



**NIC** Cloud  
Connect

Oslo Spektrum  
November 7 - 9

Jan-Tore Pedersen

**Azure Hybrid with Azure Stack HCI**

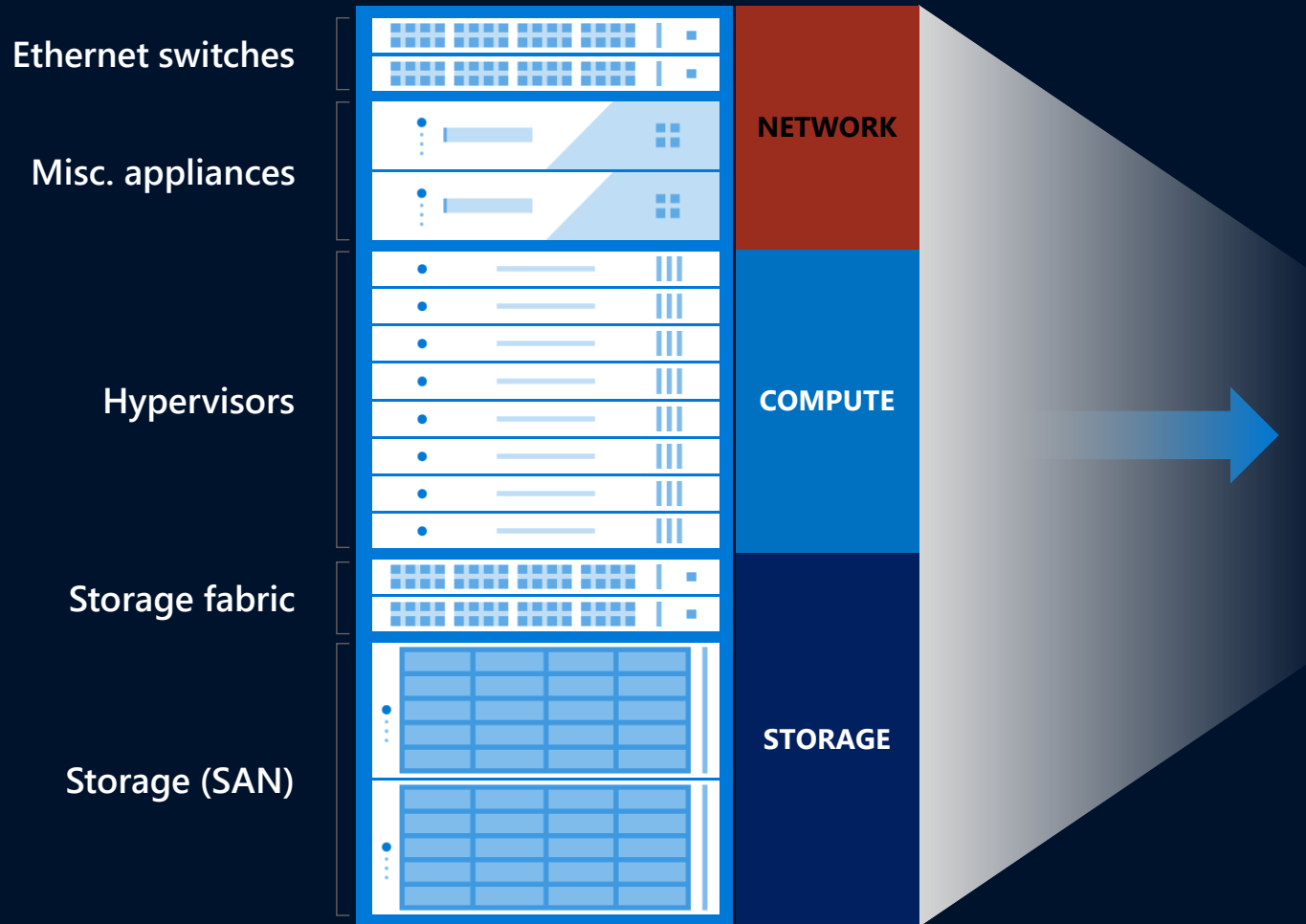
# Agenda

- Level setting
- Myth busting
- Some demos
- Secret sauce

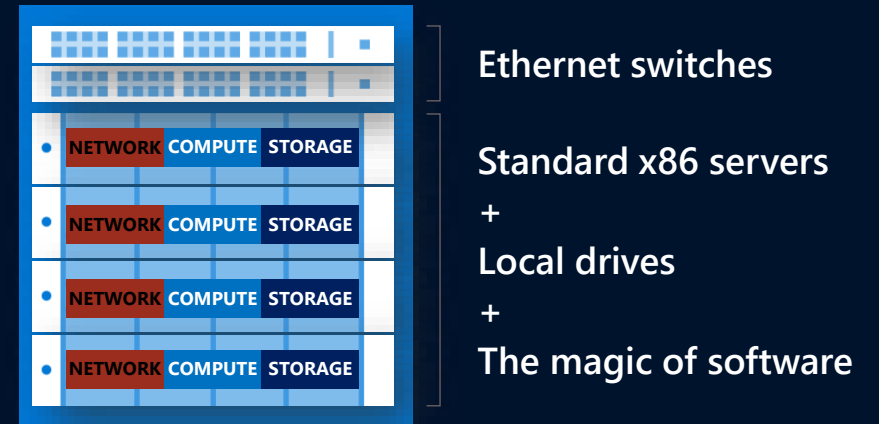
# Azure Stack HCI & Azure Arc Foundation

# What is hyperconverged?

Legacy "three tier" infrastructure



Hyperconverged infrastructure (HCI)



HCI is a software-defined, unified system that combines all the disparate and siloed elements of a traditional datacenter

# Growing Azure Stack HCI into its own product line



Azure Stack HCI



Windows Server

✓ Exciting roadmap of new HCI focused releases

Innovation focused on being the  
**best virtualization host**

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

Run apps inside Windows or Linux virtual machines

Runs on **your hardware**

✓ Exciting roadmap of new releases

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

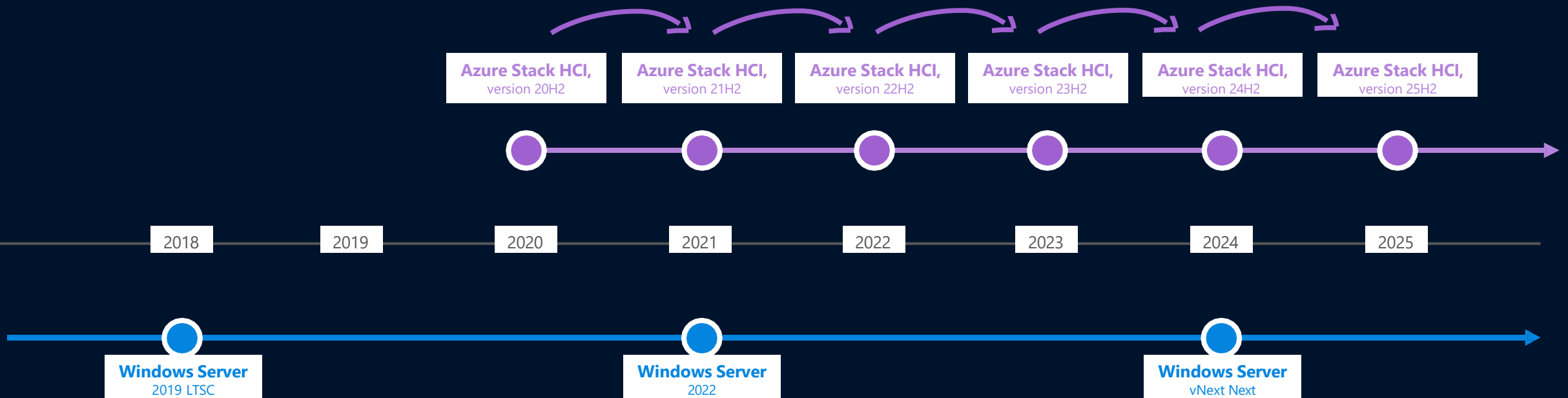
**All other Windows Server roles,**  
like IIS, File Services, DNS, DHCP, AD/DS

Runtime for Windows apps like SQL Server

Runs **anywhere**

# No multi-year waiting, no painful migration

Annual feature updates are free, one-click, and non-disruptive



# Comparison with Windows Server

## New feature update delivers more differentiation

### Azure workloads and benefits

| Feature / Scenario                         | Azure Stack HCI | Windows Server  |
|--|-----------------|-----------------|
| Windows Server Azure Edition               | Yes             | No              |
| Free ESUs for WS & SQL 2008/R2 and 2012/R2 | Yes             | No <sup>1</sup> |
| Windows Server subscription add-on         | Yes             | No              |
| AVD for Azure Stack HCI (preview)          | Yes             | No              |
| Azure Kubernetes Service                   | Yes             | Yes             |
| Azure Arc-enabled PaaS services            | Yes             | Yes             |

### Azure management and governance

| Feature / Scenario                              | Azure Stack HCI | Windows Server      |
|---|-----------------|---------------------|
| Cluster integrates with Azure Resource Manager  | Yes             | No                  |
| Extensions and Arc-enabled host servers         | Yes             | Manual <sup>2</sup> |
| Multi-cluster monitoring with for HCI (preview) | Yes             | No                  |
| WAC in Portal for HCI (preview)                 | Yes             | Manual <sup>2</sup> |
| Arc-enabled VM management (preview)             | Yes             | No                  |
| Azure Backup and Azure Site Recovery support    | Yes             | Yes                 |

### Azure infrastructure innovation

| Feature / Scenario                                     | Azure Stack HCI | Windows Server |
|--|-----------------|----------------|
| High availability for GPU workloads                    | Yes             | No             |
| Restart up to 10X faster with Kernel Soft Reboot (KSR) | Yes             | No             |
| Intent-driven cluster networking configuration         | Yes             | No             |
| Storage Spaces Direct thin provisioning                | Yes             | No             |
| Adjustable storage repair speed                        | Yes             | Yes            |
| Dynamic processor compatibility mode                   | Yes             | No             |
| Secured-core server                                    | Yes             | Yes            |
| Stronger, faster network encryption                    | Yes             | Yes            |

### How to get it

| Feature / Scenario                        | Azure Stack HCI | Windows Server |
|---|-----------------|----------------|
| Over-the-air cluster-aware feature update | Yes             | No             |
| Azure Stack HCI solutions catalog         | Yes             | No             |
| Azure Stack HCI sizer tool                | Yes             | No             |

1: Requires purchasing an Extended Security Updates license key and manually applying it to every VM. 2: Requires manually installing the Arc Connected Machine agent on every machine.



# Azure Stack HCI

## Hybrid Services



Site Recovery



Backup



Update Mgmt



File Sync



Monitor



Defender



**Windows Admin Center**  
Edge-local management

## Applications



## Windows



## Linux



## Containers



## Cognitive Services



## Data Services



## Virtual machines

Any size and configuration



## Azure Kubernetes Service

Managed container platform



## Azure Stack HCI

Hyperconverged infrastructure software stack

## Hardware ecosystem

200+ solutions, validated by Microsoft

[Azure Stack HCI Catalog | Microsoft](#)



**Azure Arc**  
Cloud management



Microsoft Azure

Home > ContosoCluster

### ContosoCluster | Virtual machines

Azure Stack HCI

Search

- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems

Settings

- Windows Admin Center (preview)
- Extensions
- Configuration
- Locks

Resources (preview)

- Virtual machines
- Virtual networks
- Disks
- VM images

Monitoring

- Insights (preview)
- Logs
- Workbooks

Automation

Microsoft Azure (Preview) Report a bug

Search resources, services, and docs (G+/)

Home > ContosoCluster-0809-1 | VM images >

## Create an image

Basics Tags Review + create

Create a VM image from Azure Marketplace and use the image to deploy VMs. [Learn more](#)

Image to download \* ⓘ

Save image as \* ⓘ

Select VM images from Azure Marketplace

Filter items

Azure Marketplace images

|   | Downloaded |
|---|------------|
| Windows Server 2022 Datacenter: Azure Edition Core - Gen2                     | ✓          |
| Windows Server 2022 Datacenter: Azure Edition - Gen2                          | ⬇          |
| Windows 11 Enterprise multi-session, version 21H2 + Microsoft 365 Apps - Gen2 | ⬇          |
| Windows 10 Enterprise multi-session, version 21H2 + Microsoft 365 Apps - Gen2 | ⬇          |
| Windows 10 Enterprise multi-session, version 21H2 - Gen2                      | ✓          |
| Windows 11 Enterprise multi-session - Gen2                                    | ⬇          |

Review + create Previous Next : Tags

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# Guest management and VM extensions

- ✓ **Guest automatically Arc-enabled**  
When created through Arc VM management
- ✓ **Install and configure your applications**  
With Custom Script extension
- ✓ **Automate OS configuration**  
Join domain, apply policies, and more
- ✓ **Coming soon...**  
*More Azure VM extensions*



## Available now



Fully ARM Integrated



Custom Script extension



Domain Join extension



Azure Policy Machine Config



Azure Monitor (Logs, Metrics, Alerts)



Microsoft Defender for Cloud

## Coming soon

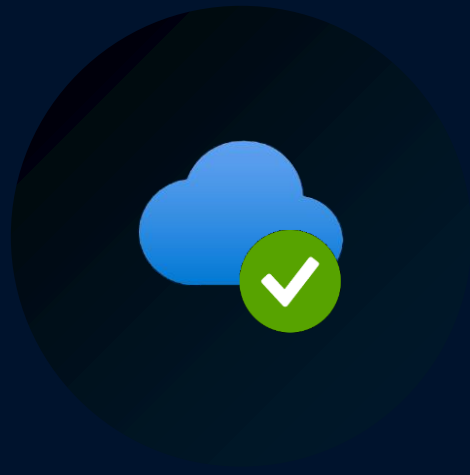


Azure Update Management Center



Arc-enabled VM management

# Azure Virtual Desktop for Azure Stack HCI (preview)



## **Modernize your app and virtual desktop infrastructure**

Fully managed, cloud-hosted VDI management plane



## **Deliver Windows 10 to any device**

Windows 10 and 11 Enterprise multi-session with seamless Microsoft Office and Microsoft Teams experience



## **Optimal performance with full control**

Direct access to local session hosts with RDP Shortpath

# Arc-enabled PaaS on Azure Stack HCI

Each with their own scenarios and feature roadmap



## SQL managed instances

Fully managed SQL managed instance with built-in management capabilities to drastically reduce your management overhead.



## PostgreSQL Hyperscale (preview)

Semi-managed PostgreSQL Hyperscale server group that meets your requirements of data residency and customer control.



## App services (preview)

Powerful web, mobile, and API apps. Build standards-based web apps and APIs using .NET, Java, Node.js, PHP, and Python.



## Functions

Process events with serverless code. Accelerate and simplify serverless application development with serverless compute.



## Logic apps (preview)

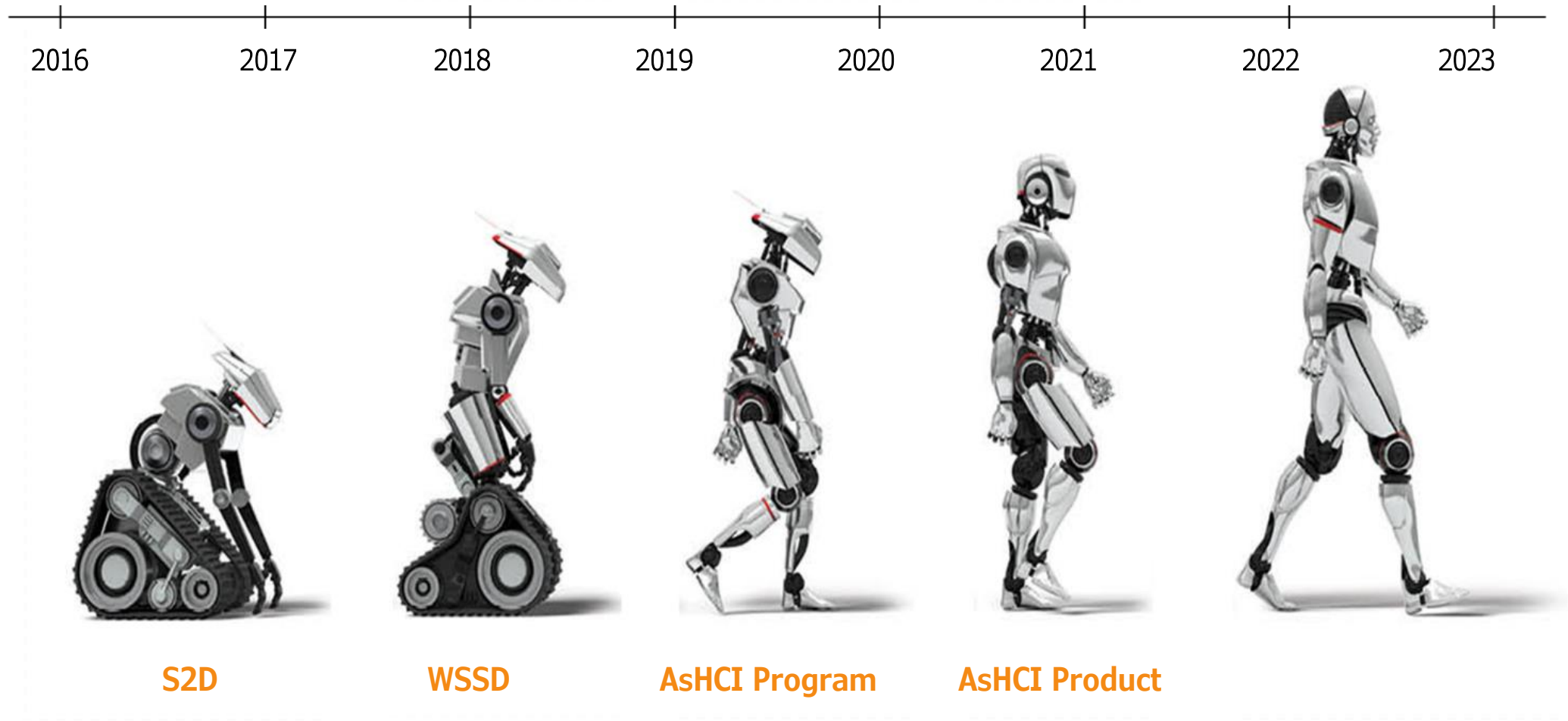
Quickly build powerful integration solutions. Create workflows leveraging hundreds of connectors and the visual designer.



## API management (preview)

Move faster with unified management platform for APIs across hybrid, edge, multi-cloud, and all your environments.

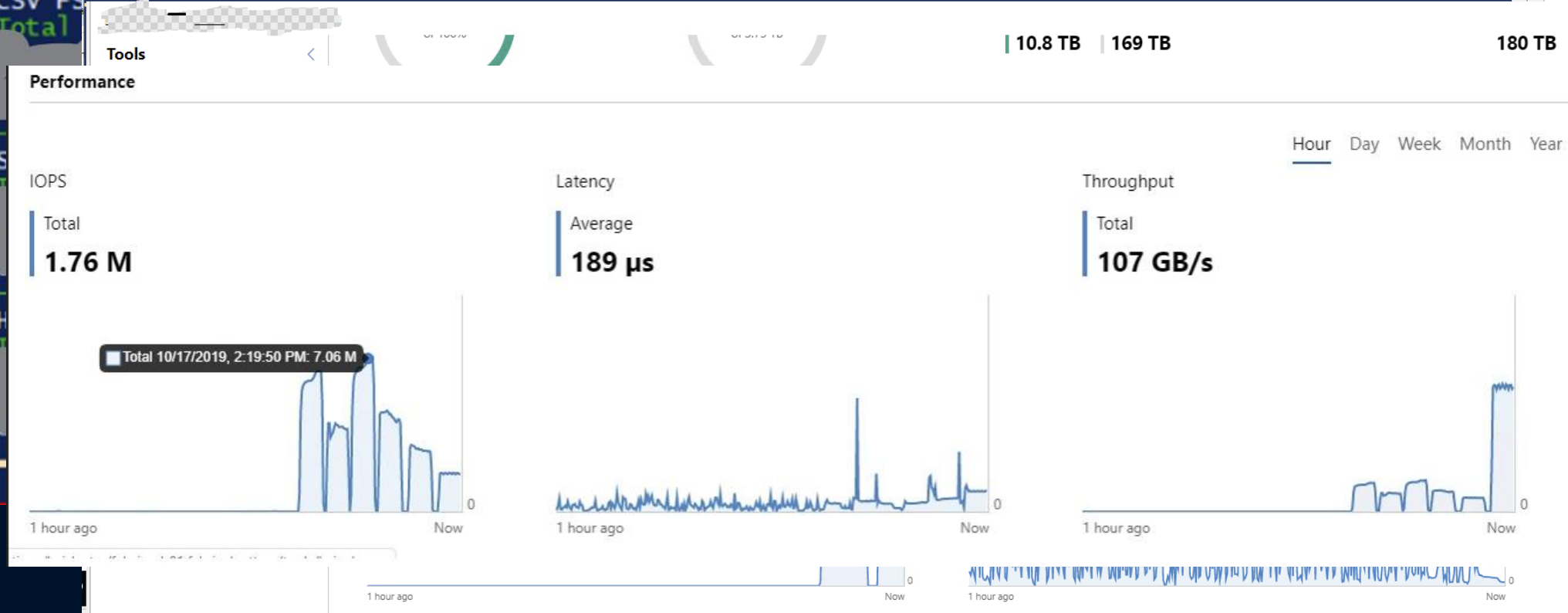
# Evolution of Azure Stack HCI core technology



# Azure Stack HCI – Performance

Administrator: Windows PowerShell

| CSV FS        | IOPS      | Reads     | Writes | BW (MB/s) | Read   | Write | Read Lat (ms) | Write Lat |
|---------------|-----------|-----------|--------|-----------|--------|-------|---------------|-----------|
| Total         | 8 704 302 | 8 704 286 | 16     | 35 653    | 35 653 |       |               |           |
| FaHCI-IAS-01a | 877 606   | 877 606   |        | 3 595     | 3 595  |       | 0,028         | 0,000     |
| FaHCI-IAS-01b | 882 331   | 882 331   |        | 3 614     | 3 614  |       | 0,026         | 0,000     |
| FaHCI-IAS-01c | 883 340   | 883 340   |        | 3 618     | 3 618  |       | 0,027         | 0,000     |
| FaHCI-IAS-01d | 870 247   | 870 233   | 14     | 3 565     | 3 565  |       | 0,029         | 0,766     |
| FaHCI-IAS-01e | 874 963   | 874 963   |        | 3 584     | 3 584  |       | 0,027         | 0,000     |
| FaHCI-IAS-01f | 874 404   | 874 404   |        | 3 582     | 3 582  |       | 0,028         | 0,000     |
| FaHCI-IAS-01g | 859 295   | 859 295   |        | 3 520     | 3 520  |       | 0,029         | 0,000     |
| FaHCI-IAS-01h | 848 411   | 848 411   |        | 3 475     | 3 475  |       | 0,029         | 0,000     |
| FaHCI-IAS-01i | 867 833   | 867 831   | 2      | 3 555     | 3 555  |       | 0,028         | 1,600     |
| FaHCI-IAS-01j | 865 872   | 865 872   |        | 3 547     | 3 547  |       | 0,028         | 0,000     |



\*publicly demonstrated over 13.7 million IOPs from a 12-node cluster. No other HCI vendor has demonstrated half this performance.

# Azure Stack HCI – At a glance

- Performance – “unparalleled”
    - Best in class – Demonstratable – Not just theoretical
  - Resiliency – “Bulletproof”
    - Challenged a customer to run their own testing of 2 other SDS’s vs S2D
    - 70+ sites of S2D replaced other ‘popular’ SDS offering
  - Scalability
    - 1-16 nodes, 4PB storage, 64 Volumes per cluster “supported”
    - Stretched Clusters
  - Flexibility
    - 33 Vendors, 192 platforms, 559 certified solutions
    - Solution with node configs: 4-128cores, 32GB-8TB, 2TB-555TB\*
  - Cloud Services:
    - AKS, Azure Arc Data Services (SQL MI), Arc for App Service, and AVD
  - Hybrid Cloud Services:
    - Azure Site Recovery, Azure Backup, Azure Monitor, Log Analytics, Azure Policy, Defender, etc
- \*400TB per node supported limit...



# Azure Stack HCI solution partner ecosystem

|   |   |  |   |   |   |
|---|---|--|---|---|---|
|    |    |    |    |    |    |
|    |    |    |    |    |    |
|    |    |    |    |    |    |
|    |    |    |    |    |    |
|  |  |  |  |  |  |
|  |  |  | Visit the <a href="#">Azure Stack HCI Catalog</a>                                     |   |   |

# Actual HCI OEM Solution Partners



**Lenovo**

**Dataon**<sup>TM</sup>



**Hewlett Packard  
Enterprise**

# Free ESUs with Azure Stack HCI

On-premises: Eligible customers will be able to purchase Extended Security Updates for their on-premises environment. Licenses are sold in 2 core packs for SQL Server and 16 core packs for Windows Server 2012, and are priced as below:

Year 1: 75% of full license price annually

Year 2: 100% of full license price annually

Year 3: 125% of full license price annually

## Benefits of getting ESU for VMs on Azure Stack HCI through

- **Free of charge:**

You can get ESUs through Azure Stack HCI for free.

- **Get an additional year of ESUs for Windows Server and SQL Server 2012 and 2012 R2:**

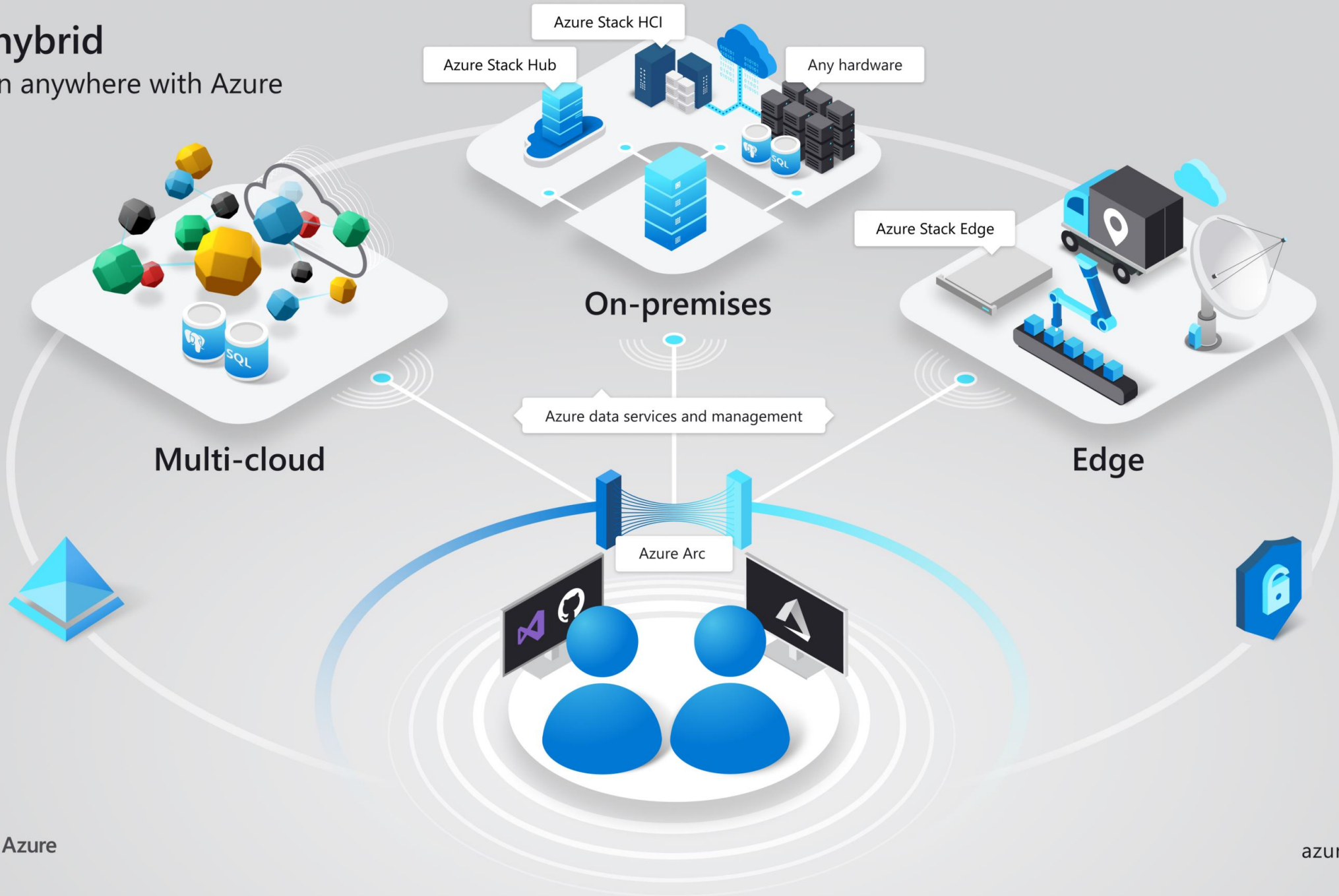
On Azure and Azure Stack HCI only, ESUs for Windows Server and SQL Server 2012 and 2012 R2 will end on October 13, 2026 and July 8, 2025 respectively; a year longer than the usual three-year ESU programs.

# HCI + Arc Summary

- Hyperconverged Infrastructure
- Mature virtualization platform
- Performance supercharged
- ESU for Windows & SQL Server 2012 + R2
- Future proof – extensive roadmap
- Azure Arc (SQL/Postgress, App Services)
- Azure Virtual Desktop
- Super flexible

# Azure hybrid

Innovation anywhere with Azure



# What does Azure Stack HCI cost?

**NOK 111/month**  
per physical processor core\*

*\*Does not include Guest OS licensing*

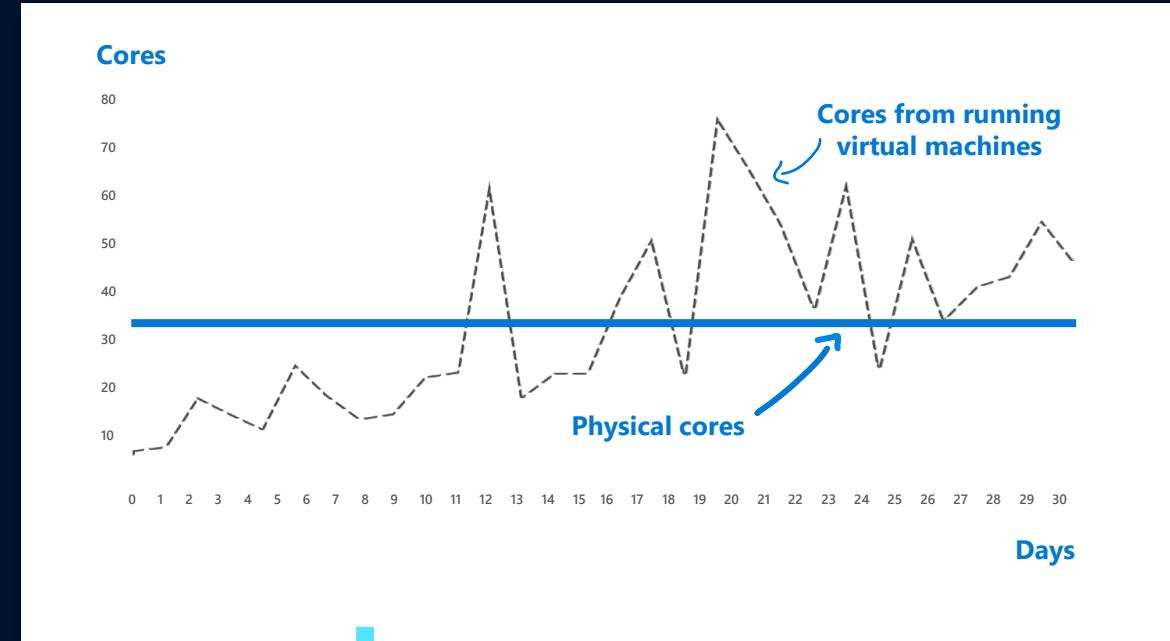
New Software Assurance benefit \*



Licensed cores of WS Datacenter  
with Software Assurance



Cores of Azure Stack HCI  
at no additional cost



\* 1 physical core license of Windows Server Datacenter with Software Assurance (SA) entitles you to use 1 physical core of Azure Stack HCI at no additional cost. You must register your Azure Stack HCI cluster to claim this benefit in the Azure Portal. Once your SA contract is verified, the monthly service fee for that cluster changes to zero. Please note that add-on services like Microsoft Defender for Cloud are still sold separately.

# Myth busting

# Myths

If I lose connection to Azure, I lose connection to my services...

True or False?

- Existing services all run uninterrupted
- 30 days registration timeout



# Myths

It's a new service so it's in untested

True or False?

- Hyper-V – Windows Server 2008
- S2D – Server 2016
- SDN – Server 2012
- The *cloudy* stuff is kinda new

# Myths

Storage Spaces Direct (S2D) is complicated/has issues

True or False?

- 100+ S2D/HCI clusters
- Lenovo, Dell and HPE
- AFAIK – Some of the largest S2D deployments in Norway

# Myths

vSAN/Nutanix are more flexible and resilient storage options...

True or False?

LOL – not even close



# Demo time

Some secret sauce

# Pro-Tip #1 - Networking

3 or more nodes - Dedicated switches

2 nodes – Switchless/Direct Connect

Network ATC is HCI networking beastmode

Using switches, iWarp for simplicity

Switchless, or you know what you are doing  
get on that RoCE bandwagon pst it really is faster

# Pro-Tip #2 – Flash & Cache

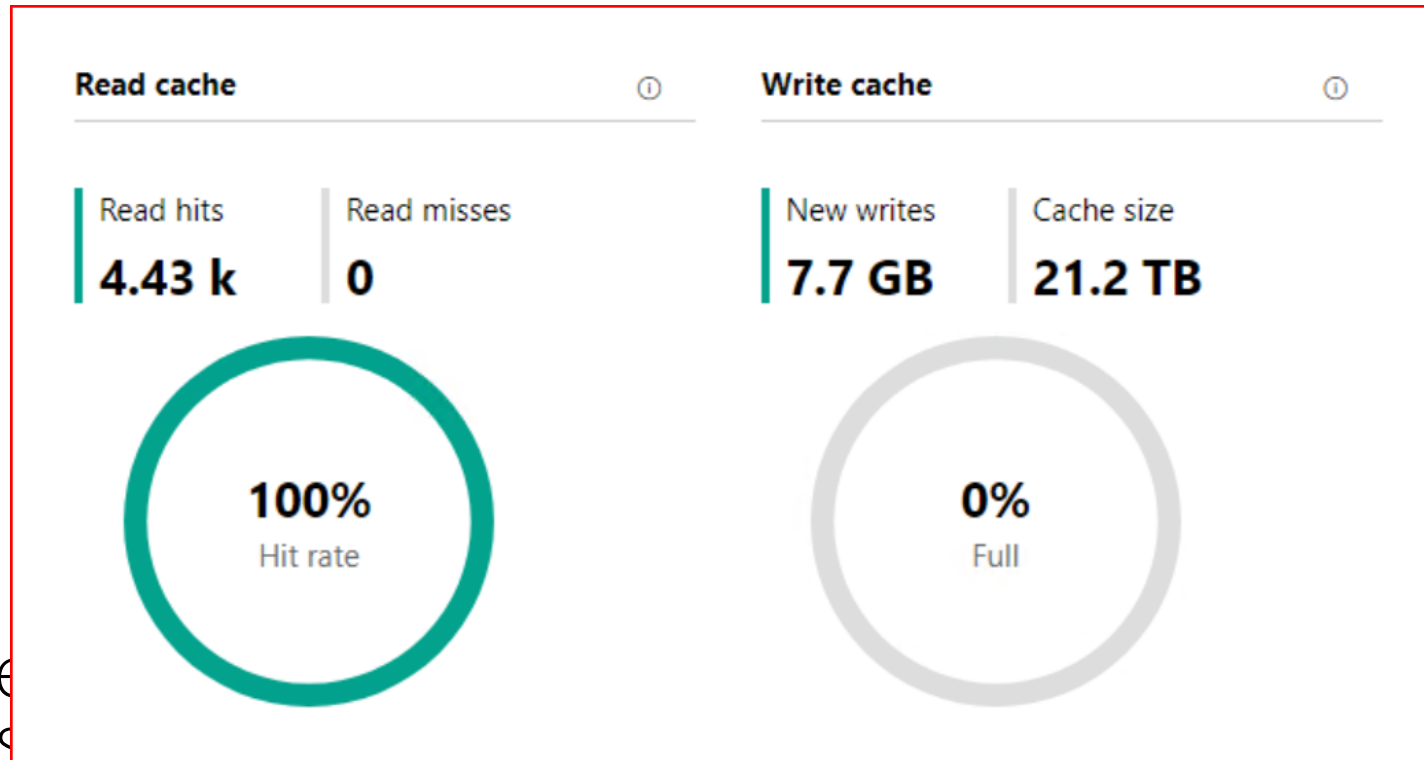
- Use NVMe\*

- SSD is

- NVMe

- Fewer

- \*NVMe  
Don't s



CPU directly.

## Pro-Tip #3 – AADS

Dedicated AADS, aka fabric domain

Don't inherit your legacy AD crap. Start new and isolate the fabric from the workloads.

Don't argue, just do it.



## Pro-Tip #4 – Get an Expert to help

There are a handful of integrators that actually know these solutions.

Don't spend weeks/months working it out only to back yourself into a corner

Do it once, do it right.

# Pro-Tip #5 – Update your clusters!

Mo

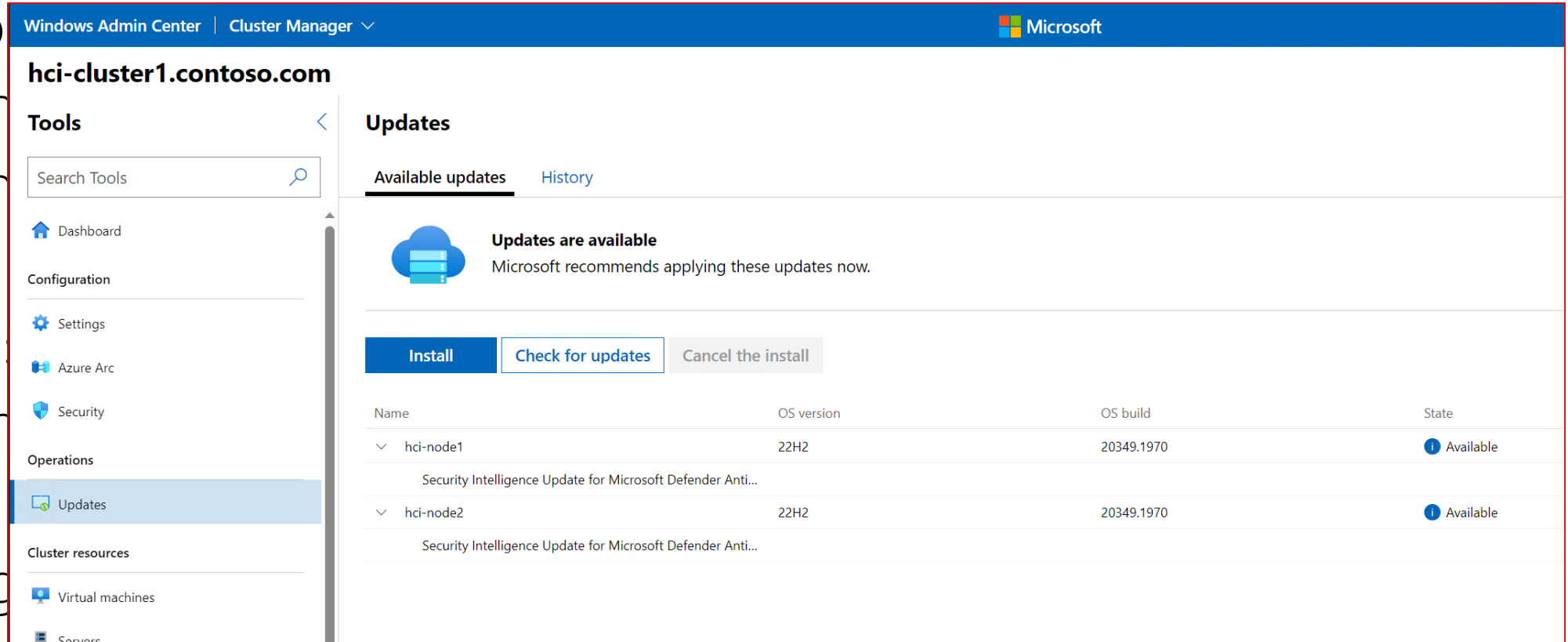
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Bug



Windows Admin Center | Cluster Manager

hci-cluster1.contoso.com

Tools

Search Tools

Dashboard

Configuration

Settings

Azure Arc

Security

Operations

Updates

Cluster resources

Virtual machines

Servers

Updates

Available updates History

Updates are available  
Microsoft recommends applying these updates now.

Install Check for updates Cancel the install

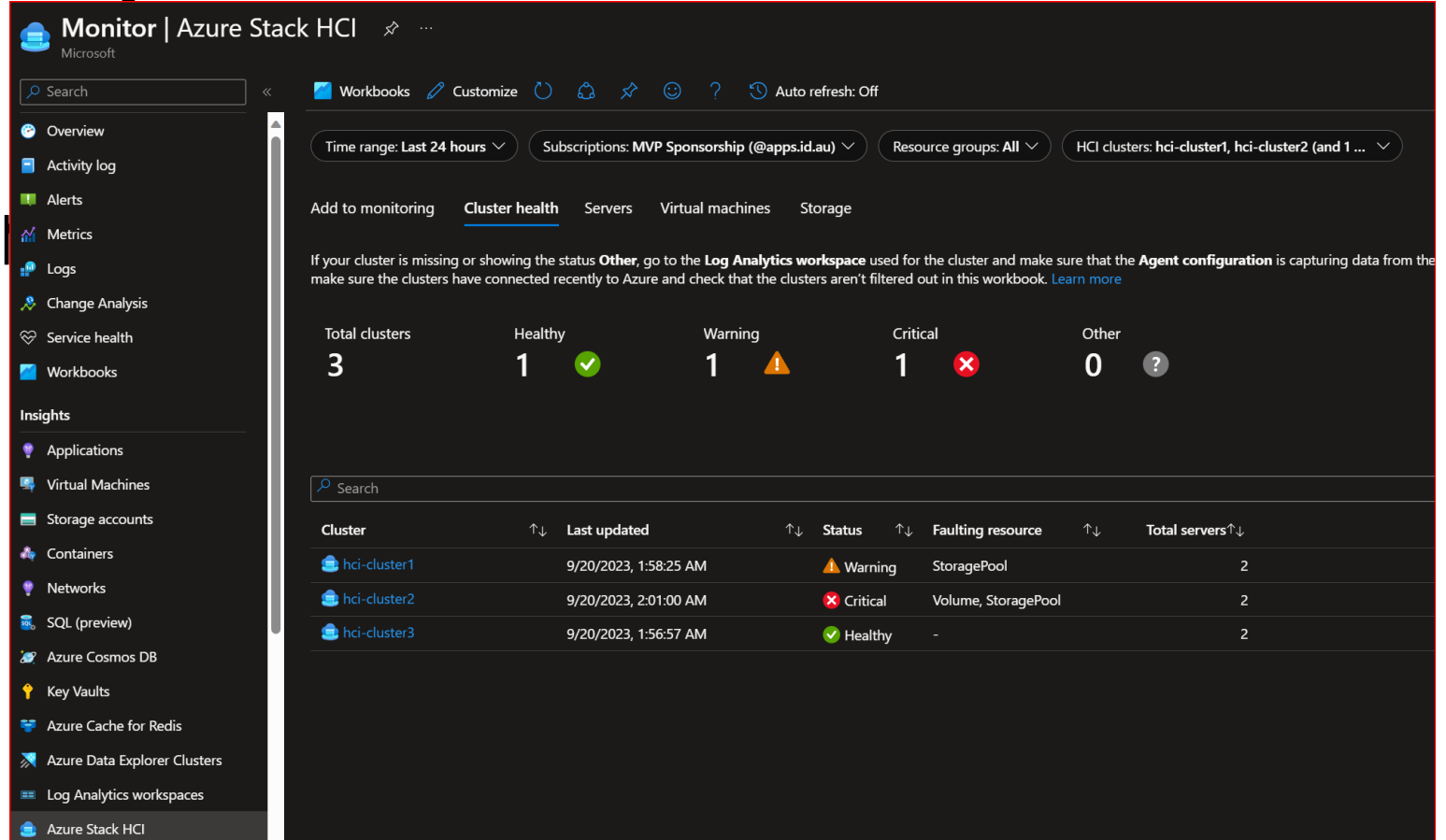
| Name  | OS version | OS build   | State     |
|---|------------|------------|-----------|
| hci-node1   | 22H2       | 20349.1970 | Available |
| Security Intelligence Update for Microsoft Defender Anti... |            |            |           |
| hci-node2   | 22H2       | 20349.1970 | Available |
| Security Intelligence Update for Microsoft Defender Anti... |            |            |           |

Windows here and it cleans out WinRM, flushes RHS, and deals with the usual “Windows” overheads

# Pro-Tip #6 – Azure Insights

Azure Monitor by default.

Data collection



The screenshot displays the Azure Monitor interface for Azure Stack HCI. The left sidebar shows the navigation menu with categories like Overview, Activity log, Alerts, Metrics, Logs, Change Analysis, Service health, Workbooks, and Insights. The main content area is titled 'Monitor | Azure Stack HCI' and shows the 'Cluster health' tab. It includes filters for Time range (Last 24 hours), Subscriptions (MVP Sponsorship), Resource groups (All), and HCI clusters (hci-cluster1, hci-cluster2, and 1 ...). A summary section shows the status of clusters: 3 Total clusters, 1 Healthy, 1 Warning, 1 Critical, and 0 Other. Below this is a table listing the clusters and their health status.

| Cluster      | Last updated          | Status   | Faulting resource   | Total servers |
|--------------|-----------------------|----------|---------------------|---------------|
| hci-cluster1 | 9/20/2023, 1:58:25 AM | Warning  | StoragePool         | 2             |
| hci-cluster2 | 9/20/2023, 2:01:00 AM | Critical | Volume, StoragePool | 2             |
| hci-cluster3 | 9/20/2023, 1:56:57 AM | Healthy  | -                   | 2             |

□ A A A A C a

## Pro-Tip #8 – Resource Scoping

Deploy each cluster into its own resource group\*

Naming conflicts for images, networks, etc

\*This advice might change with updates to Arc Management

Ok, now what?

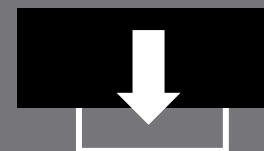
# How to try the new Azure Stack HCI



Buy a validated hardware solution from a trusted partner or reuse existing hardware if it matches a solution in the Azure Stack HCI Catalog

**[Browse solutions](#)**

**AND**



Install Azure Stack HCI software with a free 60-day trial

**[Download software](#)**

Please note:

1. An Azure subscription is required to complete the full set-up on your server hardware
2. Integrated systems (and some validated nodes) come with Azure Stack HCI software pre-installed

# Community overload for HCI

Community:

<https://azurestackhci.slack.com>

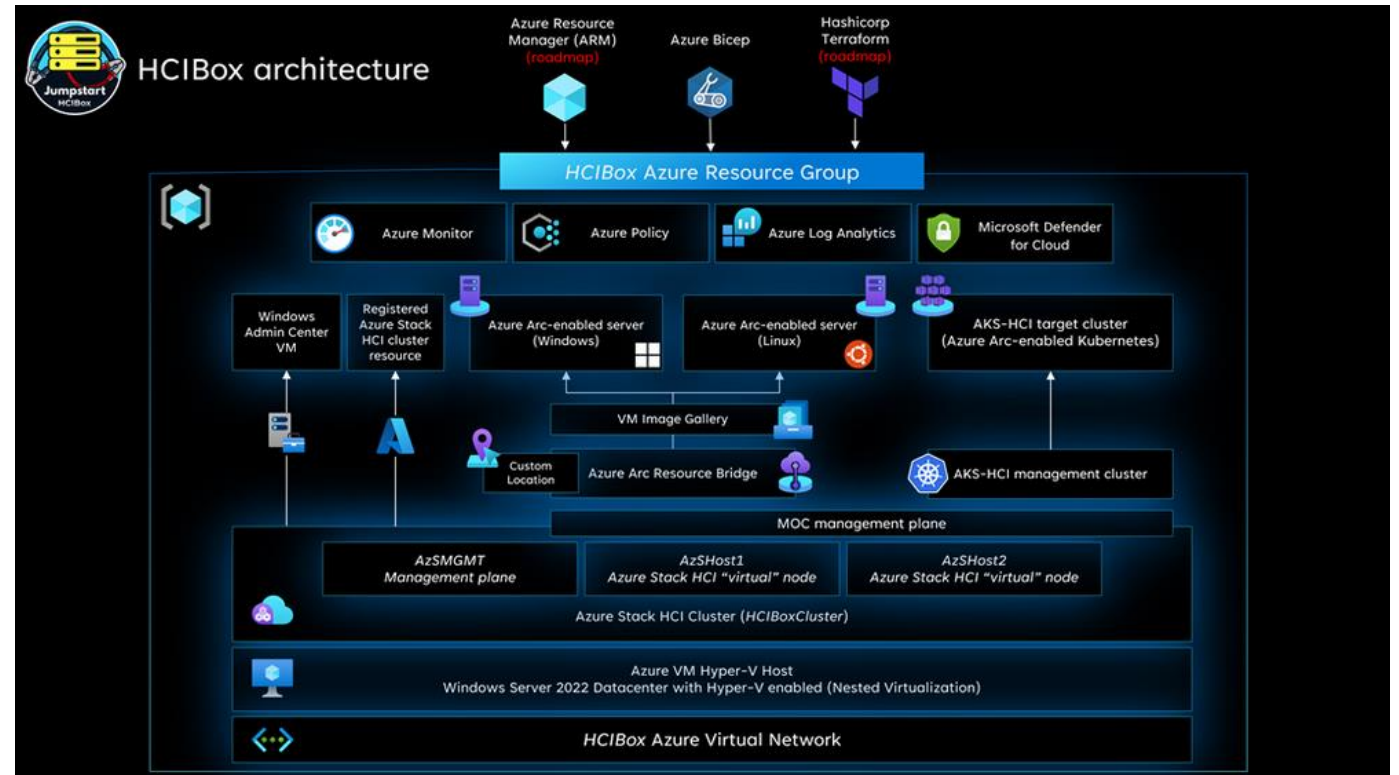
YouTube content:

Real World IT (DataON)

Carsten Rachfahl

The Hybrid Friends

[Jumpstart HCIBox](#)





# Microsoft Learning Paths

Learn new skills and discover the power of Azure Stack HCI with step-by-step guidance



## Azure Stack HCI Foundations

### Modules:

- Introduction to Azure Stack
- Introduction to Azure Stack HCI core technologies
- Plan and deploy Azure Stack HCI
- Integrate Azure Arc and Azure Stack HCI



## Operate and Maintain Azure Stack HCI

### Modules:

- Manage Azure Stack HCI clusters
- Integrate Azure services with Azure Stack HCI
- Manage Azure Stack HCI virtual machine workloads
- Manage Azure Kubernetes Service on Azure Stack HCI

## Questions??

Can you give examples on what a HCI solution costs?

What is the difference between Azure Stack Hub and HCI

Nutanix has the CVM overhead, vmWare charges extra for VSAN, vSphere, every bits in NSX Cloud foundation, does Azure Stack HCI have overhead and what is the cost?

Did you just make all of that up?

[Home](#) > [Technology Industry](#) > [VMware](#)

# Broadcom's VMware acquisition sparks concern

But chip leader Broadcom vows to learn lessons from its CA and Symantec deals and says this time will be different.



By Jeff Vance

Network World | SEP 22, 2022 3:00 AM PDT



Chip powerhouse Broadcom recently announced its intention to acquire virtualization pioneer VMware for \$61 billion. In light of Broadcom's less than stellar track record with prior acquisitions (CA Technologies in 2018 and Symantec in 2019), VMware's enterprise customers are understandably worried.

"Following the purchases of CA and Symantec, Broadcom raised prices, decreased support, and stopped investing in innovation," says Tracy Woo, senior analyst for Forrester. "VMware customers would be wise to have an exit plan," she cautioned.

IDC analyst Stephen Elliot sees it differently. Rather than advising VMware customers to identify the exits, Elliot believes customers should "double down" on their relationship with the vendor, moving towards a more strategic business partnership.

Thank you all

Remember to vote for the session 😊



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