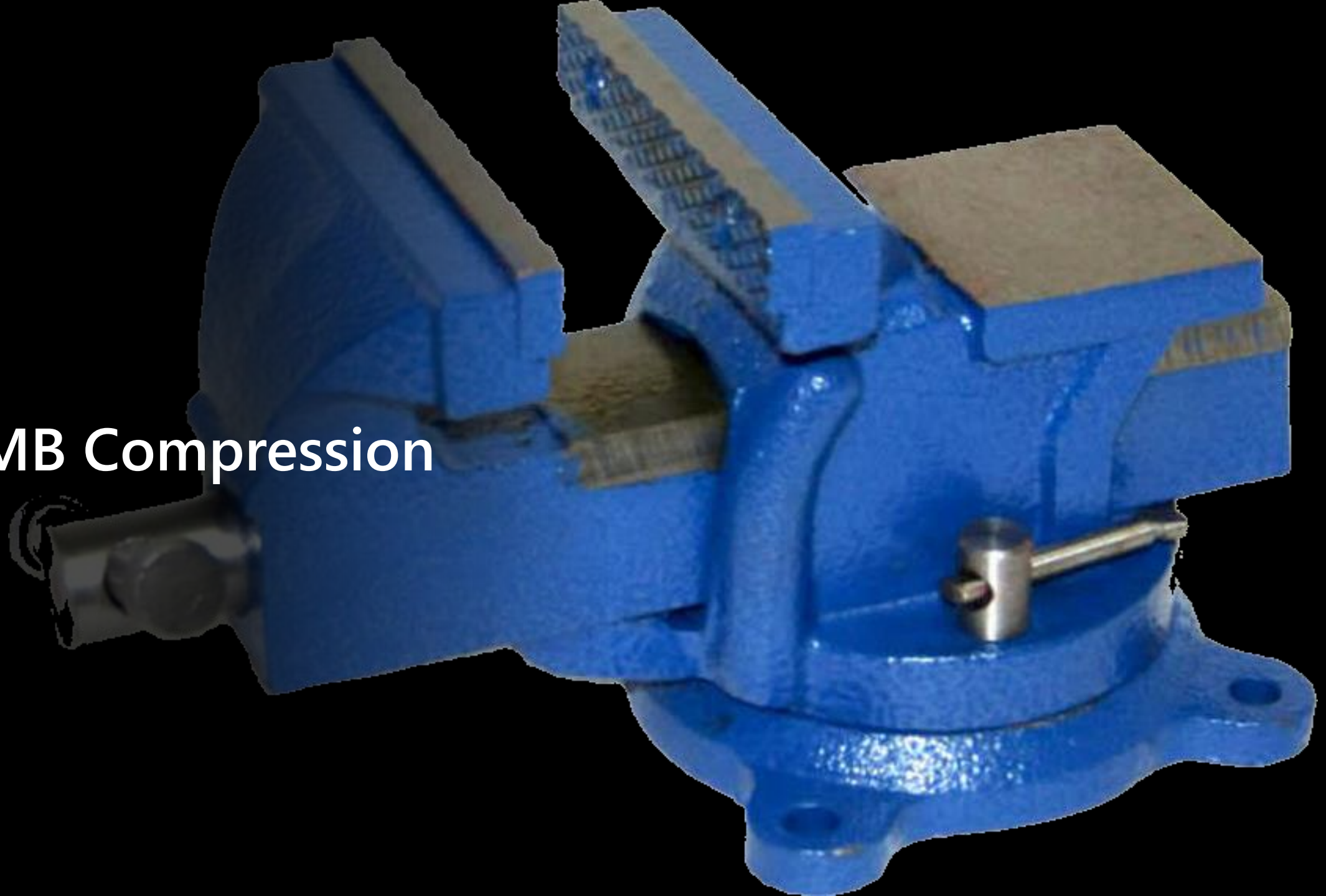
- Protects against Man in the Middle attacks
- More Secure
  - Windows Server 2022 & Windows 11 introduce AES-256-GCM and AES-256-CCM cryptographic suites for SMB 3.1.1 encryption
  - Windows will automatically negotiate this more advanced cipher method
- Flexible and Easy to Use:
  - Can be configured per share or entire file server
  - Can be mandated through Group Policy
  - Via PowerShell
  - One checkbox in Windows Admin Center



SMB Encryption & SMB Direct (RDMA)

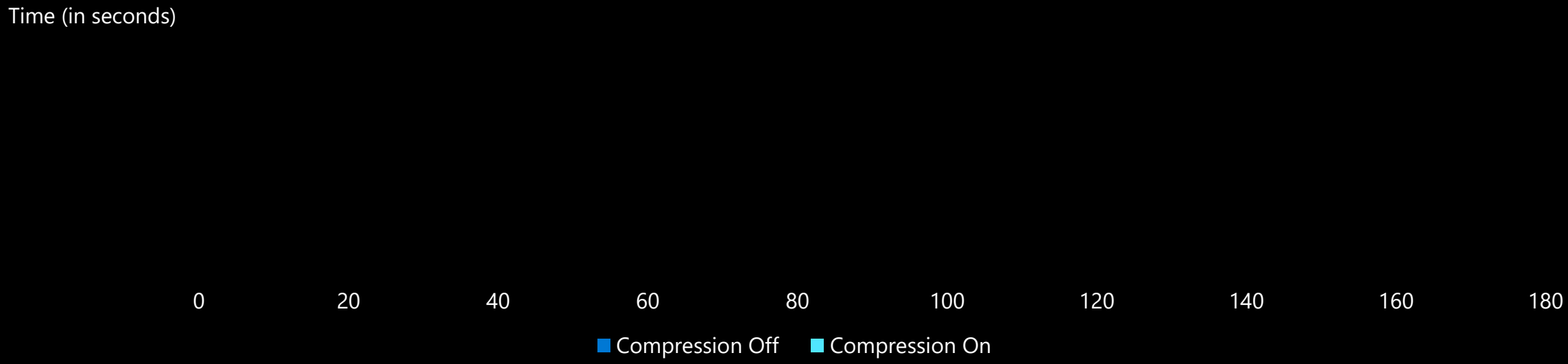
- Windows Server 2022 and Windows 11 SMB Direct now supports encryption
- Previously, enabling SMB encryption disabled direct data placement, making RDMA performance as slow as TCP
- Now data is encrypted before placement resulting in security and performance while adding AES-128 and AES-256 protected packet privacy
- You can enable encryption using Windows Admin Center, Set-SmbServerConfiguration, or UNC Hardening group policy

SMB Compression



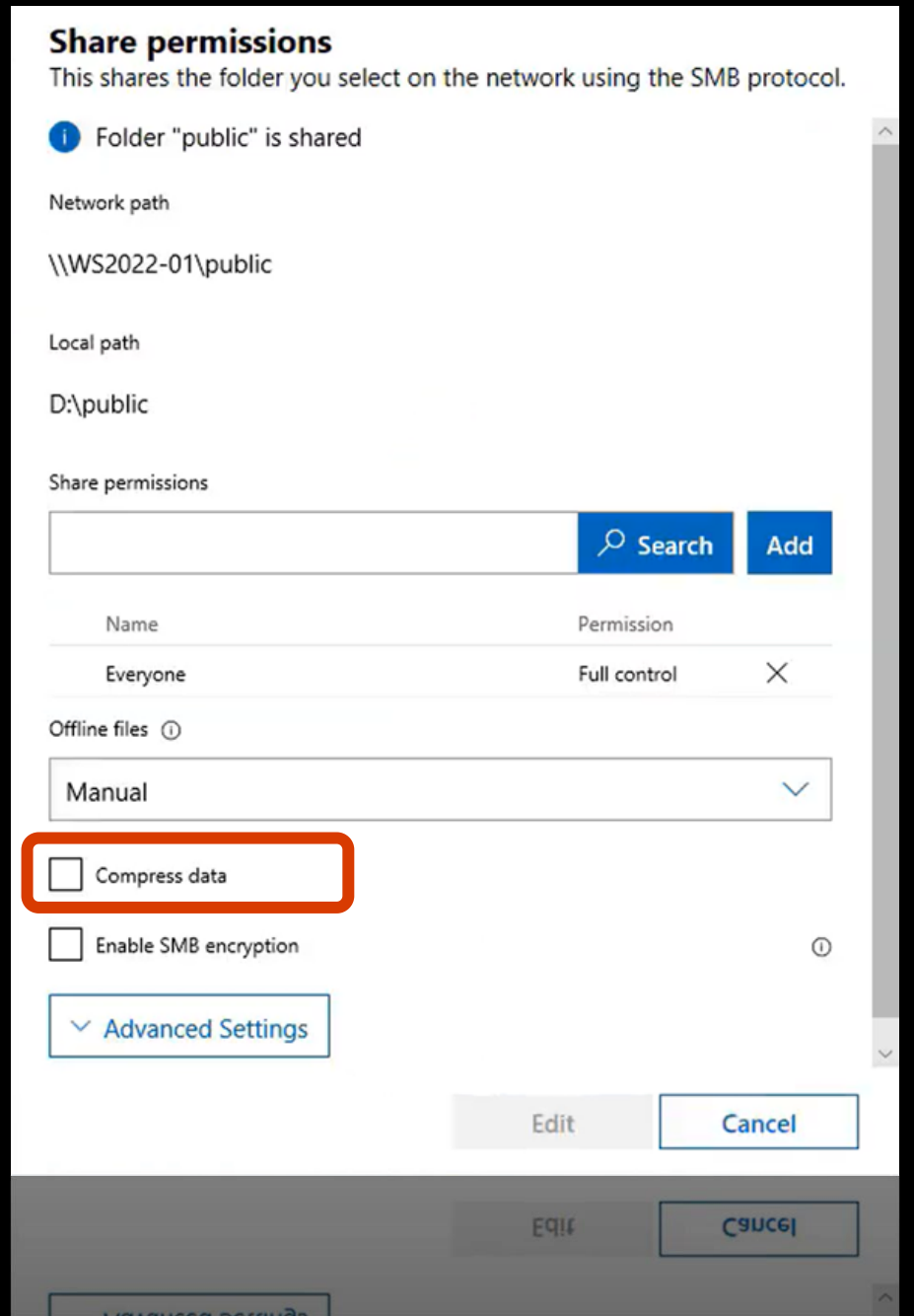
SMB Compression – Test

20 GB VHD File Copy from Windows 11 to Windows Server 2022 via 1 GbE*



SMB Compression

Enable with one checkbox

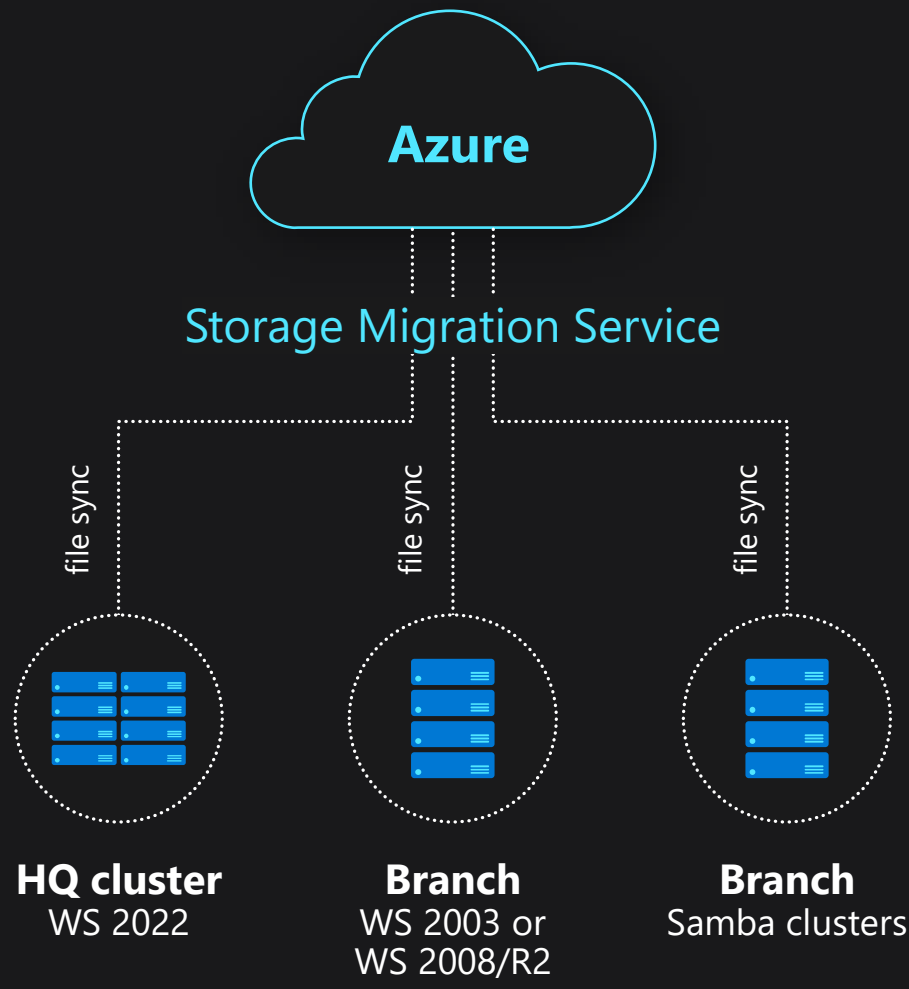


MICROSOFT CONFIDENTIAL

Storage Migration Service
With Windows Server 2022

- **Modernize your File Server and Future Proof On-Prem Storage Costs**
  - SMS will:
    - Automatically use Azure File Sync
    - Sync your data into Azure Files for bottomless storage
    - Migrate all your data to a modern Windows Server
  - On-premises File Server is a hot cache

- **NetApp FAS Migration**
  - Migrate from NetApp FAS to Windows Server or a Windows Server Cluster running in the cloud or on-premises



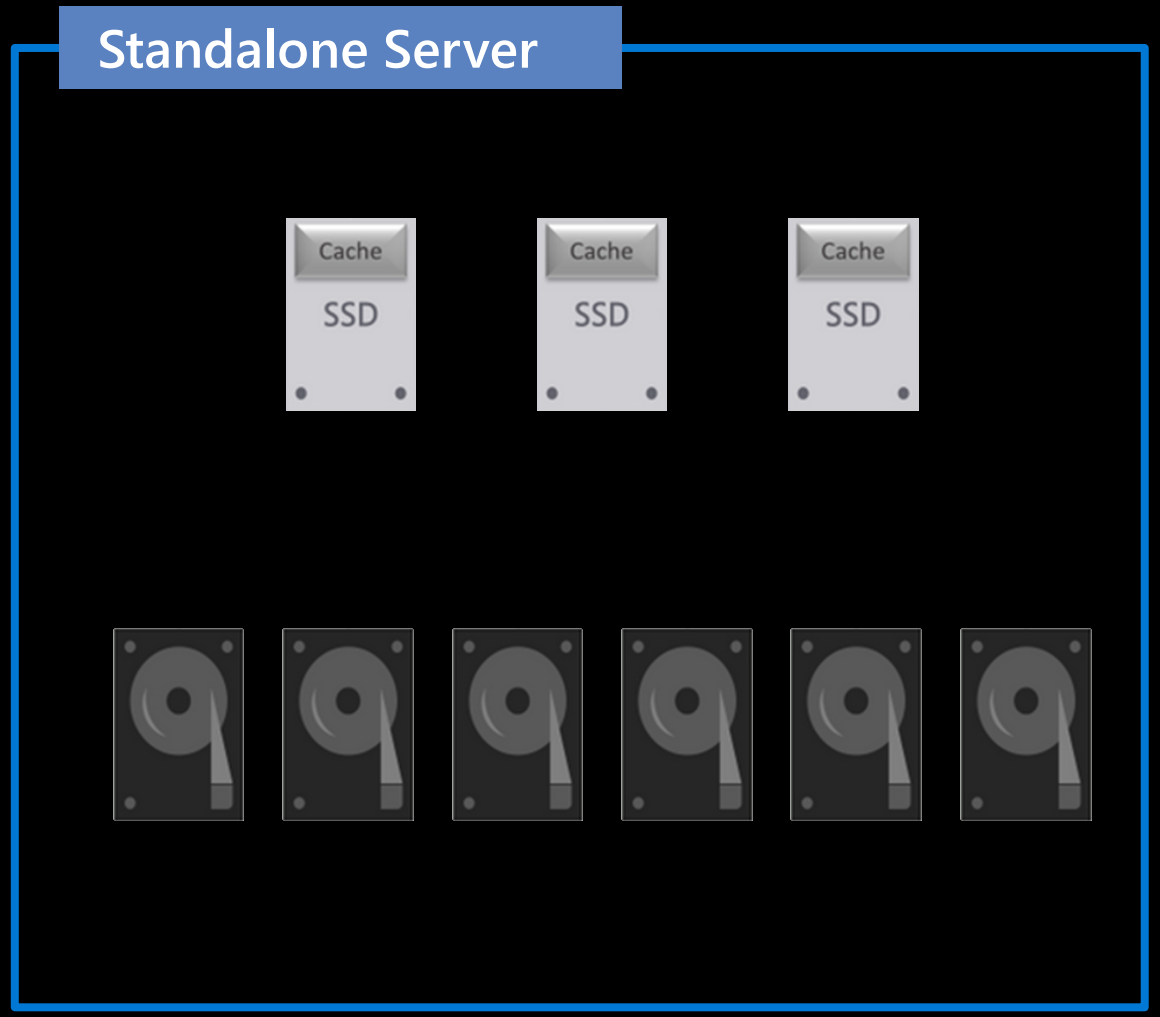
"S2D rocks. The performance, caching and tiering are AWESOME. It would be great if you could use this in a single node environment for test/dev."

Introducing

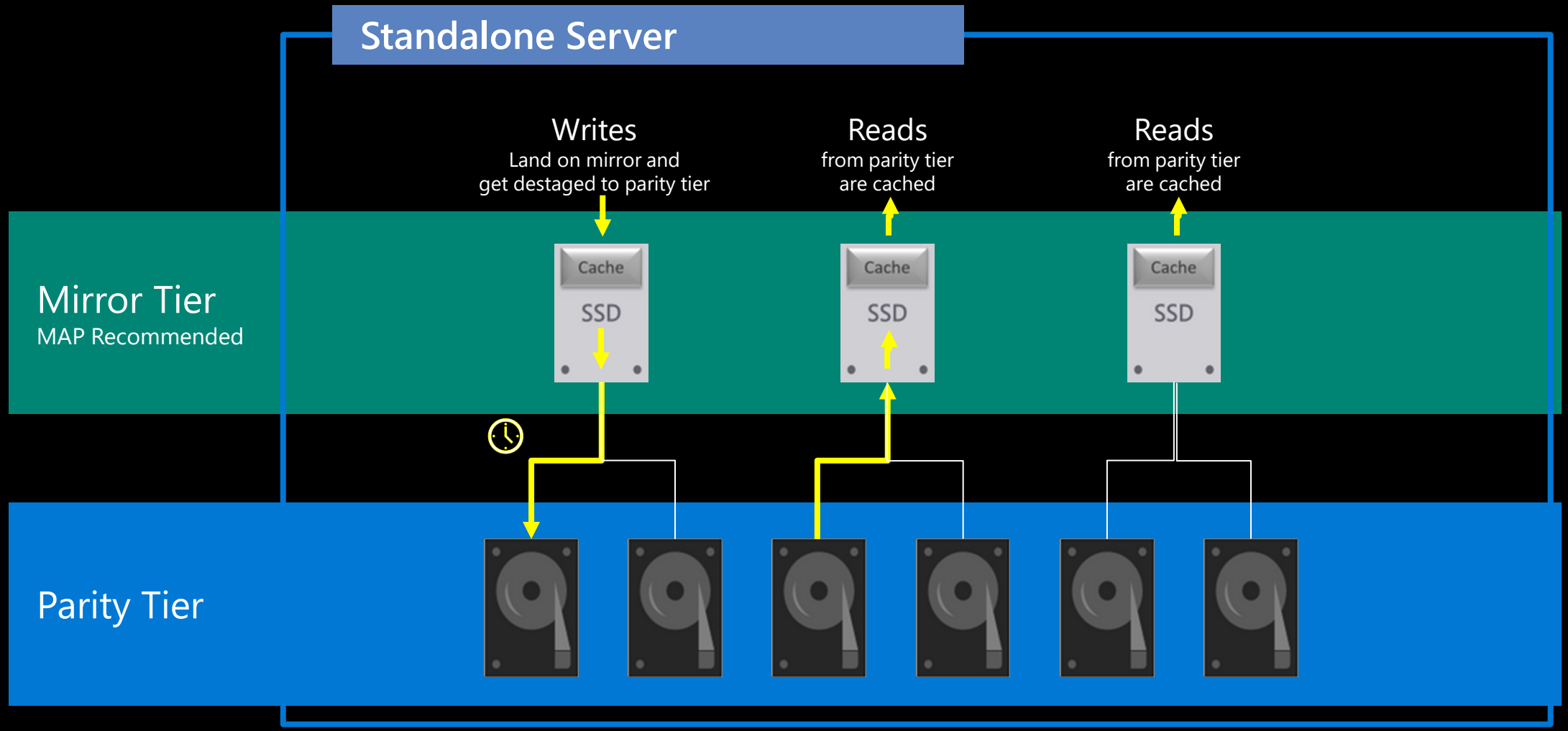
Windows Server 2022 Single Node Caching/Tiering

Windows Server 2022: Single Node Caching/Tiering

- Benefits
  - Great for Random I/O Workloads
- Scenarios
  - SQL Development
  - Container Development
  - File Server (synced with Azure File Sync)
- Important
  - This is **single** node and **not** a high availability solution.
- Requirements
  - Windows Server 2022
  - 2 drive types SSD+HDD or NVMe+HDD



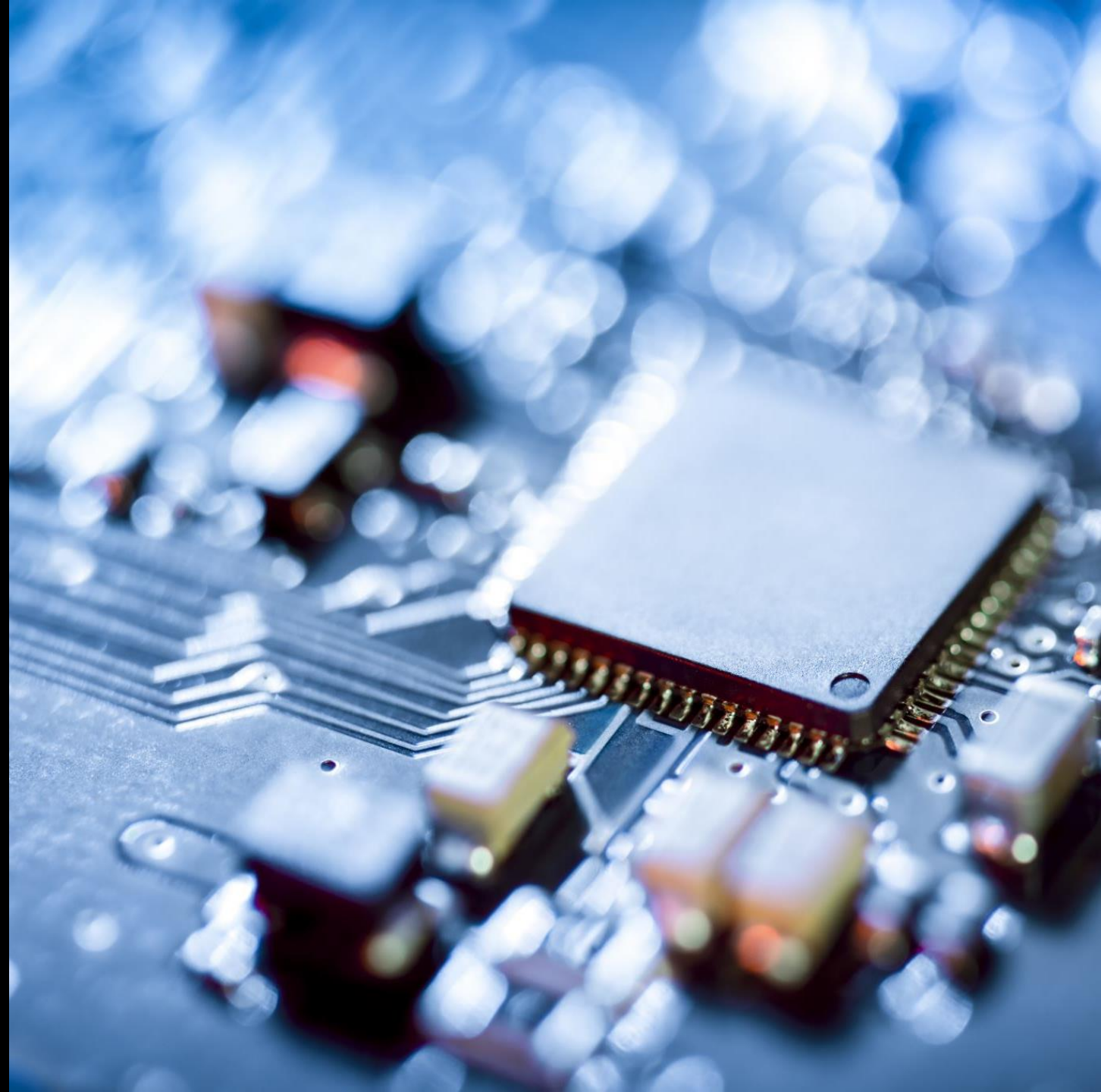
Windows Server 2022: Single Node Caching/Tiering



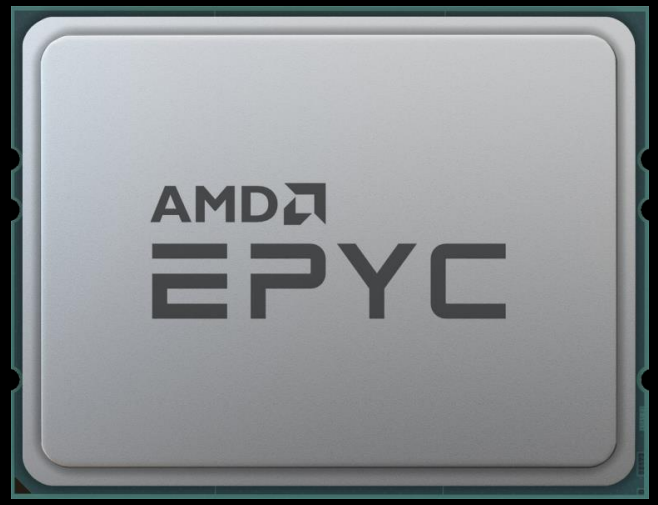
One last note…

The server **must** have the Failover Cluster Feature Enabled.

HOWEVER, the server **cannot** be a member of a Failover Cluster.



Windows Server 2022 & the Latest CPUs



3rd Gen AMD EPYC™ processors

3rd Gen Intel® Xeon® Scalable processors

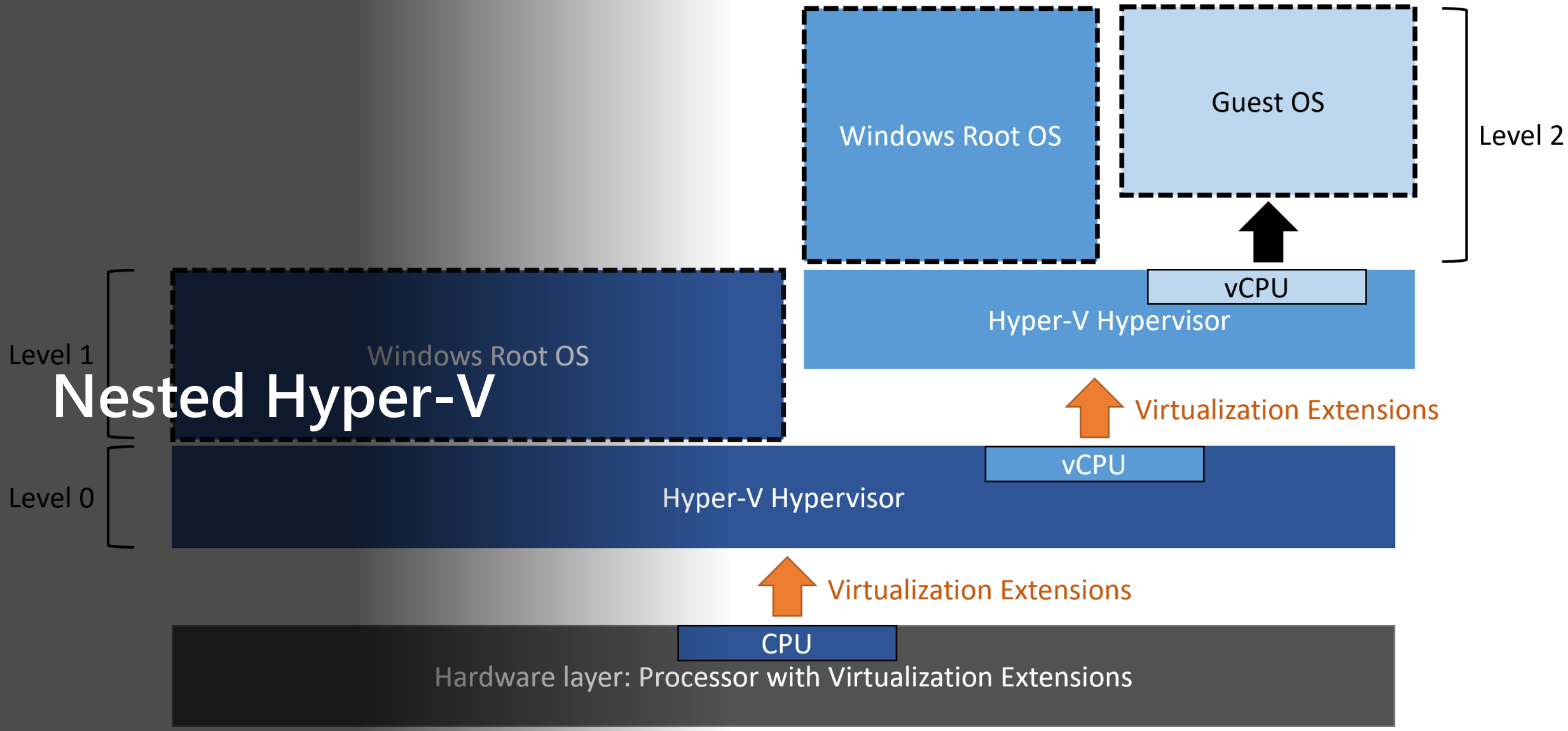
Windows Server & SQL Server

Capability	Windows Server 2012/2012 R2 Standard and Datacenter	Windows Server 2016/2019 Standard and Datacenter
Physical (Host) Memory Support	Up to 4 TB per physical server	Up to 24 TB per physical server
Physical (Host) Logical Processor Support	Up to 320 LPs	Up to 512 LPs

Windows Server 2022 Hyper-V

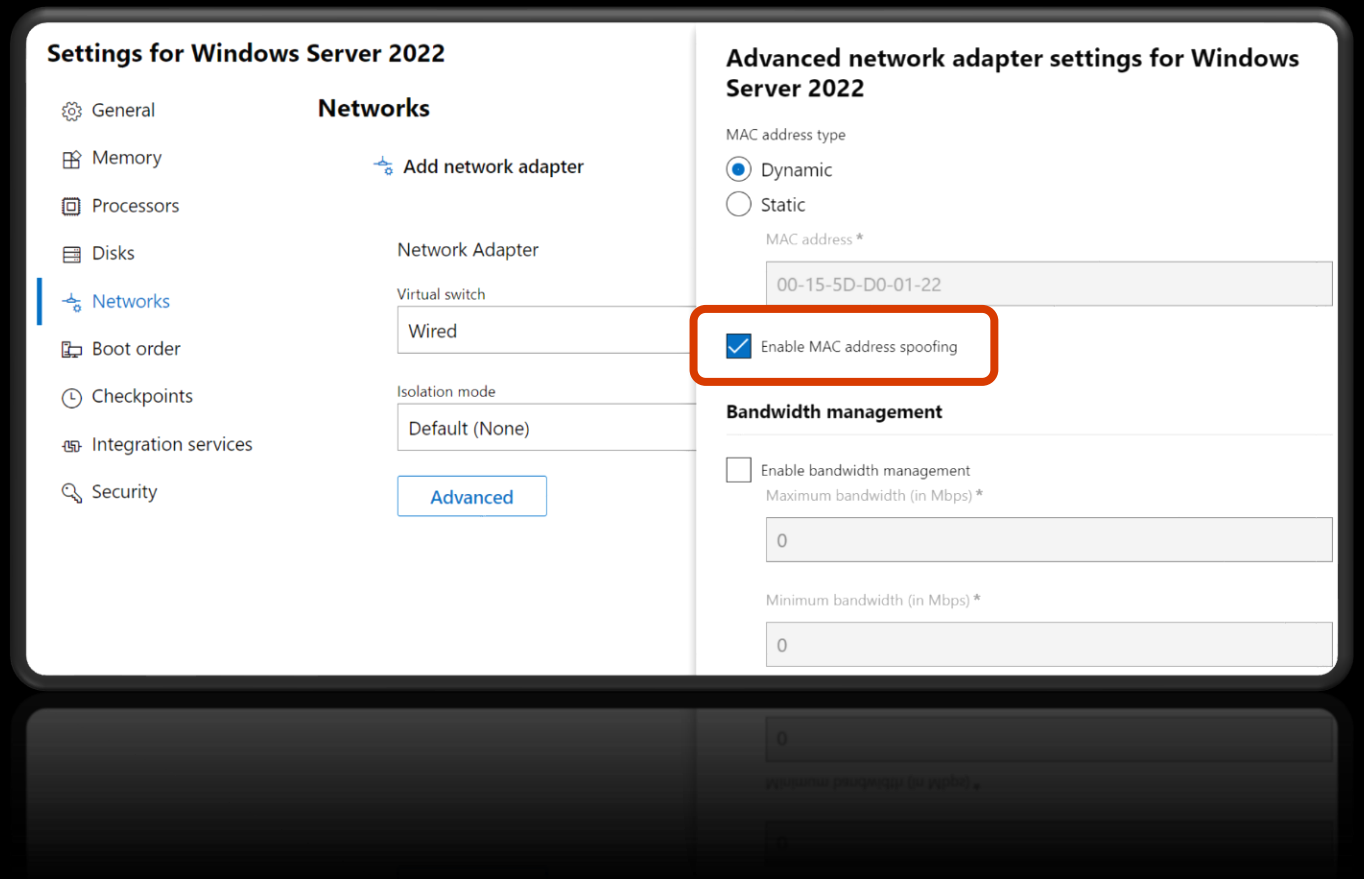
Support for Nested Virtualization with AMD EPYC/Ryzen

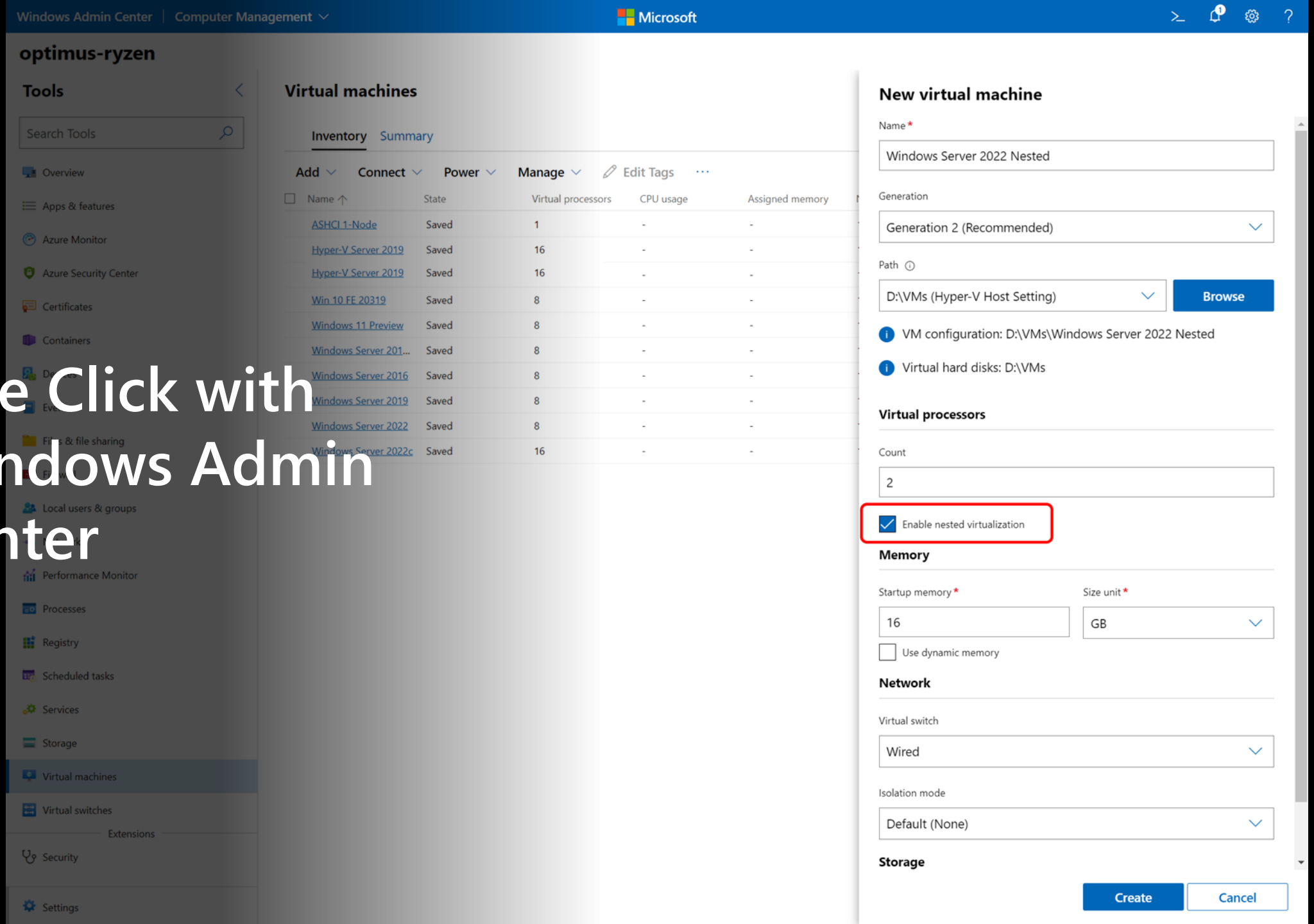
Nested Hyper-V



Nested Hyper-V Considerations

- Within the Nested Hyper-V Environment…
- Static Memory only
  - Dynamic Memory and Hot Add do not work
- Enable MAC Address Spoofing
  - Get-VMNetworkAdapter -VMName <VMName> | Set-VMNetworkAdapter -MacAddressSpoofing On





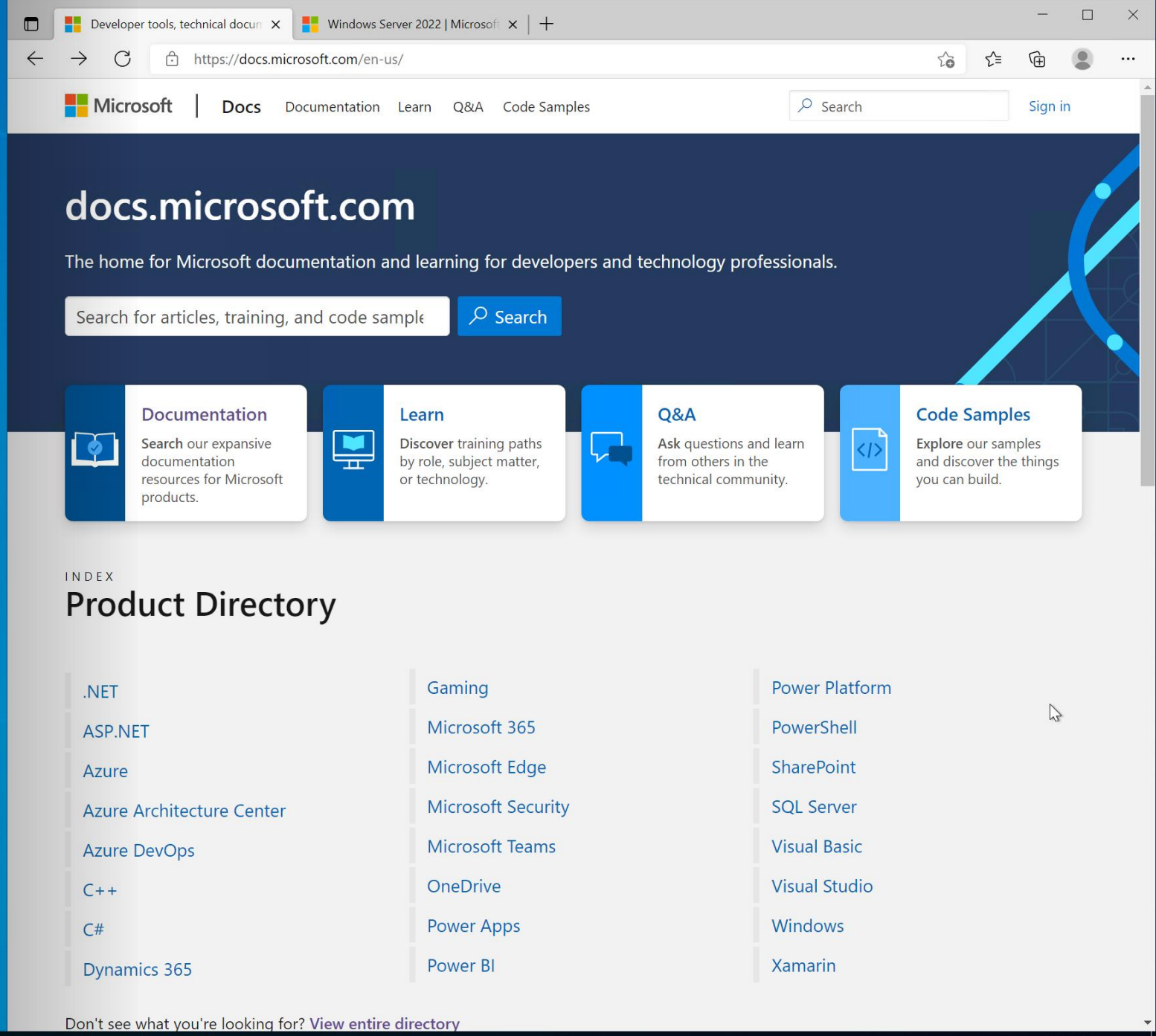
One Click with Windows Admin Center

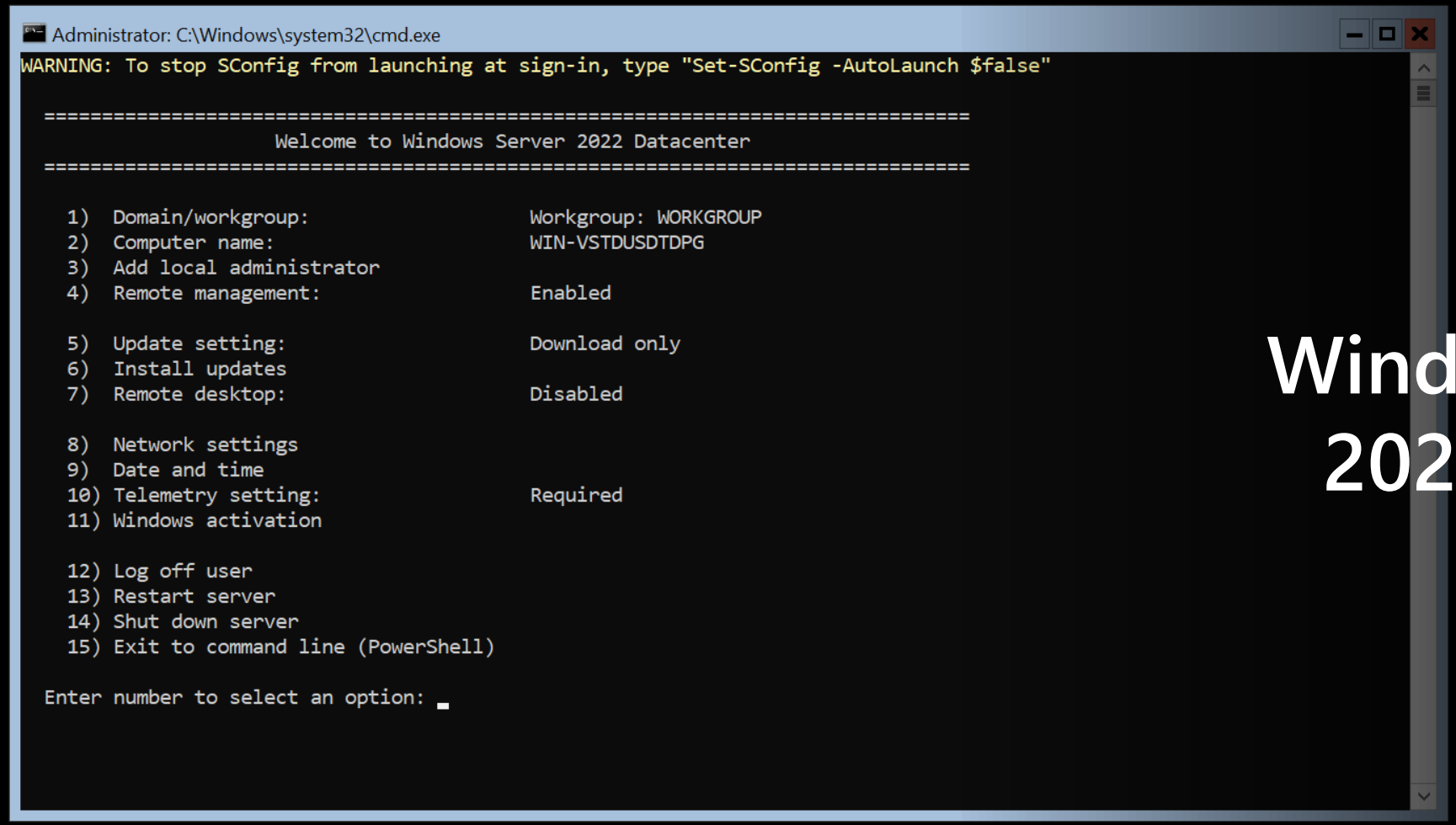
Windows Server 2022 Networking

Networking Performance Improvements

- UDP Performance
  - UDP Segmentation Offload support
  - UDP Receive Side Coalescing
- TCP Performance
  - Support for TCP HyStart++
  - Support for RACK-TLP
- Hyper-V Virtual Switch Receive Side Coalescing
  - Allows the hypervisor network to coalesce packets and process as one larger segment
  - CPU cycles are reduced, and segments will remain coalesced across the entire data path

Windows Server 2022 with Edge





Windows Server 2022 SCONFIG

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

…more on the way…

Application Innovation

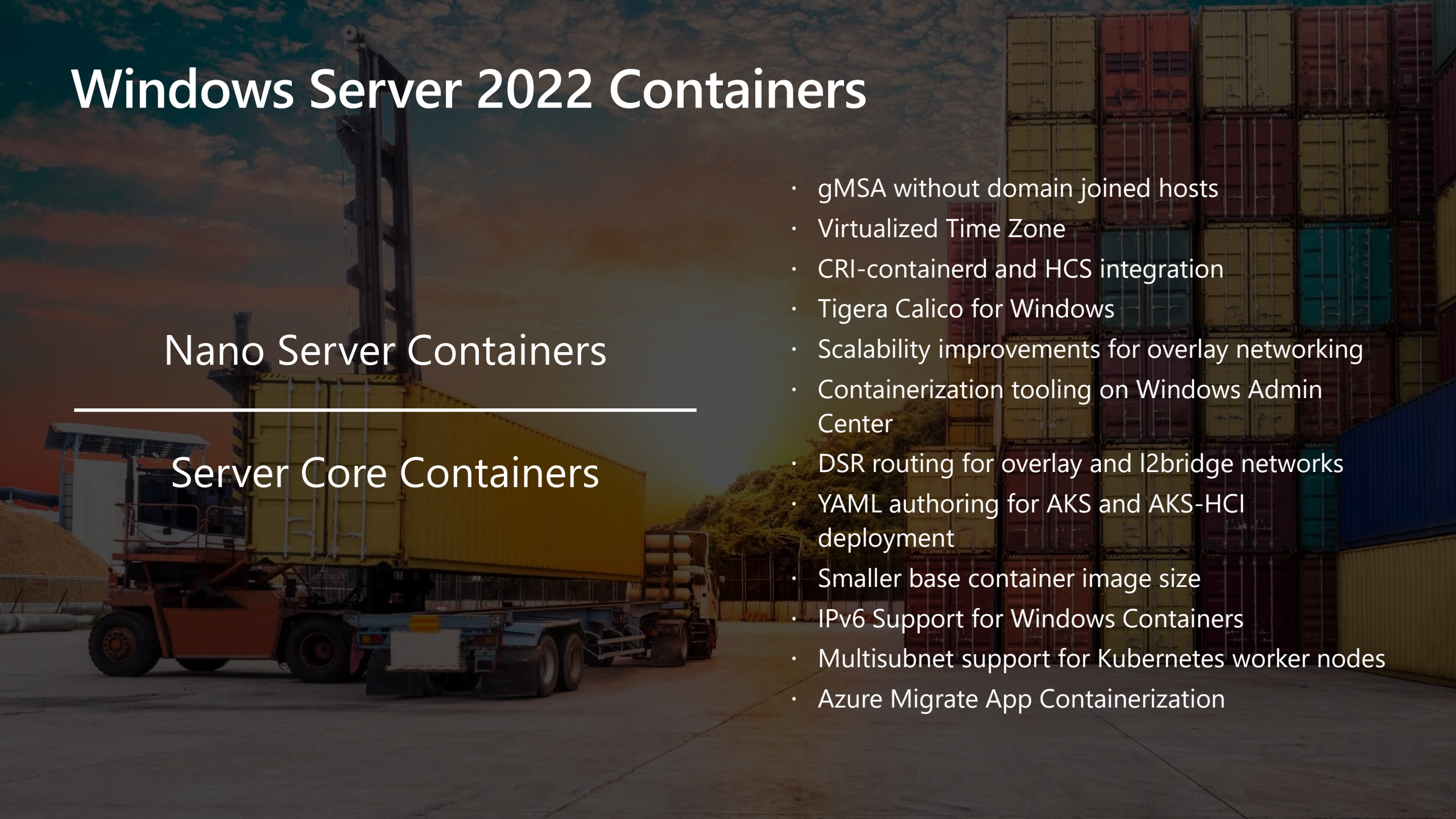
“Microsoft, the container features and open-source integration is great. Our org has what we need to run containers with K8s. At this point we need a longer support lifecycle. 18 months isn’t enough.”

Introducing

5 Year

Container Support

Windows Server 2022 Containers

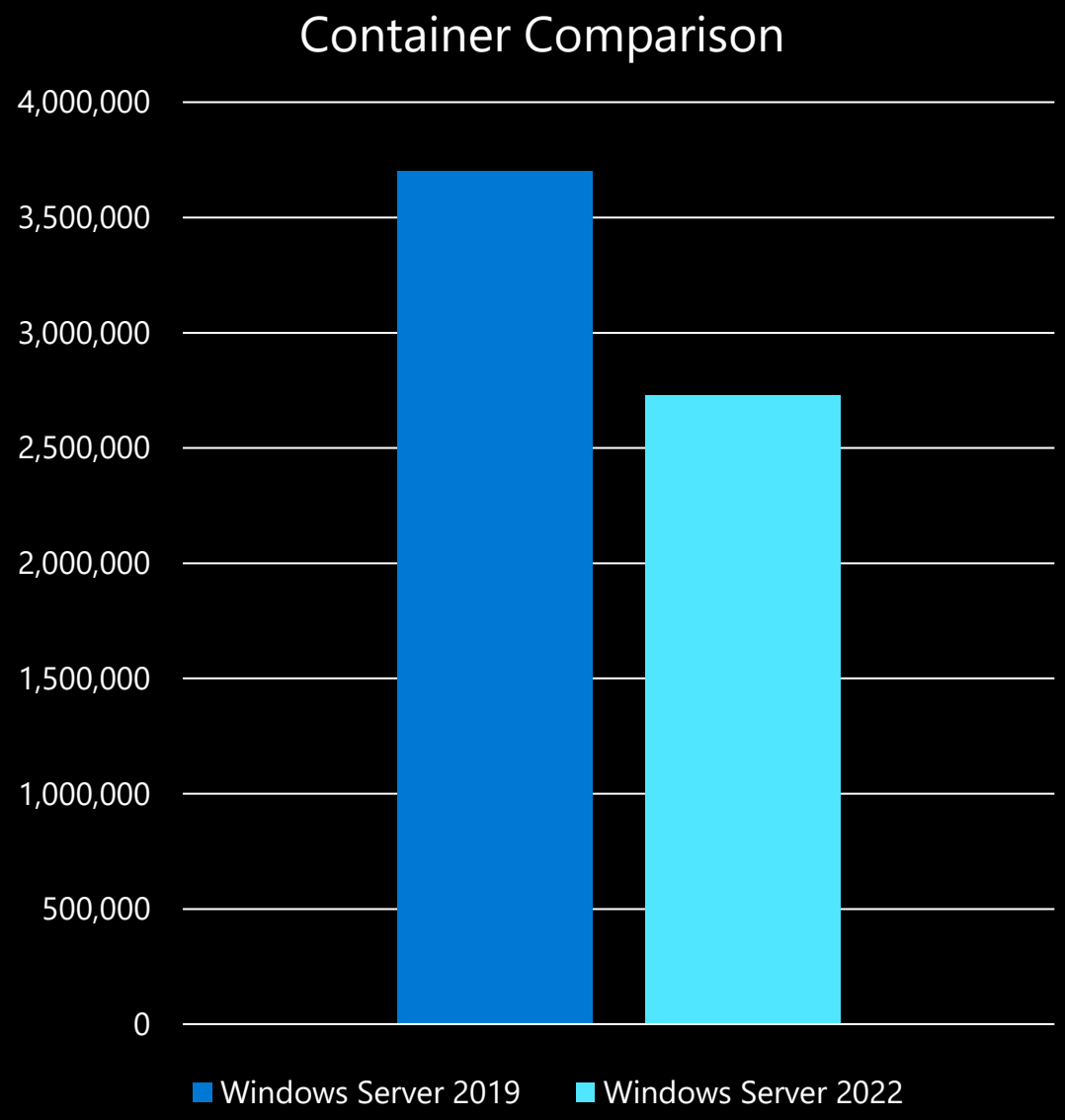


Nano Server Containers

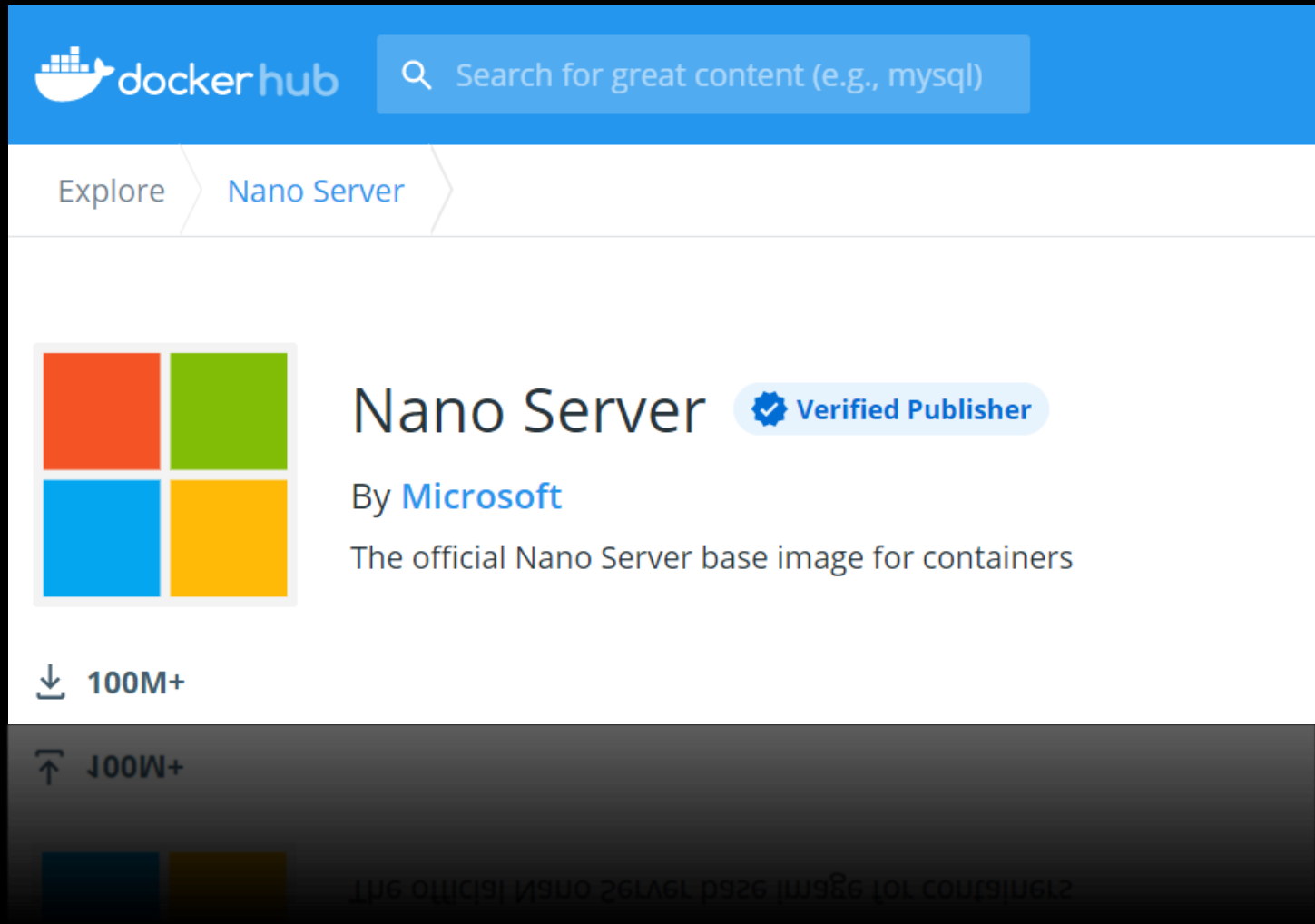
Server Core Containers

- gMSA without domain joined hosts
- Virtualized Time Zone
- CRI-containerd and HCS integration
- Tigera Calico for Windows
- Scalability improvements for overlay networking
- Containerization tooling on Windows Admin Center
- DSR routing for overlay and l2bridge networks
- YAML authoring for AKS and AKS-HCI deployment
- Smaller base container image size
- IPv6 Support for Windows Containers
- Multisubnet support for Kubernetes worker nodes
- Azure Migrate App Containerization

Windows Server Core 2022 Container Size Reduced 1 GB



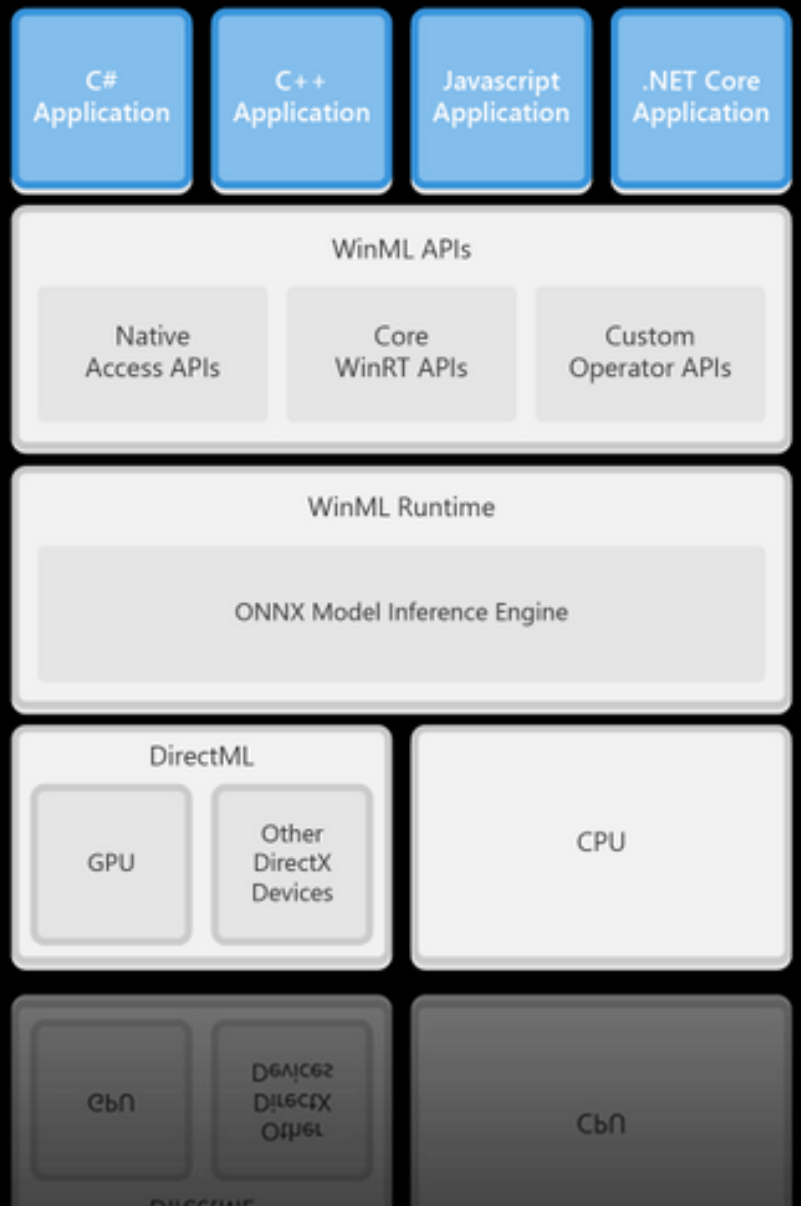
Windows Server 2022 Nano Server <100 MB



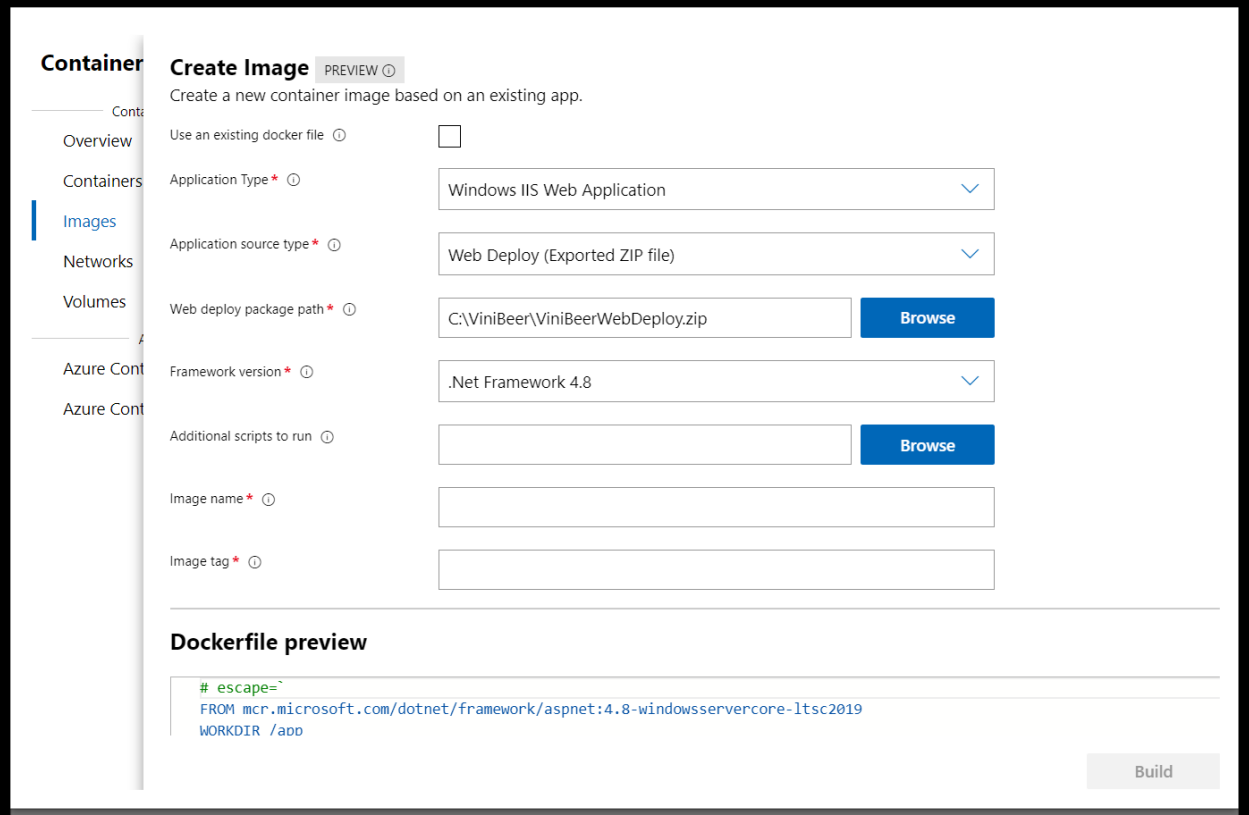
Introducing

Windows Server Base Image

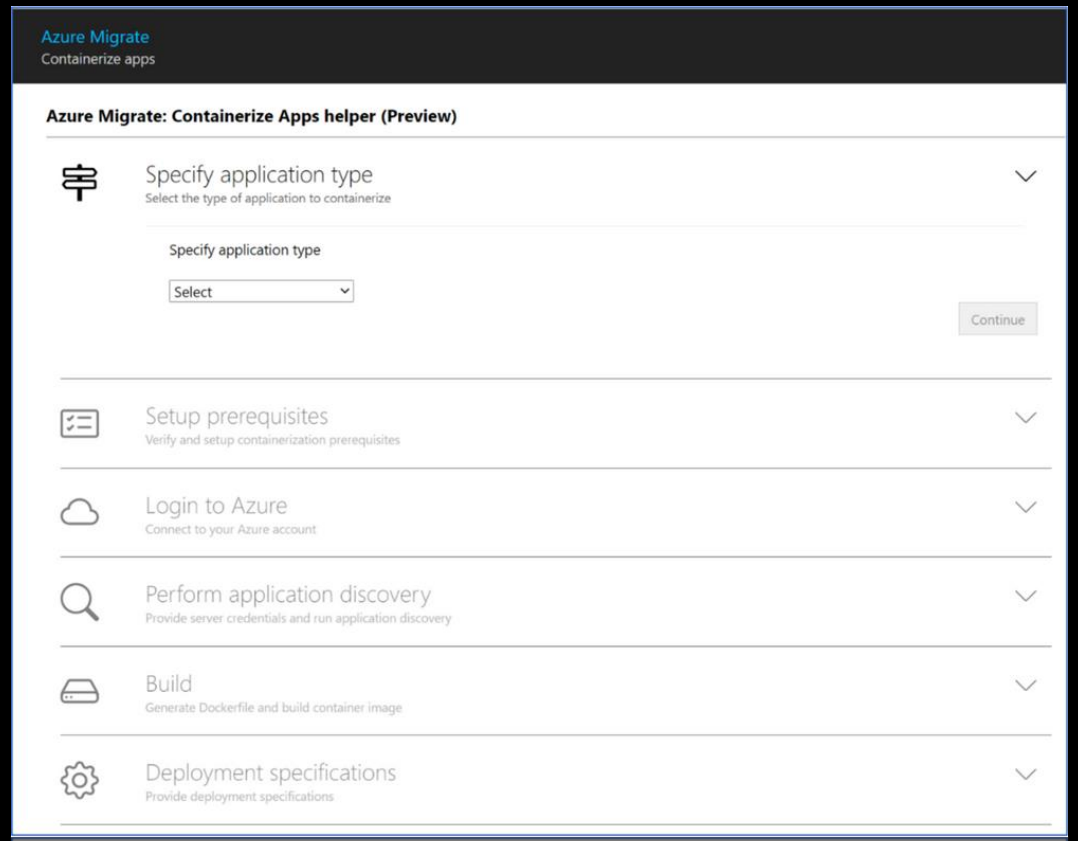
Support for ML and GPU dependent applications via DirectX for Windows Containers



Better tooling for Lift & Shift



Container tool in Windows Admin Center



Azure Migration Containerize App