



NT KONFERENCA 2022

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Azure Stack HCI - delček Azure infrastrukture pri vas

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MCT in prijazen fant

Agenda

- ➔ What is Azure Stack HCI?
- ➔ Azure Stack HCI vs. Windows Server 2022
- ➔ Technologies in Azure Stack HCI
- ➔ Azure Arc
- ➔ Questions & Answers

What is Azure Stack?

Extension of Azure to consistently run hybrid applications

Azure Stack HCI

Hyperconverged solution



Operating system and hardware
Scalable virtualization and storage
High-performance workloads
AKS on Azure Stack HCI
Integration with Azure Arc

Azure Stack Edge

Cloud-managed appliance



Compute, AI & IoT
at the edge

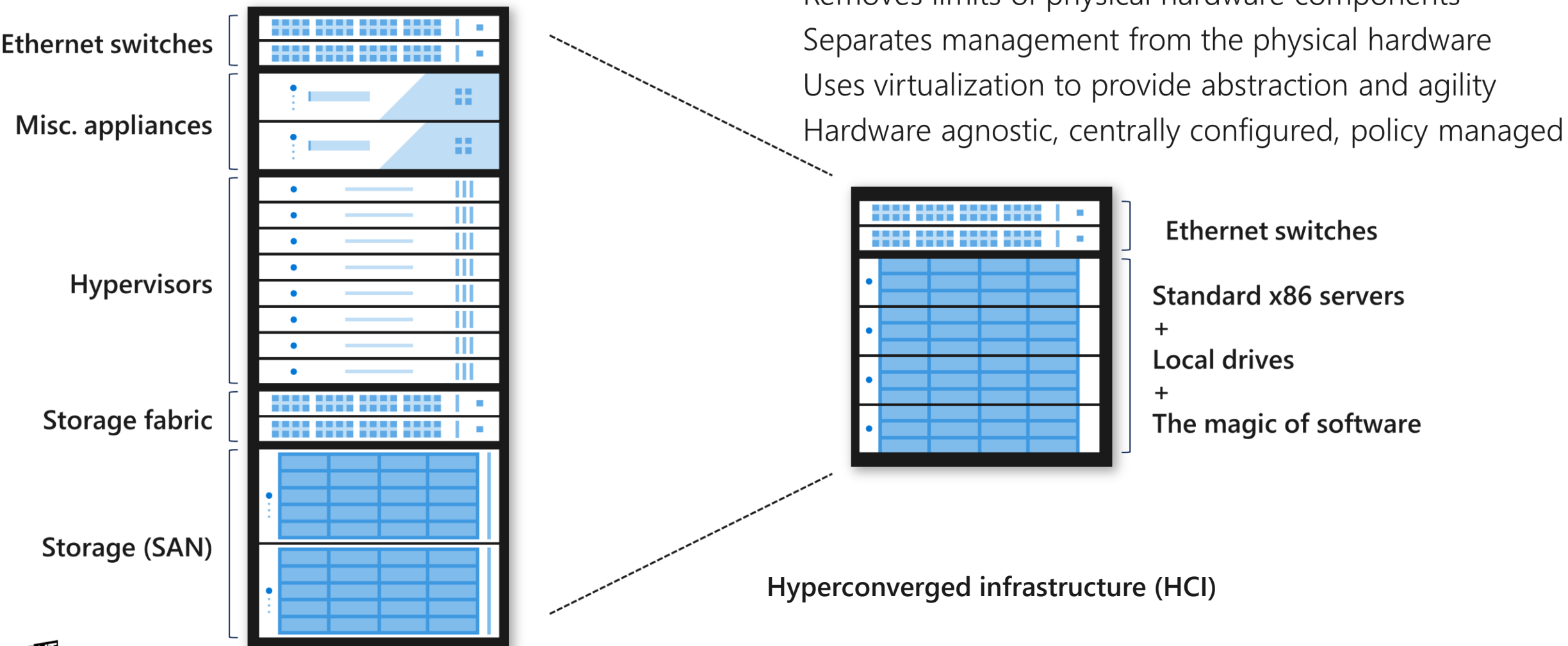
Azure Stack Hub

Cloud-native integrated system

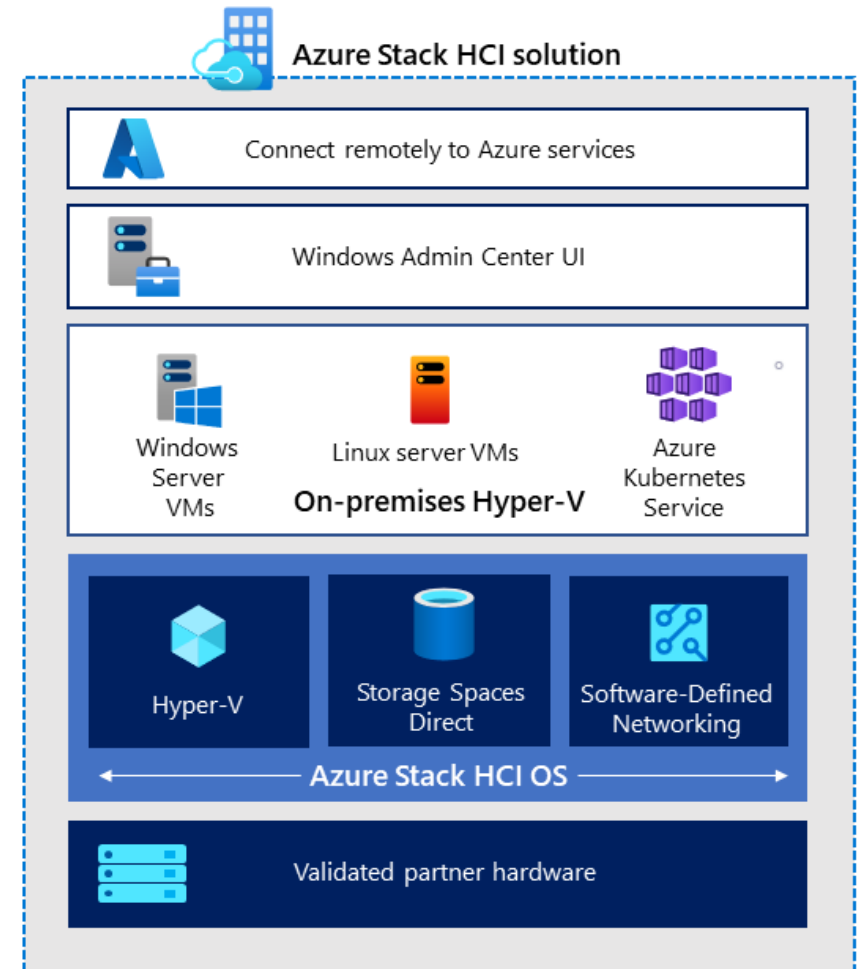
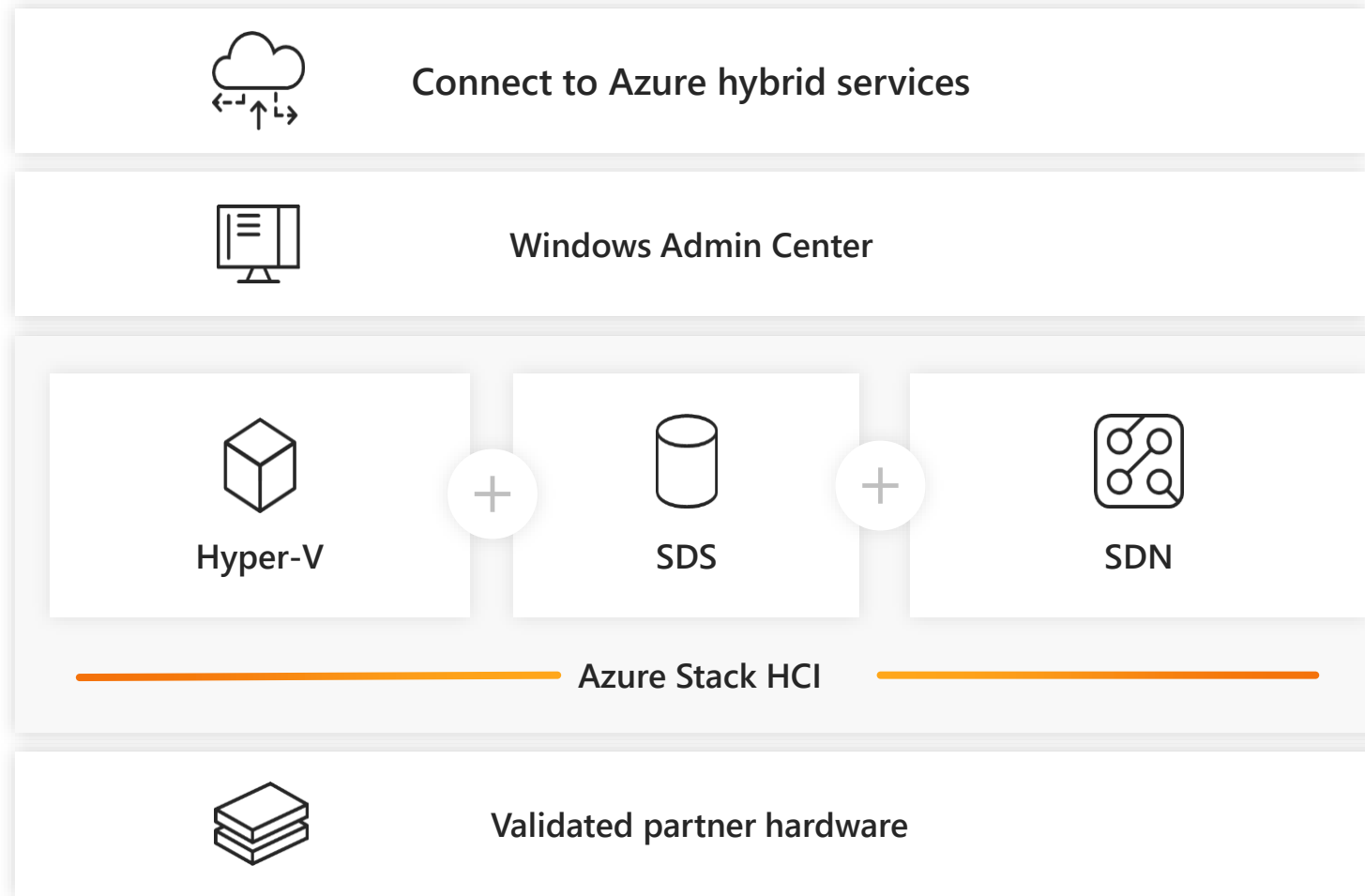


Disconnected
scenarios

Hyperconverged infrastructure (HCI)



What is Azure Stack HCI?



Azure Stack HCI is delivered as Azure hybrid service



No software licenses to buy and track

Automatically billed to your Azure subscription



No standalone legal agreement to read and sign

Covered by Azure services terms



No separate support contract number

Azure Support from the Azure Portal



No versions to upgrade

Continuous feature updates



Windows Server and Azure Stack HCI



Azure Stack HCI

✓ Exciting roadmap of new releases

Innovation focused on being the
best virtualization host

Future of Hyper-V virtualization,
software-defined storage and networking

Azure **subscription-based** model at \$10 per core per month

Runs on **your hardware**



Windows Server

✓ Exciting roadmap of new releases

Innovation focused on being the
best guest and **traditional server**

All other Windows Server roles,
like IIS, File Services, DNS, DHCP, AD/DS

Traditional licensing model

Runs **anywhere**

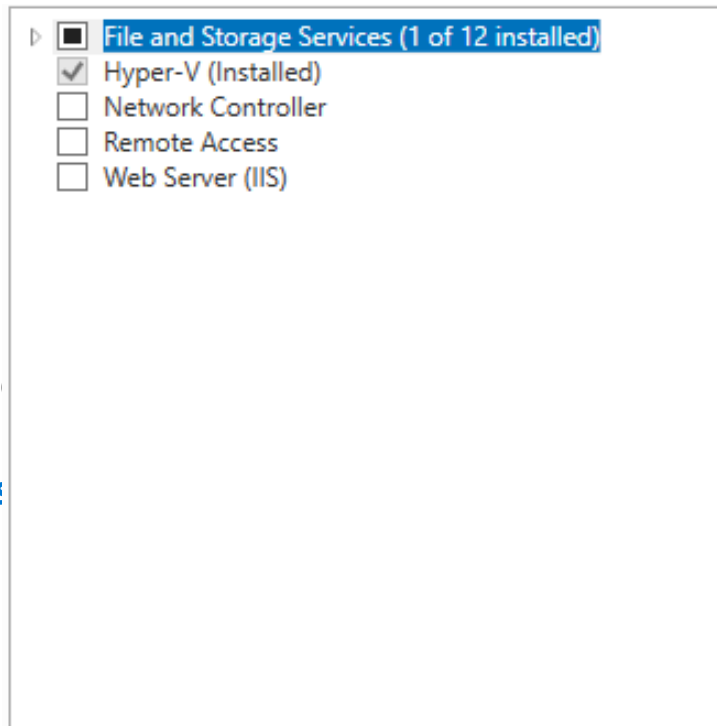
Windows Server and Azure Stack HCI



Azure Stack HCI



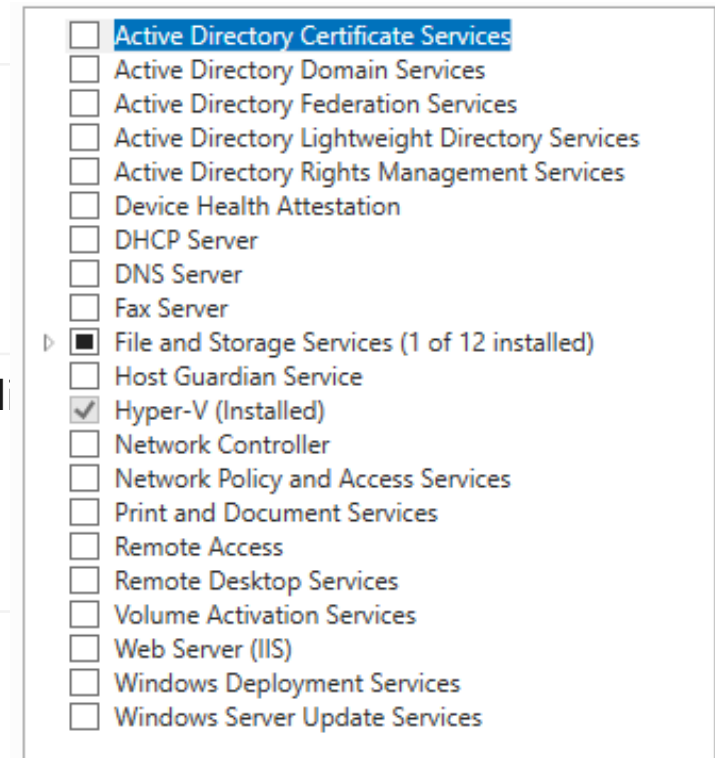
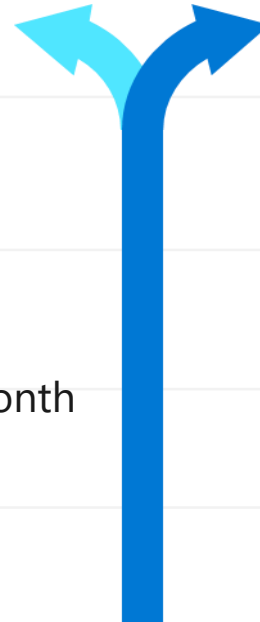
Windows Server



Azure **subs**

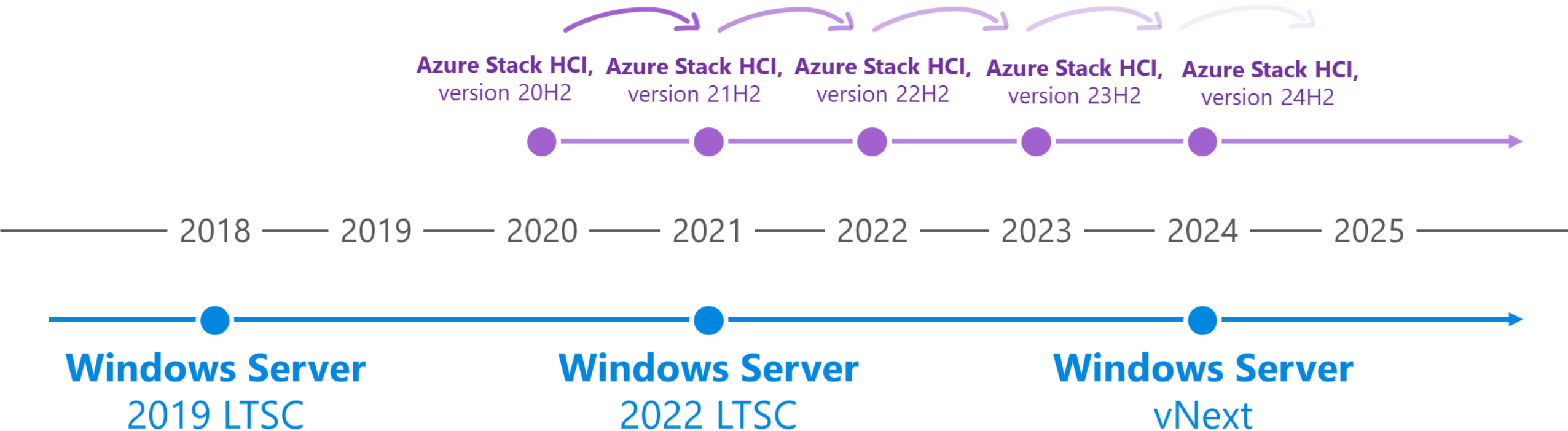


g
per month



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Annual updates are free and non-disruptive



Subscription business model = customers are always entitled to updates

Comparing Azure Stack HCI and Windows Server 2022

Azure Stack HCI

- Premier platform for running VMs
- Stripped-down version of Windows Server
- Cloud service that includes an OS
- Subscription based
- Includes Azure benefits
- Does not include virtualization rights
- Focuses on infrastructure level
- Run workloads in VMs or containers
- Clients don't connect directly to it

Windows Server 2022

- Latest Windows Server version
- Multi-purpose OS with many different roles
- Can run anywhere
- Clients can connect directly

Comparing Azure Stack HCI and Windows Server 2022

Attribute	Azure Stack HCI	Windows Server 2022
Hyper-V	Yes	Yes
Storage Spaces Direct	Yes	Yes
Software-Defined Networking	Yes	Yes
Adjustable storage repair speed	Yes	Yes
Secured-core Server	Yes	Yes
Stronger, faster network encryption	Yes	Yes
4-5x faster Storage Spaces repairs	Yes	Yes
Stretch clustering for disaster recovery with Storage Spaces Direct	Yes	No
High availability for GPU workload	Yes	No
Restart up to 10x faster with kernel-only restarts	Yes	No
Simplified host networking with Network ATC	Yes	No

Comparing Azure Stack HCI and Windows Server 2022

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Stretch clustering for disaster recovery with Storage Spaces Direct	Yes	No
High availability for GPU workload	Yes	No
Restart up to 10x faster with kernel-only restarts	Yes	No
Simplified host networking with Network ATC	Yes	No
Single-node clusters with Storage Spaces Direct	Yes	No
Storage Spaces Direct thin provisioning	Yes	No
Dynamic processor compatibility mode	Yes	No
Cluster-Aware OS feature update	Yes	No
Integrated driver and firmware updates	Yes (Integrated Systems only)	No

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Technologies in Azure
Stack HCI

Software-Defined Compute

Workloads can transparently move and run on any host

Failover clustering, Hyper-V virtualization

Some of Hyper-V features for Software-Defined Compute

Live Migration

Hot add/resize VHDX

Runtime resize of VM memory

Hot add and vNIC naming

Dynamic processor compatibility

Hyper-V Replica

Shielded VMs

PowerShell Direct

Discrete Device Assignment

Capability	Azure Stack HCI
Physical (Host) Memory Support	Up to 24 TB per physical server
Physical (Host) Logical Processor Support	Up to 512 LPs
Virtual Machine Memory Support	Up to 12 TB per VM
Virtual Machine Virtual Processor Support	Up to 240 VPs per VM

Software-Defined Storage

Removes separation between local storage and SAN

Policy configured, feature-rich cloud scale storage on standard HW

Some of Azure Stack HCI features for SDS

Storage Spaces Direct - software-defined, shared-nothing storage

Server Message Block 3 (Transparent Failover, Scale Out, Multichannel, Direct, ...)

Storage Quality of Service (QoS)

Scale-Out File Server (SoFS)

Storage Replica

Stretch clustering with S2D

	Azure Stack HCI
Max servers per cluster	16
Max storage per cluster	16 PB
Max storage per server	400 TB
Max volumes per cluster	64
Max volume size	64 TB

Supported Drive Types

Faster

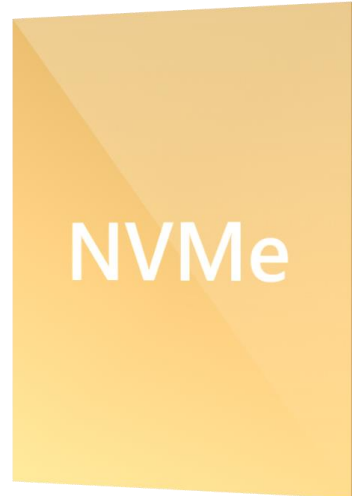


Slower



Persistent Memory
(Storage Class Memory)

~ 1 μ s
1,000 ns



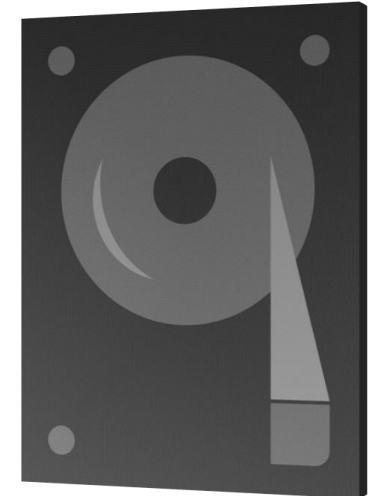
Non-Volatile Memory
Express

~ 0.1 ms
100,000 ns



Solid-State Drive

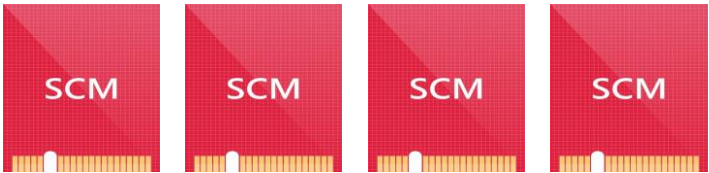
~ 0.1 ms
100,000 ns



Hard Disk Drive

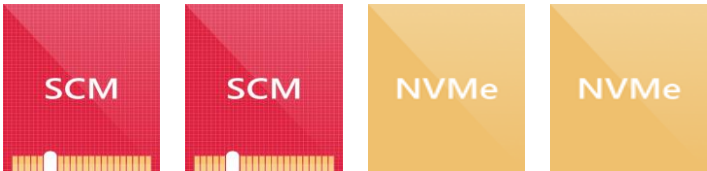
~ 10 ms
10,000,000 ns

S2D storage



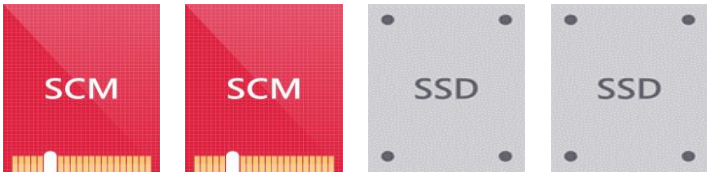
SCM for Capacity

OR



SCM + NVMe for Capacity

OR



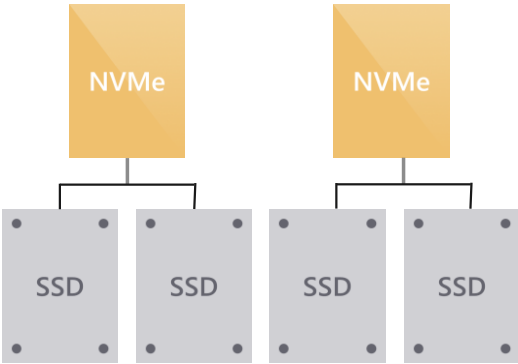
SCM + SSD for Capacity

Flat design of all flash delivers the best IOPS and throughput



NVMe for Capacity

OR

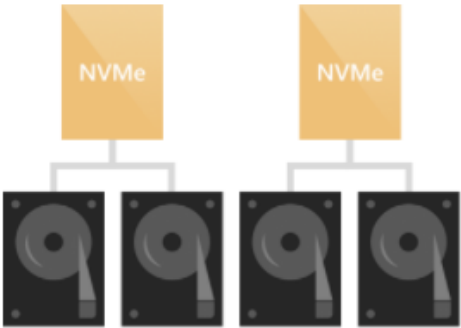


NVMe for Cache & **SSD** for Capacity

OR

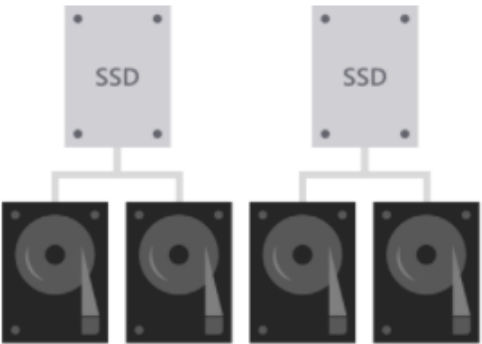


SSD for Capacity



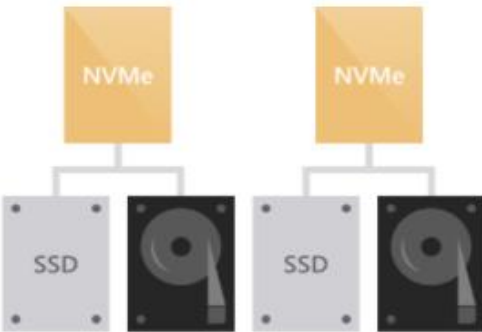
NVMe for Cache HDD for Capacity

OR



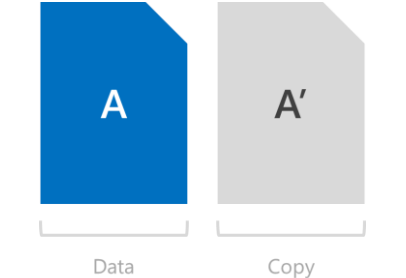
SSD for Cache HDD for Capacity

OR



NVMe for Cache SSD + HDD for Capacity

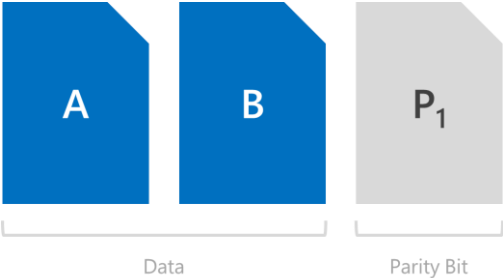
S2D Storage Resiliency Types



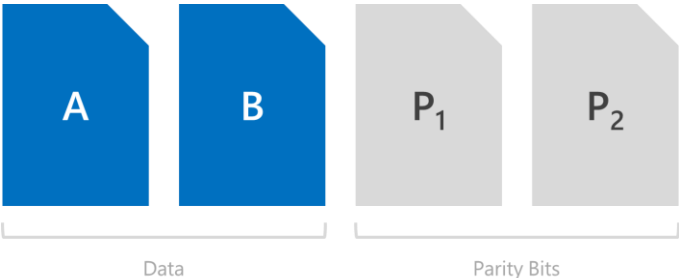
Two-way mirror
2 servers



Three-way mirror
3+ servers



Single parity
Possible but not recommended



Dual parity
4+ servers

Software-Defined Networking

Separates network control and forwarding functions from the network topology

Some of Azure Stack HCI features for Azure-inspired SDN

Remote Direct Memory Access (RDMA)

NIC Teaming

Switch-Embedded Teaming (SET)

Receive Side Scaling (RSS)

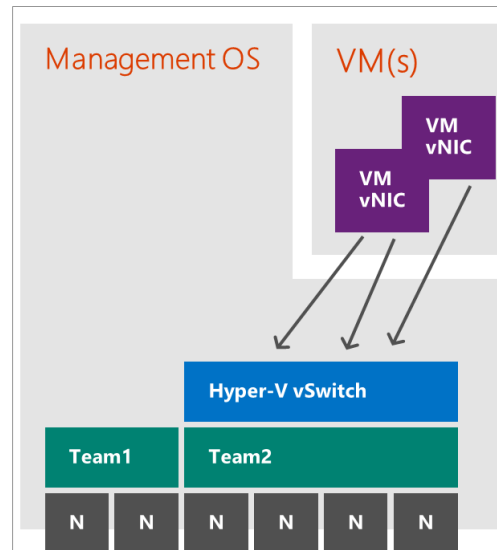
Virtual Machine Queue (VMQ)

Data Center Bridging

Network Virtualization

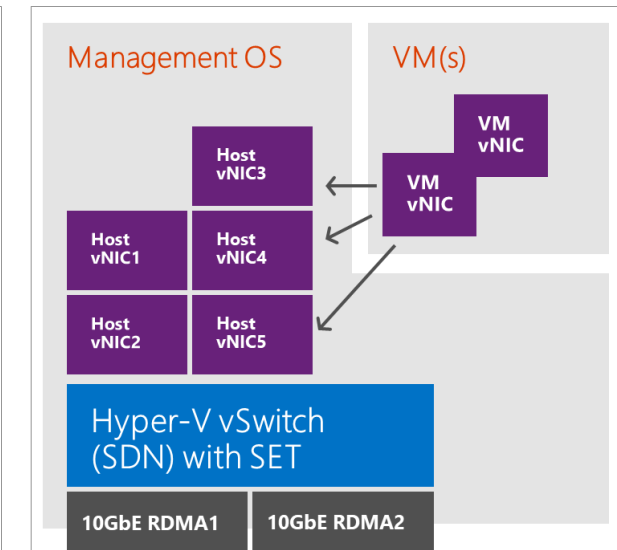
Network Controller

Non-converged network



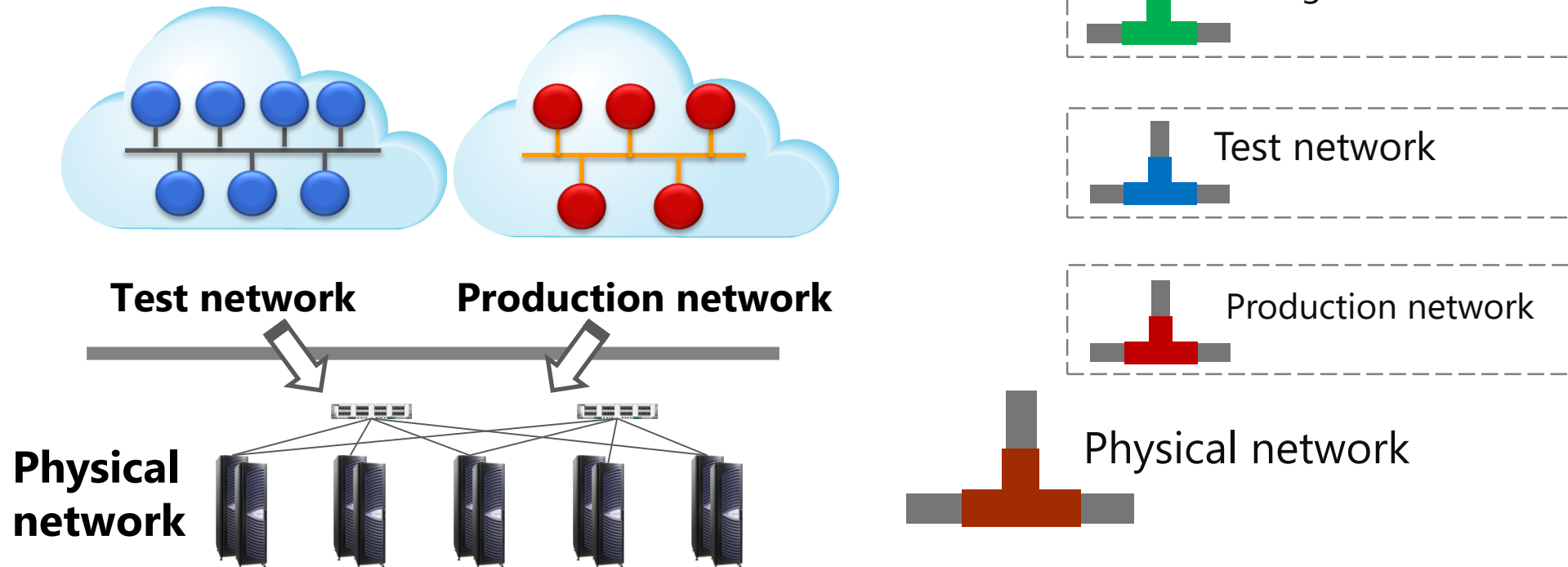
Traditional Hyper-V Host
Example 6 x 1GbE NICs

Converged network



Azure Stack HCI Host
Example 2 x 10GbE RDMA NICs

Network Virtualization



Multiple virtual networks on a same physical network

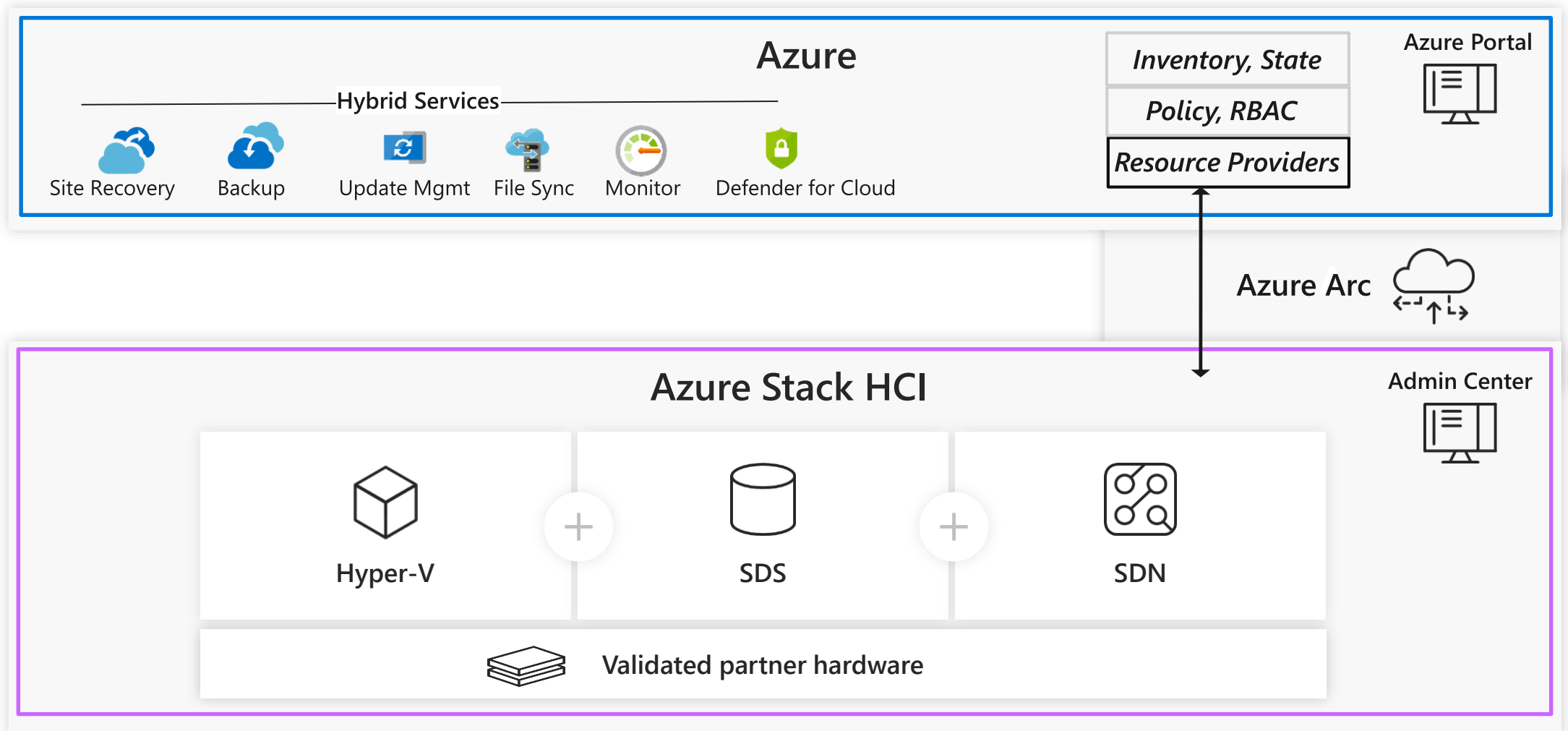
Each virtual network is isolated from others

Can be implemented on any network infrastructure

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Azure Arc

Azure Stack HCI and Azure Arc



Azure Arc

Infrastructure



Multi-cloud



Azure Arc virtual machines
(preview)



Azure Stack HCI



Kubernetes clusters



Servers



SQL Servers



VMware vCenters (preview)



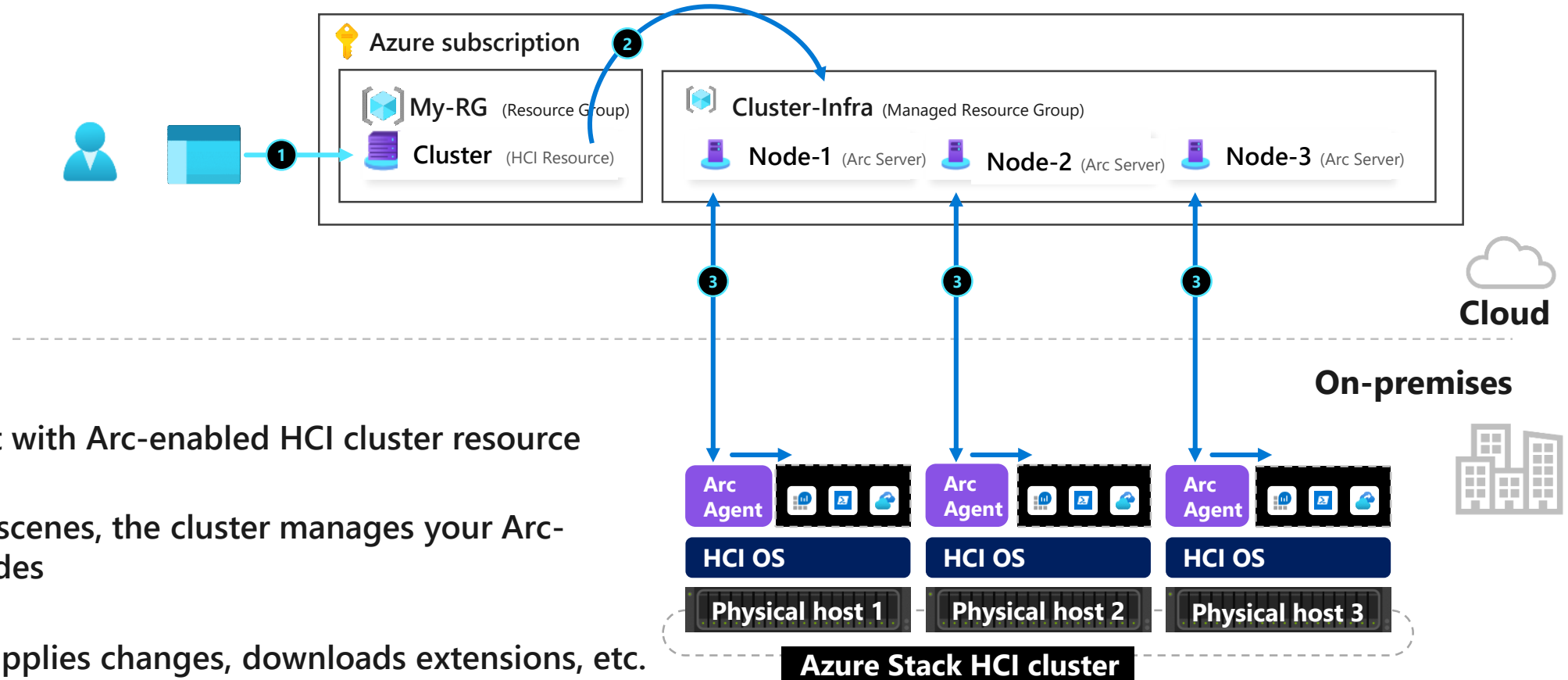
SCVMM management servers
(preview)



Edge



Every Azure Stack HCI node is Arc-enabled



- 1 You interact with Arc-enabled HCI cluster resource
- 2 Behind the scenes, the cluster manages your Arc-enabled nodes
- 3 Each node applies changes, downloads extensions, etc.

Azure Stack HCI integrates with Azure Arc



Manage HCI infrastructure

with Arc-enabled hosts



Create and manage VMs on HCI

with Arc resource bridge



Manage guest OS inside VMs

with Arc-enabled VMs



Manage K8s clusters

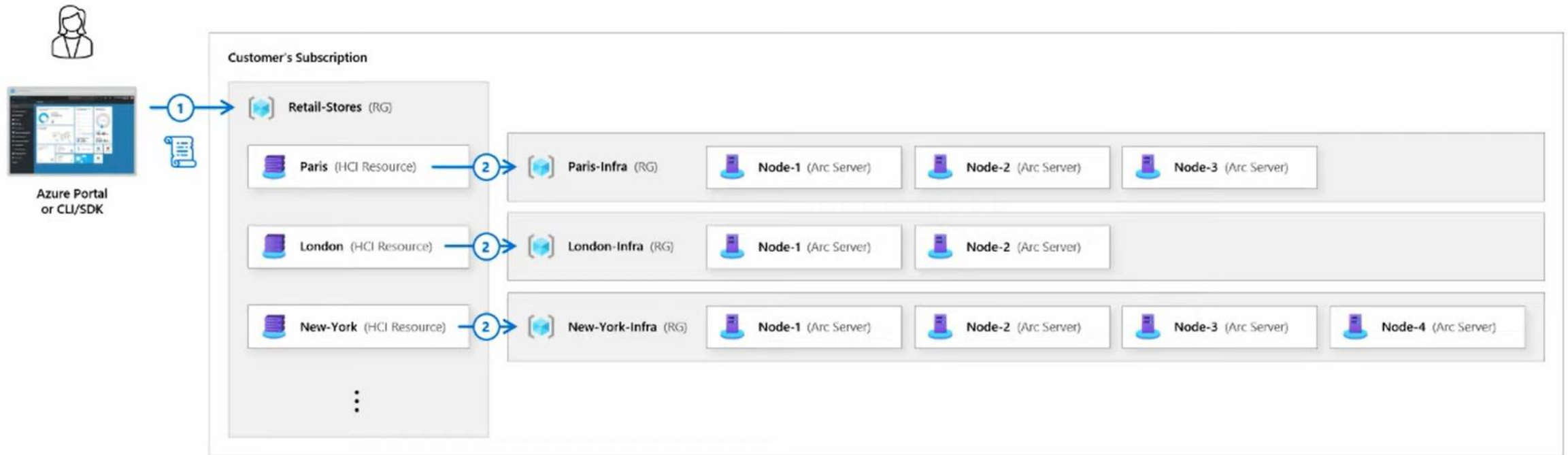
with Arc-enabled Kubernetes



Run PaaS services locally

with Arc-enabled services

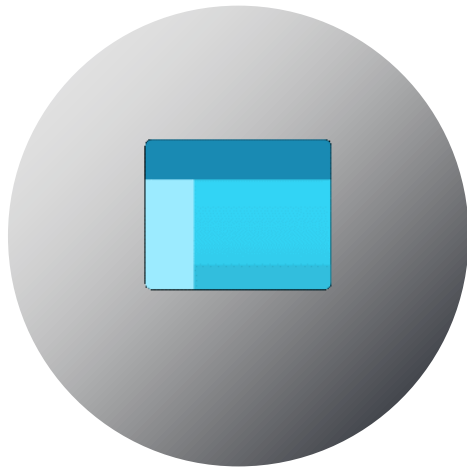
At-a-scale Azure Stack HCI management



User applies Azure policy to resource group containing HCI resources
HCI cluster forwards the policy to every Arc-enabled member node

Provision and manage VMs from the Azure Portal

with Arc-enabled VM management for Azure Stack HCI (preview)



Azure Portal

Consistent user experience
across cloud and edge



ARM templates

Automate VM deployments
with ARM templates



RBAC and self-service

Users can access their VMs
only, not the host fabric



Arc-enabled guests

Manage and monitor the
guest OS and apps

Summary

Azure Stack HCI evolved from Windows Server

HW + Azure Stack HCI OS + Azure Subscription

Best virtualization host from Microsoft

On-premises part of Azure - includes Azure benefits

Pay-as-you go subscription based service

Additional information

Azure Stack HCI documentation

<https://docs.microsoft.com/en-us/azure-stack/hci/>

Azure Stack HCI foundations

<https://docs.microsoft.com/en-us/training/paths/azure-stack-hci-foundations/>

Azure Arc overview

<https://aka.ms/AzStackHCISandbox>

Try out the Azure Stack HCI Sandbox

<https://aka.ms/AzStackHCISandbox>

Jumpstart ArcBox sandbox environment

<https://aka.ms/JumpstartArcBox>



Questions?

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