

Storage Spaces Direct / Azure Stack HCI Neuigkeiten



Carsten Rachfahl

**Microsoft Cloud & Datacenter Management
and Azure MVP, Veeam Vanguard**

Inhalte aus meinen Webinaren: Ignite 2019 News around Azure Stack HCI - Part 1+2



Carsten Rachfahl

**Microsoft Cloud & Datacenter Management
and Azure MVP, Veeam Vanguard**



BRK2138: Discover Azure Stack HCI



Cosmos Darwin
Senior PM, Core OS Engineering

 @cosmosdarwin



Azure Stack Portfolio

Consistently build and run hybrid apps across on-premises, cloud, and edge



Azure Stack Edge

Cloud-managed appliance



Azure Stack HCI

Hyperconverged solution

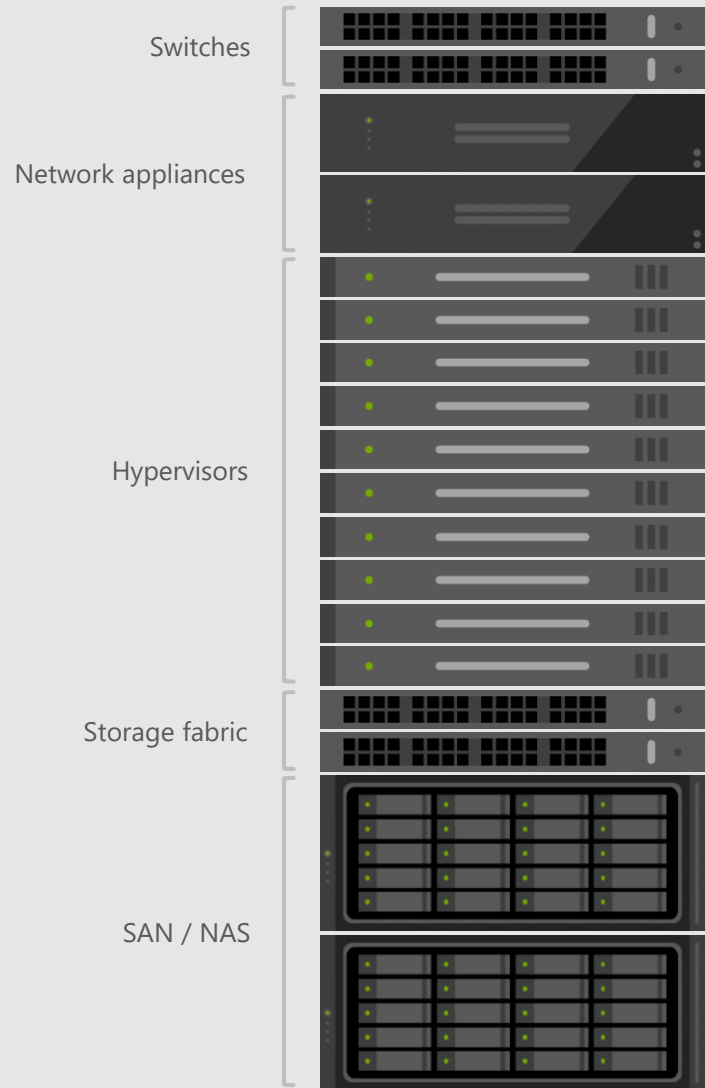


Azure Stack Hub

Cloud-native integrated system

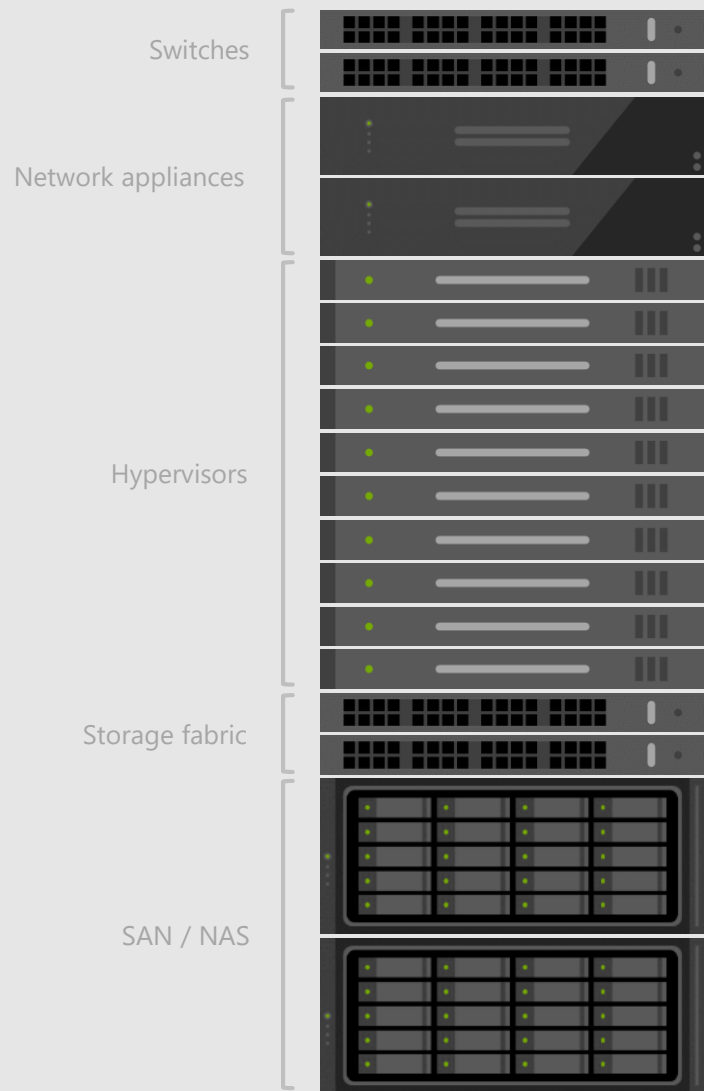
Microsoft Azure Stack HCI is
Hyper-Converged Infrastructure

Before...



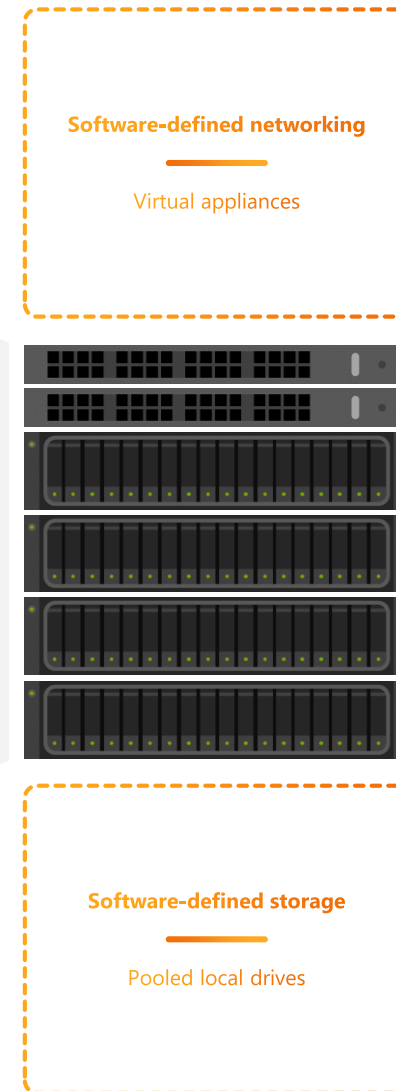
Legacy "three tier" infrastructure

Before...



Legacy "three tier" infrastructure

...after



Hyperconverged infrastructure (HCI)

54%

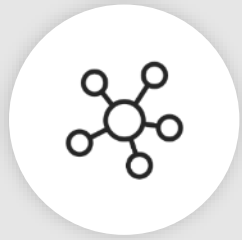
of organizations expect deploying converged/**hyperconverged** infrastructure to be among their **most significant** datacenter modernization investments over the **next 12-18 months**

ESG Data Point of the Week, April 2019
<https://www.esg-global.com/data-point-of-the-week-04-29-19>

+57%

hyperconverged infrastructure investment **year-over-year growth**
from Q4 2017 to Q4 2018, to nearly **\$2B US per quarter**

When to use Azure Stack HCI



Branch office
and edge



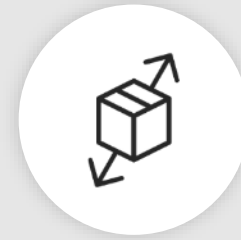
Virtual desktop
infrastructure



High-performance
SQL Server



Trusted enterprise
virtualization



Scale-out
storage



BRK3251: What's next for software-defined storage and networking for Windows Server



Steven Ekren
Senior PM, Core OS Engineering
StevenEk@Microsoft.com



John Marlin
Senior PM, Core OS Engineering
 [@JohnMarlin_MSFT](https://twitter.com/JohnMarlin_MSFT)



Greg Cusanza
Principal PM, Core OS Engineering

BRK3251



Software Defined Storage



Steven Ekren

Senior PM, Core OS Engineering
StevenEk@Microsoft.com



Focus for Software Defined Storage

Safest place....

Continue leading in performance

Enable cutting edge hardware

Best edge host platform

Repair Improvements

Less Data to Resync

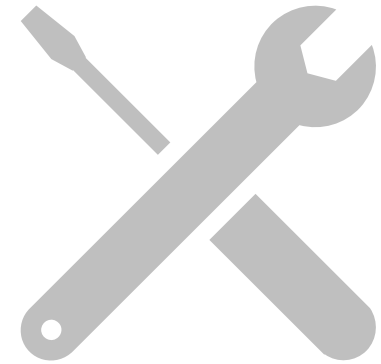
Sub-extent granularity change tracking

User throttle to control repair (Coming soon)

High | Medium | Low | Pause

Insight

Better information on status of repair jobs



Alerting

The screenshot displays the Windows Admin Center interface for Cluster Manager. The top navigation bar shows 'Windows Admin Center Cluster Manager' and the Microsoft logo. The main content area is titled '<computer name>' and is divided into a left-hand 'Tools' sidebar and a central 'Dashboard'.

Tools Sidebar:

- Search Tools
- Dashboard (selected)
- Virtual machines
- Servers
- Volumes
- Drives
- Virtual switches
- Updates
- Diagnostics
- Performance Monitor
- Settings

Dashboard Summary:

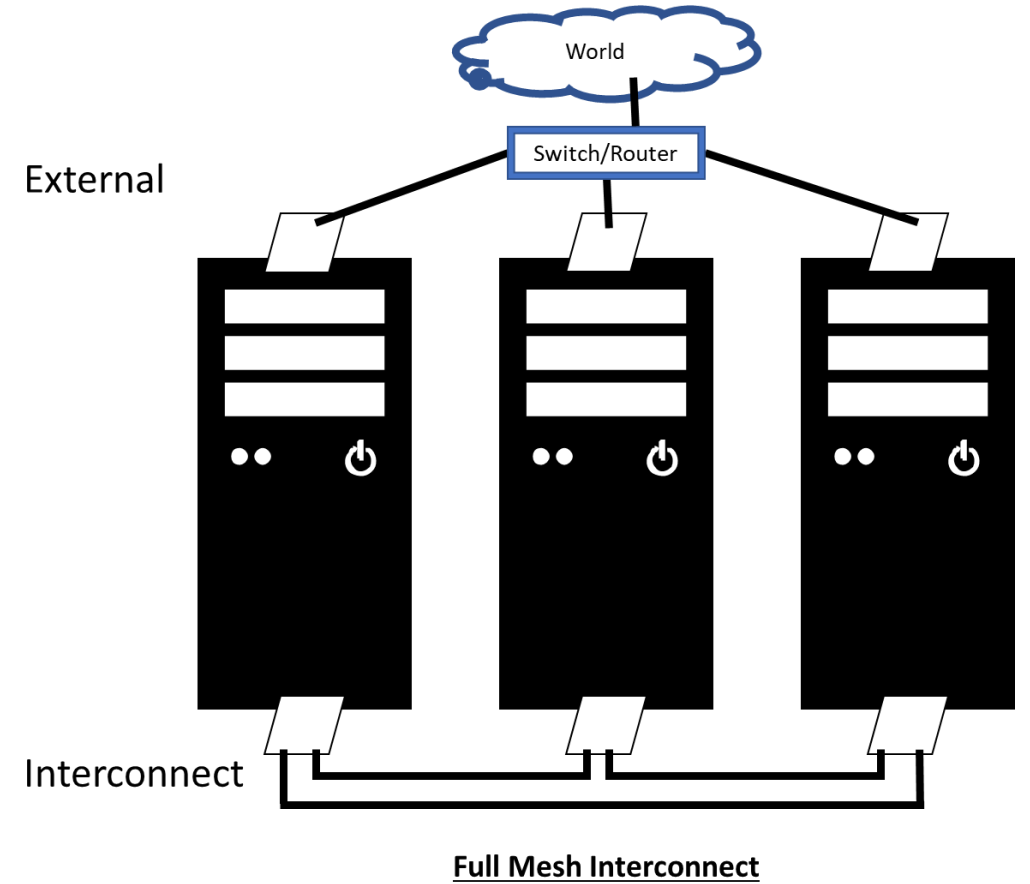
- Alerts (Total 1):** A critical alert is shown for 'CLUSTER KEPLER191010CLU' with the message 'Cluster Validation has found problems'.
- Servers (Total 2):** A status indicator shows 'All servers healthy' with a green checkmark.
- Virtual machines (Total 4):** A status indicator shows 'Running' with the number '4'.
- CPU usage:** Two gauges are visible, showing 21% and 36.9% usage.

Critical Alert Details:

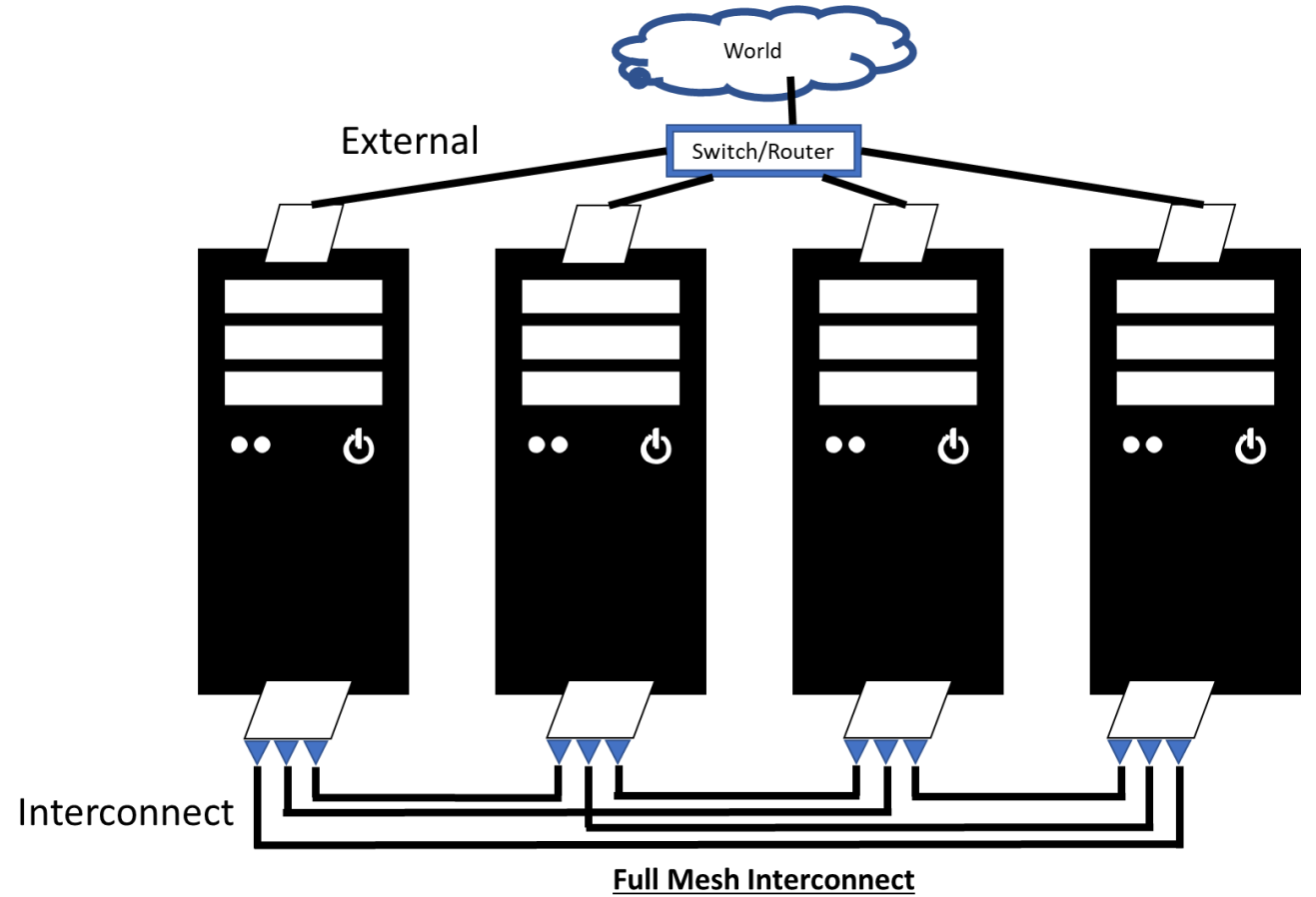
- Alert Type:** Critical Alert
- Cluster Name:** Cluster Kepler191010Clu
- Message:** Cluster Validation has found problems.
- Details:** Cluster Validation has found problems.
- Location:** Not available
- Time:** an hour ago
- Suggestion:** Cluster Validation has found failures in 1 categories of tests. Cluster Configuration: Failed, Hyper-V Configuration: Success, Inventory: Success, Network: Success, Storage: N/A, Storage Spaces Direct: Warning, System Configuration: Warning. See cluster validation report here: 'C:\windows\cluster\reports\Validation Report Test.htm'.

A 'Close' button is located at the bottom right of the alert dialog.

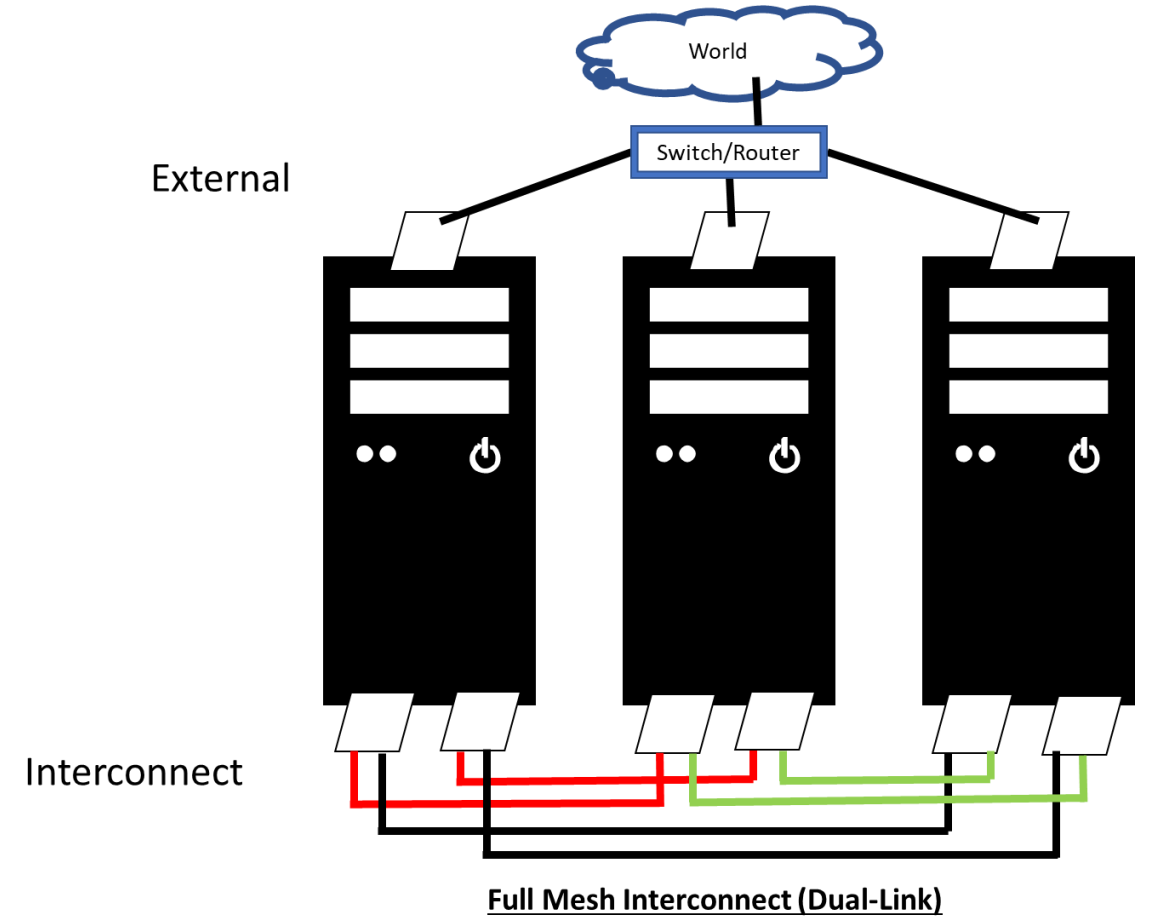
Removing the Interconnect Switch



More Nodes, More Adapters



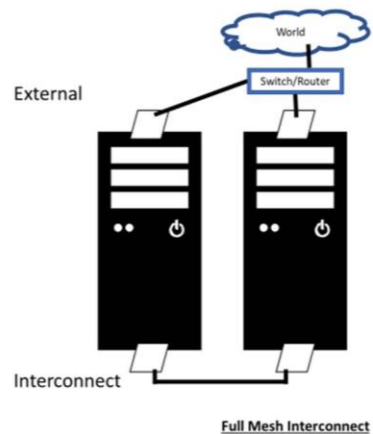
Redundancy for Increased Resiliency



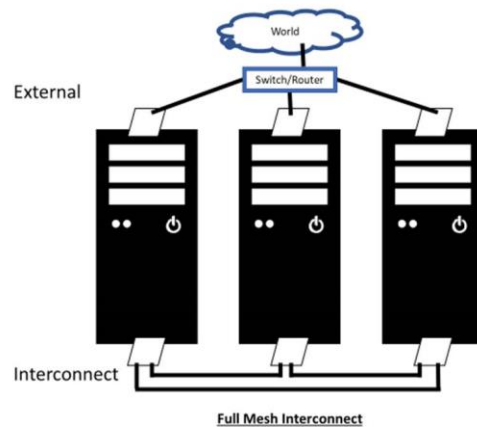
Requirements

Must be full mesh, no bridged or ring topologies
All other requirement for SDDC NICs apply

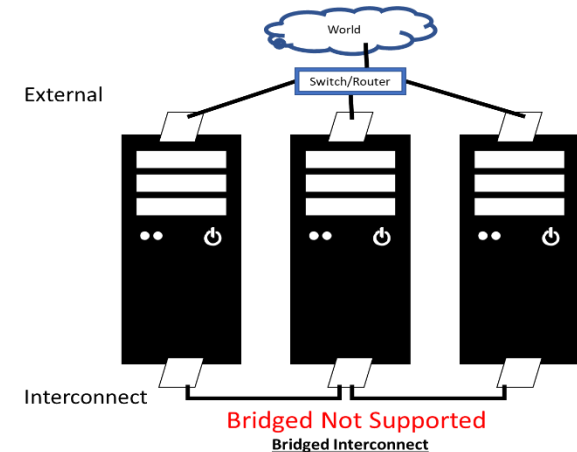
Supported

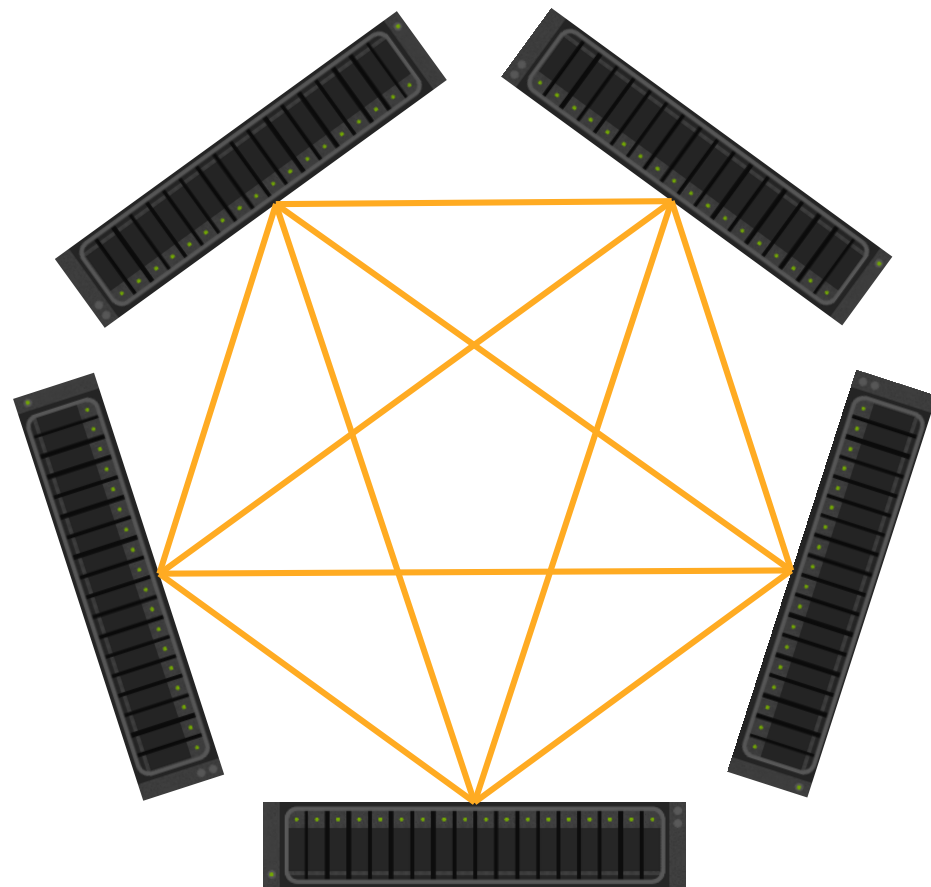


Supported



Don't do it






10+ GbE full mesh connectivity with 5 servers, no high-speed switch required

Disaster Recovery



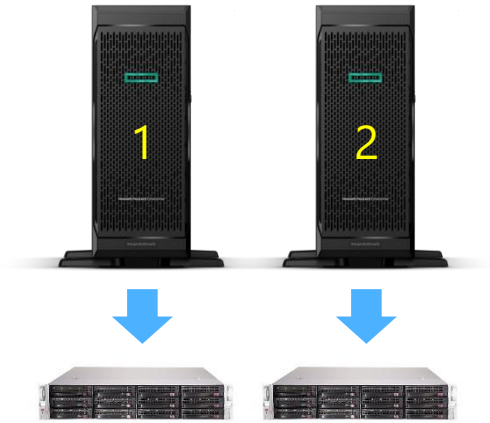
John Marlin

Senior PM, Core OS Engineering

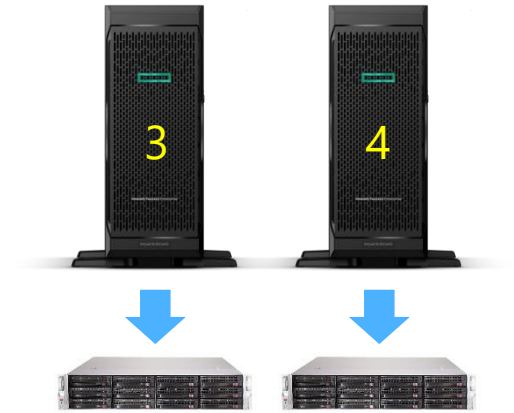
 @JohnMarlin_MSFT



Site A



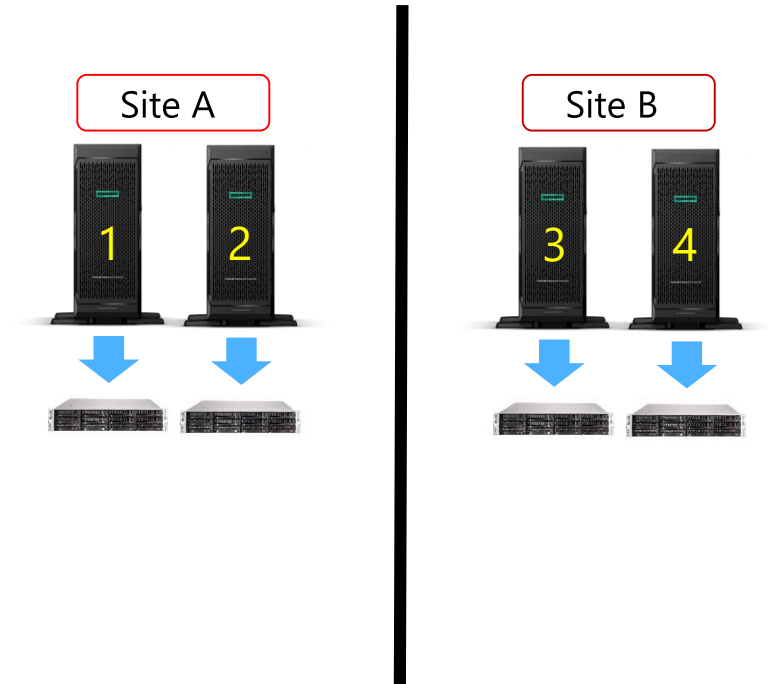
Site B



What's being updated?

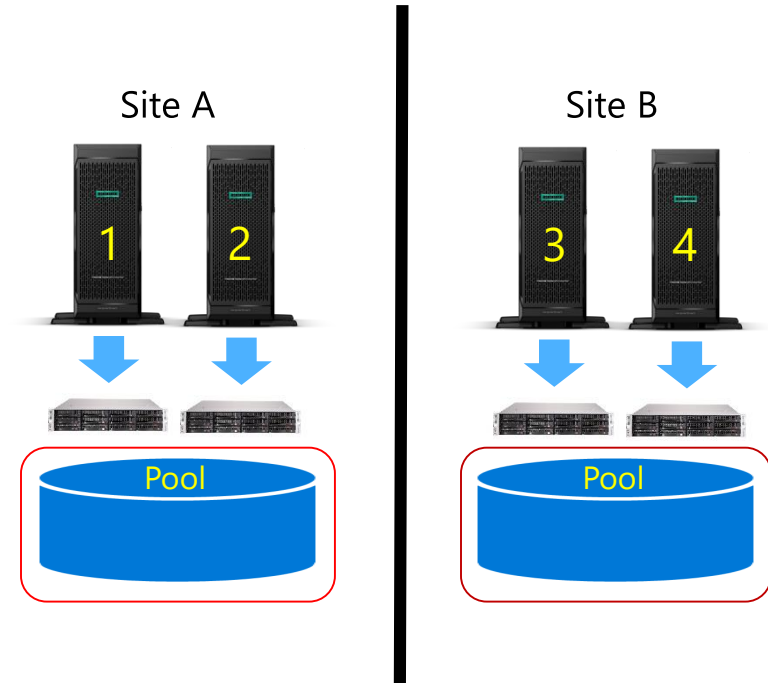
What's being updated

- Autosites



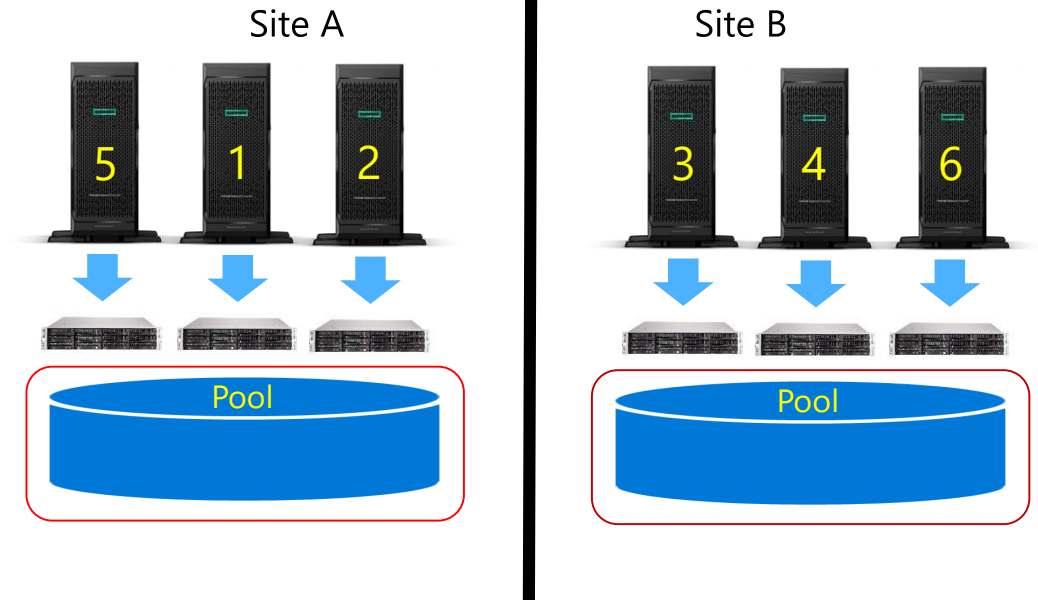
What's being updated

- Autosites
- Multiple pools
- Autopooling by fault domain



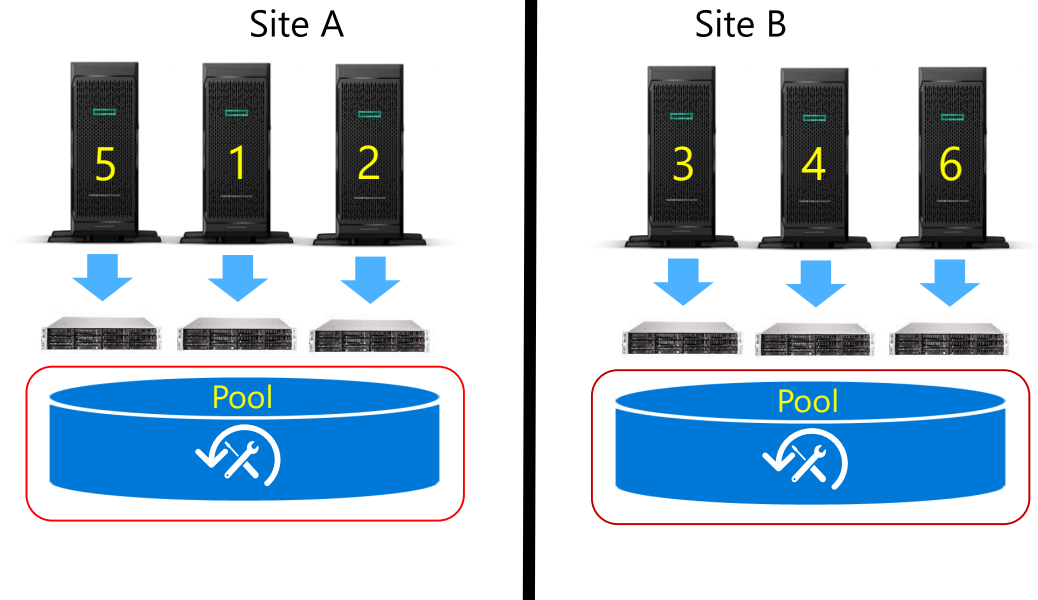
What's being updated

- Autosites
- Multiple pools
- Autopooling by fault domain
- Add nodes / storage



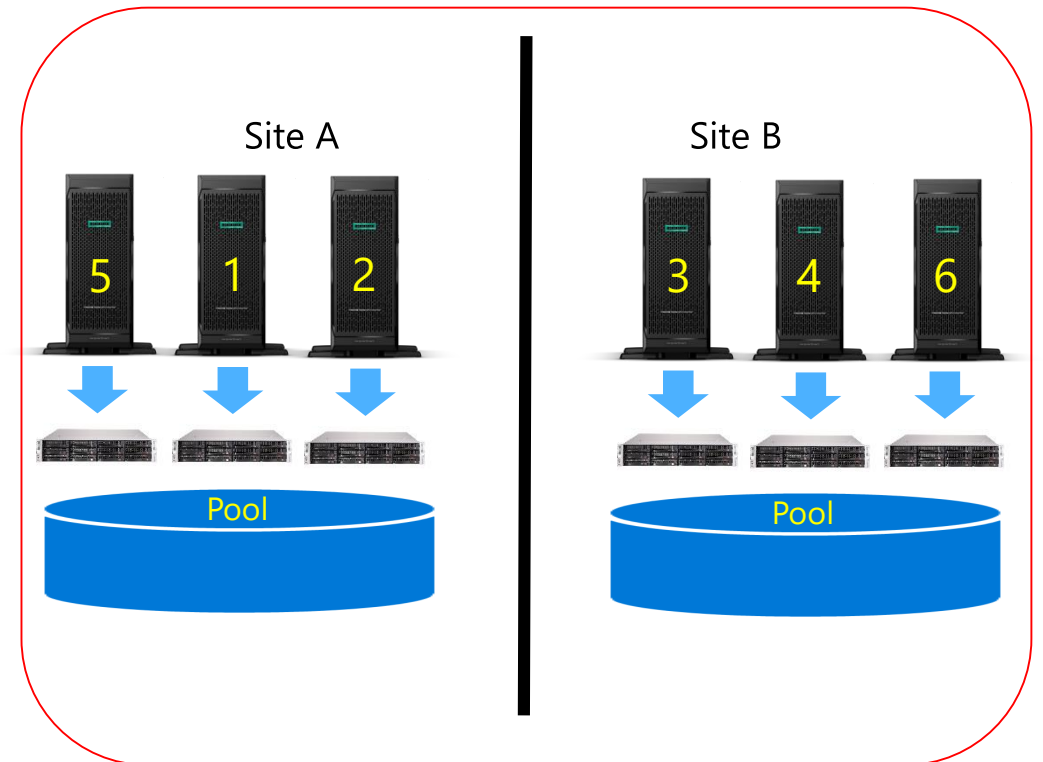
What's being updated

- Autosites
- Multiple pools
- Autopooling by fault domain
- Add nodes / storage
- Health



What's being updated

- Autosites
- Multiple pools
- Autopooling by fault domain
- Health
- Cluster Performance History



Virtual Machine Affinity/AntiAffinity

Keep VMs/Roles together or apart

Site Awareness

Multiple Options:

- Same Node
- Different Node
- Same Fault Domain
- Different Fault Domain

Software Defined Networking



Greg Cusanza
Principal PM, Core OS Engineering



Enterprise-grade software-defined networking in Windows Server

High Performance Data Plane

- ✓ Optimized for 40 Gbit or higher
- ✓ Switch Embedded Teaming
- ✓ RSSv2 / Dynamic VMMQ
- ✓ Host RDMA
- ✓ Guest RDMA
- ✓ Receive Side Coalescing (RSC) in the virtual switch

Highly Available Control Plane

- ✓ Multi-node Network Controller
- ✓ REST API
- ✓ Standards based with VXLAN and OVSDB

Virtual Networking

- ✓ Bring your own IP address space
- ✓ Tenant isolation
- ✓ Distributed router
- ✓ Distributed DHCP
- ✓ iDNS
- ✓ IPv4, IPv6 and dual-stack
- ✓ Virtual network peering
- ✓ Quality of service

Software Load Balancing

- ✓ L3 & L4 Load balancing
- ✓ Network address translation (NAT)
- ✓ Active-active configuration
- ✓ Direct server return
- ✓ East-west optimizations
- ✓ Health probes

High Perf Gateways

- ✓ M:N redundancy
- ✓ IKEv2 Site-to-site VPN
- ✓ GRE tunneling
- ✓ L3 forwarding
- ✓ Multi-tenant
- ✓ BGP with transit routing

Security with Micro-segmentation

- ✓ Hypervisor enforced firewall
- ✓ 3rd party virtual appliances
- ✓ User defined routing
- ✓ Firewall logging
- ✓ Port mirroring
- ✓ Virtual subnet encryption

Scale

- ✓ Multi-rack, multi-subnet

Migration

- ✓ Live migrate VMs across physical networks

Monitoring and Management

- ✓ System Center Virtual Machine Manager (SCVMM) integration
- ✓ System Center Operations Manager (SCOM) Management Pack (MP)
- ✓ 100% Scripting-Friendly (PowerShell)
- ✓ Egress bandwidth metering
- ✓ Windows Admin Center integration
- ✓ 3rd party management – 5nine Cloud Manager

Enterprise-grade software-defined networking in Windows Server

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- ✓ 3rd party management – 5nine Cloud Manager

sa18n22c.sa18.nttest.microsoft.com

- ## Tools
- Search Tools
- Dashboard
 - Compute
 - Virtual machines
 - Servers**
 - Storage
 - Volumes
 - Drives
 - Networking
 - Virtual switches
 - Virtual networks
 - Access control lists
 - Logical networks
 - Settings

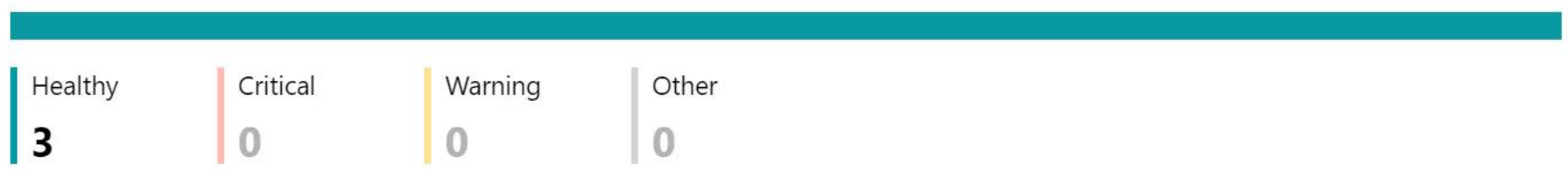
Servers PREVIEW ⓘ Feedback ⓘ

Summary Inventory

Status

3

Total servers



Alerts (Total 0)

Removing Deployment Blockers

Now available

- Workloads connected to SDN can co-exist with non-SDN workloads **on the same host**
- Reduced the number of networks to configure
- Improvements to SDN Express for deployment on Github

Coming weeks

- SDN deployment integrated into Windows Admin Center UI

Future

- Making BGP optional
- Reducing SDN overhead with fewer SDN infrastructure VMs



BRK3124 - Azure Stack HCI Jumpstart your deployment



Carmen Crincoli
Senior PM, Microsoft

 @CarmenCrincoli























Dan Cuomo
Senior PM, Microsoft

 @Dan2_2023

BRK3124



Find solutions from your preferred vendor

154 solutions

20 partners

Deploying Azure Stack HCI



Scenarios

Hyperconverged + SDN

- ✓ Hyper-V
- ✓ Failover Clustering
- ✓ Storage Spaces Direct
- ✓ Software-Defined Networking

Hyperconverged

- ✓ Hyper-V
- ✓ Failover Clustering
- ✓ Storage Spaces Direct
- Software-Defined Networking

Storage Cluster

- Hyper-V
- ✓ Failover Clustering
- ✓ Storage Spaces Direct
- Software-Defined Networking

Compute Cluster

- ✓ Hyper-V
- ✓ Failover Clustering
- Storage Spaces Direct
- Software-Defined Networking

Compute Cluster + SDN

- ✓ Hyper-V
- ✓ Failover Clustering
- Storage Spaces Direct
- ✓ Software-Defined Networking

Classic Failover Cluster

- Hyper-V
- ✓ Failover Clustering
- Storage Spaces Direct
- Software-Defined Networking

Roadmap: 30 steps in 5 stages

Stage 1:

Get Started

- 1.1 Prerequisites
- 1.2 Add servers
- 1.3 Solution compliance
- 1.4 Install Windows features
- 1.5 Install Windows updates
- 1.6 Join domain
- 1.7 Restart

Stage 2:

Networking

- 2.1 Verify network adapters
- 2.2 Select management
- 2.3 Edit adapter properties
- 2.5 Create virtual switch
- 2.6 Enable RDMA

Stage 3:

Clustering

- 3.1 Validate cluster
- 3.2 Create cluster
- 3.3 Quorum witness
- 3.4 Specify sites
- 3.5 Cluster settings

Stage 4:

Storage

- 4.1 Verify drives
- 4.2 Clean drives
- 4.3 Validate storage
- 4.4 Storage Spaces Direct
- 4.5 Create file server

Stage 5:

SDN

- 5.1 Intro to SDN
- 5.2 SDN infrastructure VMs
- 5.3 SDN infrastructure network
- 5.4 Network Controller
- 5.5 Load Balancer
- 5.6 Gateway
- 2.7 Summary



Available today in Preview



On the roadmap

Demo

Azure Stack HCI
Hyperconverged Deployment





BRK3123 - What's new for Azure Stack HCI 45 things in 45 minutes



Greg Cusanza
Principal PM, Microsoft

 @microsoft_sdn



Cosmos Darwin
Senior PM, Microsoft

 @cosmosdarwin



45 THINGS IN 45 MINUTES

Over 150 solutions, up from 75

First solutions with AMD EPYC and PCIe 4.0

Welcome Cisco and other partners!

Workload-optimized solutions

VLAN-based networking and SDN side-by-side

Windows Admin Center version 1910

Dell-EMC OpenManage extension version 1.0

HPE Azure Stack HCI extension (Preview)

Hyper-V live migration to/from any server/cluster

Easily identify noisy VMs

Deploy Azure Stack HCI (Preview)

Deploy SDN too! (coming very soon)

Modify cluster settings

Set up cloud, file share, or USB witness

Many more enhancements...!

1,000,000 batch requests/sec

Storage Review: "fastest we've seen"

Faster networking with fewer cycles/byte

Advanced offloads – dynamic VMMQ

High performance SDN gateways

Background transport (LEDBAT)

Mirror-accelerated parity is 2X faster

Performance Monitor for HCI

Packet monitoring

Multiple exabytes on ReFS

Deduplication and compression for ReFS

Up to 16 PB per cluster in vNext

Reengineered resync engine in vNext

Stretch HCI clustering in vNext

Span sites with SDN

Nested resiliency

Switchless with 3+ servers (full mesh)

Azure Monitor + Health Service

Azure hybrid services

Azure Network Adapter

SDN site-to-site to Azure

Azure Extended Network

SDN Load Balancing and public IP

Safer Internet with HTTP/2

More secure clustering

BitLocker encryption in vNext

Shielded virtual machines enhancements

Core scheduler

High accuracy time

[See Hyper-V roadmap]

5



VLAN-based networking and SDN side-by-side

Windows Admin Center - Hyper-Converged Cluster Manager

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Settings for Contoso-App1-DB

Tools

- Dashboard
- Compute
 - Virtual Machines
 - Virtual Switches
 - Servers
- Storage
 - Volumes
 - Drives
- Networking
 - Virtual Networks
 - Access Control List
 - Logical Networks
 - Gateway Connections
 - SDN Monitoring
- Tools
 - Updates
 - Diagnostics
- Extensions
 - SDN ACL Audit
- Settings

General

Memory

Processors

Disks

Networks *

Boot order

Checkpoints

Security

Networks

Some settings cannot be modified because the virtual machine is running.

+ Add network adapter

Remove

Network Adapter

Virtual switch

SDNSwitch

Connect to

Virtual Network

Virtual Network

Contoso-BackEnd

Virtual Subnet

BackEnd [10.0.2.0/24]

IP Addresses

+ Add IP Address

Remove

IP Address *

10.0.2.100

Advanced

Save network settings | Discard changes | Close

9



Hyper-V live migration to/from any server/cluster

sme-cluster21.redmond.corp.microsoft.com

Tools

Dashboard

Compute

Virtual machines

Servers

Storage

Volumes

Drives

Networking

Virtual switches

Tools

Updates

Diagnostics

Settings

Virtual machines

Help protect your VMs from disasters by using Azure Site Recovery. [Update now](#)

Summary **Inventory**

[+ New](#)
[Rename](#)
[Delete](#)
[Settings](#)
[Start](#)
[Turn off](#)
[Shut down](#)
[Save](#)
[More](#)

Name	State	Host server	CPU usage	Memory pressure	Memory demand	Assigned memory
NingTestVm1	Stopped	sme-rs5-21	-	-	-	-
<input checked="" type="checkbox"/> vm-ws2019-1	Running	sme-rs5-21	1%	25%	512 MB	2 GB

Move Virtual Machine

The virtual machine will be moved using the 'best practice' available for its current hosting. Running virtual machines will operate normally during the move.

Move the virtual machine to a

Failover Cluster Server

Select cluster:*

Select cluster node:

[Add new cluster](#)

New path

Browse

i The VM configuration and virtual hard disks are saved under C:\ClusterStorage\Volume1\vm-ws2019-1

Move

Cancel

10

Easily identify noisy VMs

hci-cluster.corp.contoso.com

Feedback 🗨️

Tools ⌵

Search Tools 🔍

- Dashboard
- Compute
 - Virtual machines
 - Servers
- Storage
 - Volumes**
 - Drives
- Networking
 - Virtual switches
- Tools
 - Updates
 - Diagnostics
 - Performance Monitor

Settings ⚙️

Volumes

Summary **Inventory**

+ Create 📁 Open ↗️ Expand 🔄 Online ⏴ Offline 🗑️ Delete 12 items 🔄 Search 🔍

<input type="checkbox"/>	Name ↑	Status	File system	Resiliency	Size	Storage usage	IOPS
<input type="checkbox"/>	App1	✔️ OK	CSVFS_ReFS	Three-way mirror	1 TB	1% <div><div style="width: 1%;"></div></div>	0
<input type="checkbox"/>	App2	✔️ OK	CSVFS_ReFS	Three-way mirror	1 TB	1% <div><div style="width: 1%;"></div></div>	0
<input type="checkbox"/>	Backup	✔️ Needs repair	CSVFS_ReFS	Three-way mirror	1 TB	6% <div><div style="width: 6%;"></div></div>	0
<input type="checkbox"/>	ClusterPerformanceHistory	✔️ OK	ReFS	Three-way mirror	55.9 GB	3% <div><div style="width: 3%;"></div></div>	0
<input type="checkbox"/>	Contoso-HR	✔️ Needs repair	CSVFS_ReFS	Three-way mirror	1 TB	30% <div><div style="width: 30%;"></div></div>	0
<input type="checkbox"/>	Contoso-Marketing	✔️ Needs repair	CSVFS_ReFS	Three-way mirror	1 TB	84% <div><div style="width: 84%;"></div></div>	0
<input type="checkbox"/>	Contoso-Sales	❌ Needs repair	CSVFS_ReFS	Three-way mirror	1 TB	98% <div><div style="width: 98%;"></div></div>	0
<input type="checkbox"/>	DevTest	✔️ OK	CSVFS_ReFS	Three-way mirror	1 TB	6% <div><div style="width: 6%;"></div></div>	0
<input type="checkbox"/>	Log	⚠️ Needs repair	CSVFS_ReFS	Three-way mirror	1 TB	90% <div><div style="width: 90%;"></div></div>	0
<input type="checkbox"/>	NY1-WebStor	✔️ Needs repair	CSVFS_ReFS	Three-way mirror	1 TB	42% <div><div style="width: 42%;"></div></div>	0
<input type="checkbox"/>	NY2-WebStor	✔️ Needs repair	CSVFS_ReFS	Three-way mirror	1 TB	47% <div><div style="width: 47%;"></div></div>	0
<input type="checkbox"/>	SQL-Finance	✔️ OK	CSVFS_ReFS	Three-way mirror	1 TB	11% <div><div style="width: 11%;"></div></div>	2.44 k

12



Deploy SDN too!
(coming very soon)

Welcome to Microsoft SDN GitHub Repo

This repo includes scripts, templates, and sample switch configurations to aid admins in deploying the Windows Server 2016 Software Defined Networking (SDN) Stack and connecting it to their existing network topologies. It also includes sample diagnostics and examples for attaching Windows Container endpoints to a virtual network in addition to other tenant workflows.

More details can be found on the [SDN TechNet Topic](#)

The first step in any SDN Deployment involves planning and working with a network administrator to ensure the correct IP subnets and VLANs are used as well as switch port configuration settings (e.g. VLANs to trunk, possibly DCB settings) which connect the Hyper-V Hosts (physical servers) to the physical network. To plan and deploy Microsoft SDN, refer to the following topics on Microsoft TechNet:

- [Plan a Software Defined Network Infrastructure](#)
- [Deploy a Software Defined Network Infrastructure](#)

SDN Fabric Deployment Options

The Windows Server 2016 (WS2016) SDN Stack consists of several new services and roles, not least of which is the Network Controller. The first step in the deployment is choosing the method by which you will install and configure the Network Controller. This can be done in a number of ways:

- System Center Virtual Machine Manager (SCVMM) 'VMMExpress' PowerShell scripts
- **(recommended)** 'SDNExpress' PowerShell module and script.
- SCVMM Console (GUI) Configuration and Service Template Deployment

SDNExpress

IMPORTANT: SDN Express has undergone many simplifications and improvements in the latest release that will make it more reliable and easier to use! If you have used SDN Express before, be sure to update your config files to use the new format. If you are new to SDN express, then just download this repository to a local folder on one of your SDN hosts (Windows Server 2016 or 2019) and run `./SDNExpress.ps1` for an interactive UI to help define your configuration and deploy!

The SDNExpress scripts will deploy the entire SDN Fabric including Network Controller, Software Load Balancer, and Gateway. The script will use a configuration file as input which defines the IP subnet prefixes, VLANs, credentials, Hyper-V Host servers, and BGP Peering info required by the SDN Fabric. At a minimum, a user will need to download the SDNExpress scripts to a host from which deployment will occur. The MultiNodeSampleConfig.psd1 configuration file can be copied and

[Introduction](#)[VM Creation](#)[Management Network](#)[Provider Network](#)[Network Controller](#)[Software Load Balancer](#)[Gateways](#)[BGP](#)[Review](#)

Welcome to the SDN Express deployment wizard

For additional information on any of these steps, click on the Docs link below. Before you can complete this wizard you must perform some prerequisite configuration steps in your network:

- Allocate a block of static IP addresses from your management subnet for each Network Controller, Mux and Gateway VM to be created.
- Allocate a subnet and vlan for Hyper-V Network Virtualization Provider Addresses (HNV PA).
- Allocate a set of subnets for Private VIPs, Public VIPs and GRE VIPs. Do not configure these on a VLAN, instead enable them to be advertised by SDN through BGP.
- Configure HNV PA network's routers for BGP, with a 16-bit ASN for the router and one for SDN. SDN should peer with the loopback address of each router.

Physical switch configuration examples are [available on Github](#).

In addition you will need to have the following ready:

- A set of Hyper-V hosts configured with a virtual switch.
- A virtual hard disk containing Windows Server 2016 or 2019, Datacenter Edition.
- An Active Directory domain to join and credentials with Domain Join permission.
- Domain credentials with DNS update and host administrator privileges.

When you have completed the above you can proceed by clicking Next.

Help make SDN Express better by [providing feedback](#).

For additional help and guidance, refer to the [Plan SDN topic on docs.microsoft.com](#).

[Back](#)[Next](#)

Cluster Creation - Windows Adm x +

← → ↻ 🔒 https://localhost:6516/cluster-creation ☆ 🏠 👤 😊 ⋮

Windows Admin Center Cluster Creation Microsoft > 🔔 ⚙️ ?

Choose the type of cluster to create

The cluster type determines which server features we'll install and configure in the next steps.

Hyperconverged

- ✓ Failover Clustering
- ✓ Hyper-V
- ✓ Storage Spaces Direct
- Software-Defined Networking

Hyperconverged + SDN

- ✓ Failover Clustering
- ✓ Hyper-V
- ✓ Storage Spaces Direct
- ✓ Software-Defined Networking

Compute cluster

- ✓ Failover Clustering
- ✓ Hyper-V
- Storage Spaces Direct
- Software-Defined Networking

Storage cluster

- ✓ Failover Clustering
- Hyper-V
- ✓ Storage Spaces Direct
- Software-Defined Networking

Compute cluster + SDN

- ✓ Failover Clustering
- ✓ Hyper-V
- Storage Spaces Direct
- ✓ Software-Defined Networking

Classic failover cluster

- ✓ Failover Clustering
- Hyper-V
- Storage Spaces Direct
- Software-Defined Networking

Create

Failover Clustering: Group servers together to increase the availability of virtual machines or apps. If a clustered server goes down, its workloads move to another server in the cluster, a process known as failover. This lets you apply updates or handle unexpected failures with a minimum of disruption.

Hyper-V: Flexibly share computing resources through hardware virtualization. Run multiple Windows or Linux operating systems side by side, isolated from each other, to avoid problems such as a crash affecting the other workloads, or to give different people access to different systems.

Storage Spaces Direct: Build software-defined storage from locally-attached flash and hard drives, eliminating the need for separate SAN or NAS arrays. Ensure fault tolerance with distributed software resiliency, increase performance with read/write caching, and save space with deduplication and compression.

Software-Defined Networking: Virtualize your network to meet the evolving needs of your apps. Prevent security vulnerabilities from spreading with micro-segmentation, access-control lists, and encrypted networks, and reduce costs with virtual appliances like the software load balancer and software gateway.

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Performance Monitor for HCI

Tools

Search Tools

- Dashboard
- Compute
 - Virtual machines
 - Servers
- Storage
 - Volumes
 - Drives
- Networking
 - Virtual switches
- Tools
 - Azure Monitor
 - Updates
 - Diagnostics
 - Performance Monitor**

Performance Monitor > Untitled workspace * PREVIEW

Pause Resume Save Settings

Source: tk5-3wp18r2107, tk5-3wp18r2

Object: **ReFS**

Instance: \\?\Volume{271e1546-8127-41}

Add counter



- Search
- Select All
 - Allocation of Data Clusters on Fast Tier...
 - Allocation of Data Clusters on Slow Tie...
 - Allocation of Metadata Clusters on Fast...
 - Allocation of Metadata Clusters on Slo...
 - Checkpoint latency (100 ns)
 - Checkpoints/sec
 - Compacted Container Fill Ratio (%)
 - Compaction Failure Count
 - Compaction read latency (100 ns)
 - Compaction write latency (100 ns)
 - Compactions failed due to ineligible co...
 - Compactions failed due to max fragme...
 - Container Destages From Fast Tier/sec
 - Container Destages From Slow Tier/sec
 - Container Move Failure Count
 - Container Move Retry Count
 - Container moves failed due to ineligibl...
 - Current Fast Tier Data Fill Percentage
 - Current Fast Tier Data Fill Percentage**
 - Current data fill percentage for the fast tier.
 - Data In Place Write Clusters/sec
 - Delete Queue entries
 - Dirty metadata pages
 - Dirty table list entries
 - Fast tier destage read latency (100 ns)
 - Fast tier destage write latency (100 ns)
 - Fast Tier Destaged Container Fill Ratio ...
 - Log fill percentage
 - Log writes/sec
 - Slow tier destage read latency (100 ns)
 - Slow tier destage write latency (100 ns)
 - Slow Tier Destaged Container Fill Ratio...
 - Total Allocation of Clusters/sec
 - Tree update latency (100 ns)
 - Tree updates/sec
 - Trim latency (100 ns)

Graph type

Report

Download, Refresh, Delete icons

24



Packet Monitoring

sa18n34-1.sa18.nttest.microsoft.com

PacketMon PREVIEW ⓘ

▶ New capture ↻ Restart ☐ Stop ⌵ More

1432 items

Time ↑	Source ...	So...	Destination ...	Des...	Source MAC	Destination MAC	Prot...	Flag	Ethe...	Filter	Dropped	Drop reason
16:56:55...	10.10.181.9	3343	10.10.181.96	3343	00-15-5D-84-61-01	00-15-5D-84-60-01	UDP		IPv4	1	false	
16:56:55...	10.10.181.9	3343	10.10.181.97	3343	00-15-5D-84-60-01	00-15-5D-84-61-01	UDP		IPv4	1	false	
16:56:55...	10.127.132.	3389	10.70.68.46	52962	F4-52-14-46-92-D0	00-01-E8-8B-2E-4B	TCP	PSH ACK	IPv4	1	false	
16:56:55...	10.70.68.46	52962	10.127.132.160	3389	00-01-E8-8B-2E-4B	F4-52-14-46-92-D0	TCP	ACK	IPv4	1	false	
16:56:55...	10.10.181.3		224.0.0.18		00-00-5E-00-01-08	01-00-5E-00-00-12	112		IPv4	1	true	Adapter not ready
16:56:55...	10.10.181.1		224.0.0.18		00-00-5E-00-01-0A	01-00-5E-00-00-12	112		IPv4	1	false	
16:56:55...	10.10.181.1		224.0.0.18		00-00-5E-00-01-0A	01-00-5E-00-00-12	112		IPv4	1	false	
16:56:55...	10.10.182.3		224.0.0.18		00-00-5E-00-01-0B	01-00-5E-00-00-12	112		IPv4	1	false	
16:56:55...	10.10.180.3		224.0.0.18		00-00-5E-00-01-0C	01-00-5E-00-00-12	112		IPv4	1	false	
16:56:55...	10.127.130.		224.0.0.18		00-00-5E-00-01-63	01-00-5E-00-00-12	112		IPv4	1	false	
16:56:55...	10.10.185.3		224.0.0.18		00-00-5E-00-01-50	01-00-5E-00-00-12	112		IPv4	1	false	

sa18n34-2.sa18.nttest.microsoft.com

Packet monitoring > Packet details

17 items

Appearance	Time	Component	Edge	Direction
13	18:27:36.082768600	Virtual Filtering Platform VMSwitch Extension	1	Rx
14	18:27:36.082771200	Hyper-V Virtual Switch Extension Filter	2	Rx
15	18:27:36.082776400	Hyper-V Virtual Switch Extension Filter	1	Rx
16	18:27:36.082778800	VMSVSP	1	Rx

Storage2

17	18:27:36.082788600	Storage2		Egress
----	--------------------	----------	--	--------

Packet Data - Appearance 17

Drop reason	Logged size	Original size
Adapter not ready	60	60

Raw packet

Drop: 00-00-5E-00-01-09 > 01-00-5E-00-00-12, ethertype IPv4 (0x0800), length 60: 10.10.181.67 > 224.0.0.18: ip-proto-112 20

27

Larger maximum capacity

4 PB

Windows Server 2019

16 PB

Insider Preview

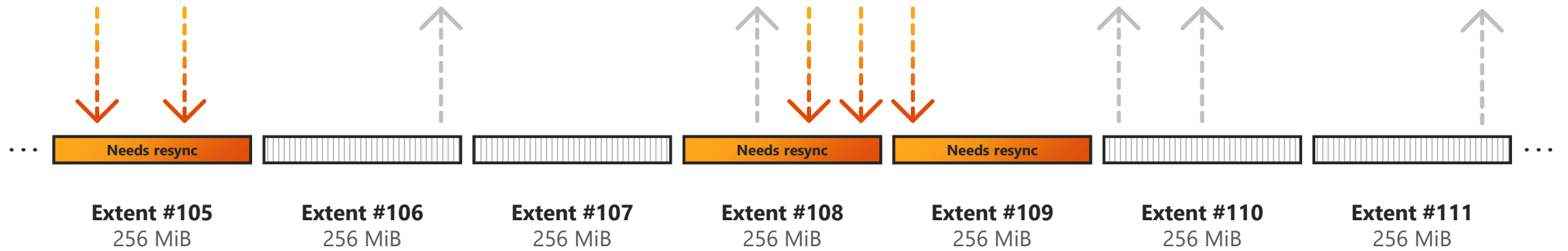


Aggregate physical capacity in the storage pool • 1 petabyte (PB) = 1,000 terabytes (TB)

28

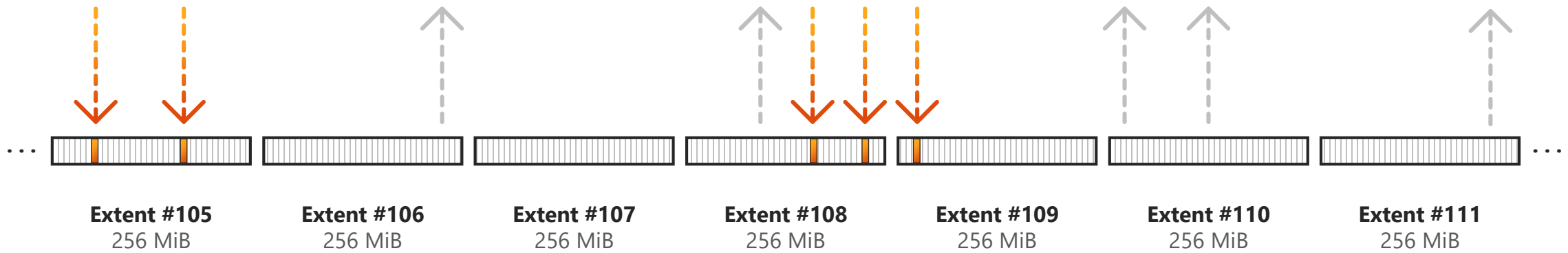
**Reengineered Storage Spaces
resync engine in vNext**

Extent-granular dirty region tracking



Windows Server 2019

NEW Sub-extent dirty region tracking



Windows Server Insider Preview

Shorter, more predictable resync duration

Average duration (50th percentile)

Windows Server 2019

22:51

Insider Preview

Worst case duration (99th percentile)

Windows Server 2019

46:36

Insider Preview

Measured by applying actual Windows cumulative updates under moderate storage I/O load.

Shorter, more predictable resync duration

Average duration (50th percentile)

Windows Server 2019

22:51

Insider Preview

12:10

Worst case duration (99th percentile)

Windows Server 2019

46:36

Insider Preview

Measured by applying actual Windows cumulative updates under moderate storage I/O load.

Shorter, more predictable resync duration

Average duration (50th percentile)

Windows Server 2019

22:51

Insider Preview

12:10

Worst case duration (99th percentile)

Windows Server 2019

46:36

Insider Preview

17:49

Measured by applying actual Windows cumulative updates under moderate storage I/O load.

34

Azure hybrid services



Azure Site Recovery



Azure Backup



Azure File Sync



Azure Update Management



Azure Monitor



Azure Security Center

36



Site-to-site to Azure through SDN

hci01.contoso.local

- ## Tools
- Search Tools
- Storage
 - Volumes
 - Drives
 - Networking
 - Virtual switches
 - Virtual networks
 - Access control lists
 - Logical networks
 - Gateway connections**
 - SDN monitoring
 - Tools
 - Azure Monitor
 - Settings

Gateway connections

PREVIEW ⓘ

Inventory

+ New + New S2S VPN to Azure ⚙ Settings 🗑

Name	Connection Type	Destination IP
No records found		

New S2S VPN To Azure

gcusanza@hotmail.com

Azure Subscription *

Visual Studio Ultimate with MSDN

Azure Region *

West US 2

Azure Virtual Network *

Contoso

[View selected Virtual network in Azure Portal](#)

Azure Virtual Network Gateway Subnet *

10.1.2.0/24

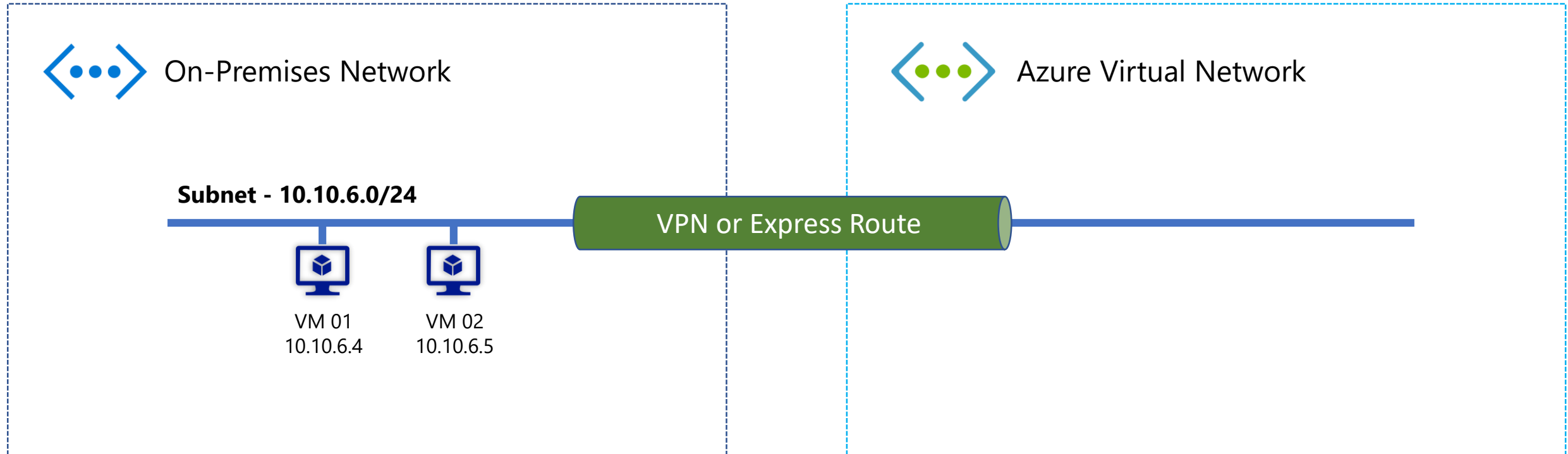
Next Cancel

37

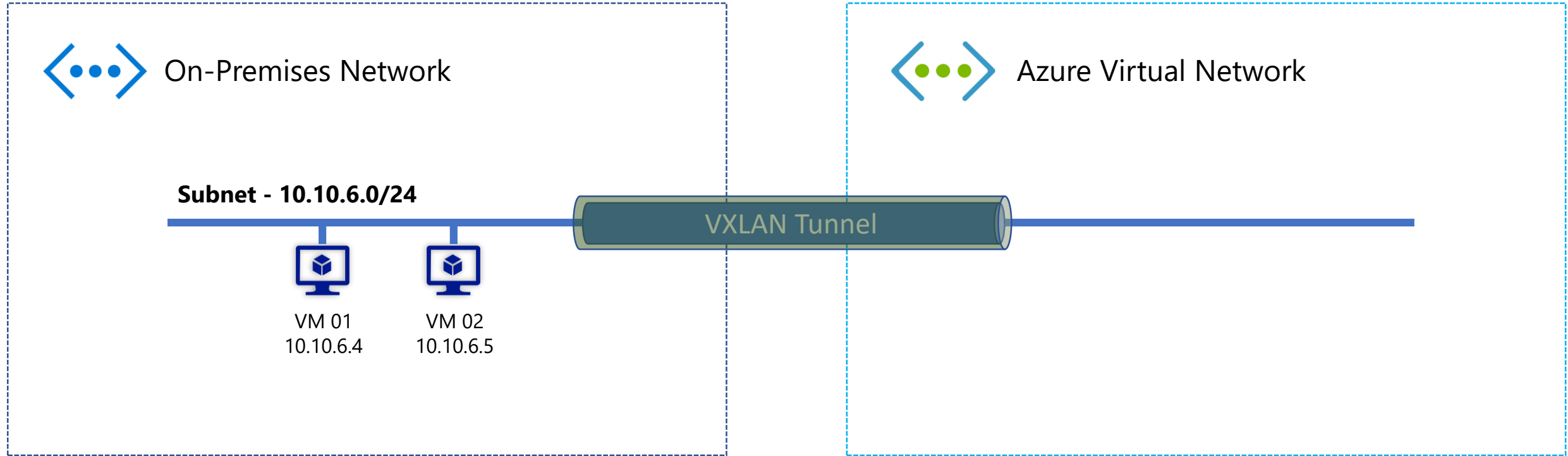


Azure Extended Network

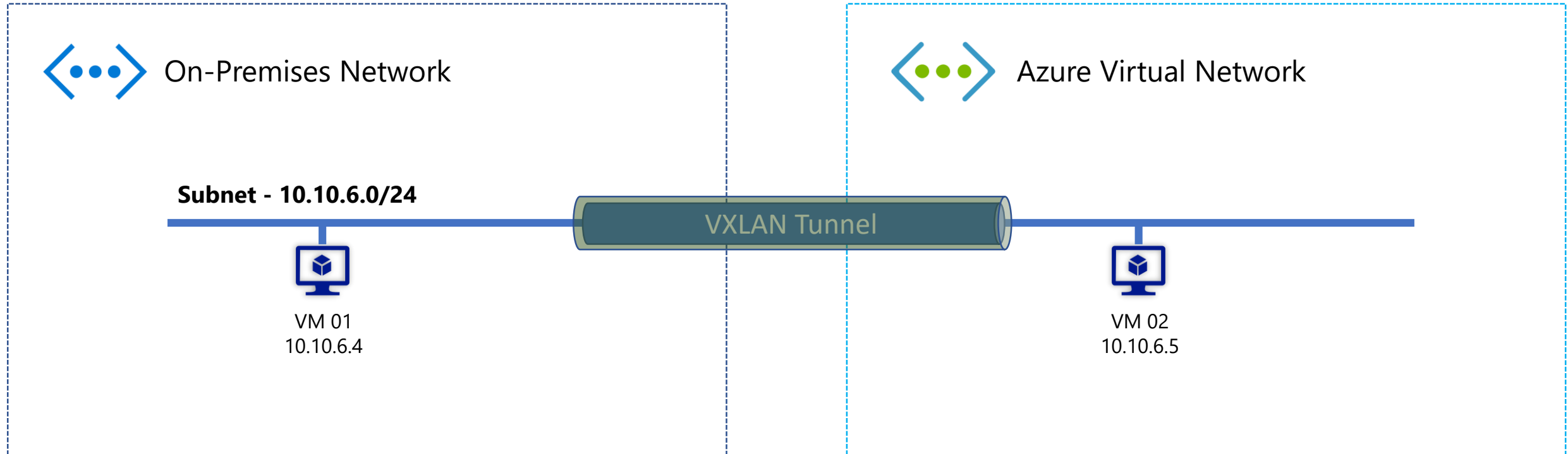
Migrate VMs to Azure that can't change IPs



Migrate VMs to Azure that can't change IPs



Migrate VMs to Azure that can't change IPs



ExtNetOnPrem

Azure Extended-Network PREVIEW ⓘ

+ Add IPv4 Addresses - Remove IPv4 Addresses ✕ Remove Azure Extended-Network ↻ Refresh

4 items

Extended-Network Subnet CIDR
192.168.1.0/24 Status
✔ Ok

On-Premises Subnet

Extended-Network Gateway: 10.0.0.20

<input type="checkbox"/>	IPv4 Address	Location	Status
<input type="checkbox"/>	192.168.1.254	On-Prem	Extended
<input type="checkbox"/>	192.168.1.4	On-Prem	Extended
<input type="checkbox"/>	192.168.1.253	On-Prem	Extended

Azure Virtual Network Subnet

Extended-Network Gateway: 10.1.1.6

[Manage Extended-Network Gateway in Azure](#)

<input type="checkbox"/>	IPv4 Address	Location	Status
<input type="checkbox"/>	192.168.1.250	Azure	Extended

40

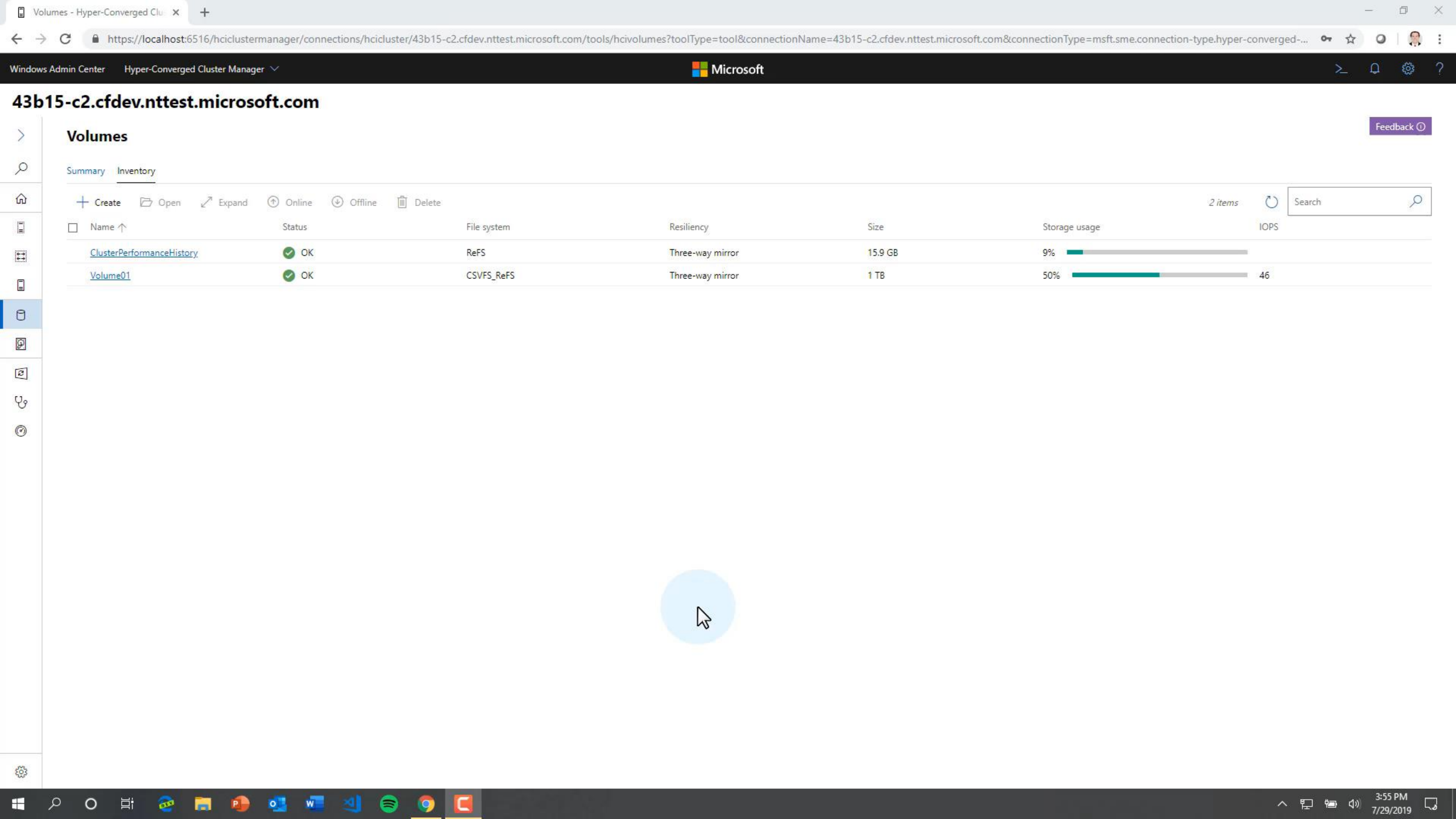
More secure clustering



- ✓ Completely remove dependency on NTLM
- ✓ All cluster and storage traffic uses **exclusively** Kerberos or certificate-based authentication between nodes
- ✓ No change required by user or deployment tools

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**Encryption for data at-rest
powered by BitLocker (Preview)**



43b15-c2.cfdev.nttest.microsoft.com

Volumes

Summary **Inventory**

[+](#) Create [Open](#) [Expand](#) [Online](#) [Offline](#) [Delete](#)

2 items



Search

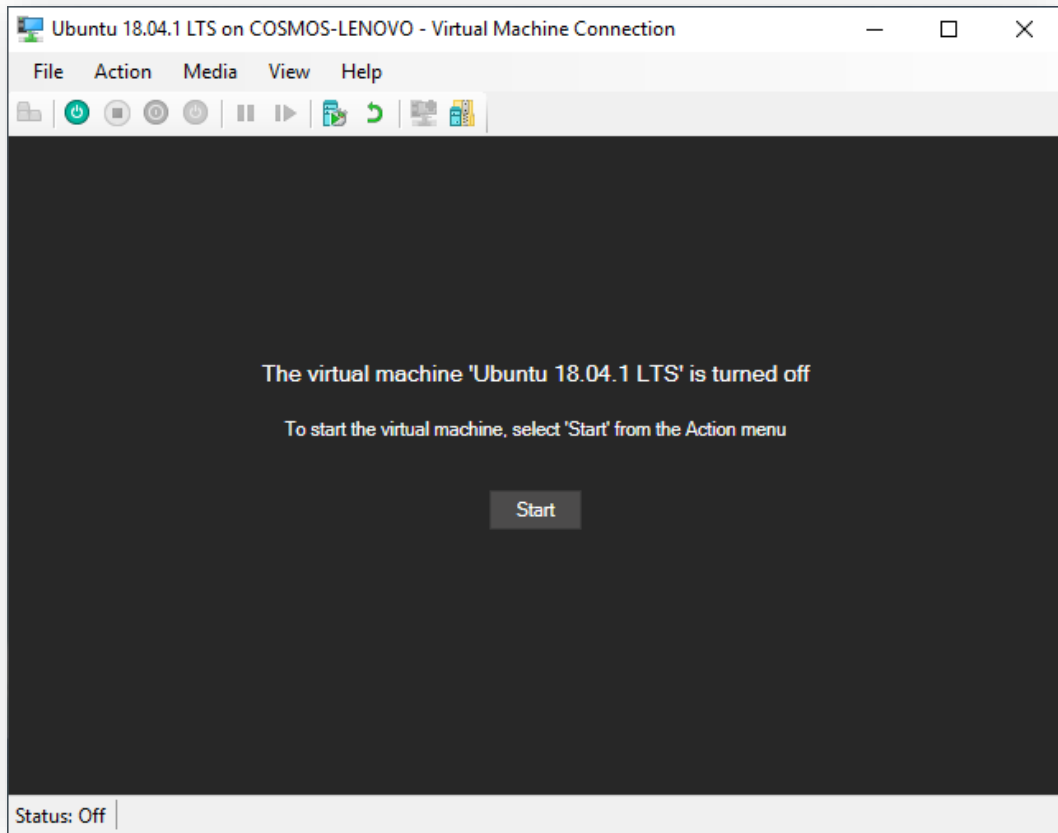
<input type="checkbox"/>	Name ↑	Status	File system	Resiliency	Size	Storage usage	IOPS
<input type="checkbox"/>	ClusterPerformanceHistory	OK	ReFS	Three-way mirror	15.9 GB	9% <div style="width: 9%;"></div>	
<input type="checkbox"/>	Volume01	OK	CSVFS_ReFS	Three-way mirror	1 TB	50% <div style="width: 50%;"></div>	46



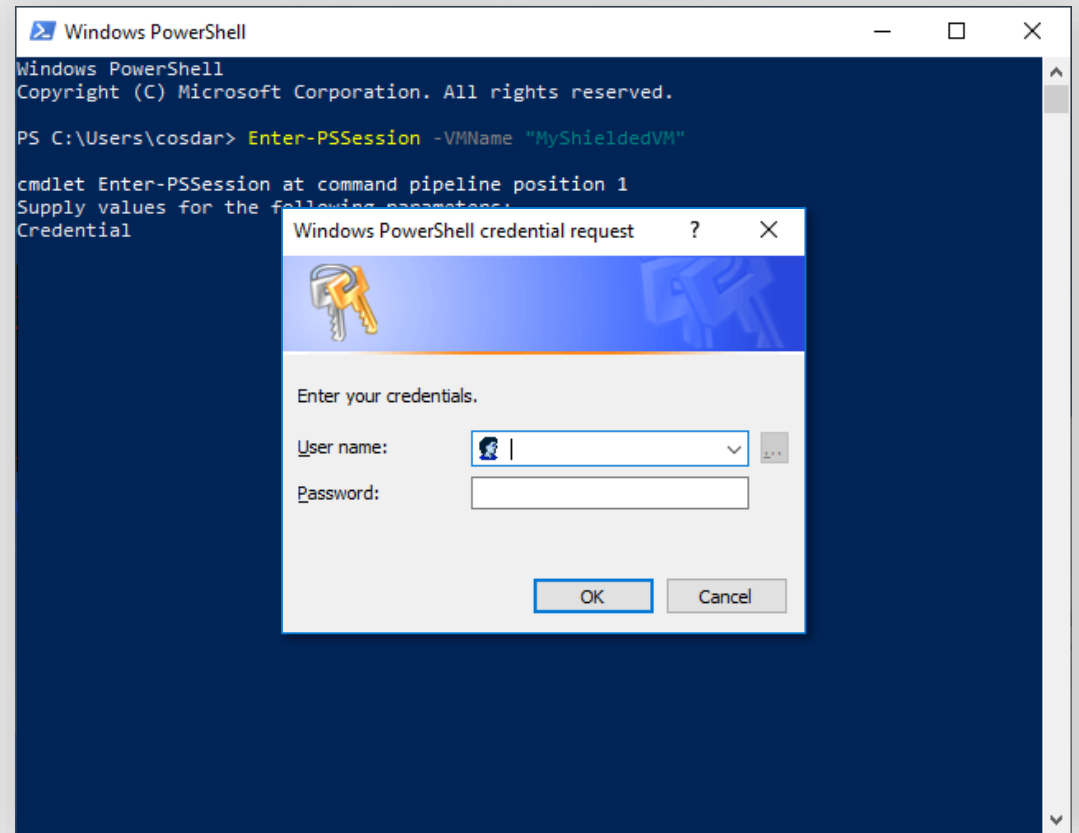
42



Shielded virtual machines



VMConnect Enhanced Session Mode
to shielded virtual machines



PowerShell Direct
to shielded virtual machines

Run Linux inside shielded virtual machines



Supported versions include:
Ubuntu 16.04 LTS with the 4.4 kernel, Red Hat Enterprise Linux 7.3, and
SUSE Linux Enterprise Server 12 Service Pack 2



Hyper-V Roadmap

Benjamin Armstrong

BRK3173



VMware Compatibility

Demo

On-prem GPU-P sneak peak





Recycle Bin



Windows Admin ...



Server Administra...



x64

Device Manager

File Action View Help

- dell1-amd-gpup
 - Computer
 - Disk drives
 - Display adapters
 - Microsoft Basic Display Adapter
 - Microsoft Remote Display Adapter
 - Radeon Instinct MI25
 - IDE ATA/ATAPI controllers
 - Keyboards
 - Mice and other pointing devices
 - Monitors
 - Network adapters
 - Ports (COM & LPT)
 - Print queues
 - Processors
 - Software devices
 - Storage controllers
 - System devices
 - Universal Serial Bus controllers

Hyper-V Manager

File Action View Help

Hyper-V Manager

DELL1-AMD-GPUP

Virtual Machines

Name	State	CPU Usage	Assigned Memory	Uptime	Status
gpup-vm1	Off				
gpup-vm2	Off				
gpup-vm3	Running	0%	16000 MB	00:33:55	
gpup-vm4	Running	0%	16000 MB	00:33:52	
gpup-vm5	Running	0%	16000 MB	00:33:50	
gpup-vm6	Running	0%	16000 MB	00:33:54	
gpup-vm7	Off				
gpup-vm8	Off				

— BRK3123

Checkpoints

gpup-vm6

Adapter	Connection	IP Addresses	Status
Network Adapter (Dynamic MAC: 00:...	External	192.168.1.126, fe80:f448:a996:4f2...	OK (VMQ active)

Summary Memory Networking Replication

Actions

DELL1-AMD-GPUP

- New
- Import Virtual Machine...
- Hyper-V Settings...
- Virtual Switch Manager...
- Virtual SAN Manager...
- Edit Disk...
- Inspect Disk...
- Stop Service
- Remove Server
- Refresh
- View
- Help

gpup-vm6

- Connect...
- Settings...
- Turn Off...
- Shut Down...
- Save
- Pause
- Reset
- Checkpoint
- Move...
- Export...
- Rename...
- Enable Replication...

Other interesting Sessions



Modernize your branch offices or retail stores with Azure Stack HCI



Adi Agashe
Program Manager, Core OS Engineering

 @adi_agashe



Elden Christensen
Principal PM Manager, Core OS Engineering

 @EldenCluster

BRK3122





Windows Admin Center

What's new and what's next

Daniel Lee

Sr. Program Manager
Server Management Experience

BRK2048



Where to find more info?

Mein nächstes Webinar

Hyper-V backups
Demo and Q&A

Freitag, 31. Januar 2020,
11 Uhr MEZ

<https://www.hyper-v-server.de/lp-webinar-archiv/>



Webinar Archive

Register NOW!

Cloud & Datacenter Conference 2020

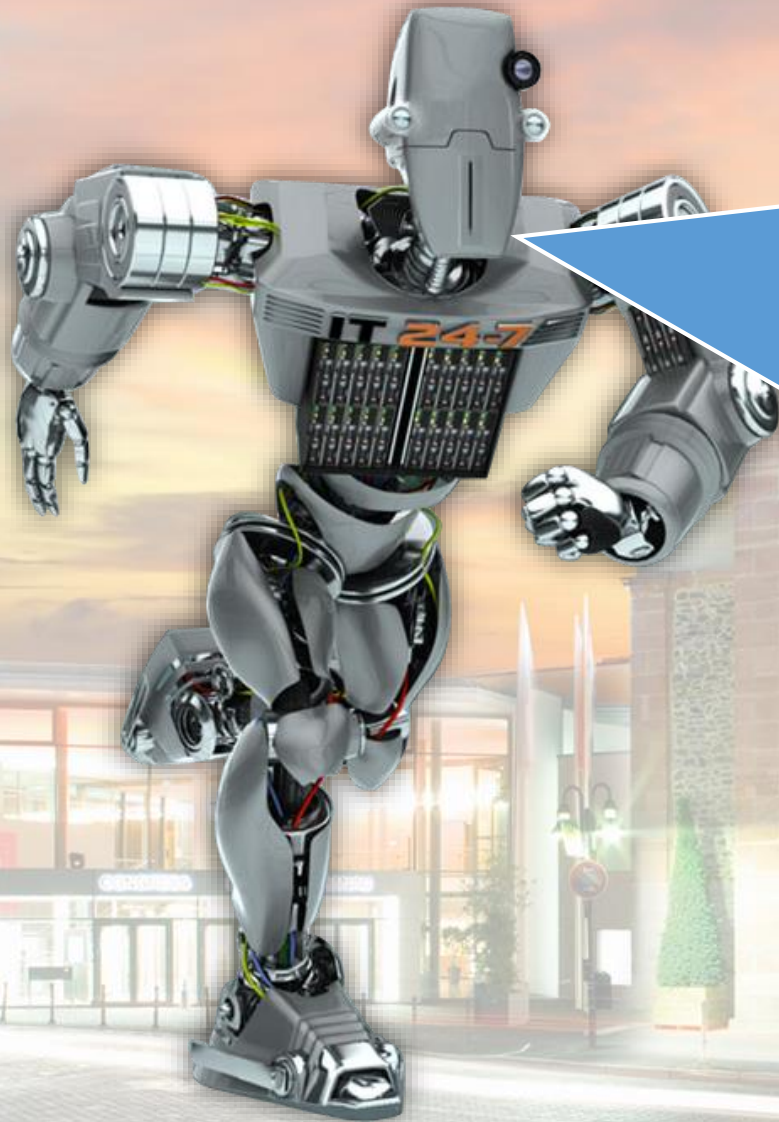
CDC-Germany 2020

- Am 13. und 14. Mai 2020
- In Hanau bei Frankfurt
- 70+ Vorträge
- Hyper-V Community und Hybrid Cloud Community am 12. Mai 2020
- Early Bird Tickets mit € 100 Rabatt bis zum 31. Januar 2020

<http://www.cdc-germany.de/>



Q&A



Q & A