Azure Stack HCI – die News von der Microsoft Ignite 2020

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Themen heute

- **HCI mit Windows Server 2019 und dem neuen Azure Stack HCI OS**
- **Neuerungen für das Azure Stack HCI OS**
- **Lizenzierung einer hyper-converged Infrastructure mit Microsoft Technologien**
- **Lösungen von Thomas Krenn für Azure Stack HCI**

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HCI mit Windows Server 2019 und dem neuen Azure Stack HCI OS

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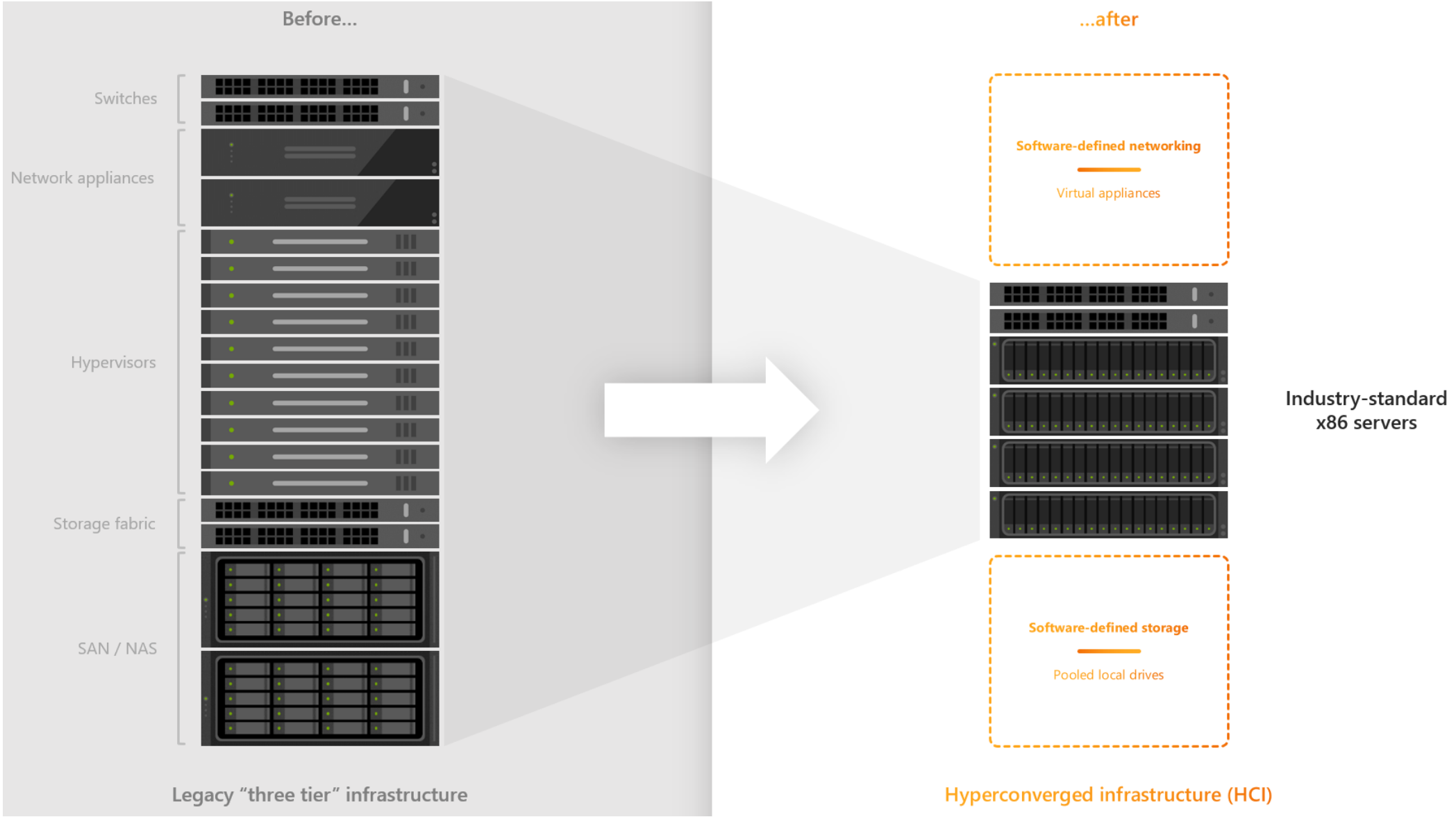
Hyper-Converged Infrastructure (HCI) - Grundlagen



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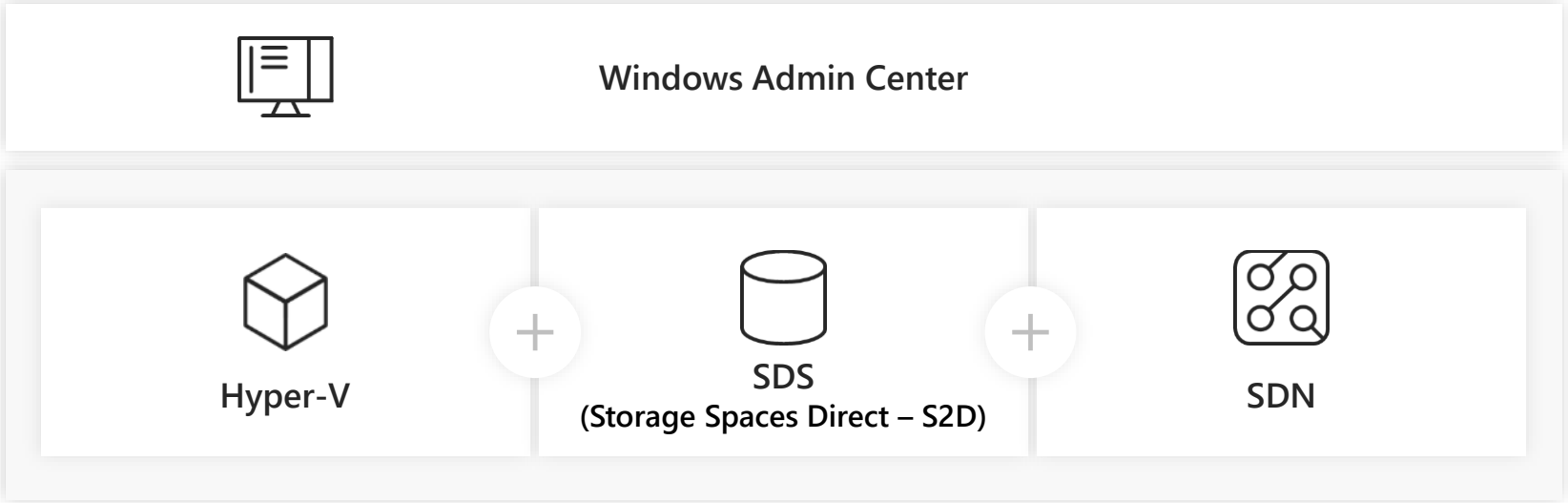
HCI mit Microsoft Technologien



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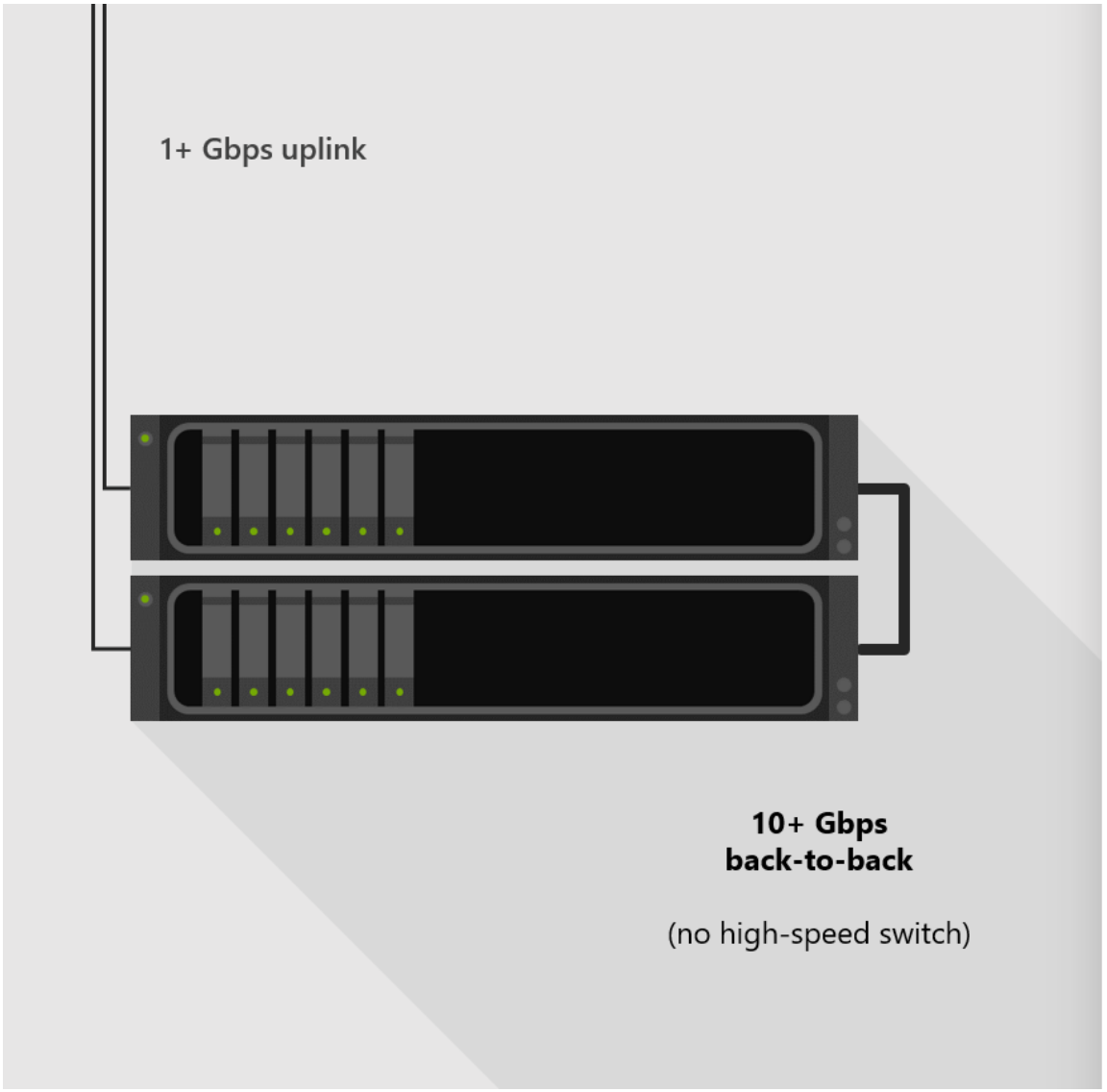
Microsoft HCI Rahmenbedingungen



Start small…

Minimal footprint

Just 2 servers minimum

(4 × SSD) or **(2 SSD + 4 HDD)** per server

No minimum processor and memory

1 × 10 Gbps network adapter

SATA, DOM, M.2

Made possible by

Lightweight quorum

Cloud, file share, or USB key

No costly Witness VM Appliance

Nested resiliency

Withstand multiple failures

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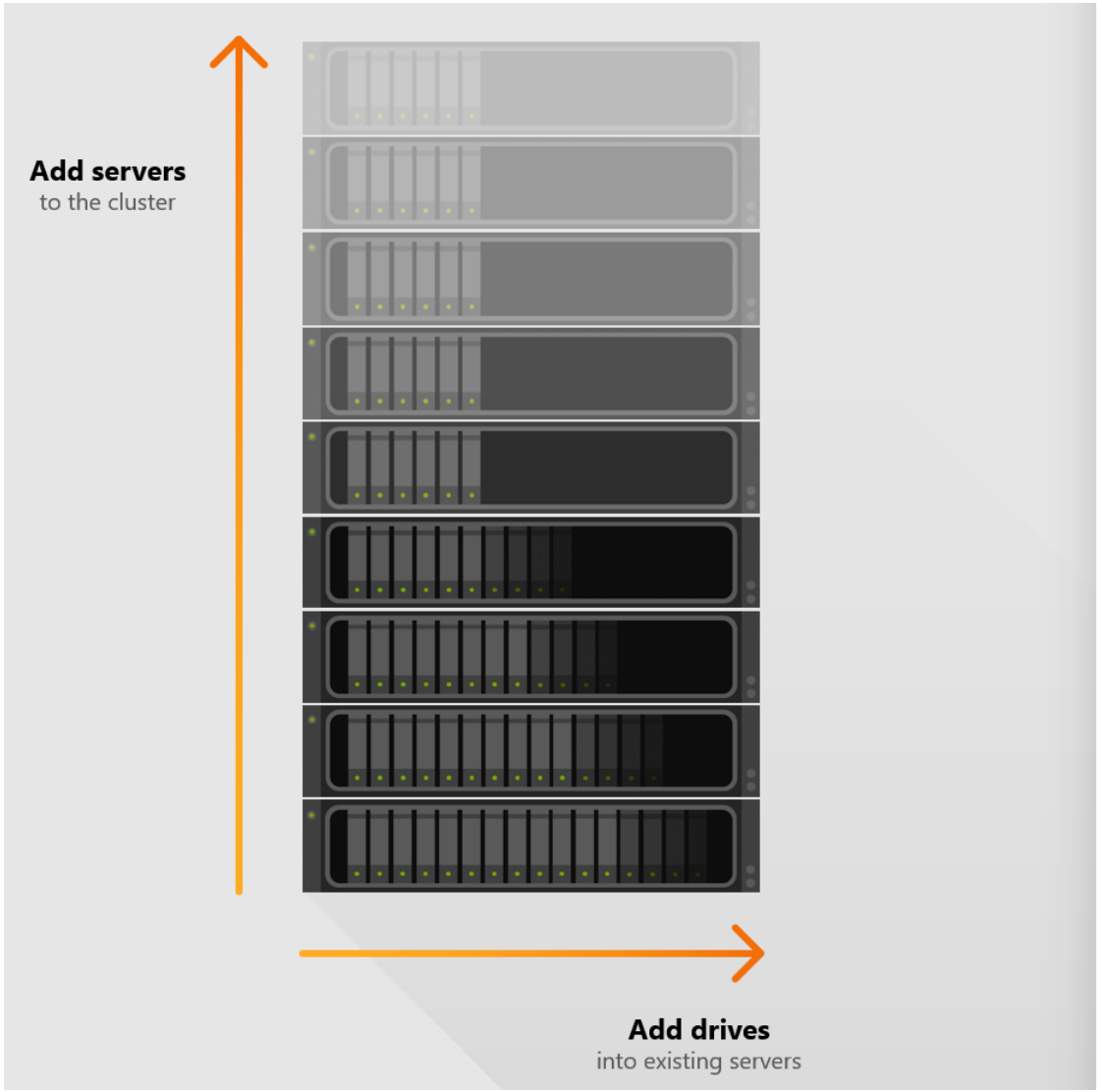

Scale with your needs

Scale up, scale out

Up to 16 servers per cluster

Limited by rack and switch ports

Up to 4,000 TB storage capacity per cluster

Store all of Wikipedia in every language 50 times

With no downtime

Automatic VM load balancing

Automatic storage rebalancing

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Microsoft HCI Rahmenbedingungen
Hyper-V als Hypervisor

Run any Windows or Linux virtual machine that works on Hyper-V

Windows

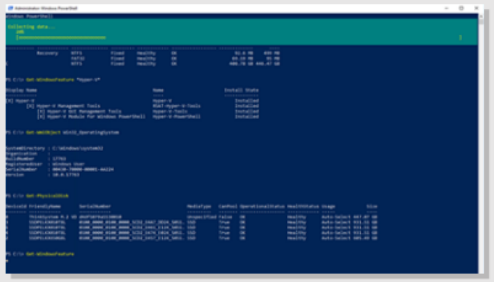
Windows 10
Windows Server 2012
Windows Server
Windows Server 2008

Linux

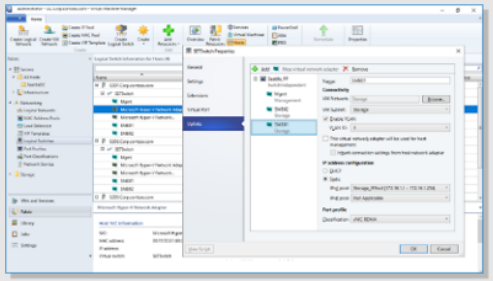
redhat
ubuntu
ORACLE LINUX
SUSE
debian
CentOS

Use any capable tool, you're the Administrator

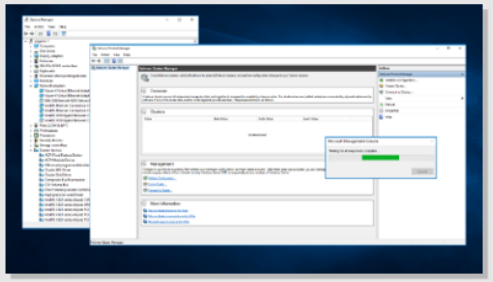
Windows Admin Center NEW



Windows PowerShell



System Center VMM



Hyper-V Manager, etc.

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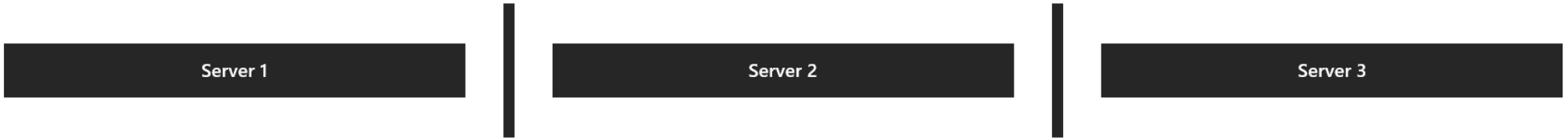
Microsoft HCI Rahmenbedingungen – S2D

Start with industry-standard servers



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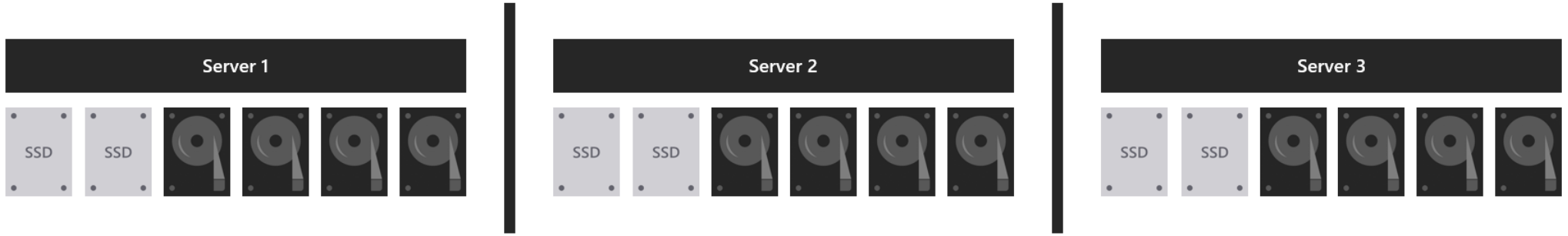
Insert additional drives to each server



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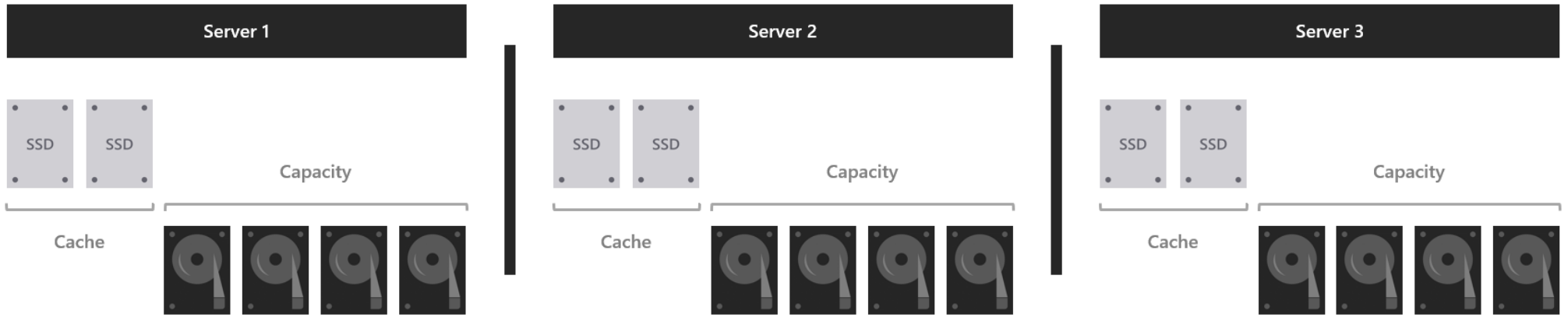
Fastest drives provide cache to accelerate the others



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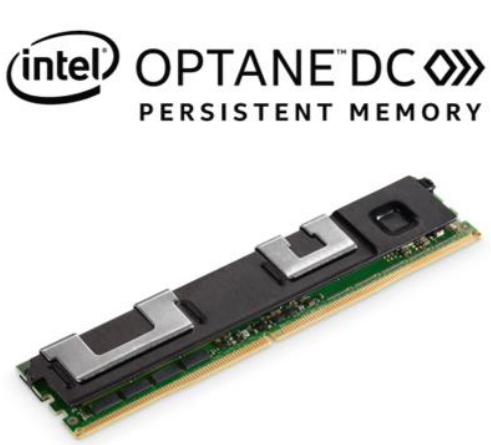
Faster ← → Slower



Persistent Memory

Non-Volatile Memory Express

Solid-State Drive

Hard Disk Drive

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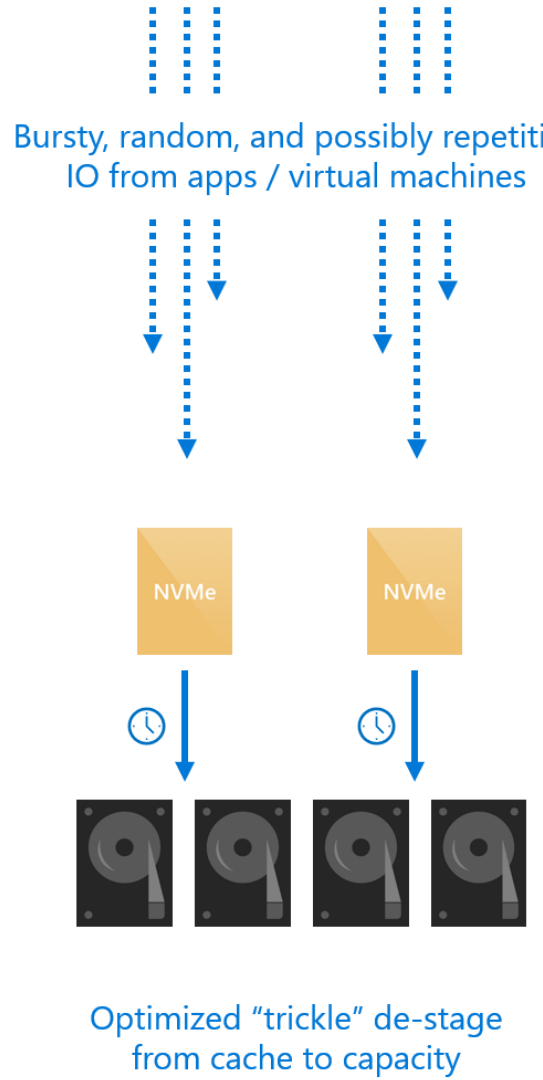
Microsoft HCI Rahmenbedingungen – S2D

Why cache writes?

Coalescence
Random IO is hard for an HDD. Squeeze up to 5X more writes by coalescing them in software to minimize arm movement and use every platter rotation effectively.

Absorb bursts
Writes may not happen uniformly over time. Amortize spikes over quieter periods to keep drives working steadily.

Just write once
Apps may overwrite data multiple times in rapid succession. Reduce overall traffic to HDD by only writing the "last" version.



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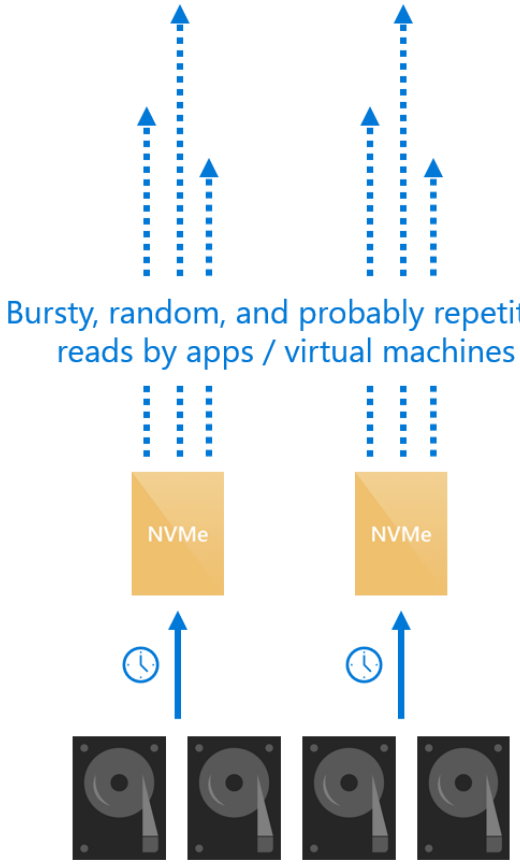
Why cache reads?

Flash is just faster
Anything that's been read multiple times is likely to be read again. The faster you respond, the faster the app proceeds, the more IOPS you get.

Don't interrupt de-stage
Reading from HDD requires seeking and settling, disrupting the optimized de-stage from the previous slide.



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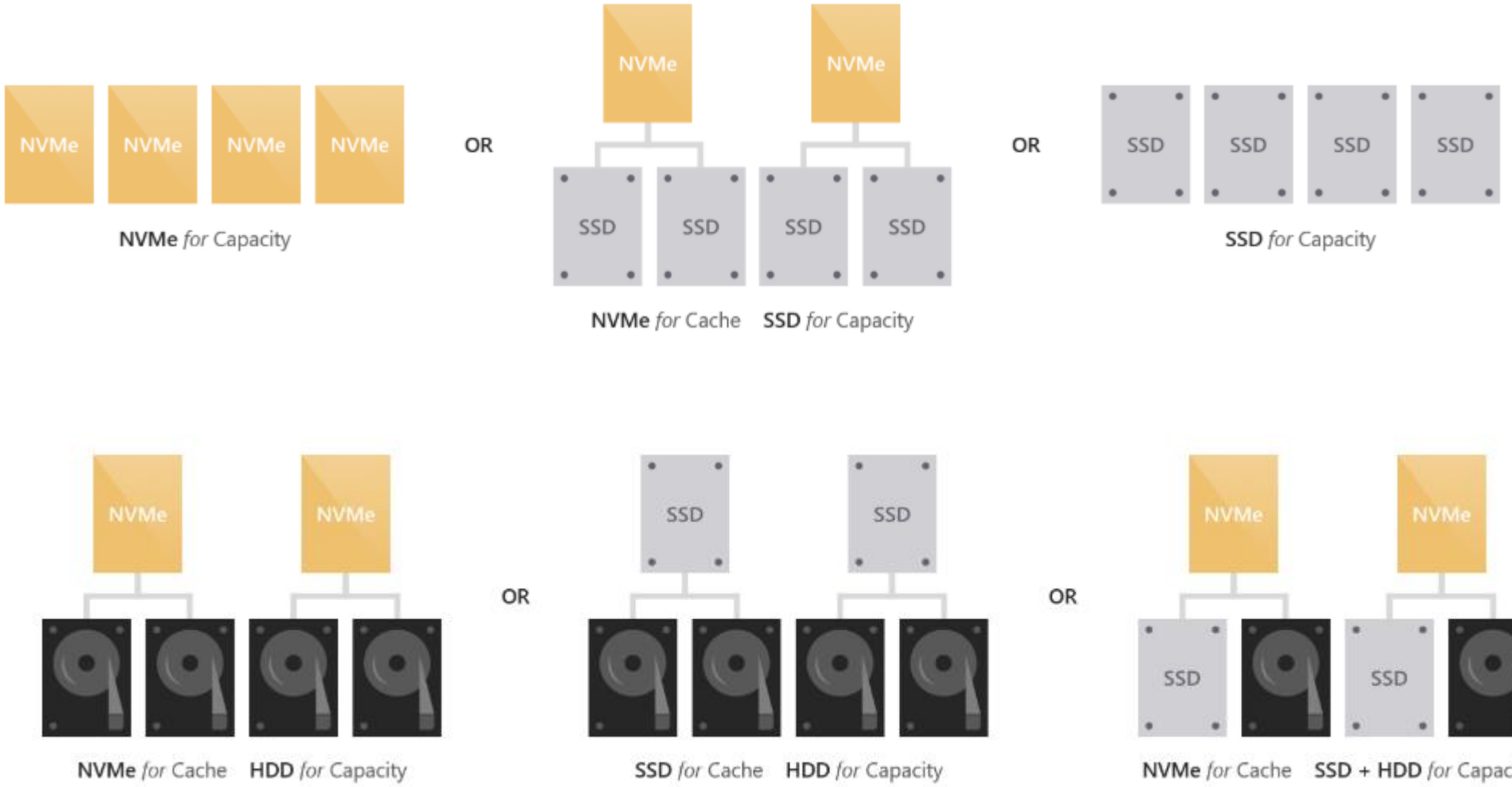

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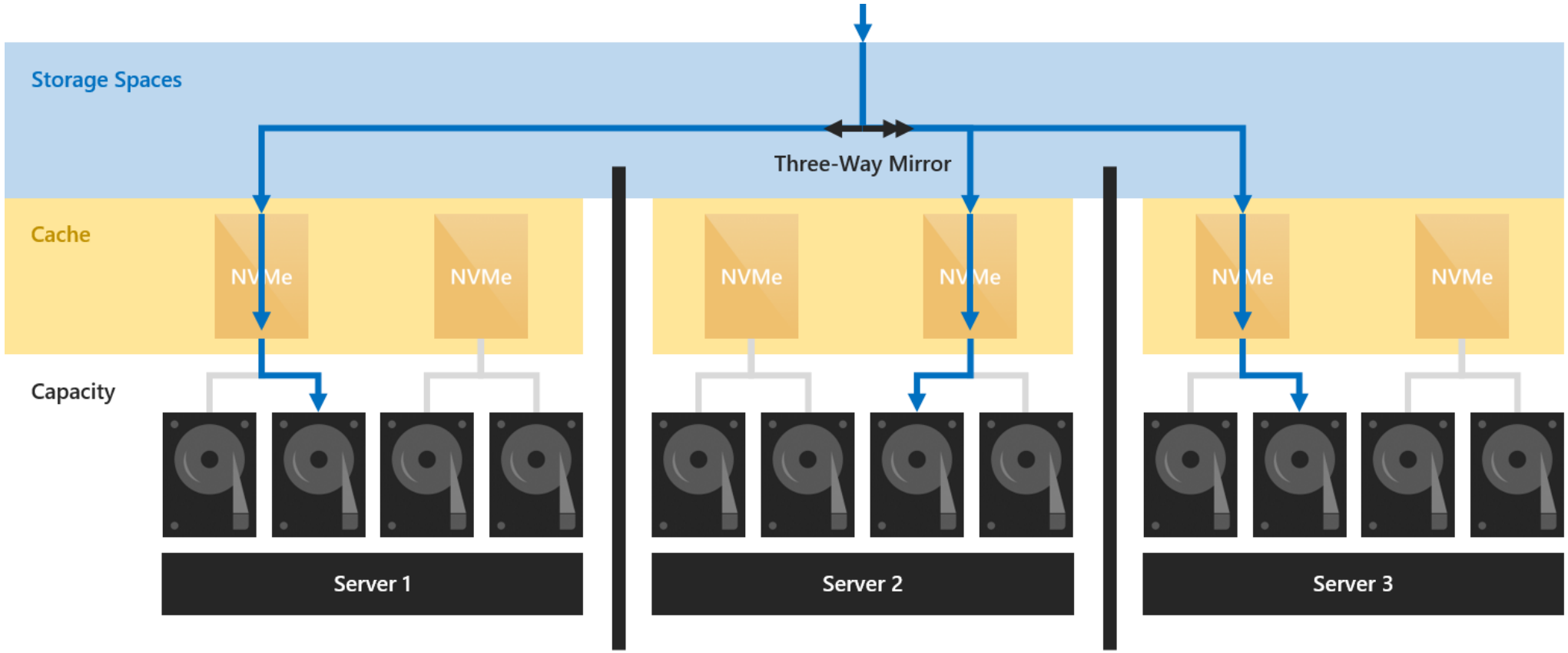

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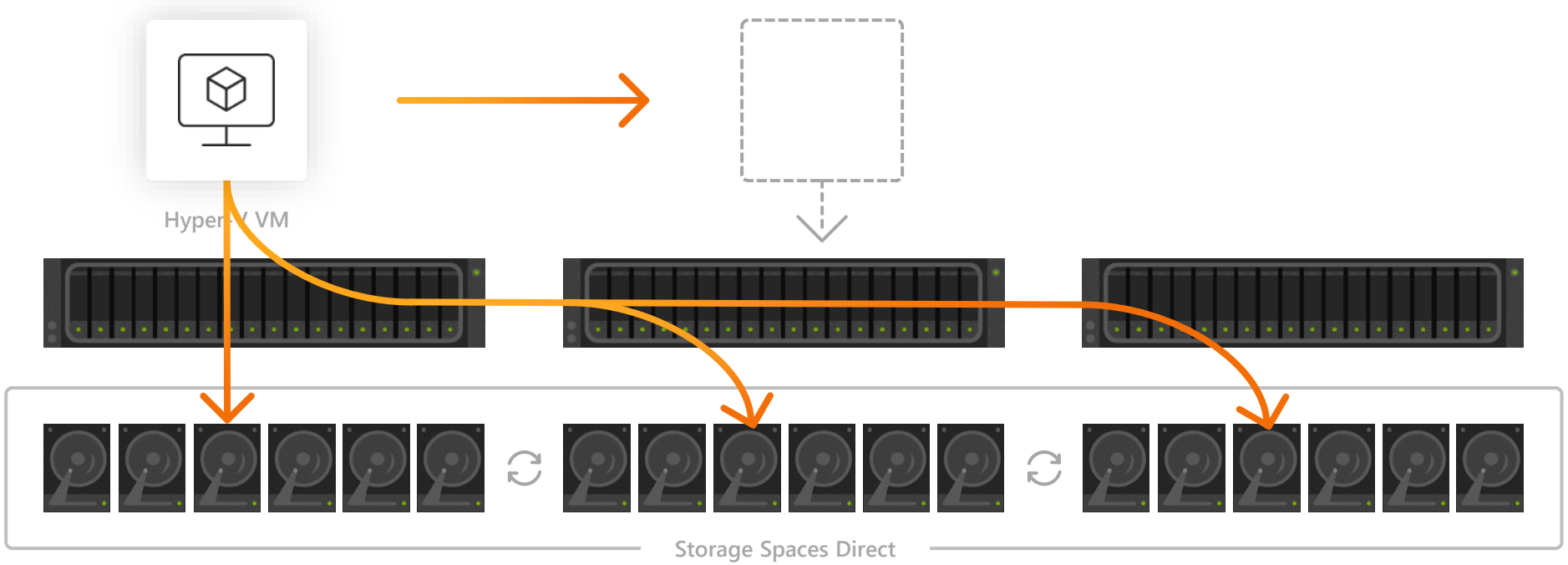
Infrastructure high availability and resiliency



Distributed storage resiliency • VM live migration • Automatic failover • Access storage from any server

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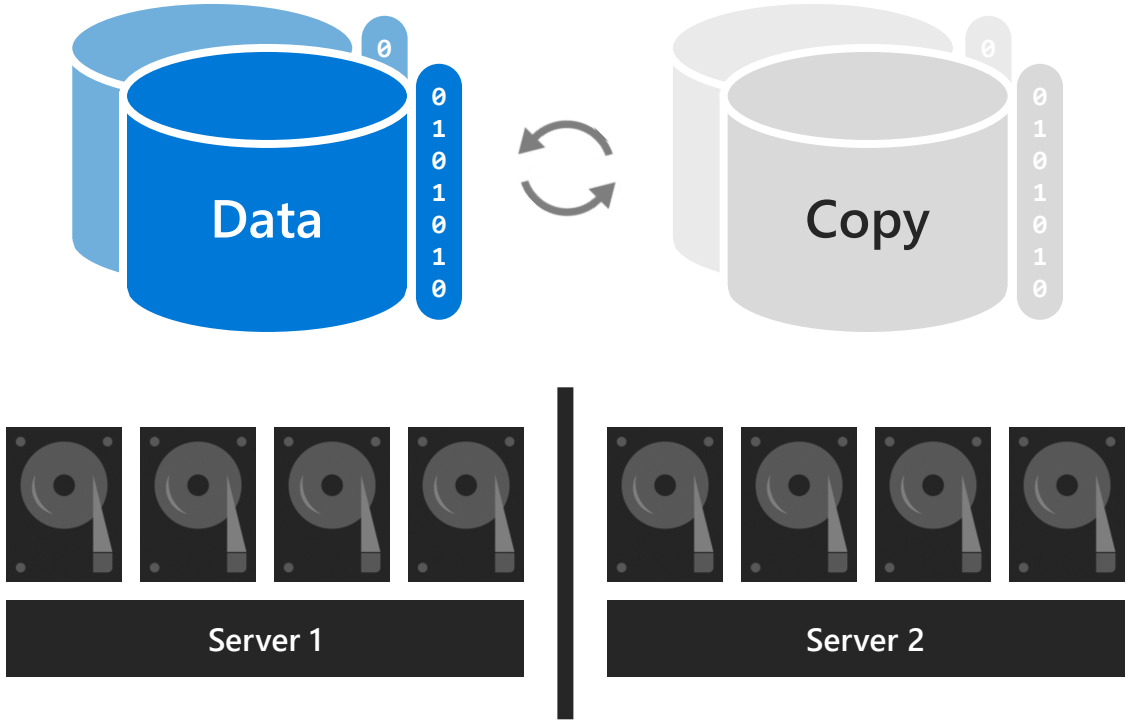

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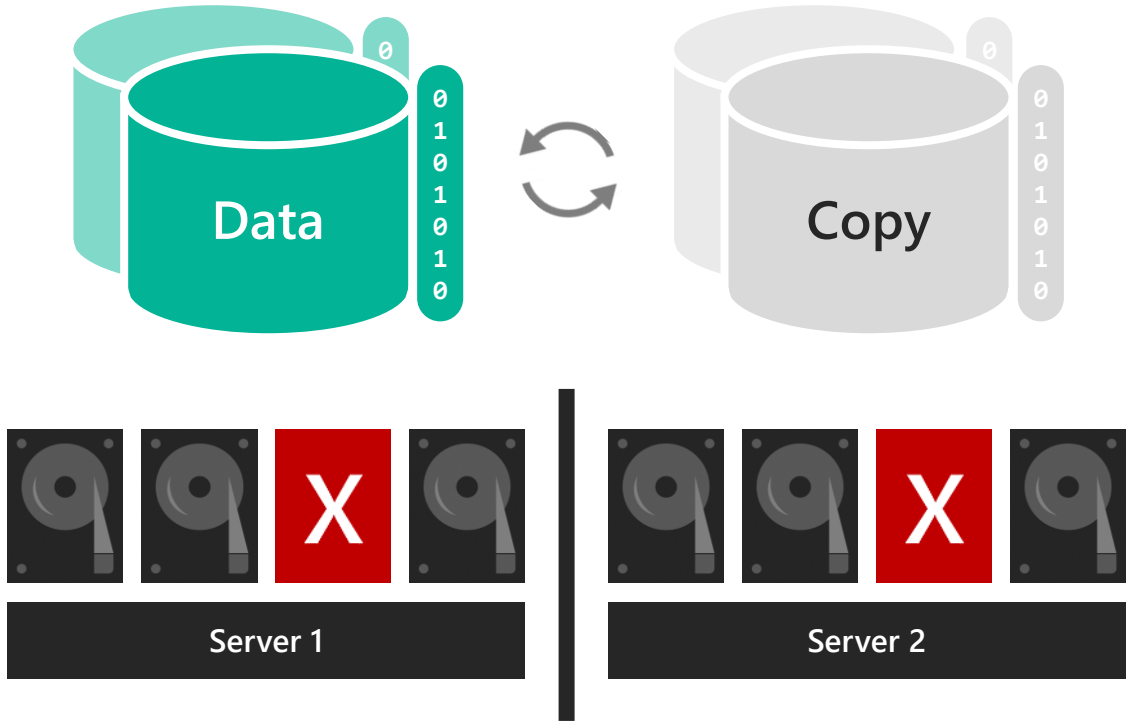

Handle two failures at once

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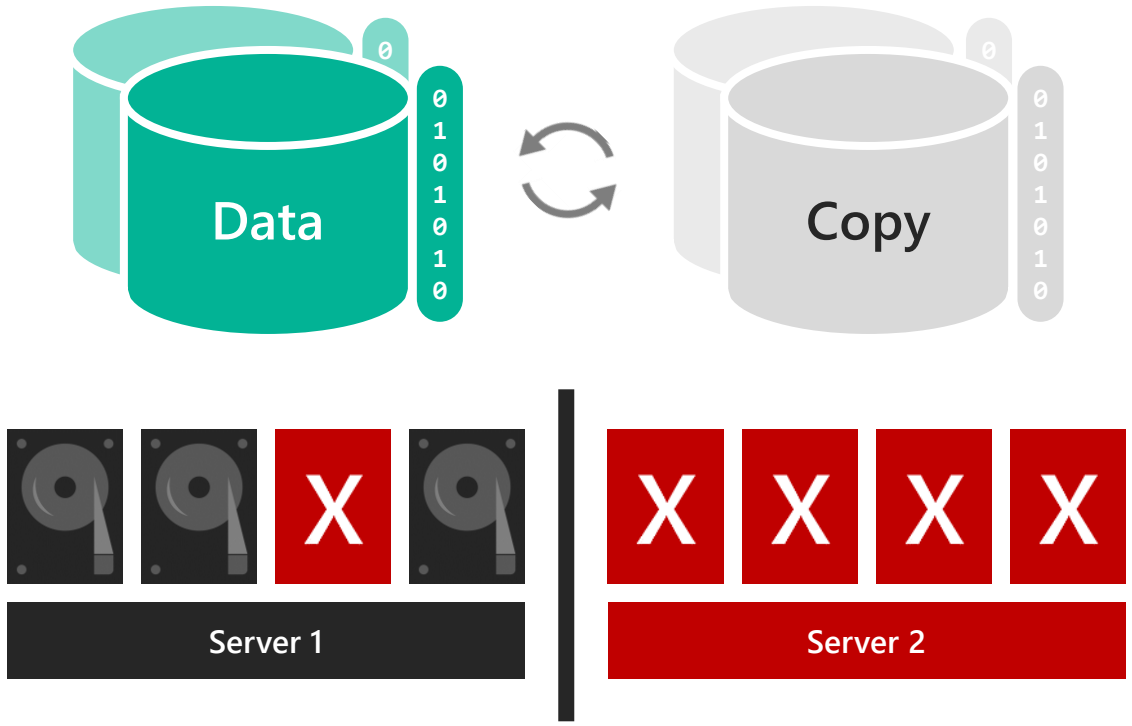

Handle two failures at once

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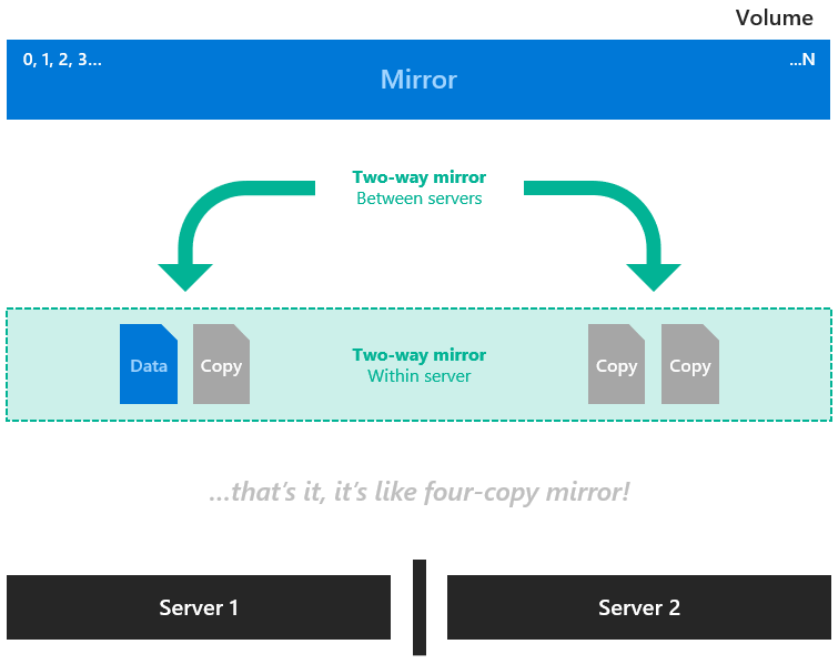
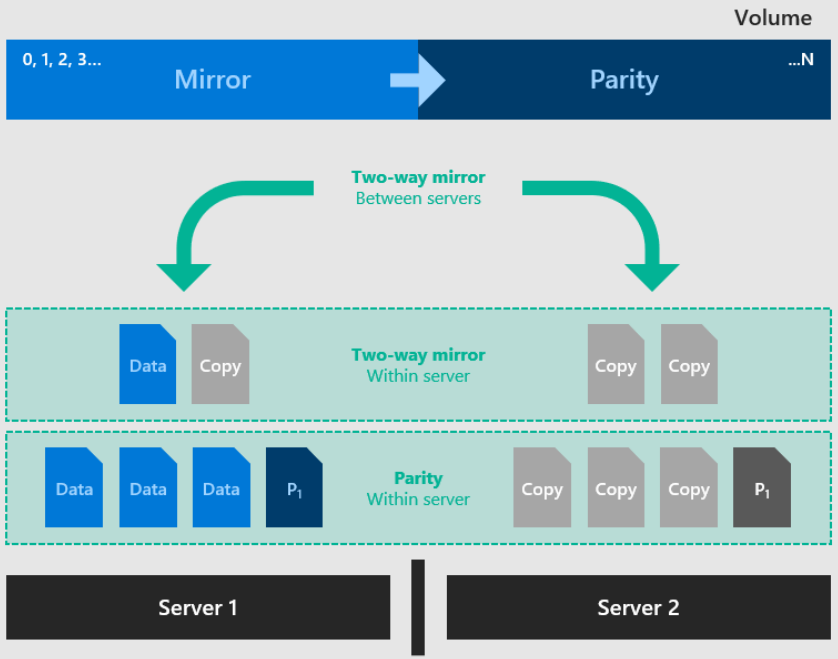
Nested two-way mirror



Nested mirror-accelerated parity



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Resilient File System (ReFS)

Recommend for Storage Spaces Direct

- ✓ Detect and correct corruptions
- ✓ Mirror-accelerated parity

Great features for Hyper-V

- ✓ Faster VHDX creation / expansion
- ✓ VHDX checkpoint integration

Learn more at aka.ms/refs

Data Deduplication

Highly optimized

- ✓ Outside of IO path (post-processing)
- ✓ Variable-size chunk store
- ✓ Multi-threaded

Highly scalable

- ✓ Volumes up to 64 TB
- ✓ Files up to 1 TB

Learn more at aka.ms/dedup

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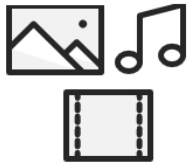
Deduplication and compression for ReFS



Up to
30%
Documents, photos, music, videos

Up to
60%
General-purpose file server

Up to
90%
Virtual hard disk files, iso files, backup

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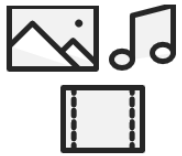
Microsoft HCI Rahmenbedingungen – S2D



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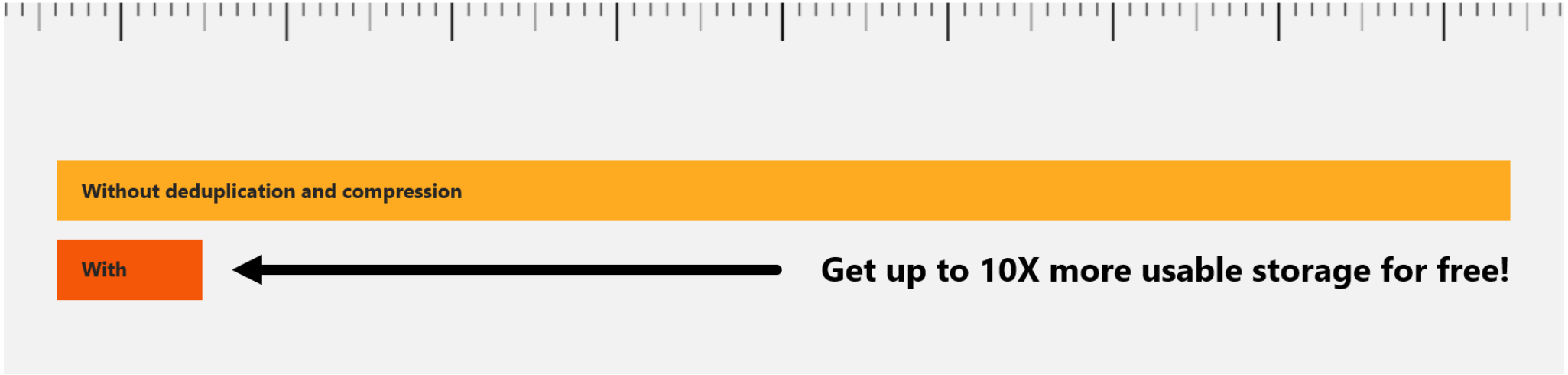

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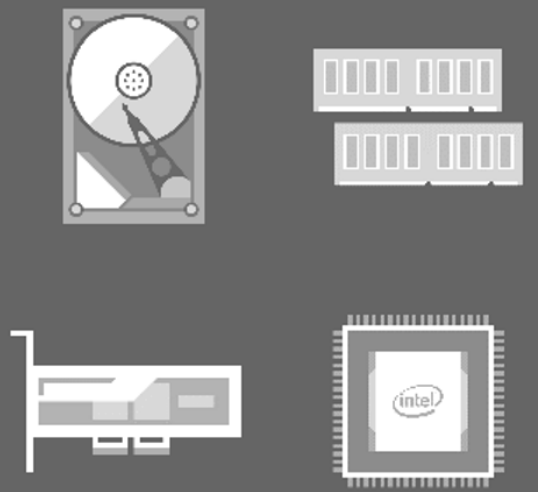
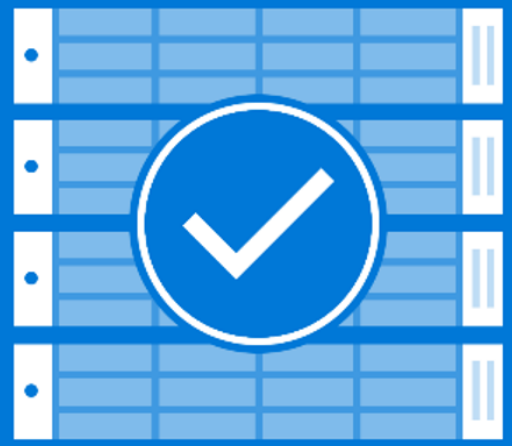
Two options to build a S2D Solution





1 Build Your Own

2 Validated Partner Solutions

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Validated Partner Solutions for Windows Server 2016:	Validated Partner Solutions for Windows Server 2019:
Windows Server Software Defined	Azure Stack HCI
https://Microsoft.com/WSSD	https://Microsoft.com/HCI

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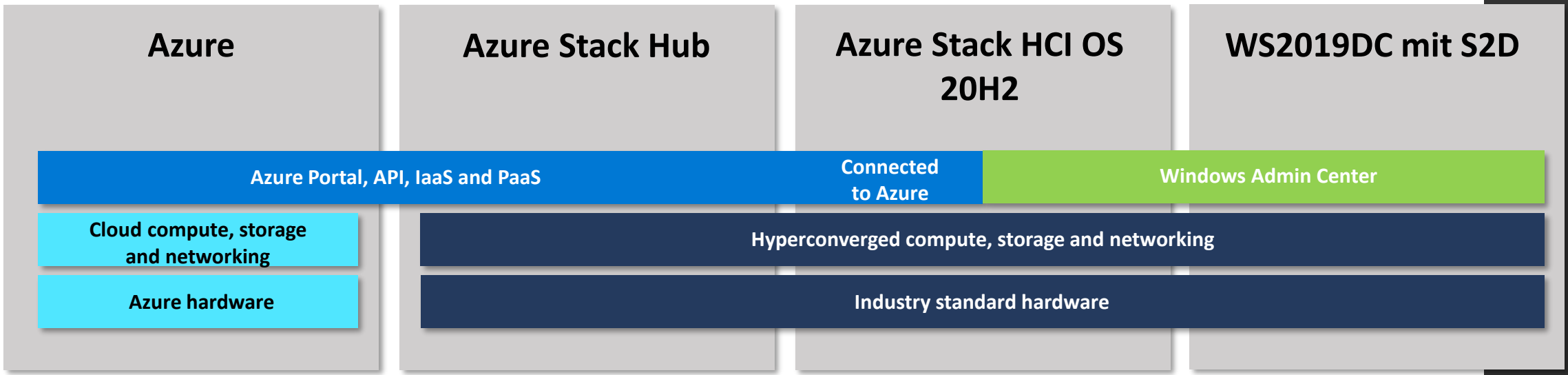
Azure, Azure Stack Hub und Azure Stack HCI



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Neuerungen für das Azure Stack HCI OS

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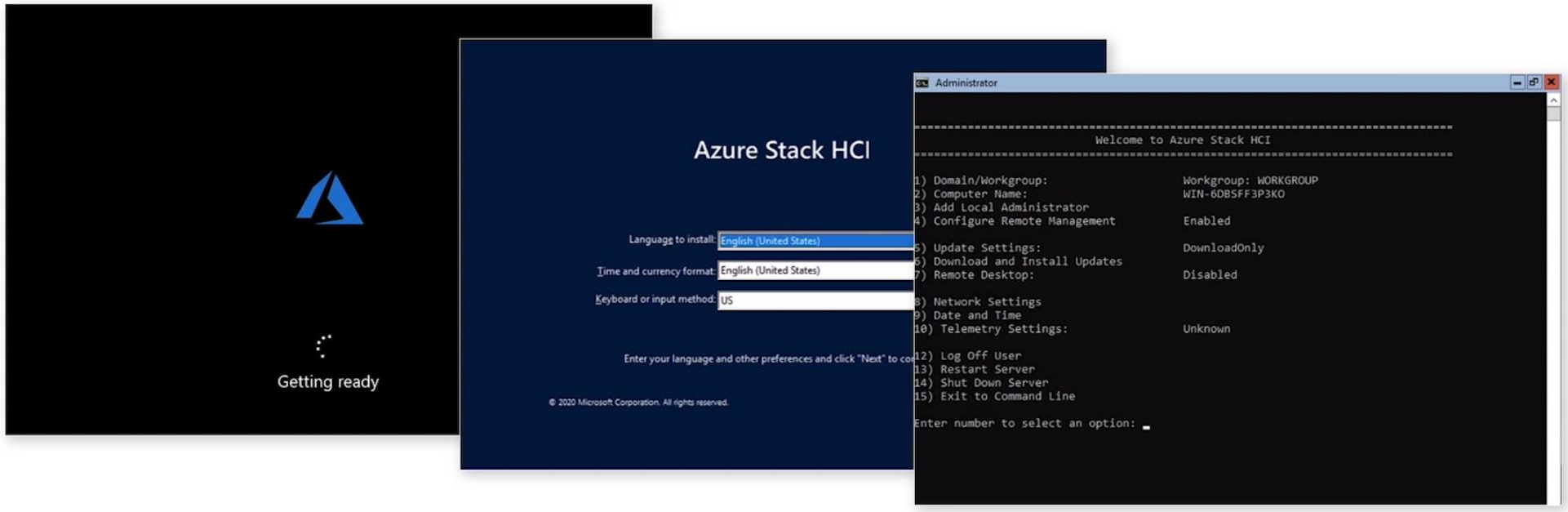
Was ist das Azure Stack HCI OS?

Specialized host operating system

Latest Azure hypervisor with built-in software-defined storage and networking

Optimized for virtualization with reduced composition

Minimal local user interface, designed for remote management



Quelle: https://myinspire.microsoft.com/sessions/4a50e354-b3a8-4d54-9d2a-9dc723ac1030?source=sessions

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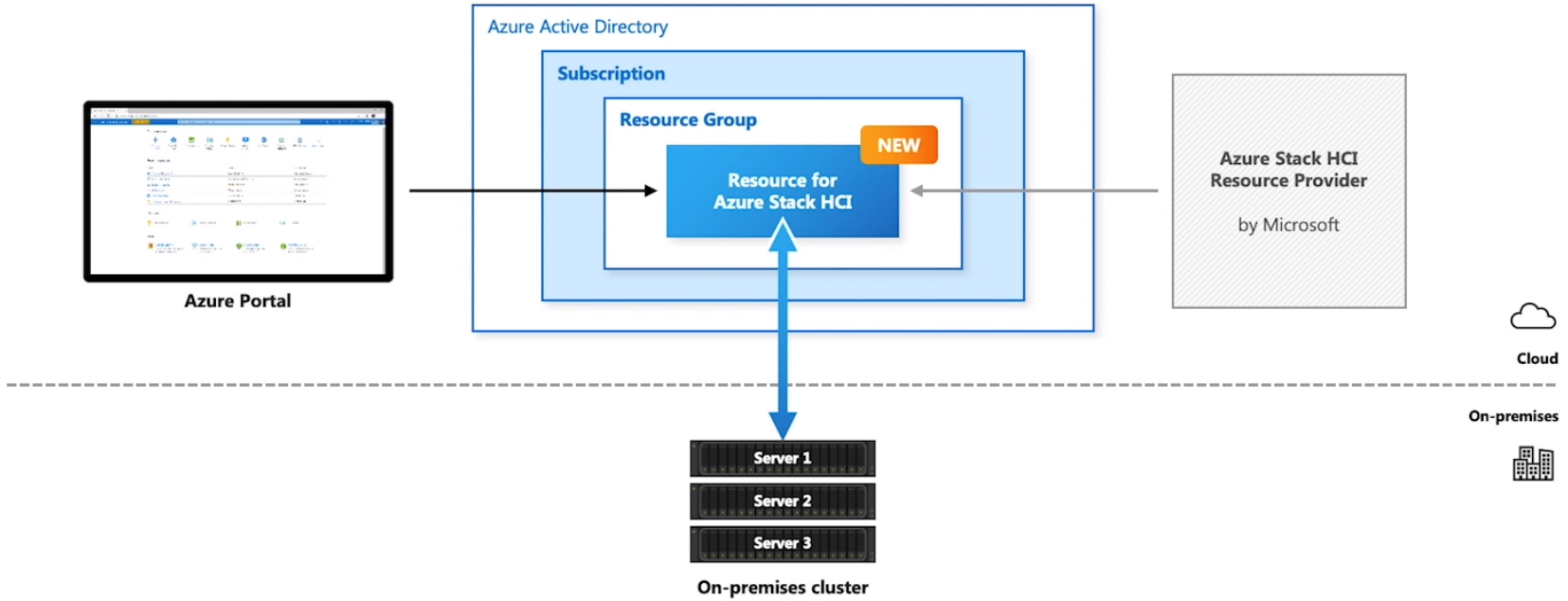
Wie ist der Zusammenhang zwischen Azure Stack HCI OS und Azure?

Natively integrates with Azure

Azure Resource Manager (ARM) resource represents each on-premises Azure Stack HCI cluster

Visibility in the Azure Portal and foundation for hybrid management

No fuss with agents or scripts – it's built-in!



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Wie wird die Nutzung des Azure Stack HCI OS abgerechnet?

Modern subscription billing for Azure Stack HCI

10$ / Core / Month

Predictable monthly fee covers cloud and on-premises together

Charged to your Azure subscription, like every other Azure service you use

Simple cost structure depends only on physical processor cores

Always up-to-date: new features through frictionless monthly updates

Guest operating systems and apps sold separately

Learn more at Azure.com/Pricing

Quelle: https://myinspire.microsoft.com/sessions/4a50e354-b3a8-4d54-9d2a-9dc723ac1030?source=sessions

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Wie sieht der Support für Azure Stack HCI OS aus?

Azure Stack HCI is covered by Azure Support

New, dedicated team of experts to support the new Azure Stack HCI

Access Azure Stack HCI self-help resources

Request technical support through the Azure Portal

Choose a plan that fits your needs, starting from $29/month

Learn more at Azure.com/Support

Quelle: https://myinspire.microsoft.com/sessions/4a50e354-b3a8-4d54-9d2a-9dc723ac1030?source=sessions

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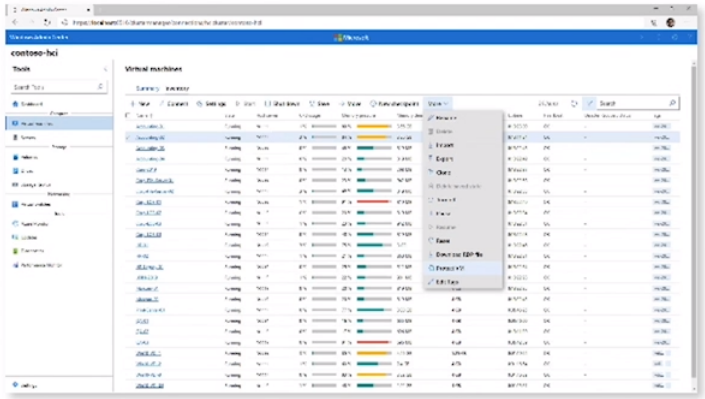
Wie wird Azure Stack HCI OS verwaltet?

Admin Center (included)

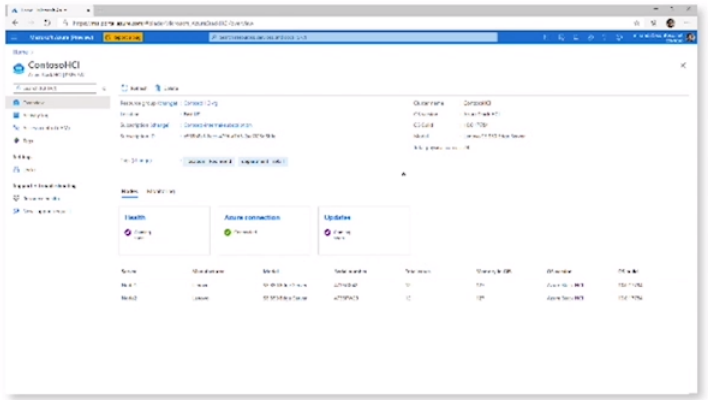
Edge-local, always available



- ✓ Initial set-up
- ✓ Manage infrastructure
- ✓ Hardware management extensions
- ✓ Troubleshooting

Azure Portal (included)

Cloud-based, highly scalable



- ✓ Global visibility
- ✓ Monitoring and security services
- ✓ Request support
- ✓ Billing

Complementary and consistent

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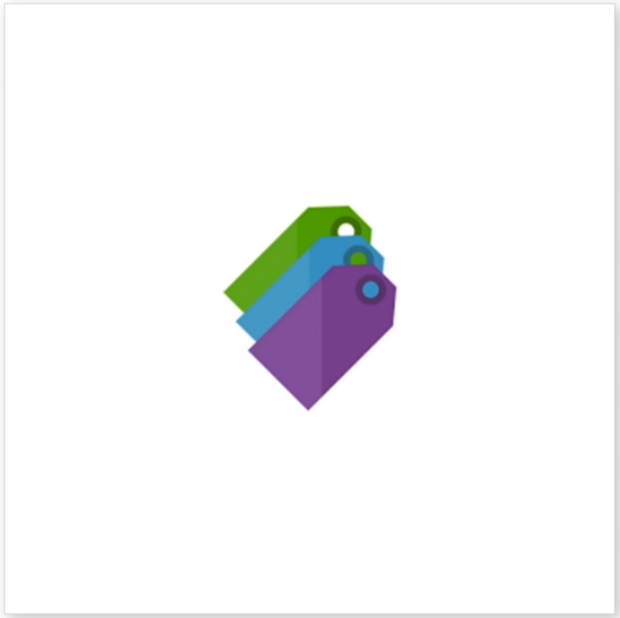
Welche Vorteile bietet die Option das neue Azure Stack HCI OS über das Azure Portal zu verwalten?



Benefit from standard Azure Resource Manager (ARM) constructs

Categorize your clusters with Tags

Organize your clusters into Resource Groups

View all your Azure Stack HCI clusters in a single, global view

Leverage Azure identity access management (IAM)

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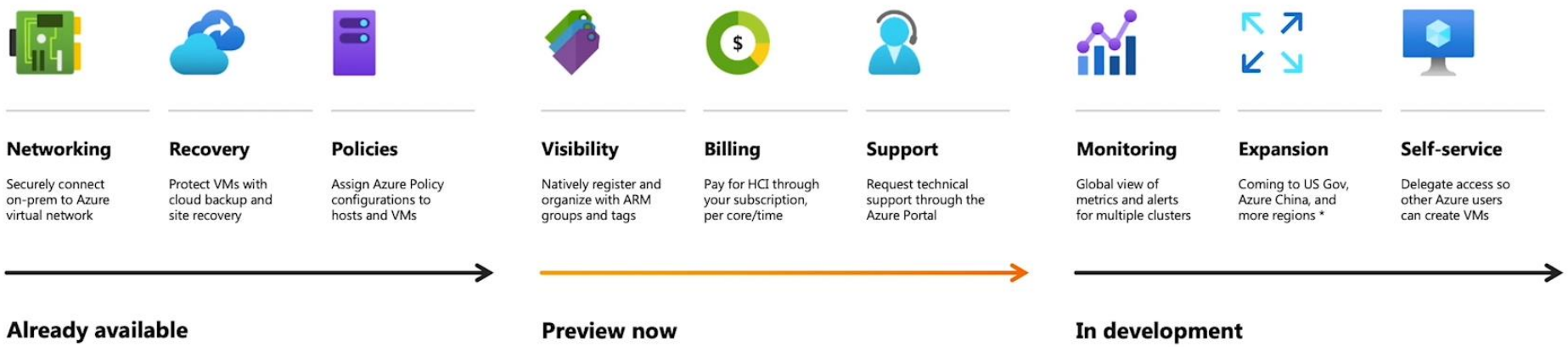
Hybrid Services für Azure Stack HCI OS



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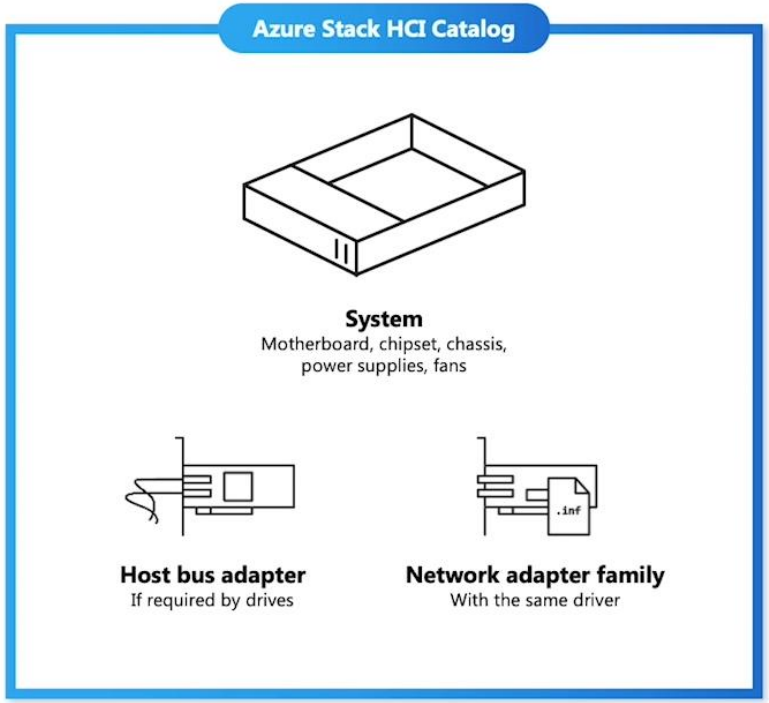
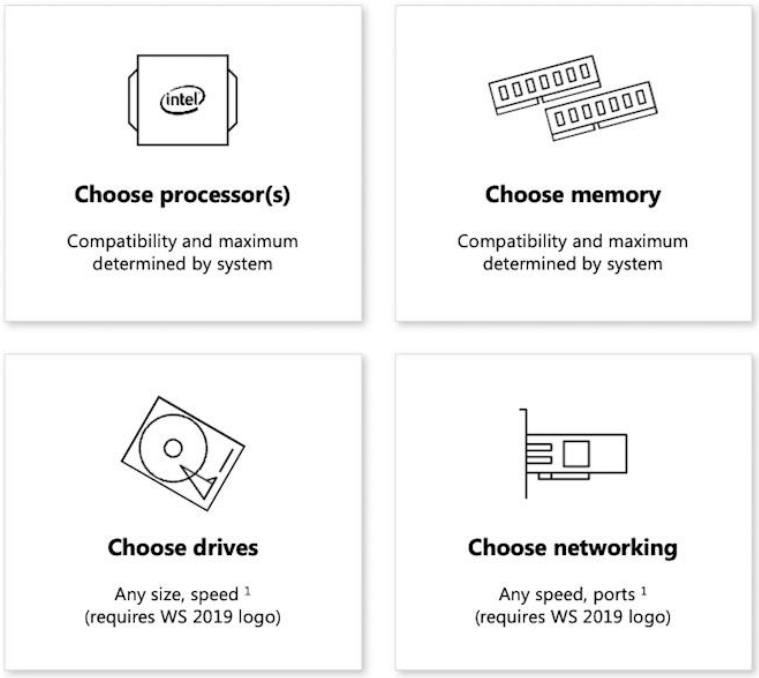
Hardware für Azure Stack HCI OS

Customize hardware to suit your needs



This exact combination, together with a representative selection of choices from the right, is what solution vendors must pre-validate in a multi-node hyperconverged configuration under sustained, heavy load in order to appear in the catalog.



[1] Microsoft strongly recommends adhering to the solution vendor's compatibility matrix for device models. Compliance may be required to receive support from them.

Quelle: https://myinspire.microsoft.com/sessions/4a50e354-b3a8-4d54-9d2a-9dc723ac1030?source=sessions

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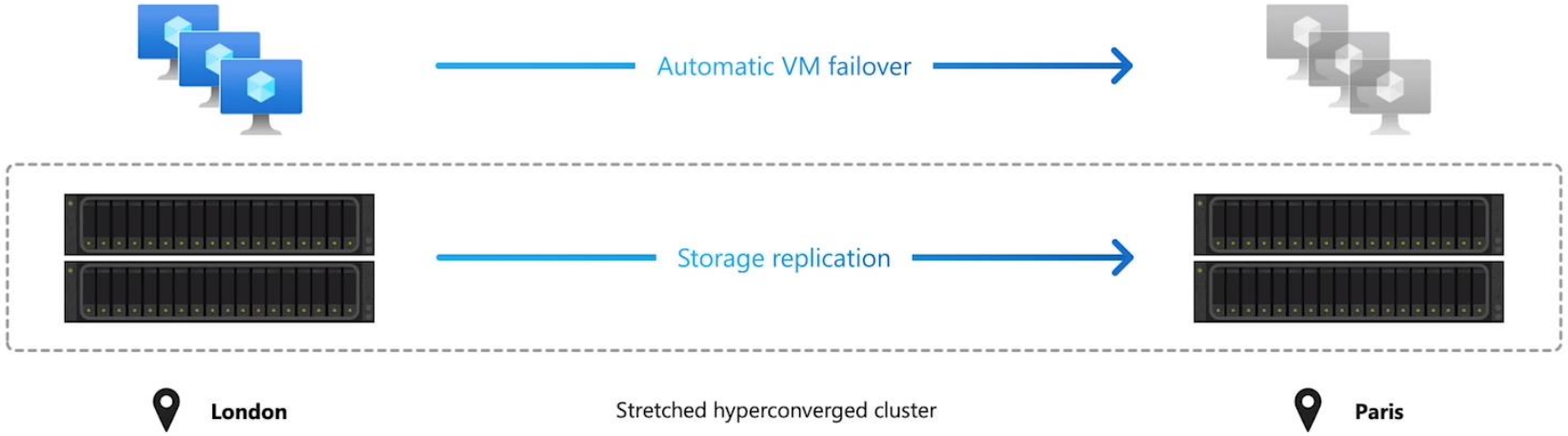
Stretched Cluster

Native disaster recovery with stretch clustering

Span an Azure Stack HCI cluster across two rooms, two buildings, or two cities

Sync or async storage replication, optional encryption, site-local resiliency



Quelle: https://myinspire.microsoft.com/sessions/4a50e354-b3a8-4d54-9d2a-9dc723ac1030?source=sessions

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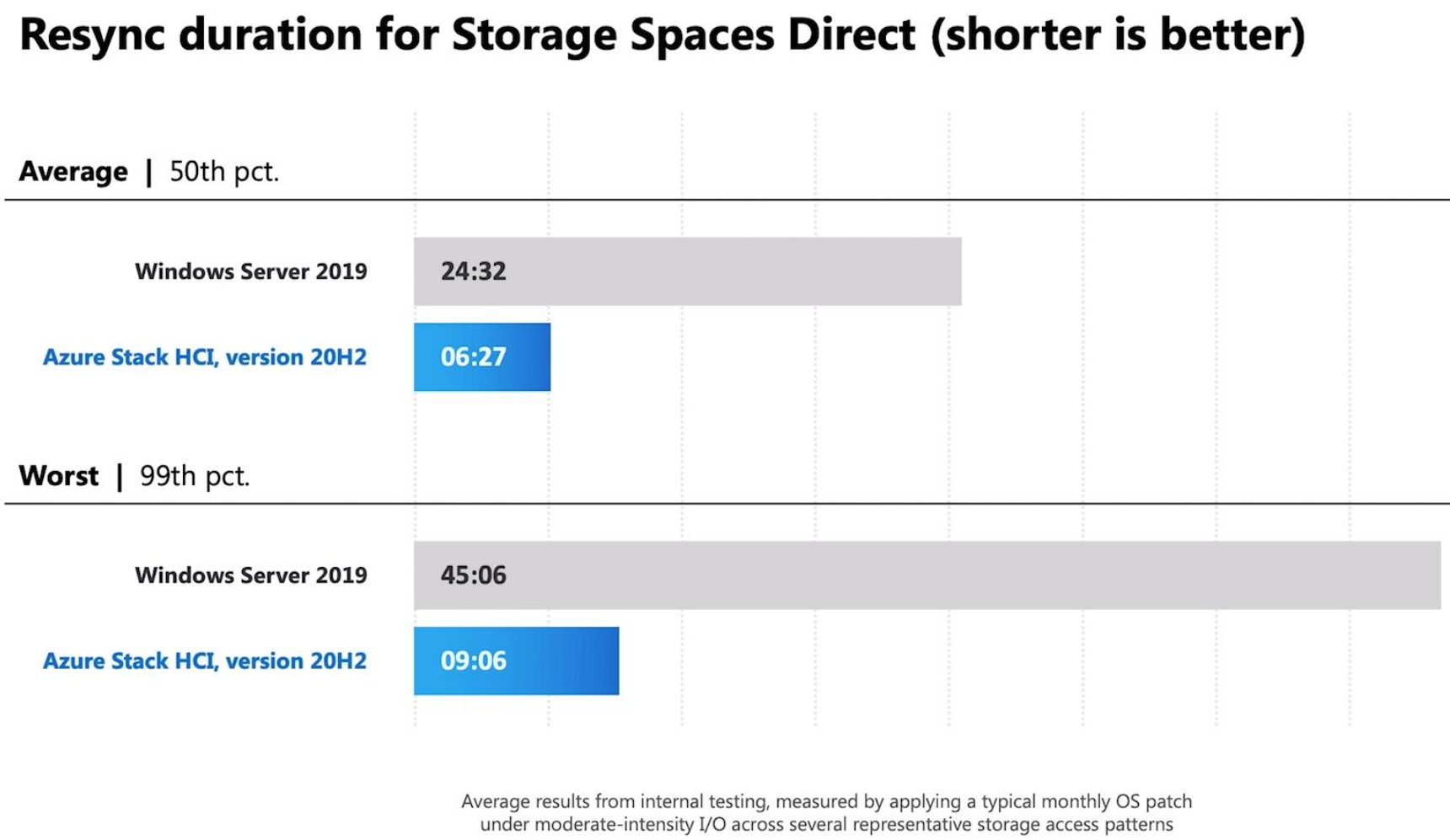
Schneller Resync



Quelle: https://myinspire.microsoft.com/sessions/4a50e354-b3a8-4d54-9d2a-9dc723ac1030?source=sessions

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Extended Security Updates inklusive

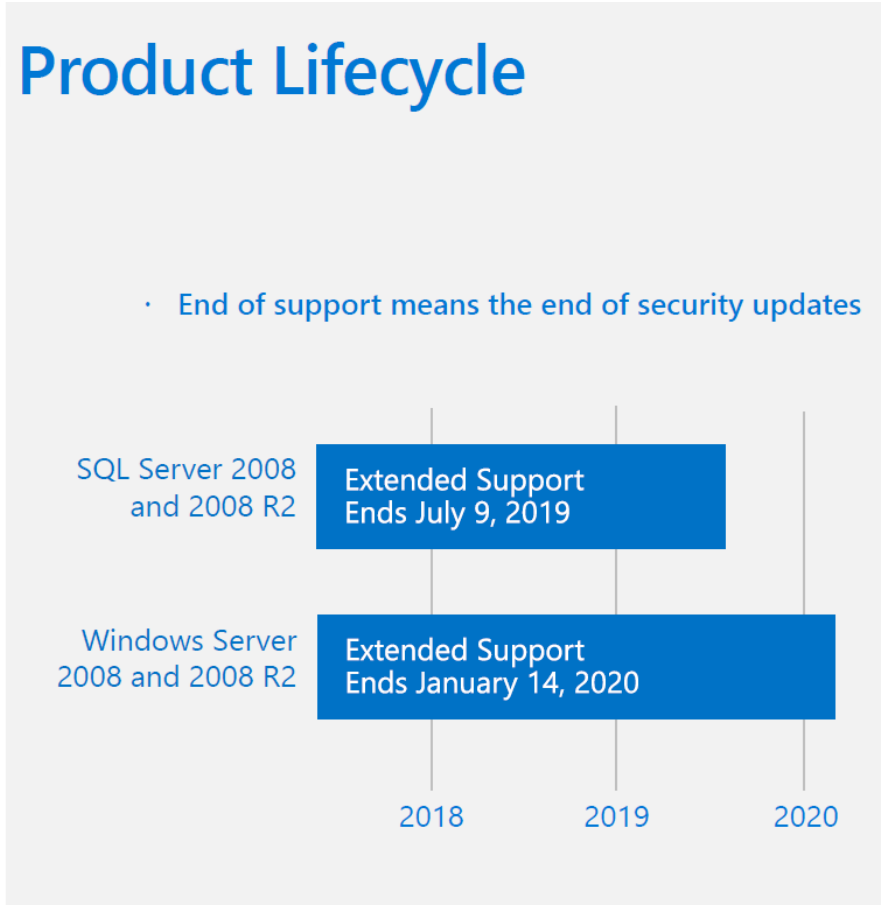
Overview of Server Product Lifecycle

Product release

End of support

Mainstream Support 5 years	Extended Support 5 years
• New features • Security updates • Non-security updates	• Security updates • Non-security updates

https://support.microsoft.com/lifecycle



Quelle: https://myinspire.microsoft.com/sessions/4a50e354-b3a8-4d54-9d2a-9dc723ac1030?source=sessions

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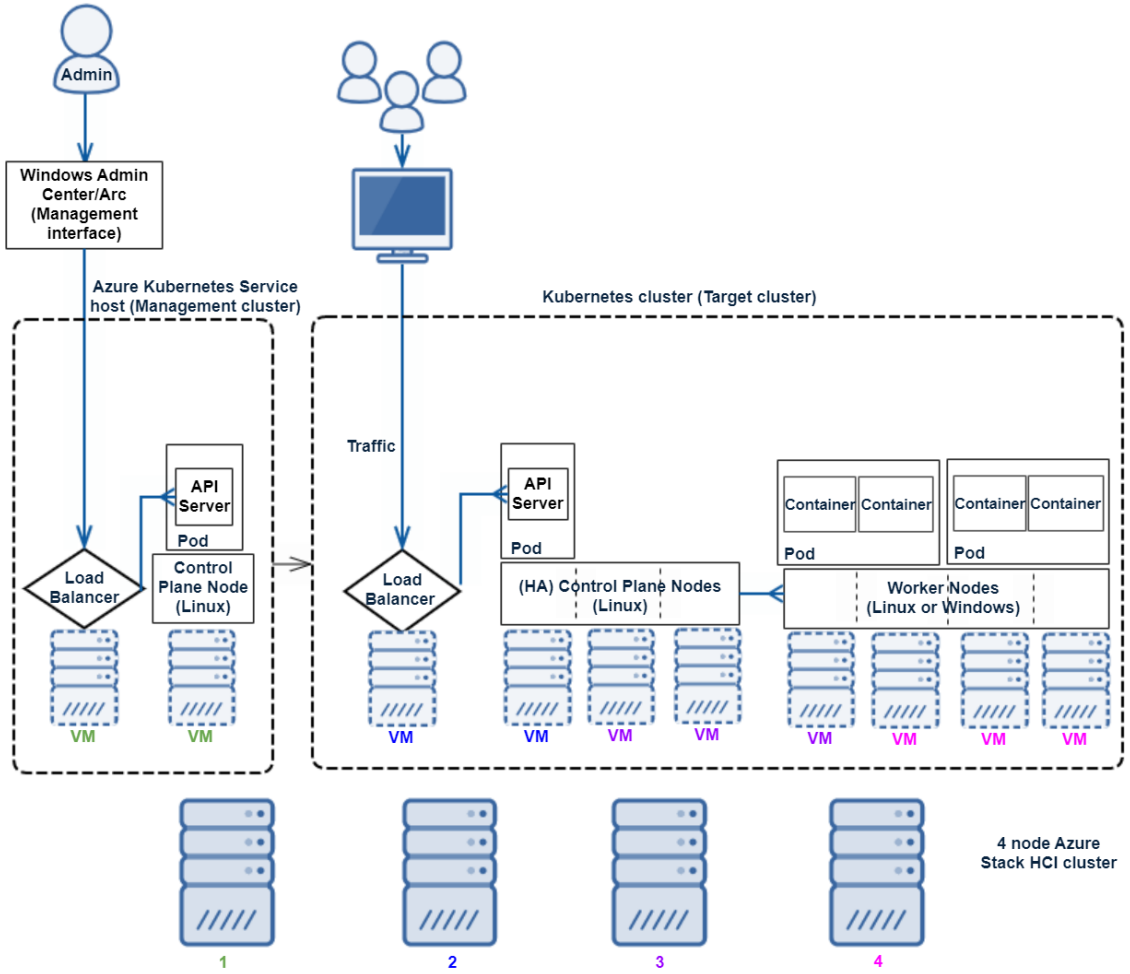
Azure Kubernetes Service on Azure Stack HCI



Quelle: https://myinspire.microsoft.com/sessions/4a50e354-b3a8-4d54-9d2a-9dc723ac1030?source=sessions

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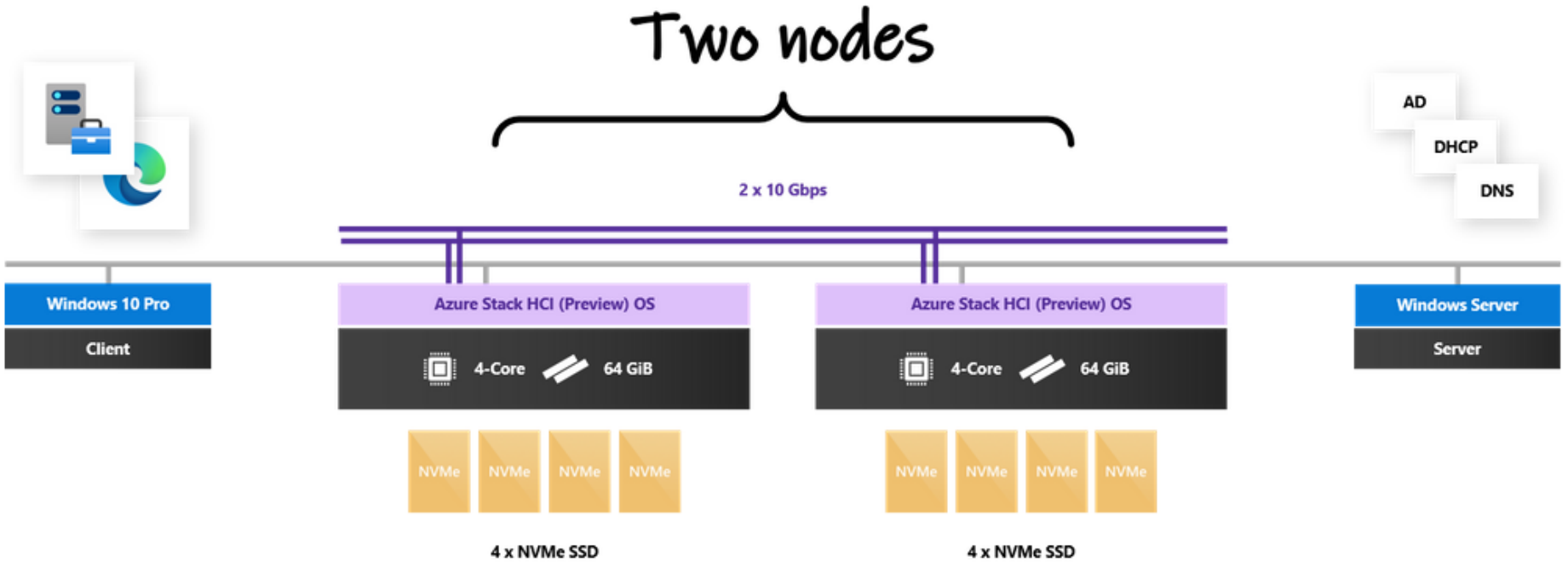
Mögliche Implementierung für ein kleines Azure Stack HCI OS Cluster



Quelle: https://docs.microsoft.com/en-us/azure-stack/aks-hci/kubernetes-concepts

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Lizenzierung einer hyper-converged Infrastructure mit Microsoft Technologien

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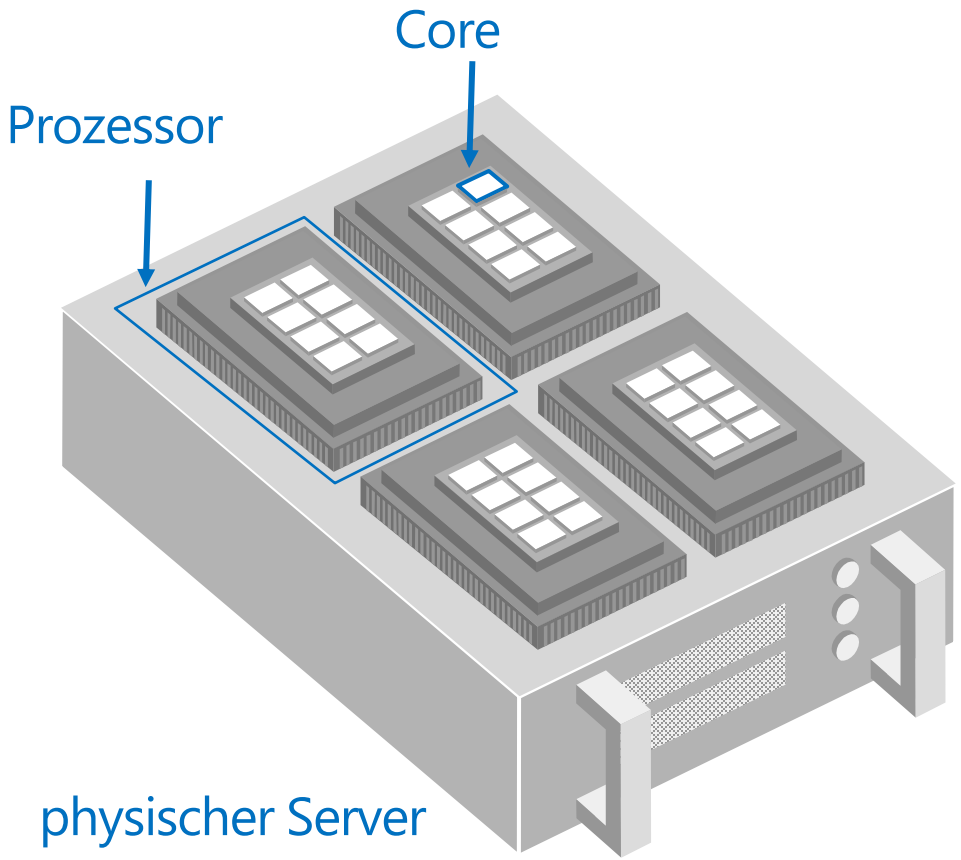
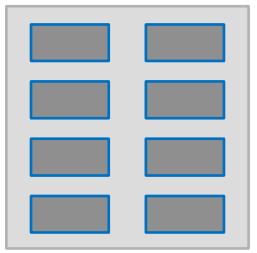
Windows Server 2019 Lizenzierung

Lizenzierung auf Basis der physischen Kerne (Cores) – Standard und Datacenter

Um lizenzkonform zu sein müssen alle physischen Cores lizenziert sein

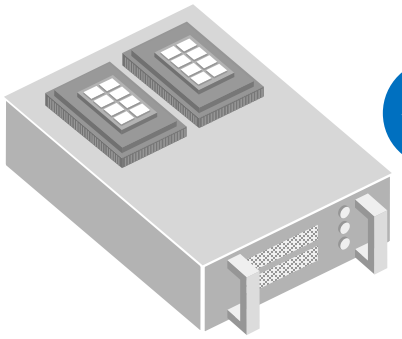


1



Mindestens
8 Cores/Prozessor

2



Mindestens 16
Cores/physischem Server

Sonderfall: Windows Server 2019 Datacenter Azure Stack HCI RoBo Lizenz

Variante der Windows Server Datacenter Lizenz für Azure Stack HCI zertifizierte Systeme mit maximal 8 Kernen

Alle Windows Server 2019 Datacenter Features enthalten – maximal 8 physische Kerne je Host erlaubt

Bei Thomas-Krenn verfügbar!

Azure Stack HCI Micro-Cluster Basic

Ver. 1.0

Nodes aufrüstbar bis zu je:
1x CPU (2,2 Ghz
8-Core)
64 GB RAM
24 TB Mirror (12 TB Nested-Mirror)
2x 10Gbit/s LAN (RJ45)

Preis inkl. 2x vorinstallierte Windows 2019 Datacenter Nodes
inkl. Windows Admin Center Extension
16 Port 10 Gbit-Switch

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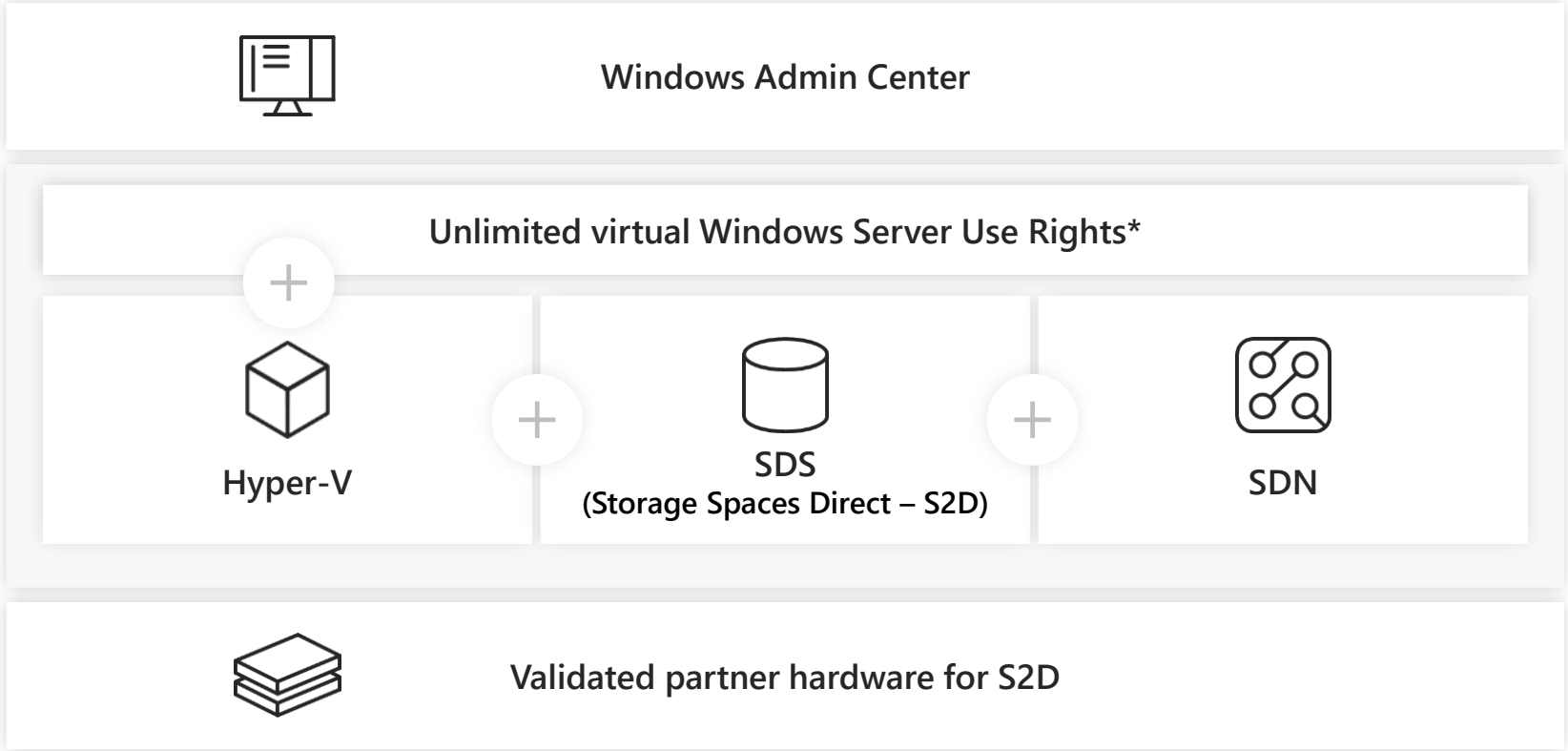
Storage Spaces Direct mit Windows Server 2019 DC



* on licensed Hosts only

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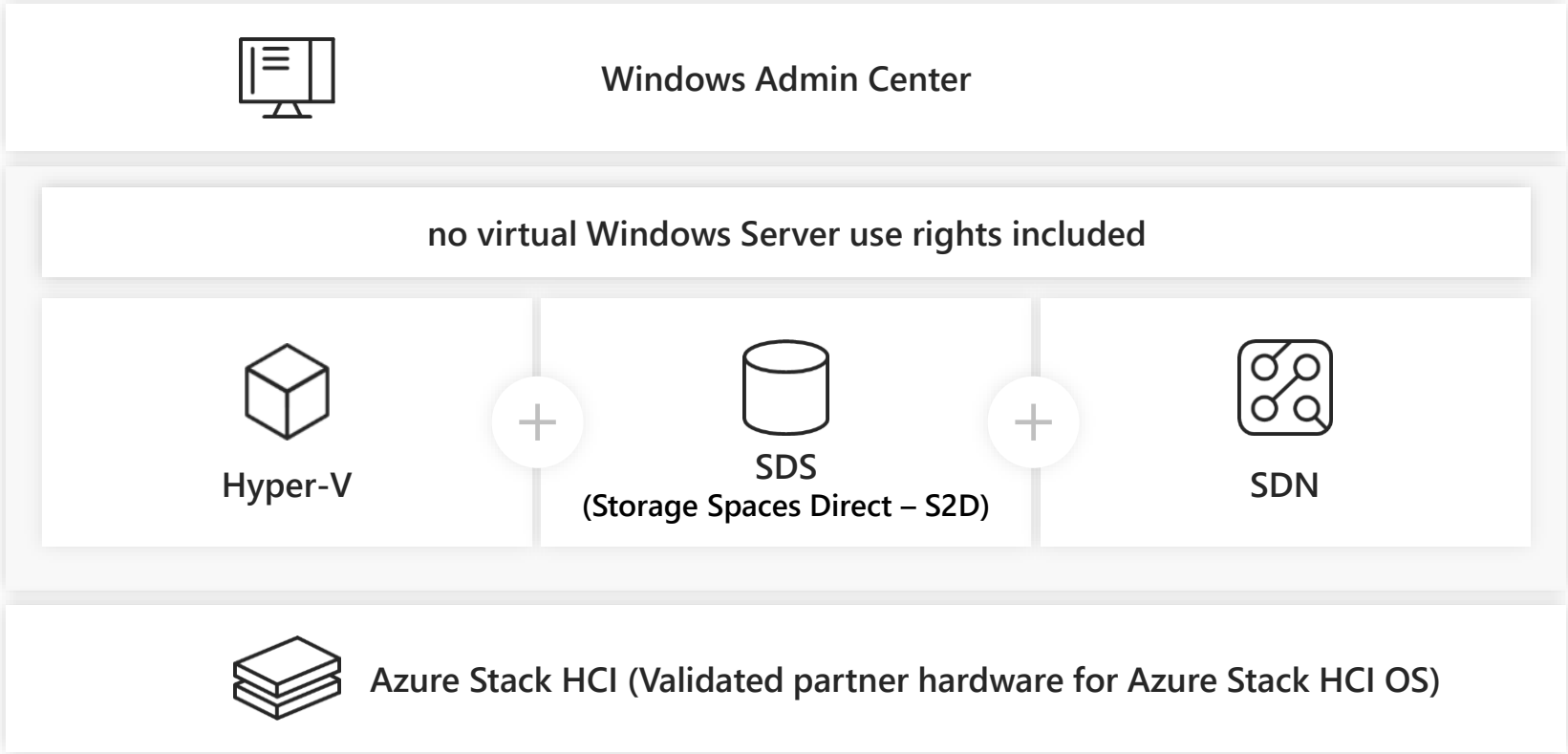
Azure Stack HCI Host OS



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Wie werden unter Azure Stack HCI OS VM Nutzungsrechte lizenziert?

As little or as much Windows Server as you need, like other HCI platforms

	What you want to run: **Linux applications** **Open source software**	What you want to run: **A few Windows Server roles or applications**	What you want to run: **Unlimited Windows Server roles or applications**
	What you buy:	What you buy:	What you buy:
	Validated OEM HW	**Validated OEM HW**	**Validated OEM HW**
	+	+	+
Host: Subscription	**Azure Stack HCI**	**Azure Stack HCI**	**Azure Stack HCI**
	+	+	+
Guest: Perpetual	*Nothing else from Microsoft*	**Windows Server 2019 Standard(s)**	**Windows Server 2019 Datacenter**

Quelle: https://myinspire.microsoft.com/sessions/4a50e354-b3a8-4d54-9d2a-9dc723ac1030?source=sessions

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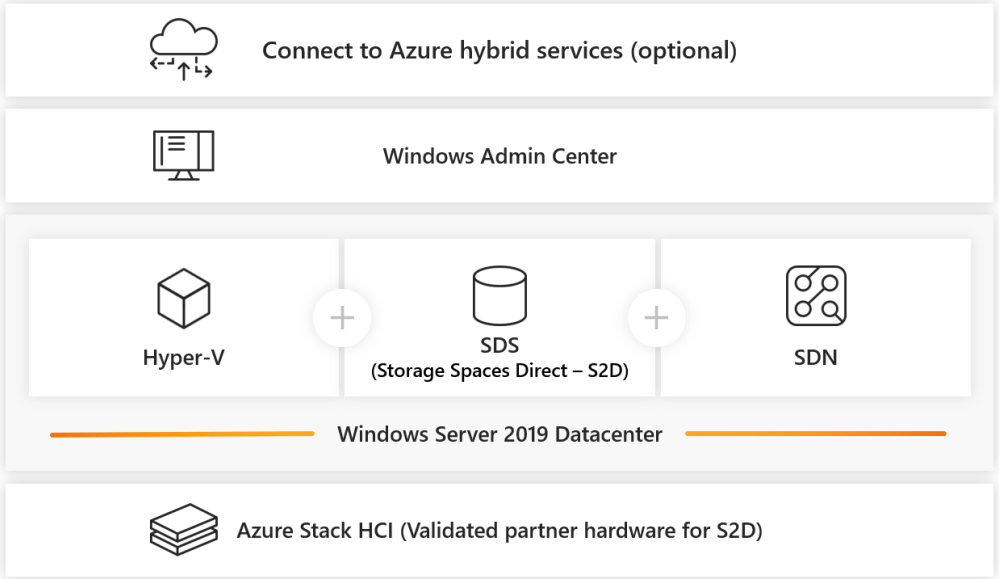
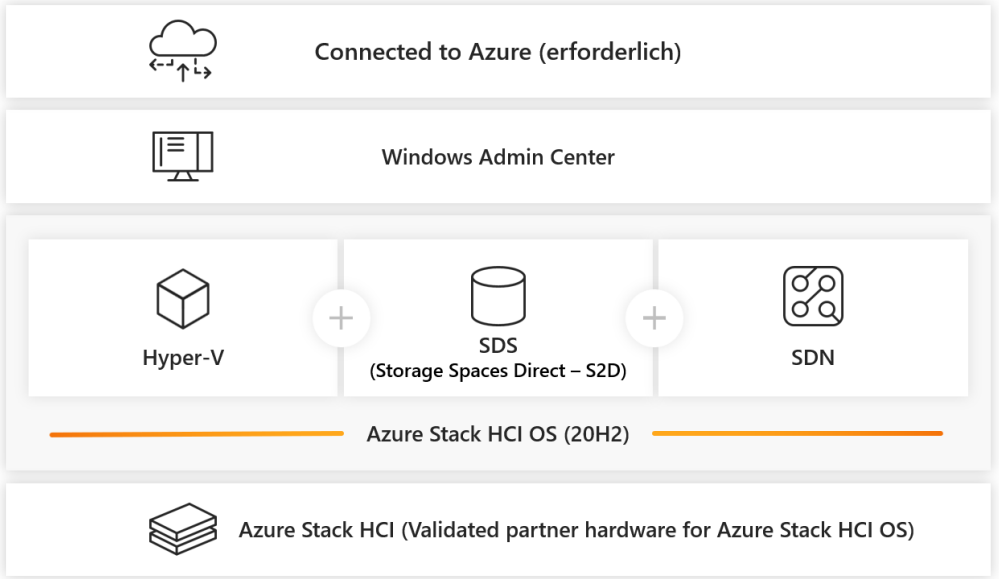
Zwei Optionen für HCI mit Microsoft Lösungen

Option 1



Option 2



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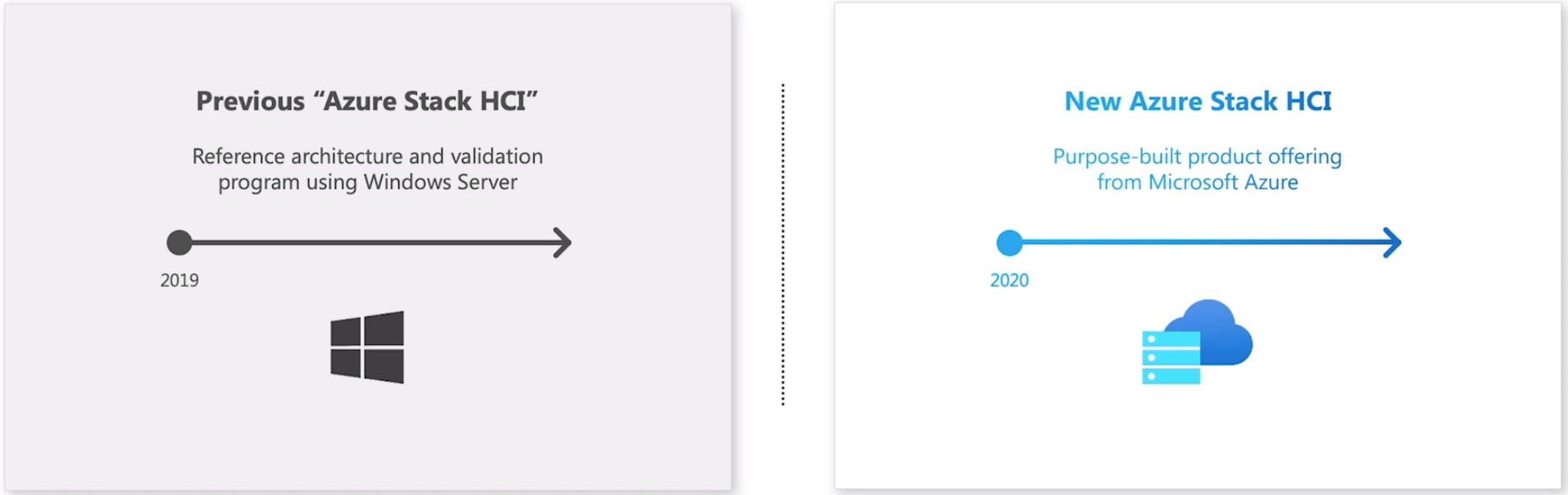
Azure Stack HCI

Inspired by its popular predecessor and namesake…



Quelle: https://docs.microsoft.com/en-us/azure-stack/aks-hci/kubernetes-concepts

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Lösungen von Thomas Krenn für Azure Stack HCI

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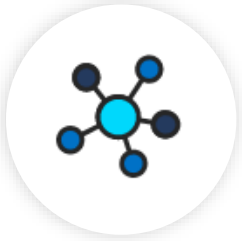
Einsatzszenarien für Microsoft HCI

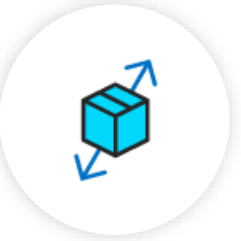


Branch office and edge

Virtual desktop infrastructure

High-performance SQL Server

Trusted enterprise virtualization



Scale-out storage

General-purpose Kubernetes

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Lösungen von Thomas Krenn für Azure Stack HCI

Thomas-Krenn.AG S2D Micro-Cluster (V1.0)

Scale

2 nodes

Single Node Data

CPU: 8-16 cores (Intel)
RAM: 128 GB
Raw storage: 16TB to 64TB
Storage type: SDD + HDD
Network speed: 10 Gbit

Webinterface der Windows Admin Center Extension

Azure Stack HCI Micro-Cluster - in Basic und Advanced Version verfügbar

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Lösungen von Thomas Krenn für Azure Stack HCI

Thomas-Krenn.AG S2D Series RI2212 (v2.0)

Scale

2 to 4 nodes

Single Node Data

CPU: 16-56 cores (Intel)
RAM: 64GB to 1TB
Raw storage: 2TB to 144TB
Storage type: NVMe + SSD + HDD
Network speed: Up to 100Gb

Thomas-Krenn.AG S2D Series RI2224 (v2.0)

Scale

2 to 4 nodes

Single Node Data

CPU: 16-56 cores (Intel)
RAM: 64GB to 1TB
Raw storage: 2TB to 92TB
Storage type: NVMe + SSD
Network speed: Up to 100Gb

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Lösungen von Thomas Krenn für Azure Stack HCI

Thomas-Krenn.AG S2D Series RI2424 (v2.0)

Scale

2 to 4 nodes

Single Node Data

CPU: 16-56 cores (Intel)
RAM: 64GB to 1TB
Raw storage: 2TB to 288TB
Storage type: NVMe + SSD + HDD
Network speed: Up to 100Gb

Thomas-Krenn.AG | S2D Series AMD RA2224 (v2.0)

Scale

2 to 4 nodes

Single Node Data

CPU: 16-128 Cores (AMD)
RAM: 64GB to 1TB
Raw storage: 2TB to 92TB
Storage type: SSD
Network speed: Up to 100Gb

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Vielen Dank!

Manfred Helber

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