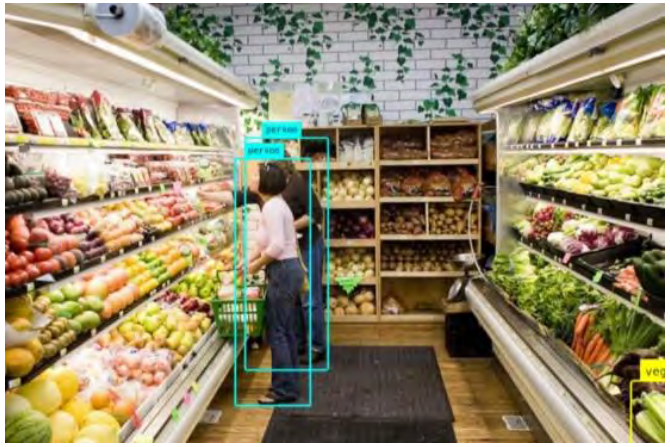
Microsoft

Azure Local

Cloud infrastructure for distributed locations, enabled by Azure Arc

November 2024

Durable scenarios for distributed infrastructure



Local AI inferencing, especially video

Process data at the source

Example: Retail

Mission critical and near real-time

Continuity and low latency

Example: Manufacturing

Regulated and limited connectivity

Keep data and control local

Example: Utilities

Adaptive cloud approach enabled by Azure Arc

Cloud services and tools

- Operate with AI-enhanced central **management & security**
- Develop and scale **applications** across boundaries
- Unify **data and AI** across a distributed estate

Global infrastructure

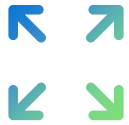
60+ Azure regions | **Azure Local** NEW | Existing infrastructure

Introducing Azure Local

Cloud infrastructure for distributed locations, enabled by Azure Arc

Operate and scale with the power of the cloud

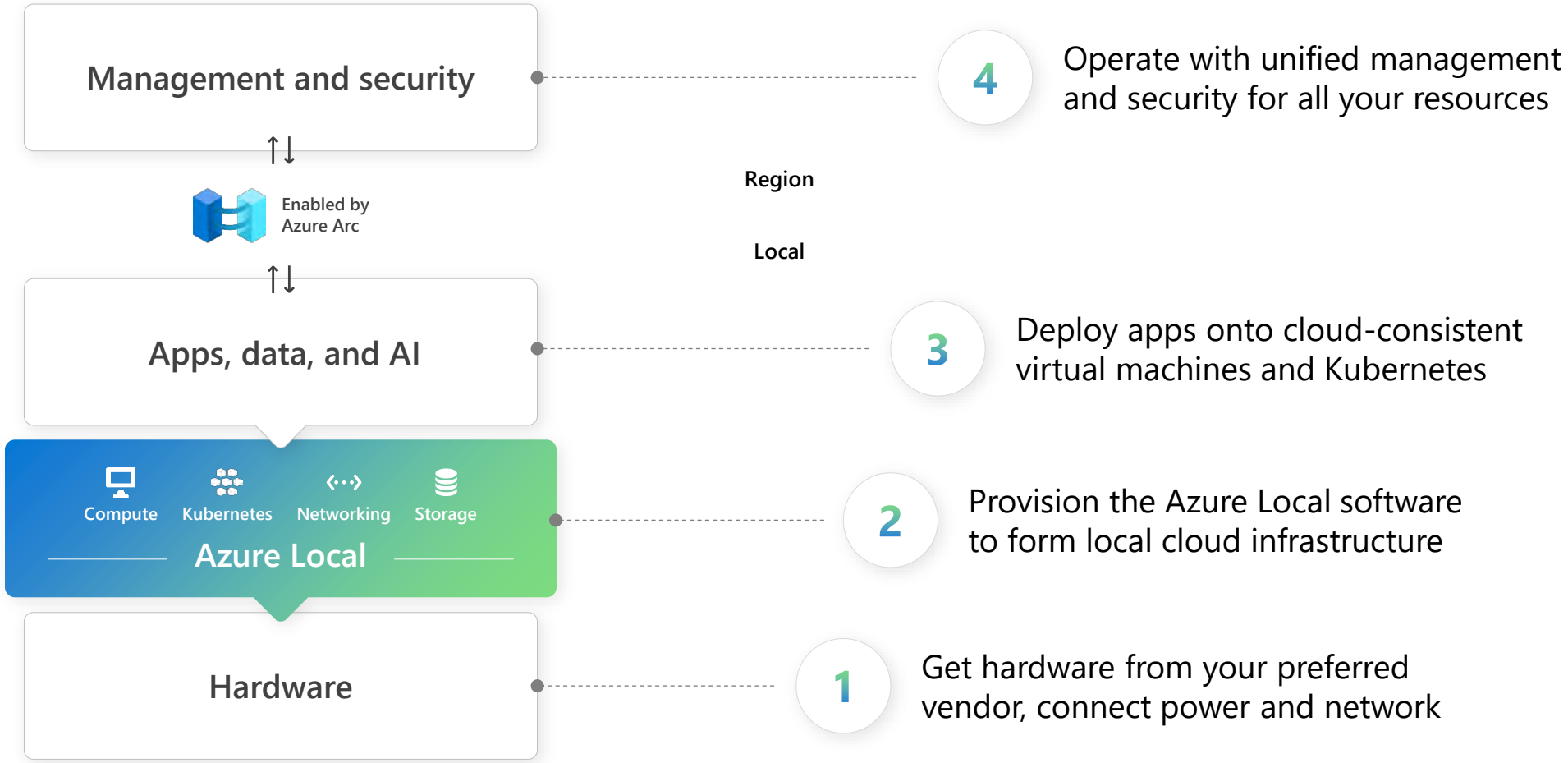
Ready for all your apps: VMs and containers alike



Flexibility to meet your requirements and budget

Extend cloud security to your distributed locations

How Azure Local works (connected)



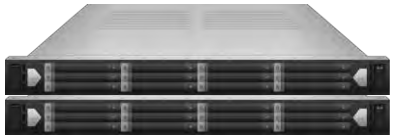
Azure Local replaces Azure Stack HCI

Consistent software platform, Portal, and APIs

Low-spec, low-cost edge servers

Simpler, smaller hardware for light computing requirements.

NEW PREVIEW



Connected servers

(formerly Azure Stack HCI)

Choose from over 100 hyperconverged server platforms from major OEMs.

GA

Disconnected operations

Meet strict data residency regulations with a permanently disconnected option.

NEW PREVIEW

Existing customers of Azure Stack HCI will transition seamlessly to Azure Local with the next software update.

Microsoft

Outline

Operate and scale with the power of the cloud

- Deploy from the cloud
- Scale with infra-as-code
- One-click updates
- Central visibility

Ready for all your apps: VMs and containers alike

- Full-featured, general-purpose VMs
- Migrate from VMware (preview)
- AKS built-in and included
- App, data, and AI services (preview)

Flexibility to meet your requirements and budget

- Choose your hardware
- Accelerate with GPUs
- Low-spec, low-cost options
- Disconnected operations (preview)

Extend cloud security to your distributed locations

- Secure by default
- Microsoft Defender for Cloud
- Network security groups
- Trusted launch

Microsoft

Azure Local

Enabled by Azure Arc

Operate and scale with the power of the cloud

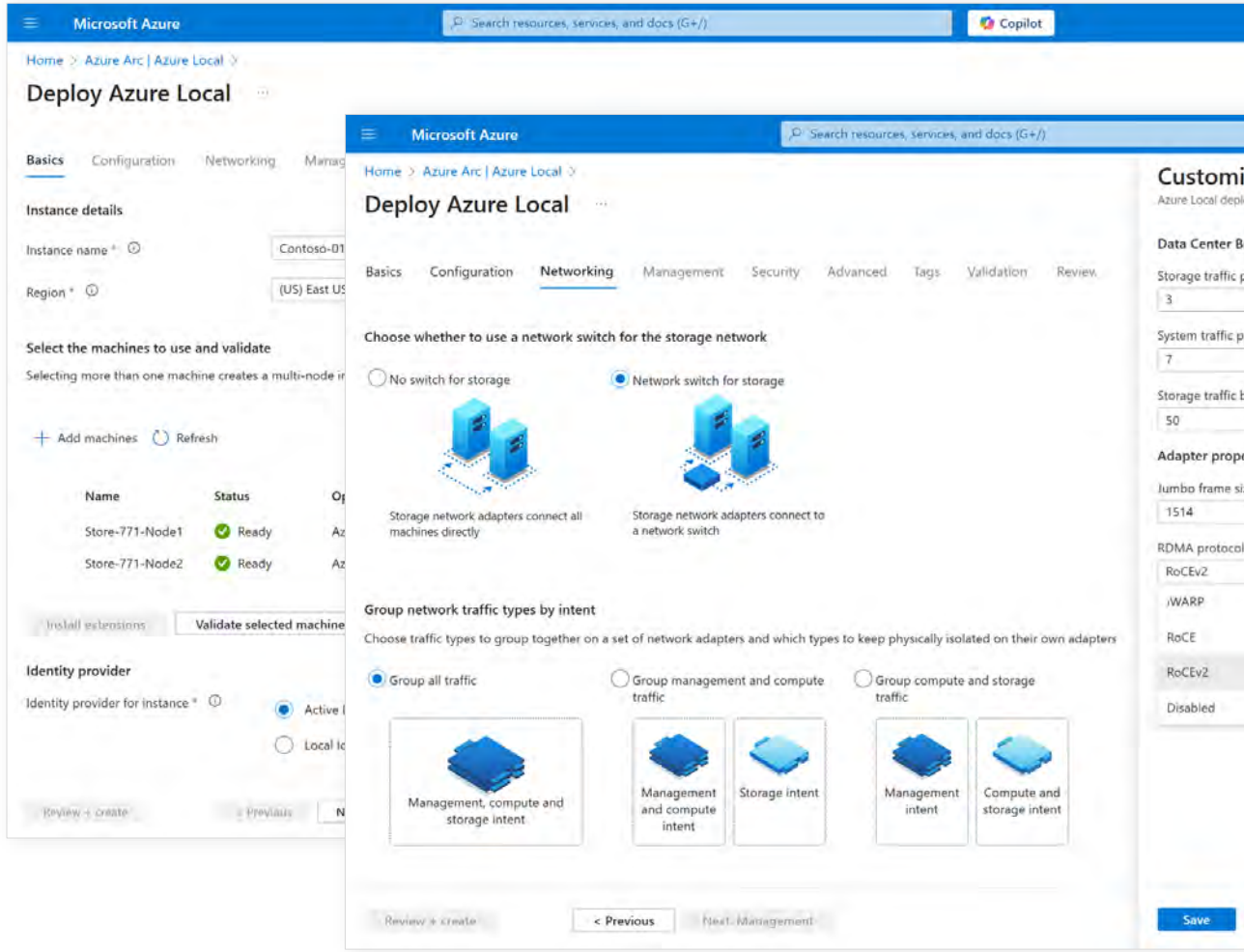
Deploy distributed infrastructure from the cloud

Shift responsibility from on-site to central IT

Treat physical machines like cloud resources, using Azure portal, APIs, or even Terraform

Simple wizard, backed by powerful automation

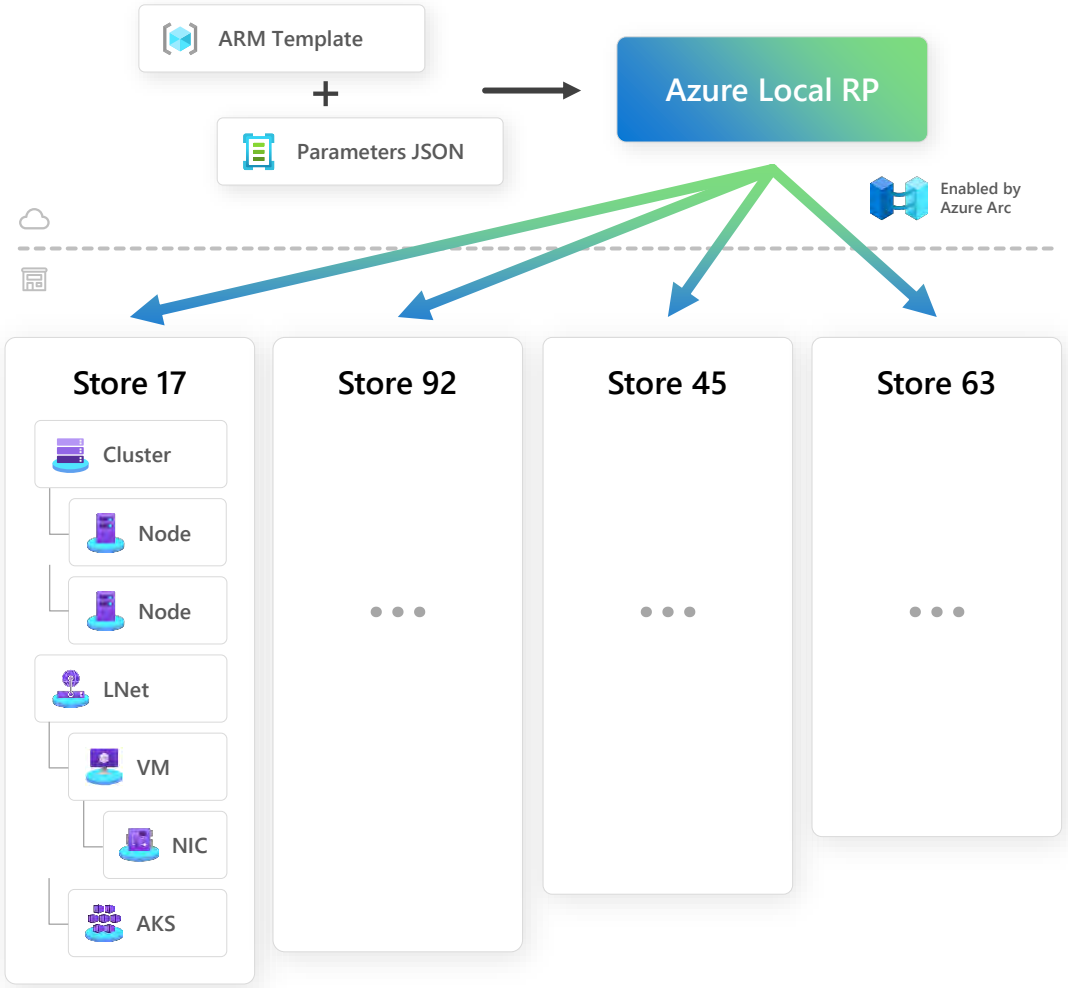
Advanced options to customize the cluster, networking, and storage for your environment



Repeat and scale with infrastructure-as-code

Contoso-Store-092.parameters.json

```
"parameters": {
  "clusterName": {
    "value": "Contoso-Store-092"
  },
  "useDhcp": {
    "value": false
  },
  "networkingPattern": {
    "value": "hyperConverged"
  },
  "physicalNodesSettings": {
    "value": [
      {
        "name": "Node1",
        "ipv4Address": "100.156.94.11"
      },
      {
        "name": "Node2",
        "ipv4Address": "100.156.94.12"
      },
      {
        "name": "Node3",
        "ipv4Address": "100.156.94.13"
      }
    ]
  },
  "securityLevel": {
    "value": "Recommended"
  },
  "clusterWitnessStorageAccountName": {
    "value": "contoso092storageaccount"
```



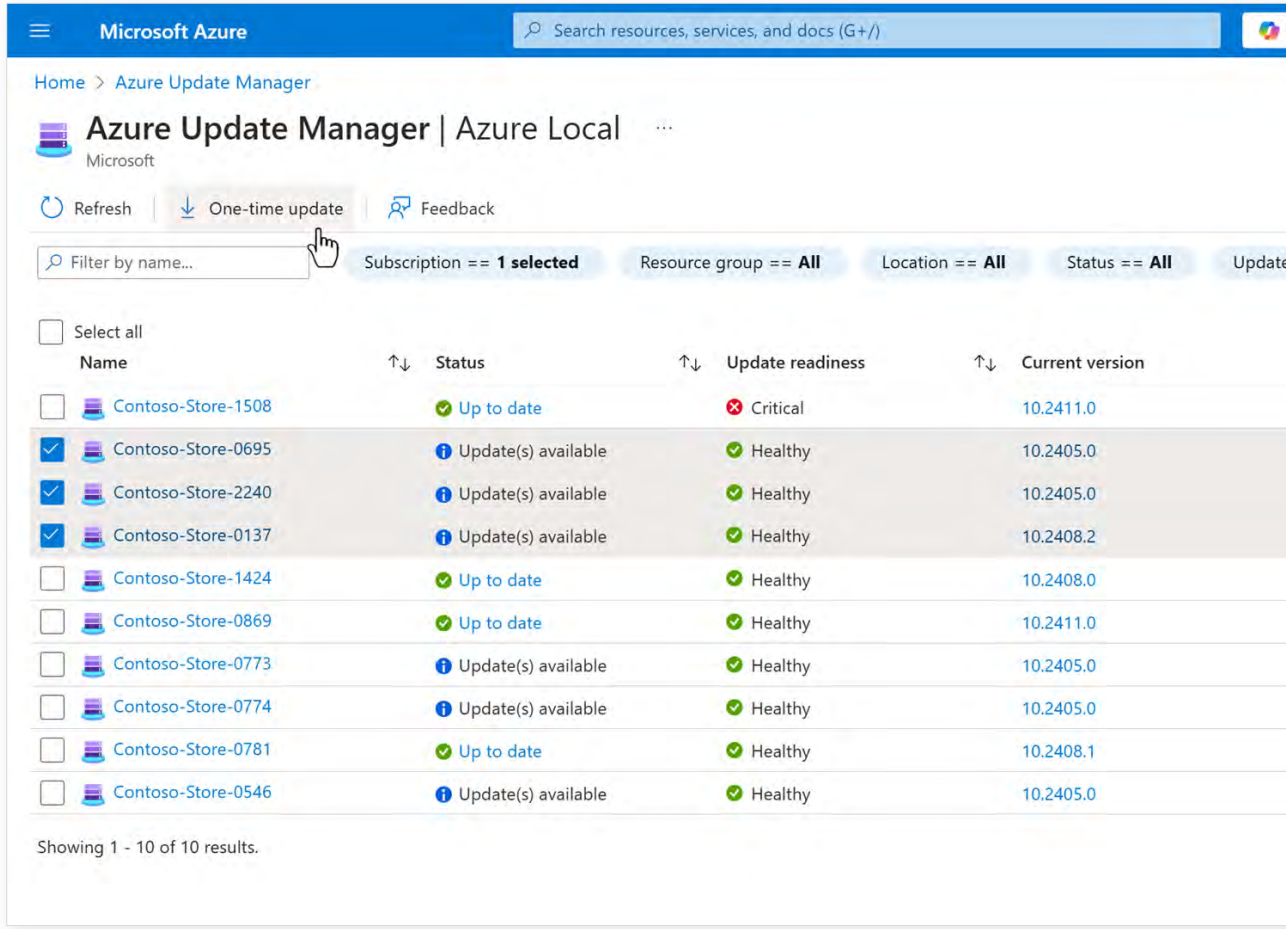
One-click infrastructure updates from the cloud

Conveniently view and manage updates across locations in Azure Update Manager

Full-stack update package includes all Azure Local software plus OEM content [1]

Non-disruptive (workloads keep running)

You control when to apply updates



1 : Firmware and driver packages available for Premier solutions like Dell APEX Cloud Platform and Lenovo ThinkAgile MX455 V3

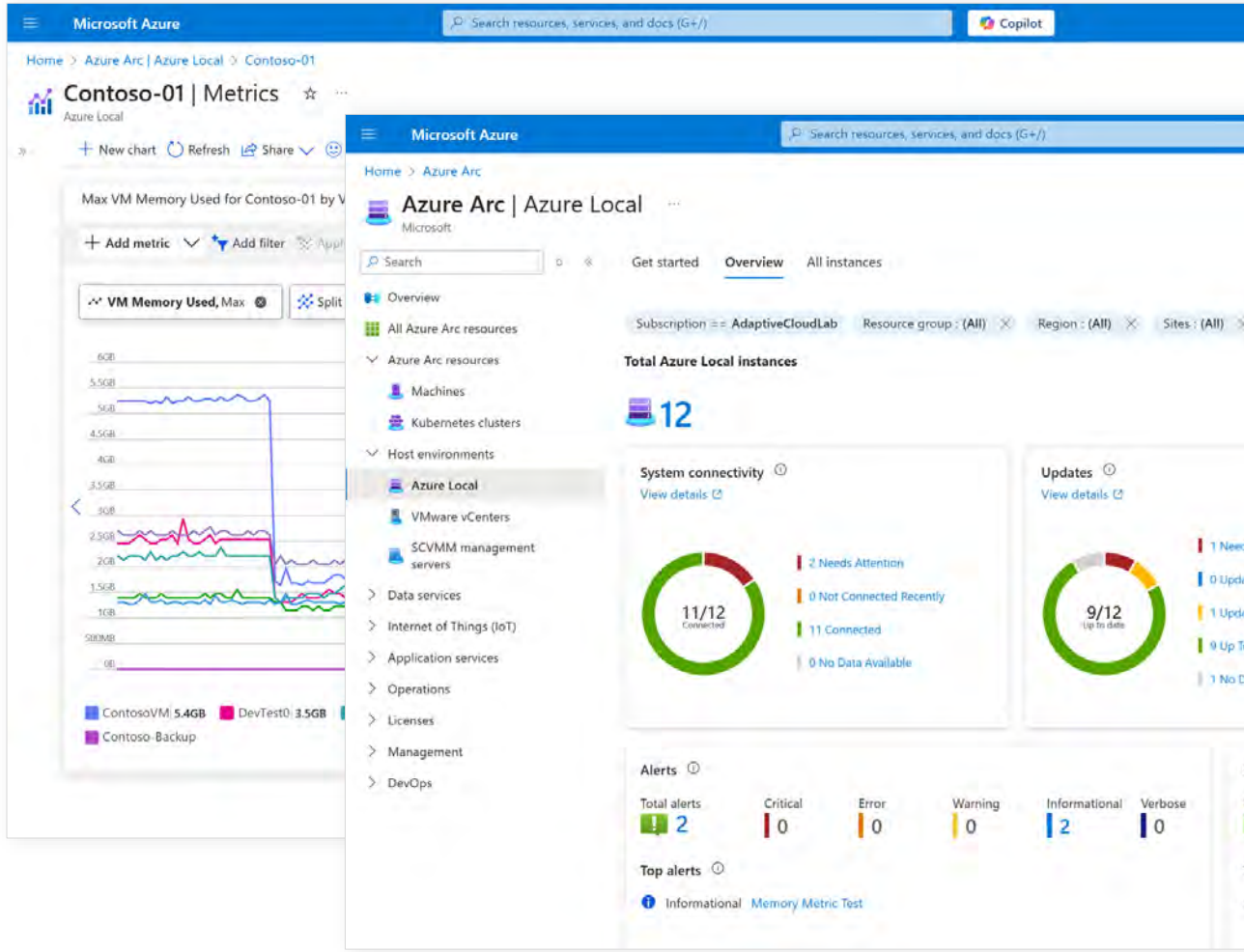
Central visibility across all your locations

Monitor infrastructure, VMs, and Kubernetes from the Azure portal, enabled by Azure Arc

Ready-made dashboards you can customize

50+ standard metrics for infrastructure cover hypervisor, storage, and networking

Set alert rules to send email and more



Microsoft

Azure Local

Enabled by Azure Arc

Ready for all your apps: VMs and containers alike

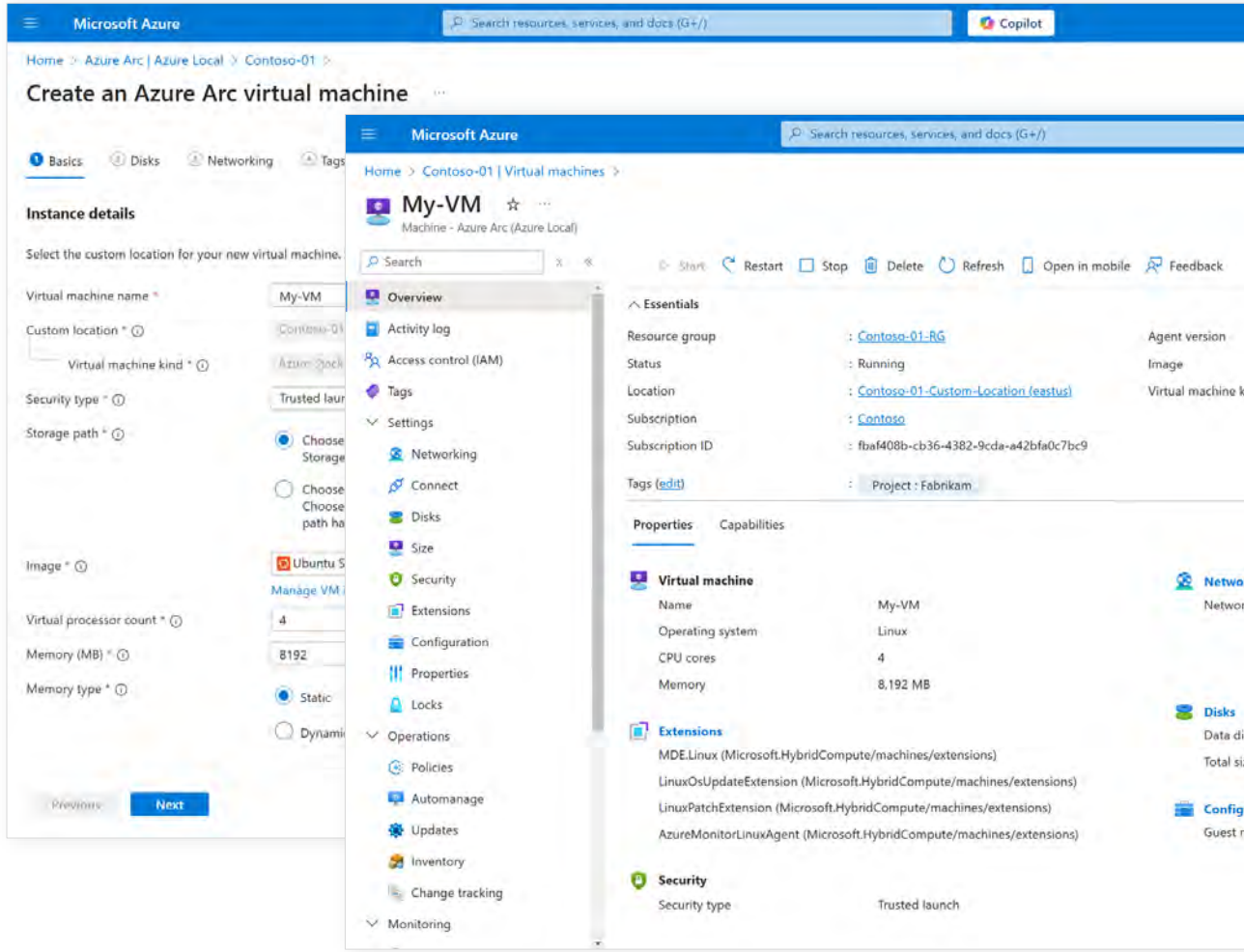
Full-featured, general-purpose virtual machines

Run traditional apps in VMs with your own images or Azure Marketplace images

Total flexibility to customize VM specs, networking, storage, and configuration

Use familiar Azure portal and automation for cloud-consistent VM operations

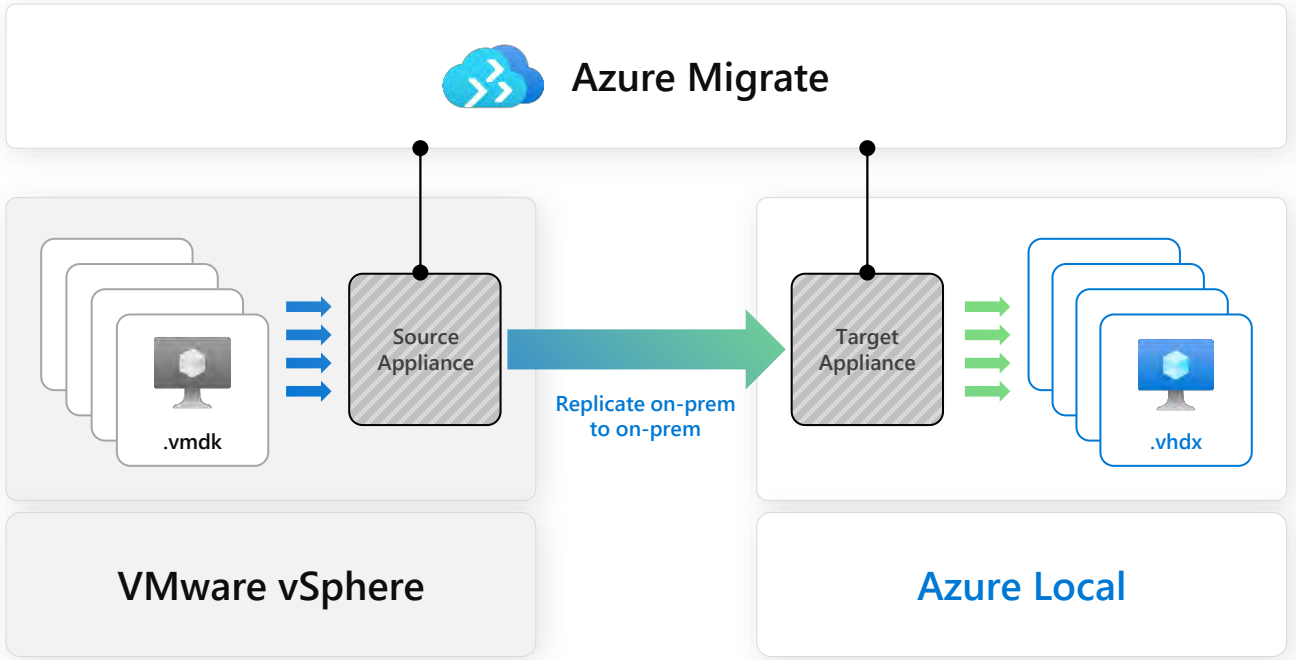
VM extensions for monitoring, security, updates, AD join, custom script, and more



Migrate from VMware to Azure Local (preview)

NEW

- Reduce your VMware costs and footprint with full-stack alternative
- No need to change/rewrite apps
- Copy and convert VMware VMDK to Azure Arc VM entirely on-premises
- Guided workflow in Azure Migrate



Learn more at aka.ms/AzureLocal/Migrate

Azure Kubernetes Service built-in and included

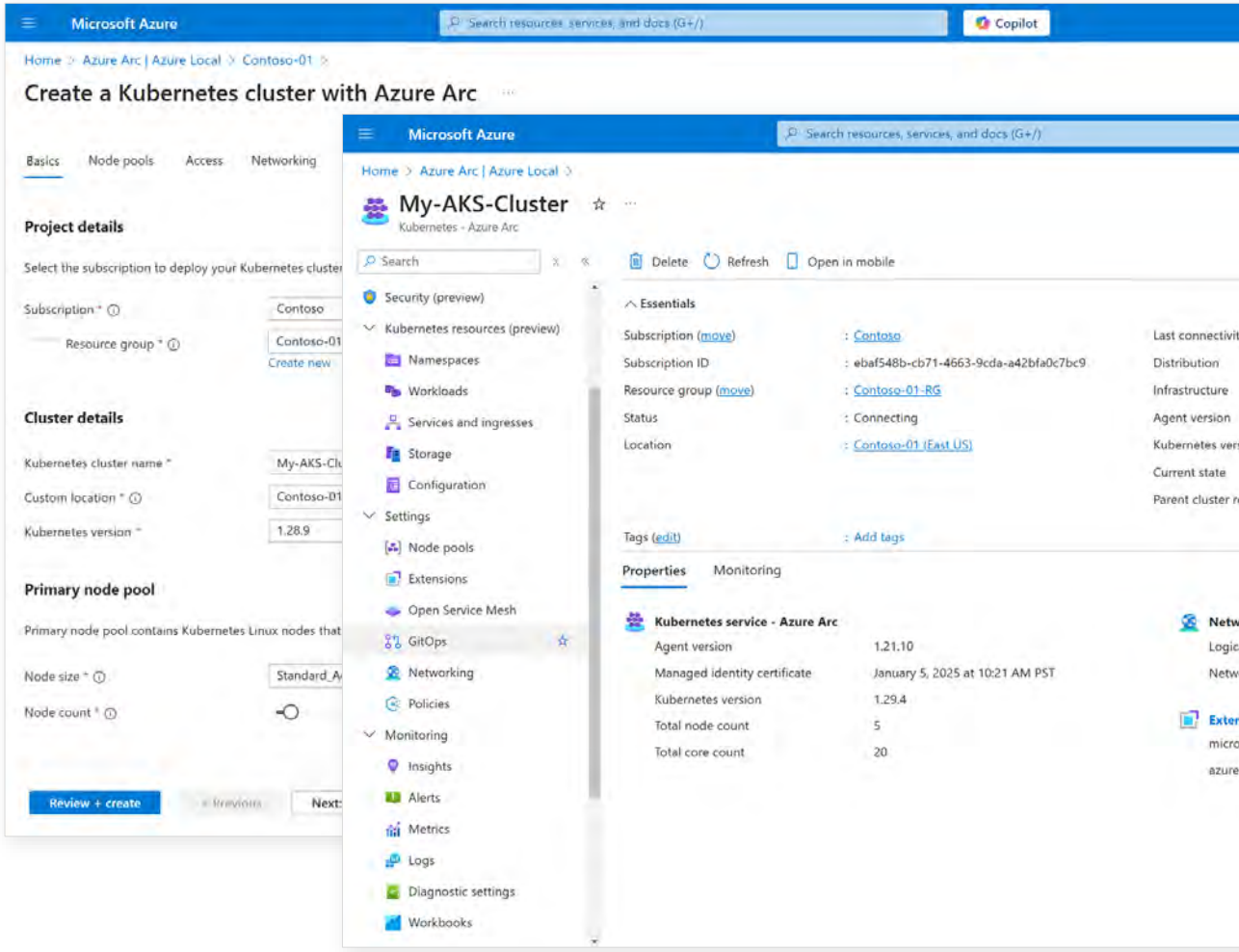
NEW

Deploy container and cloud-native apps leveraging open-source technology

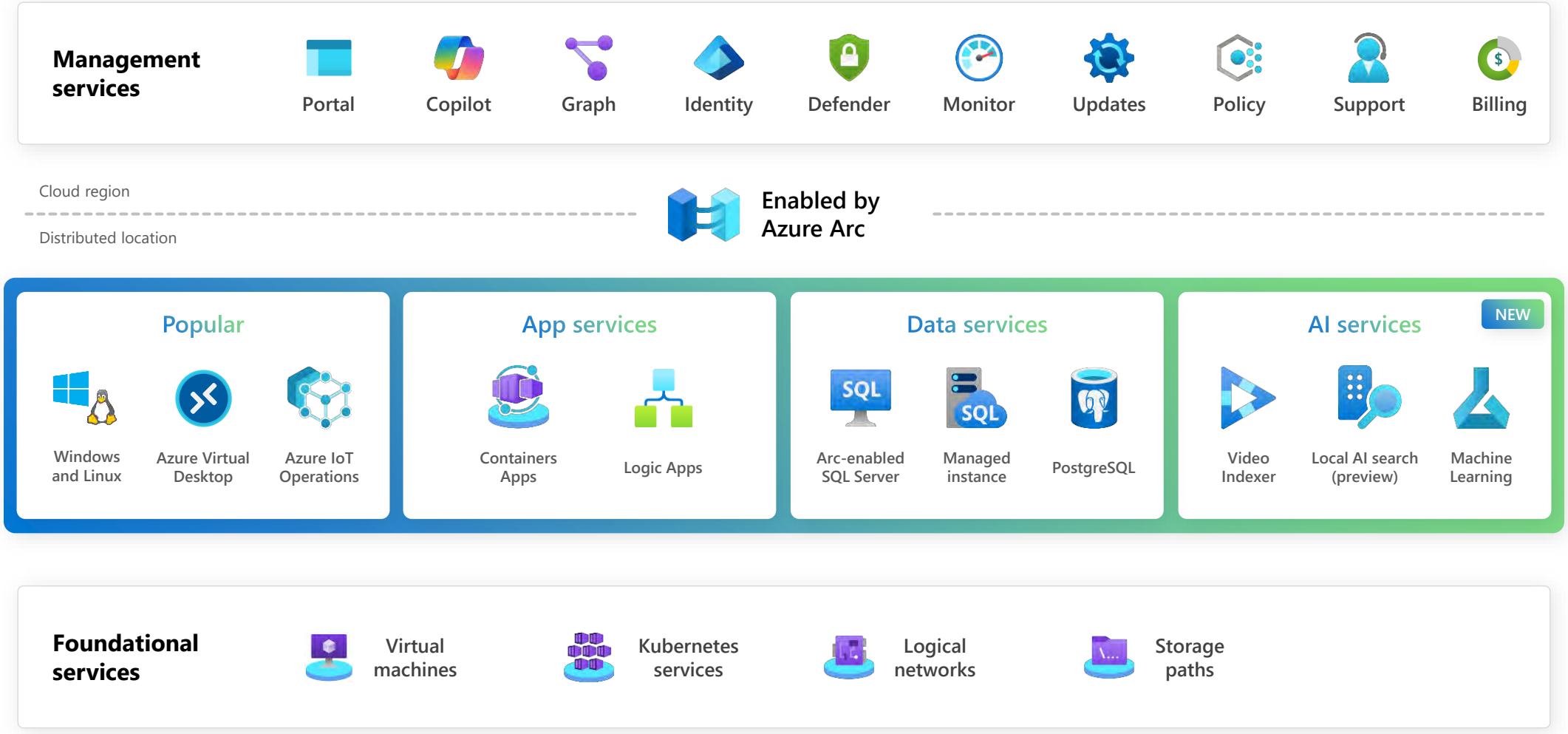
Managed Kubernetes with AKS-consistent portal and APIs to simplify operations

Microsoft-provided storage (CSI) driver and images for Linux and Windows

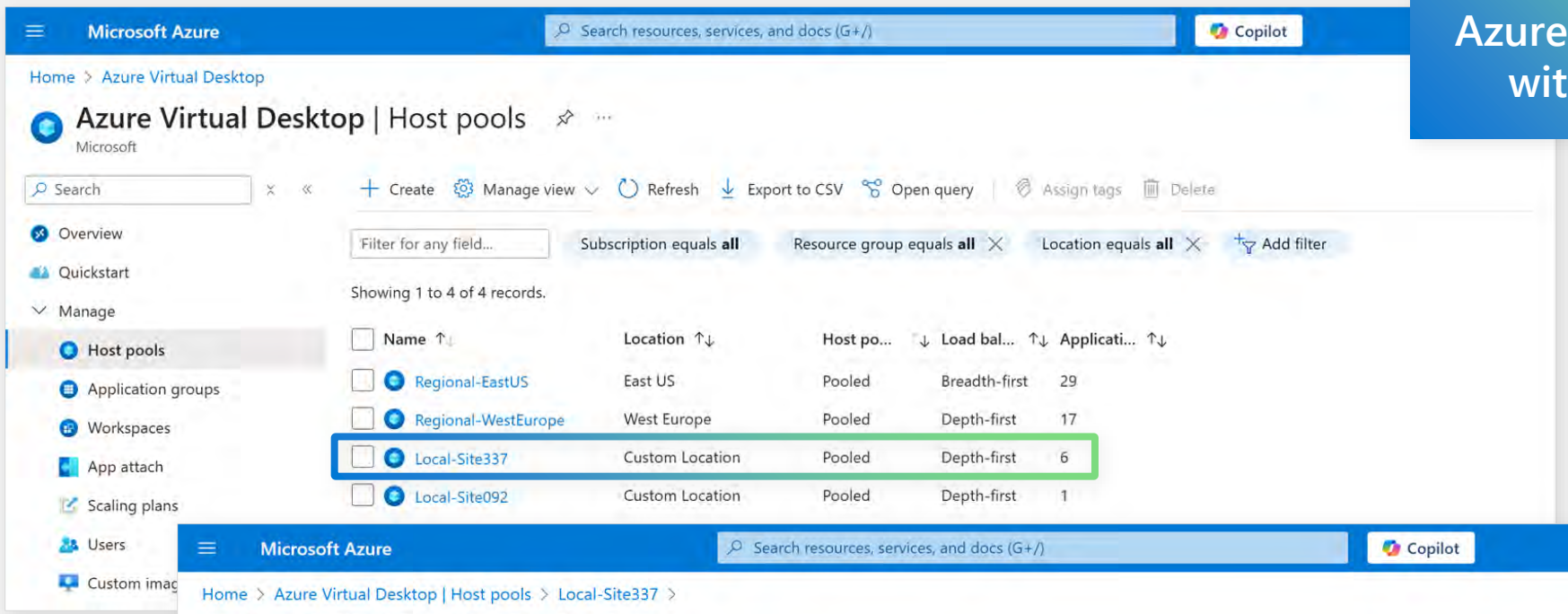
Infra-as-code and continuous delivery with Terraform and GitOps support

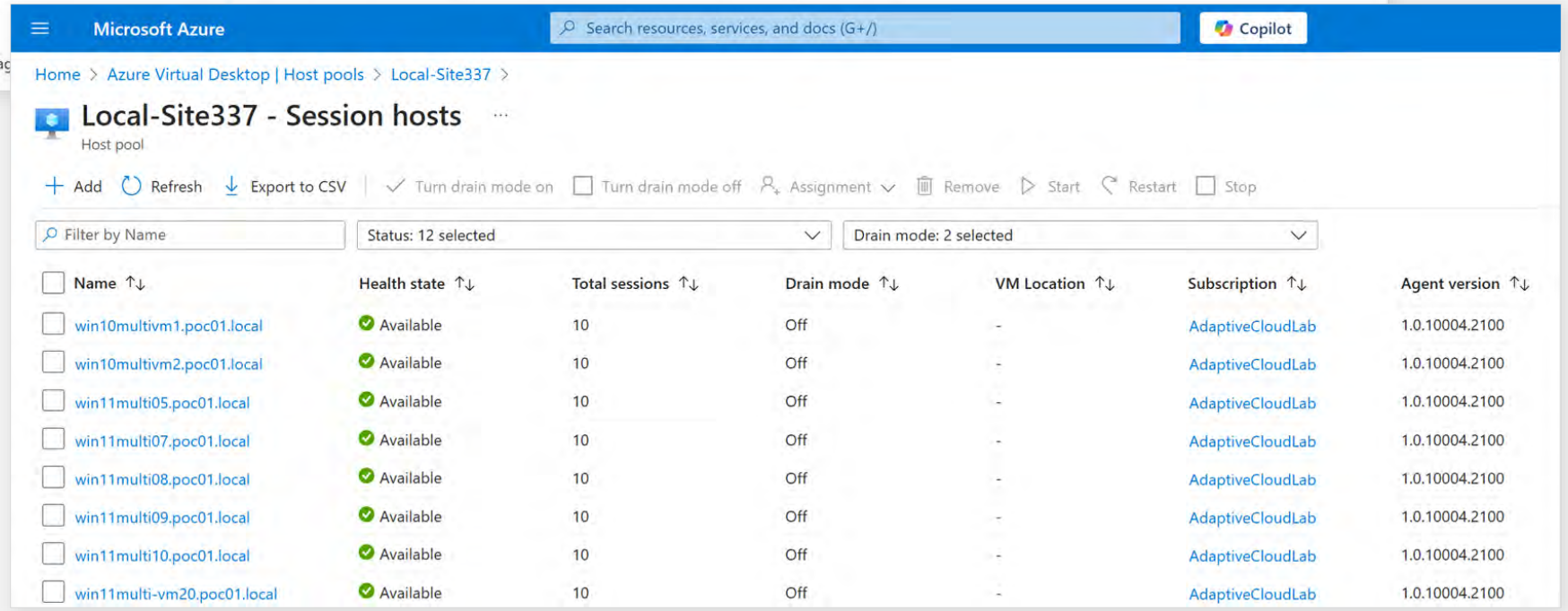


Bring Azure's app, data, and AI services anywhere



Azure Virtual Desktop with Azure Local





Azure AI services with Azure Local (preview)

NEW

Local AI Search

Search on-premises data with small and large language models

Private Preview

Azure ML Catalog

Deploy and manage validated AI models from the cloud

Private Preview

Learn more at aka.ms/AzureLocal/EdgeAI

Microsoft

Azure Local

Enabled by Azure Arc

Flexibility to meet your requirements and budget

Choose hardware from your preferred vendor

DELL Technologies

Lenovo

Hewlett Packard Enterprise

DataON

CISCO

SUPERMICRO

FUJITSU

1. Engage directly with your preferred vendor
2. Customize hardware specs, storage, and networking
3. Purchase 1 to N nodes up-front or as-a-service

Explore solutions at aka.ms/AzureLocalCatalog

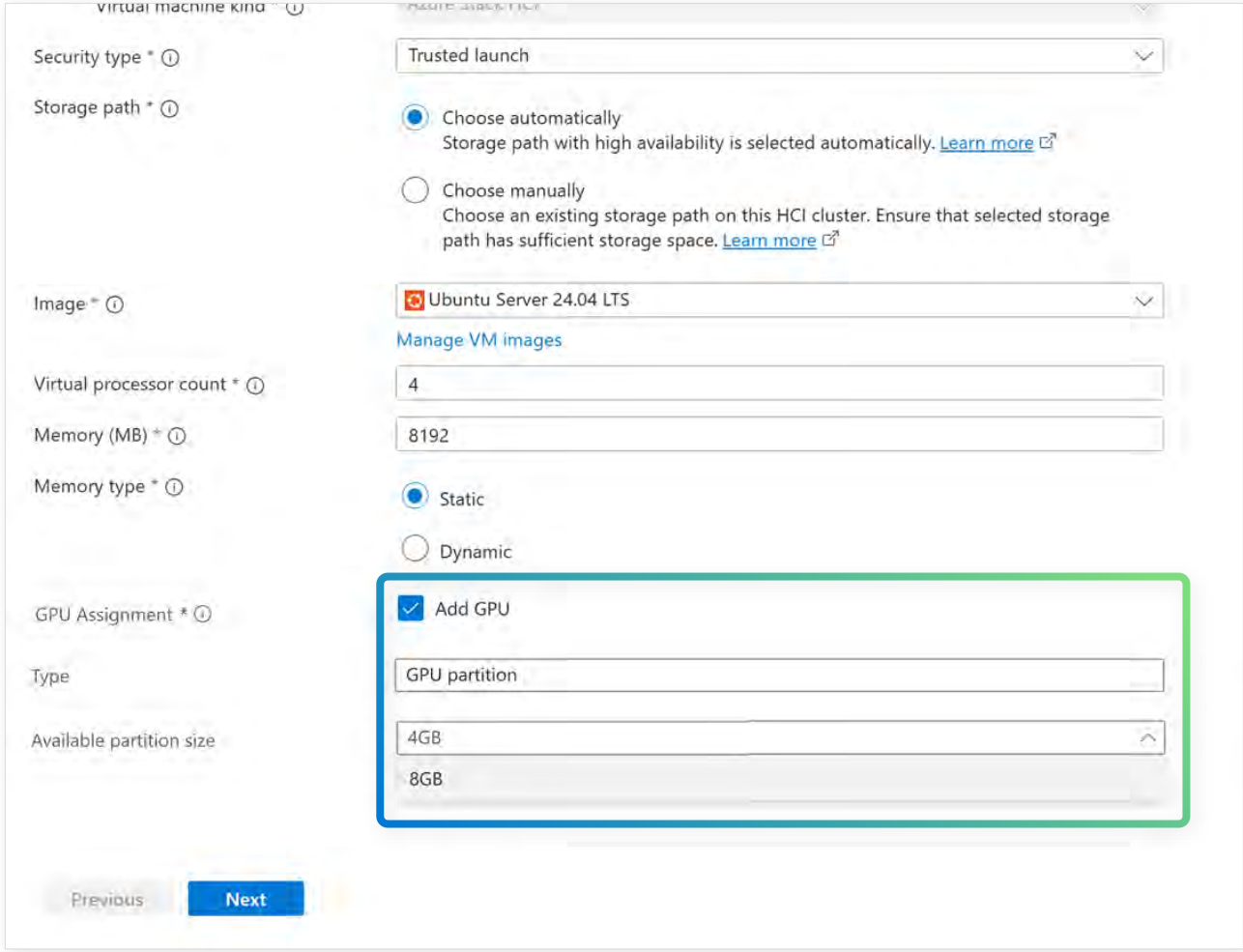
Accelerate demanding workloads with GPUs

Over 50 GPU-capable platforms with NVIDIA A2, A16, A40, and others

Dedicate whole GPUs to workloads to maximize AI/ML performance

Partition GPUs to increase density with virtual apps and desktops

VMs with GPU partitioning support live migration and failover [1] NEW



1 : Not yet supported by AKS 2 : GPU assignments in Azure Arc coming Dec 2024

Low-spec, low-cost options for edge use cases

NEW

Azure Stack HCI Requirements at launch	Azure Local [1] Requirements at launch
Windows Server certified	Windows Server certified
~~Min. 2+ machines~~	1+ machine
~~Min. 4+ disks per machine~~	1+ SSD per machine [2]
~~Min. 10 Gbps w/ RDMA~~	1 Gbps/2.5 Gbps Ethernet [3]
~~Active Directory required~~	Doesn't require AD [4]

SuperMicro SYS-E302
Fan-less server

Dell MC-4000r/z + MC-4510c
Rugged two-sled chassis

HPE MicroServer Gen11
Micro tower server

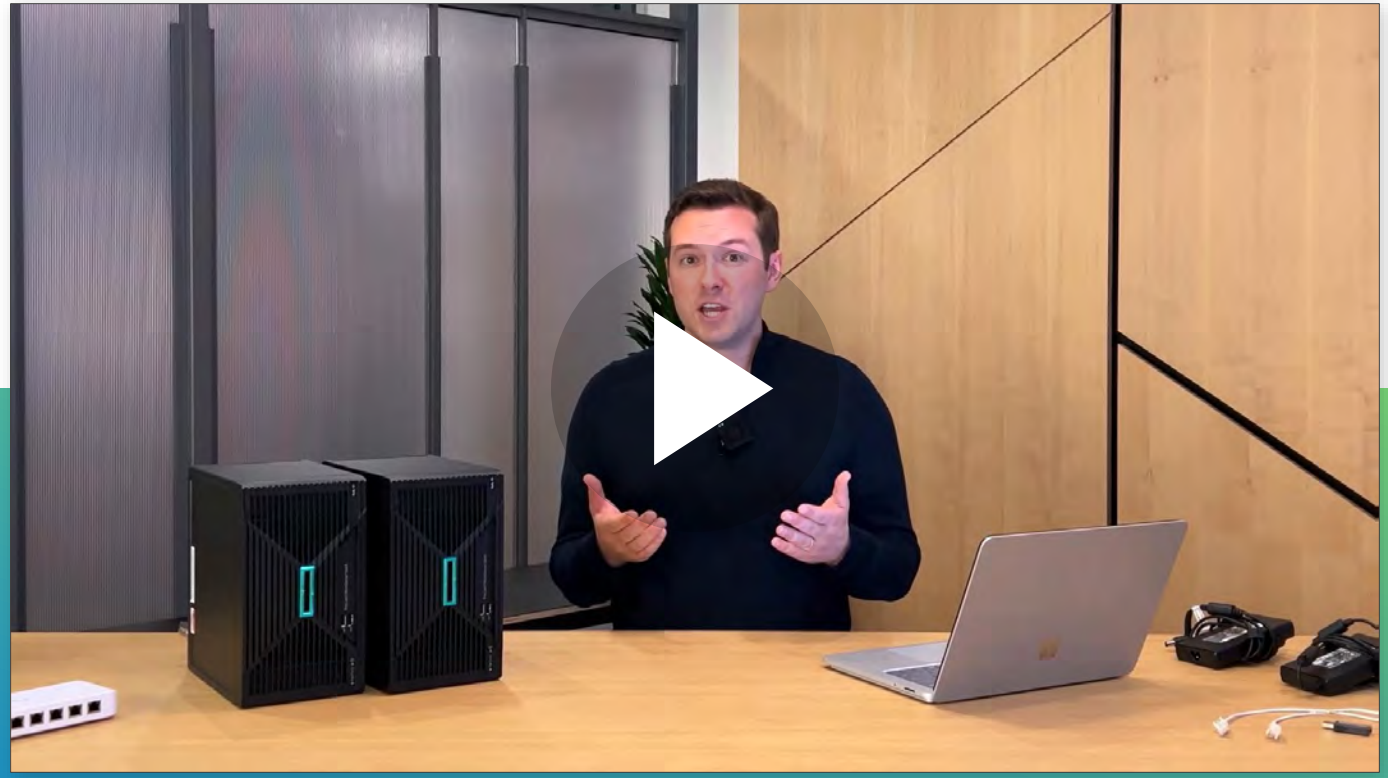
Lenovo ThinkEdge SE350v2
Half-width, half-depth 1U

Example possible solutions, pending validation

1 : Reduced requirements allowed up to maximum of 3-node cluster 2 : Excludes OS boot disk 3 : Must support Hyper-V virtualization 4 : In preview now, coming 2025

Watch the demo

Deploy AKS using tower servers and simple ethernet

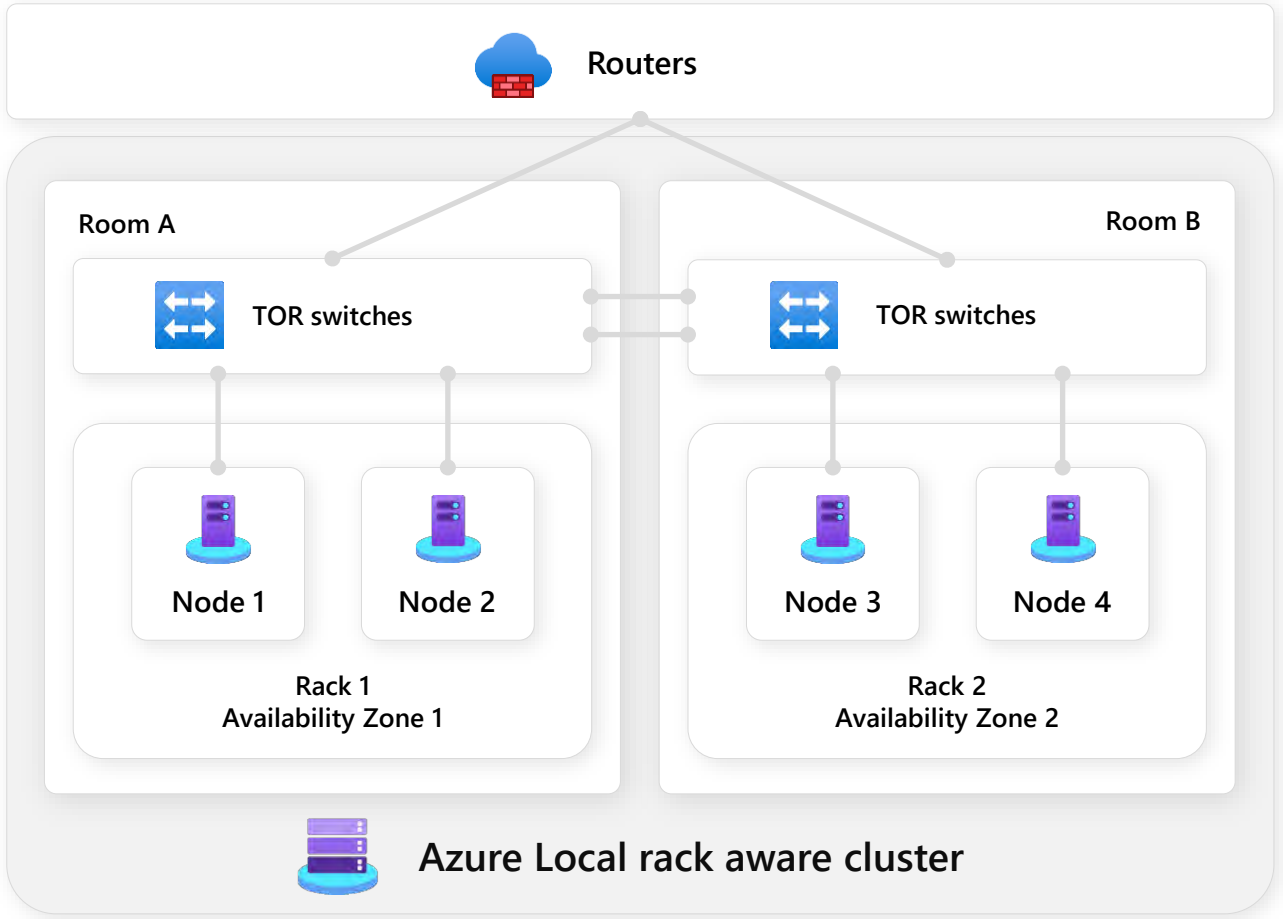


aka.ms/AzureLocalSFFDemo
(9 mins 39 secs)

Introducing rack aware clusters (preview)

NEW

- Increased high availability (HA) between 2 rooms in the same location
- Synchronized S2D storage replication between local availability zones
- Provision workloads to a specific local availability zone
- Automatic workload and volume failover and failback



Introducing disconnected operations (preview)

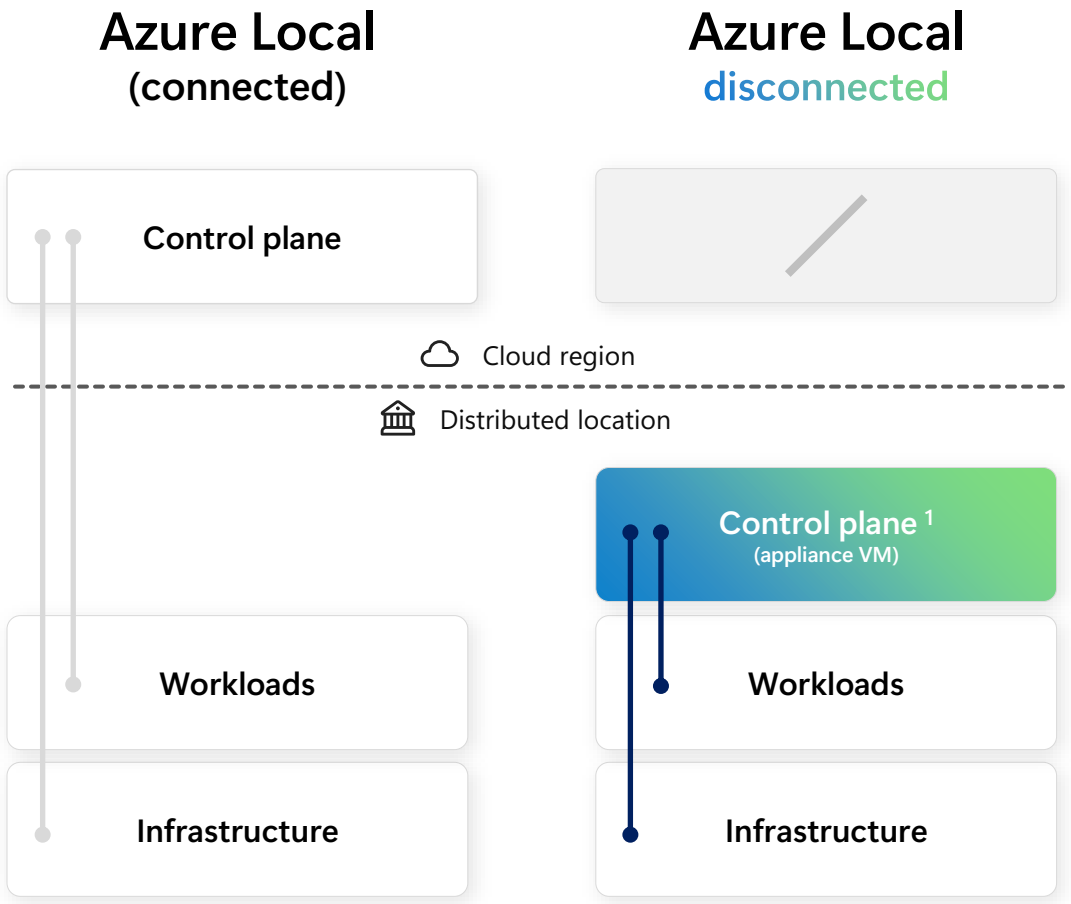
NEW

Satisfy regulatory requirements by operating permanently disconnected from the cloud

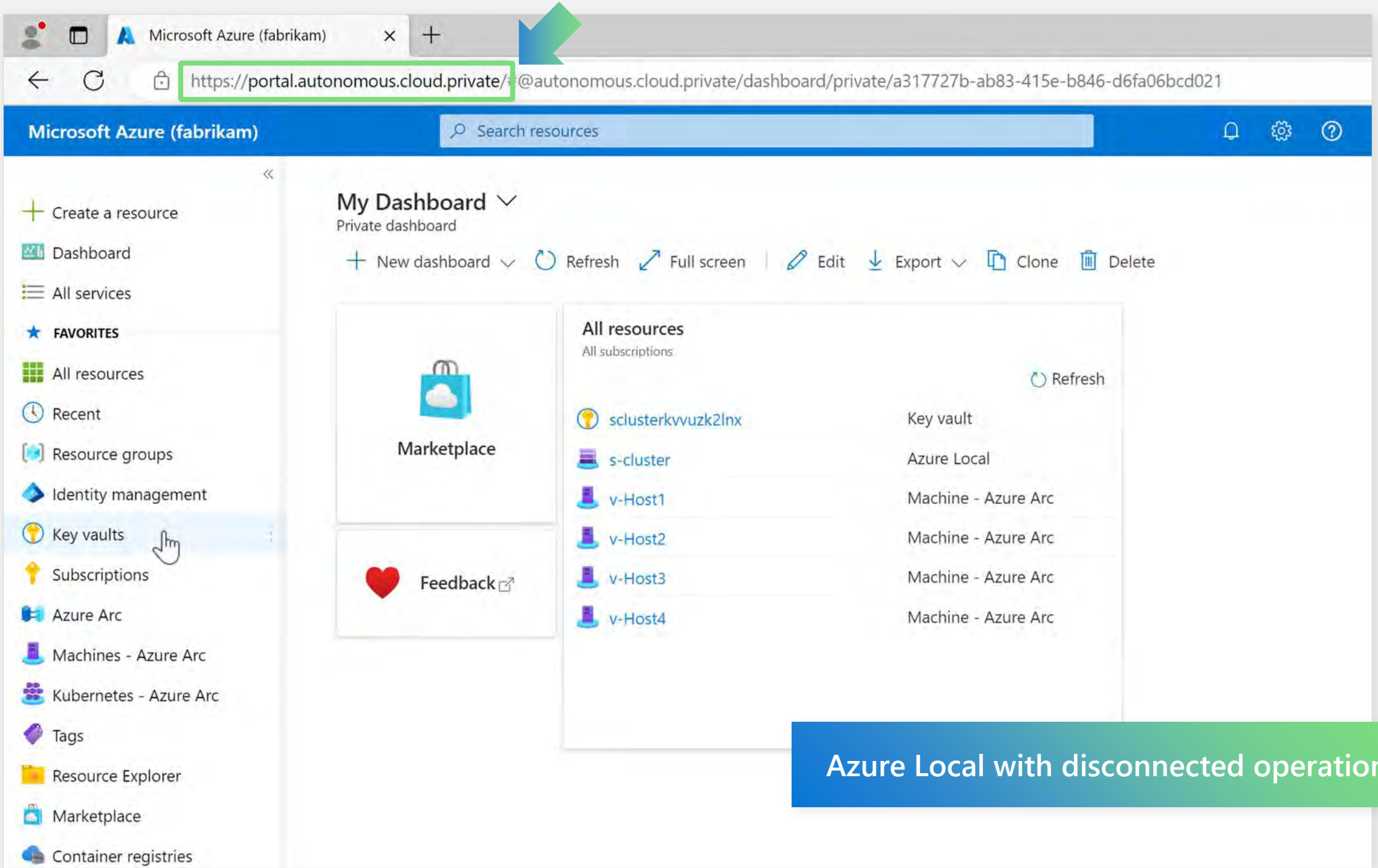
Host backend Azure resource manager, portal, and services in local appliance VM

Subset of services available:

- Portal
- ARM
- Copilot
- Key Vaults
- Policy [2]
- Defender
- Local
- Machines
- Kubernetes
- Registries
- AVD
- Others



1 : Available only to customers who prequalify based on industry, use case, and other considerations 2 : Partial functionality


Microsoft Azure (fabrikam)
https://portal.autonomous.cloud.private/@autonomous.cloud.private/dashboard/private/a317727b-ab83-415e-b846-d6fa06bcd021
Microsoft Azure (fabrikam)
Search resources
Create a resource
Dashboard
All services
FAVORITES
All resources
Recent
Resource groups
Identity management
Key vaults
Subscriptions
Azure Arc
Machines - Azure Arc
Kubernetes - Azure Arc
Tags
Resource Explorer
Marketplace
Container registries
My Dashboard
Private dashboard
New dashboard
Refresh
Full screen
Edit
Export
Clone
Delete
Marketplace
Feedback
All resources
All subscriptions
Refresh
sclusterkvvuzk2lnx
Key vault
s-cluster
Azure Local
v-Host1
Machine - Azure Arc
v-Host2
Machine - Azure Arc
v-Host3
Machine - Azure Arc
v-Host4
Machine - Azure Arc
Azure Local with disconnected operations

Microsoft

Azure Local

Enabled by Azure Arc

Extend cloud security to your distributed locations

Strong default security for apps and infrastructure

Management and security tools

- **Centralized security management** — Azure Policy, OS Config
- **Simplified compliance** — Azure Policy, Azure Security Benchmarks
- **Security posture mgmt.** — Azure Policy, Monitor, Defender for Cloud

Simplified operational hardening

- **VM isolation** — Hardware enforced VM isolation
- **Privileged access** — JIT, JEA, PIM, PAM, CG
- **Network security** — Datacenter Firewall, Secure DNS

Sensitive workload protection

- **OS + firmware protection** — TVM, Guest attestation
- **Confidential Compute*** — CVM, Guest & workload attestation

Data-at-rest and integrity protection

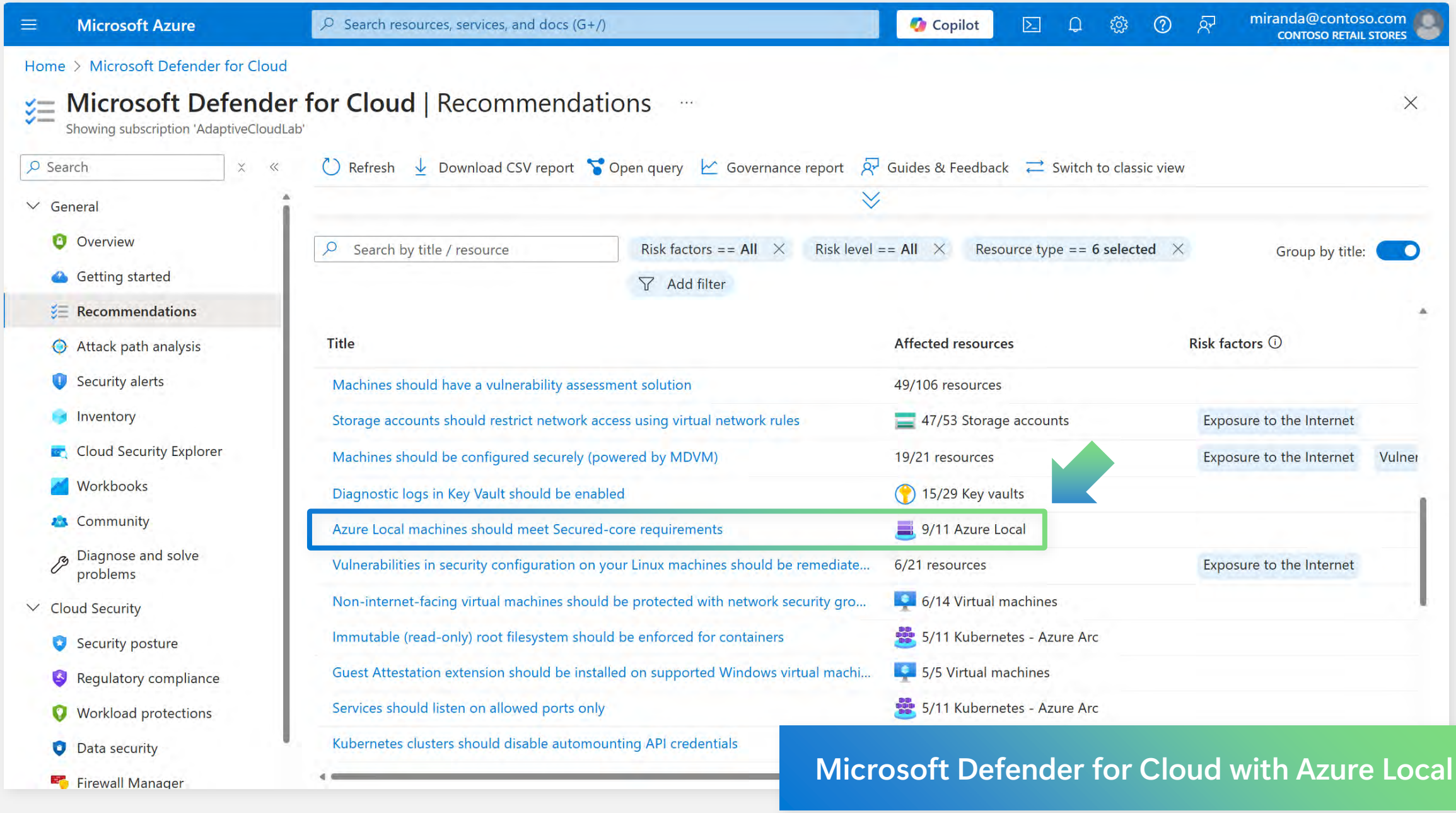
- **Encryption + data protection** — SMB, BitLocker
- **System security + zero trust** — Hardened defaults, Trusted Boot, Certificates, Cryptography, Code Signing and Integrity, Device Attestation, Zero trust

Secured-core certification

- **Hardware root-of-trust** — TPM 2.0,, DRTM, Secure Boot
- **Silicon assisted security** — Firmware, DMA, Memory, Secured Kernel

Highly regulated industries

- **Security assurance**
- **Certification**
- **Secure supply chain**
- **Host component governance** — Provenance, patching and continuous vulnerability management of OS components


Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
miranda@contoso.com
CONTOSO RETAIL STORES
Home > Microsoft Defender for Cloud
Microsoft Defender for Cloud | Recommendations
Showing subscription 'AdaptiveCloudLab'
Search
General
Overview
Getting started
Recommendations
Attack path analysis
Security alerts
Inventory
Cloud Security Explorer
Workbooks
Community
Diagnose and solve problems
Cloud Security
Security posture
Regulatory compliance
Workload protections
Data security
Firewall Manager
Refresh
Download CSV report
Open query
Governance report
Guides & Feedback
Switch to classic view
Search by title / resource
Risk factors == All
Risk level == All
Resource type == 6 selected
Group by title:
Add filter
Title
Affected resources
Risk factors
Machines should have a vulnerability assessment solution
49/106 resources
Storage accounts should restrict network access using virtual network rules
47/53 Storage accounts
Exposure to the Internet
Machines should be configured securely (powered by MDVM)
19/21 resources
Exposure to the Internet
Diagnostic logs in Key Vault should be enabled
15/29 Key vaults
Azure Local machines should meet Secured-core requirements
9/11 Azure Local
Vulnerabilities in security configuration on your Linux machines should be remediate...
6/21 resources
Exposure to the Internet
Non-internet-facing virtual machines should be protected with network security gro...
6/14 Virtual machines
Immutable (read-only) root filesystem should be enforced for containers
5/11 Kubernetes - Azure Arc
Guest Attestation extension should be installed on supported Windows virtual machi...
5/5 Virtual machines
Services should listen on allowed ports only
5/11 Kubernetes - Azure Arc
Kubernetes clusters should disable automounting API credentials
Microsoft Defender for Cloud with Azure Local

Network threat landscape: by the numbers

90%+

of all cyberattacks abused Remote Desktop Protocol (RDP) in 2023

Source: Sophos, 2023

3M+

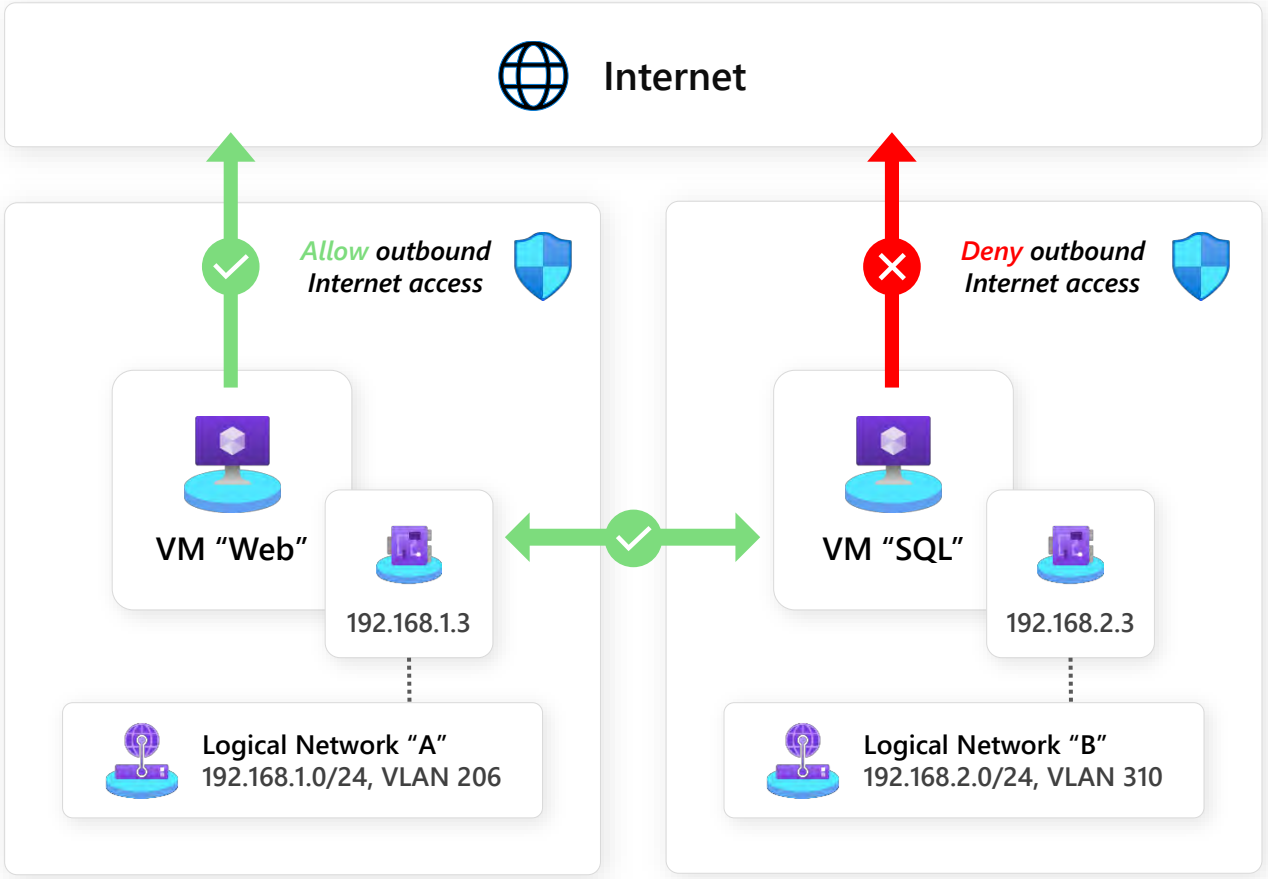
Exposed RDP ports could be protected with stronger network security

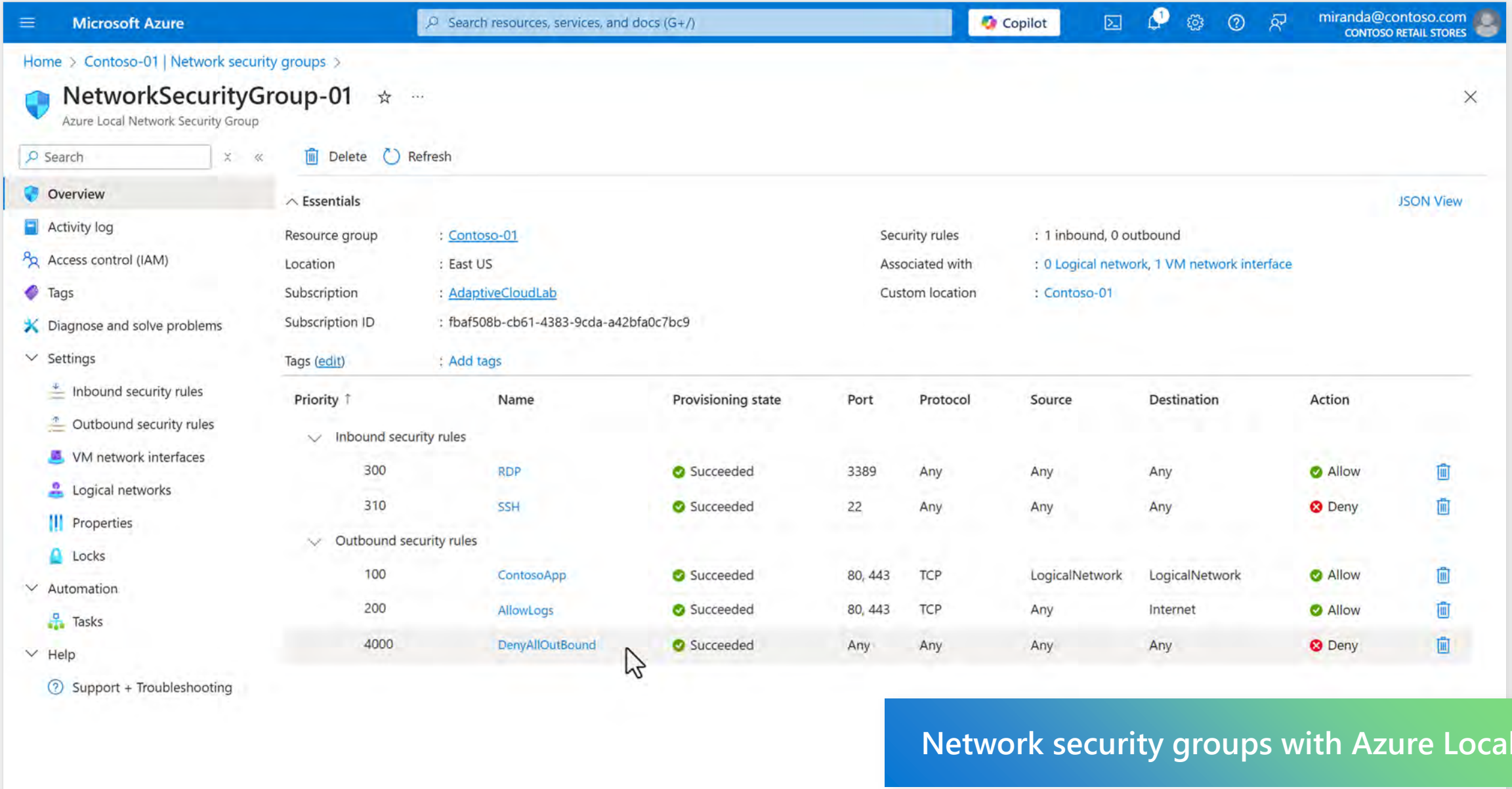
Source: Sophos, 2021

Introducing network security groups (preview)

NEW

- Protect network access with inbound and outbound allow and deny rules
- Complete 5-tuple control: source and destination IP, port, and protocol
- Assign NSGs to individual VM interfaces or whole logical networks
- Enforced within the virtual switch at the virtual port level





Network security groups with Azure Local

Low-level attacks are increasingly sophisticated

Firmware attacks are hard to detect, persistent across reboots

Example

“MoonBounce” (2022)

Description

Rootkit that targets UEFI Simple Firmware Interface (SFI)

Result

Controls system remotely

Example

“CosmicStrand” (2022)

Description

Targets the (virtual) hardware initialization components

Result

Data exfiltration

Installs more malware

Example

“BlackLotus” (2023)

Description

Boot kit (UEFI) that bypasses Secure Boot

Result

Controls system remotely

Introducing Trusted launch for VMs (preview)

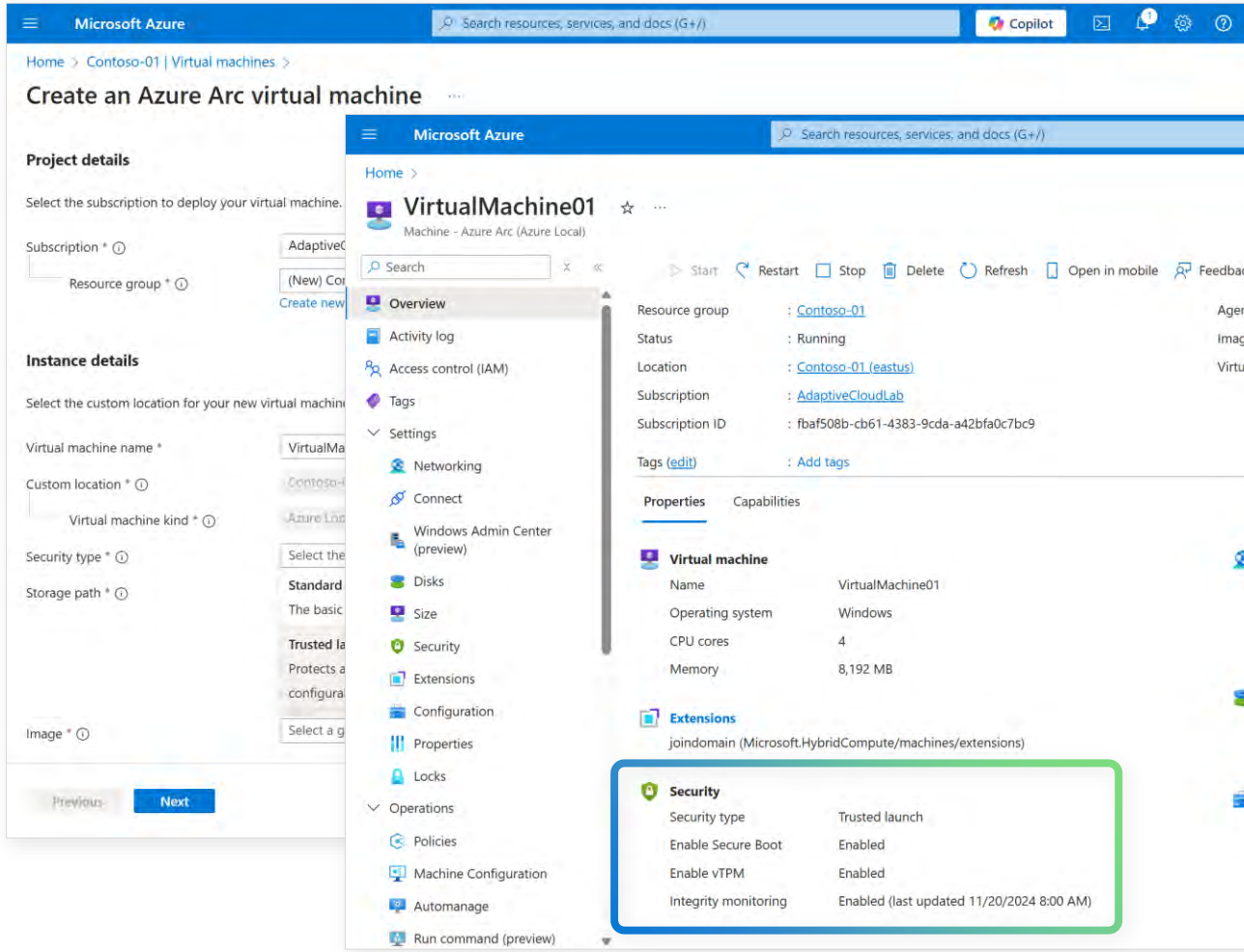
NEW

Secure Boot ensures only trusted software can run during boot

Boot Integrity extends the benefits of Secure Boot and identifies vulnerabilities

Microsoft Azure Attestation service regularly verifies TVM components [1]

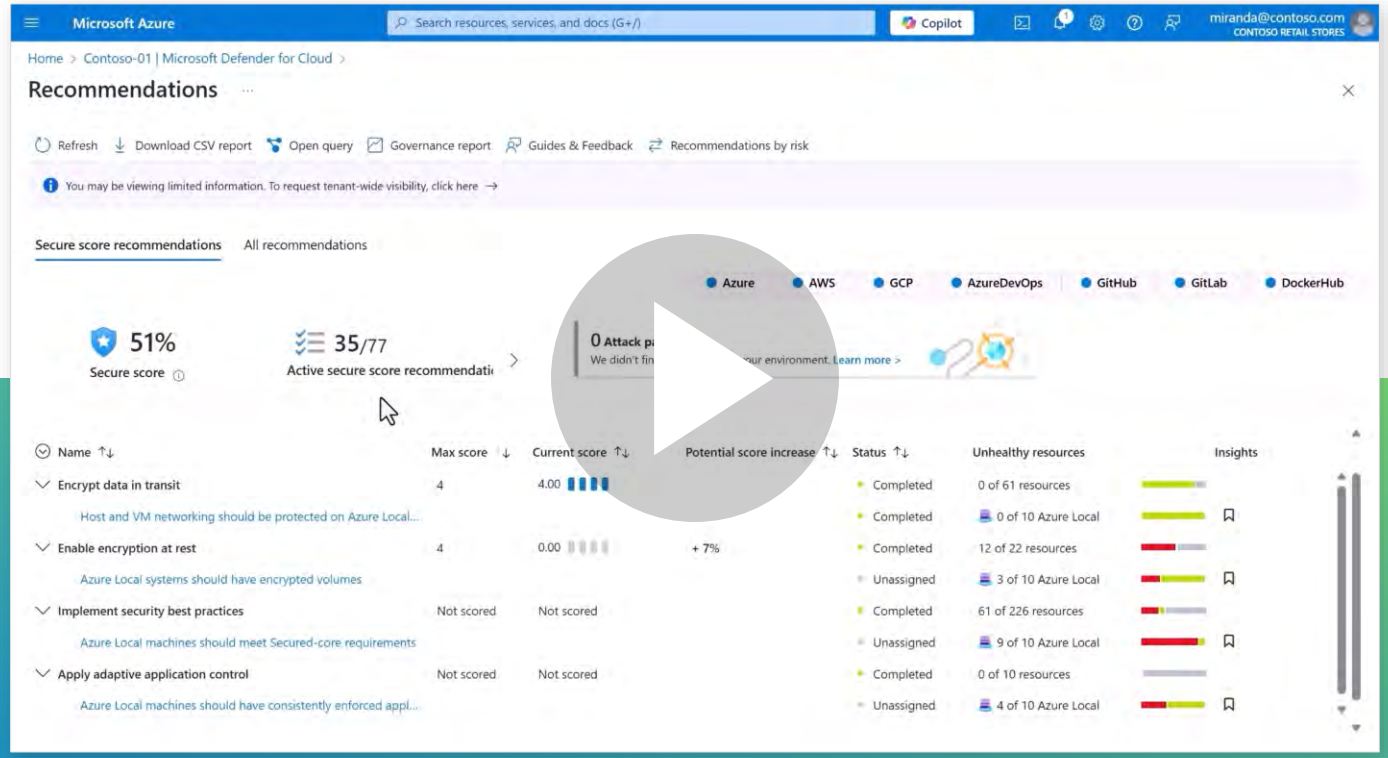
Keys and secrets persist through VM movements (live migration, failover)



1 : Attestation visibility in Azure portal coming in Q1 2025.

Watch the demo

Extend cloud security to your distributed locations



aka.ms/AzureLocalSecurityDemo
(2 mins 51 secs)

Microsoft

Review

Operate and scale with the power of the cloud

- Deploy from the cloud
- Scale with infra-as-code
- One-click updates
- Central visibility

Ready for all your apps: VMs and containers alike

- Full-featured, general-purpose VMs
- Migrate from VMware (preview)
- AKS built-in and included
- App, data, and AI services (preview)

Flexibility to meet your requirements and budget

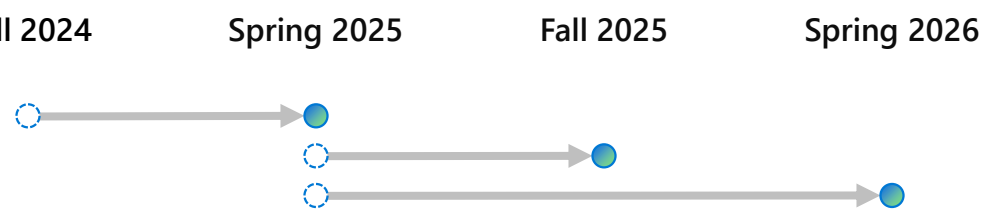
- Choose your hardware
- Accelerate with GPUs
- Low-spec, low-cost options
- Disconnected operations (preview)

Extend cloud security to your distributed locations

- Secure by default
- Microsoft Defender for Cloud
- Network security groups
- Trusted launch

Azure Local (partial) product roadmap *

Preview GA



Operate and scale with the power of the cloud

- Azure Arc gateway for simpler connectivity
- Zero-touch OS provisioning from cloud
- Day N cluster/storage/network management

Ready for all your apps: VMs and containers alike

- Migrate from VMware
- Hydrate pre-existing VMs into Azure Arc
- VMs features: day N operations, OS disk, gallery, connect

Flexibility to meet your requirements and budget

- Low-spec, low-cost hardware options
- Local identities (no on-prem Active Directory)
- Rack-aware clustering to replicate between rooms

Extend cloud security to your distributed locations

- Remediate Defender recommendations
- Software-defined networking
- Trusted launch (including attestation)

* IMPORTANT: Forward-looking roadmap is subject to change. It should not be interpreted as a commitment on the part of Microsoft, and Microsoft cannot guarantee its accuracy.

Azure Local packaging and pricing

Software subscription billed through Azure

Flat monthly fee covers complete infrastructure software stack: compute, networking, storage, Kubernetes, and management

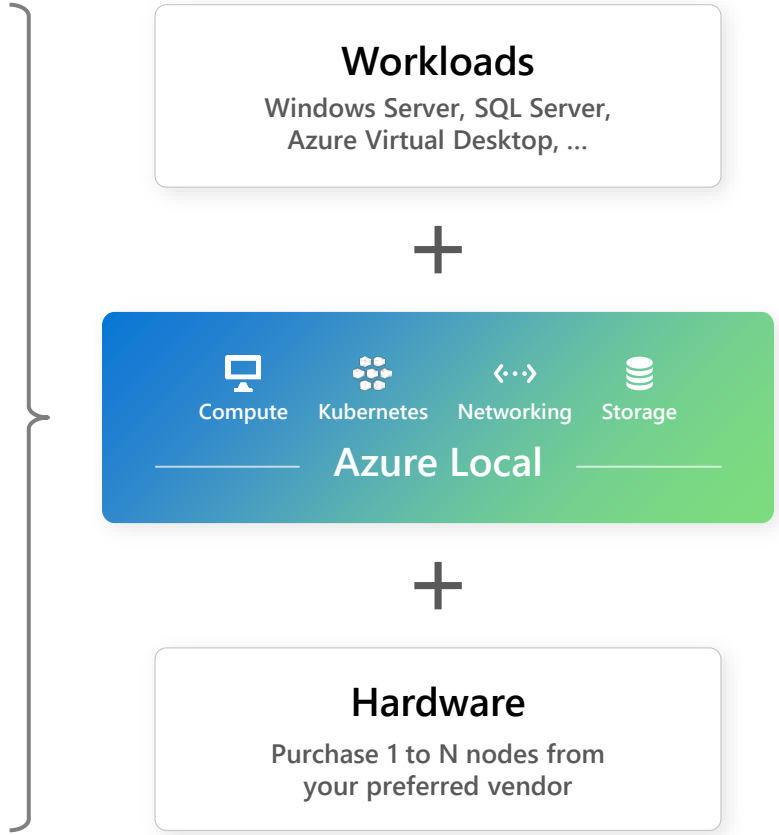
List price 10 USD/physical core/month [1]

Hardware purchased separately from your OEM

Workloads may have their own licensing (e.g., Windows)

Additionally,

- Azure Local is available preinstalled from select partners (OEM license).
- Customers with active Windows Server Datacenter Software Assurance (SA) may exchange their licensed cores for the same number of cores of Azure Local at no additional cost. Please refer to product terms for details.



1 : Applies to connected machines. Pricing for disconnected operations (preview) has not been announced.

Recognized Leader

2024 Gartner® Magic Quadrant™ for Distributed Hybrid Infrastructure

Read [the blog]

Azure Local frequently asked questions

How is Azure Local related to Azure Arc?

Azure Arc is a bridge that extends Azure to existing environments and other clouds. Azure Local is an infrastructure solution that includes all the capabilities of Azure Arc built-in and set up automatically. Use Azure Local when you need new or refreshed infrastructure at distributed locations. Use Azure Arc when your environment already has infrastructure.

What happens to Azure Stack HCI?

Azure Stack HCI is now part of Azure Local. The same features and functionality continue to be offered under the new name. There is no action required for existing customers. Compared to before, Azure Local provides additional flexibility and features: it supports lower-spec hardware (preview), disconnected operations (preview), additional services, and more.

What happens to Azure Stack Hub and Azure Stack Edge?

Microsoft recommends Azure Local for most situations where infrastructure is needed at distributed locations. Once lower-spec hardware (preview) and disconnected operations (preview) are generally available, Azure Local will offer the same capabilities as prior Azure Stack products. Until then, there is no change to Azure Stack Hub and Azure Stack Edge: they remain available as standalone products, separate from Azure Local.

Is Azure Local managed by Microsoft?

No, you own the hardware and have operational control of your Azure Local environment. Day-to-day monitoring, management, support, and other functions are surfaced through Azure tools, but actions are customer-initiated. For example, when a software update is available, a notification appears in the Azure portal, but you control when it gets applied.

Is Azure Local a replacement for VMware?

Azure Local is not designed to replace datacenters or support large-scale migrations from VMware. For most VMware migrations, Microsoft recommends using Azure VMware Solution, which offers the fastest and easiest path to the cloud, allowing IT administrators to leverage their existing VMware skills and subscriptions.

Azure Local can be an option for certain durably on-premises use cases, particularly for edge solutions in industries such as manufacturing and retail where customers have many distributed locations. Azure Local uses the Hyper-V hypervisor to run VMs and Azure Kubernetes Service enabled by Azure Arc to run container applications. This makes it a viable solution for customers with on-premises VMware workloads in the scenarios above who also want to move away from VMware licensing.

How do I buy Azure Local?

Review networking and other prerequisites and then browse the solutions catalog to find validated hardware from your preferred vendor. Many solutions come with the Azure Local software preinstalled and ready to use. If not, you can download and install Azure Local software from the Azure portal. Once installed, Azure Local connects to Azure for day-to-day management. Azure Local is billed automatically to your Azure subscription – see pricing for details.

Learn more: aka.ms/AzureLocal

Microsoft

Thank you!

Azure Local

Enabled by Azure Arc