Unified Compute Platform for Azure Hybrid Cloud

Reference Architecture Guide

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March 2025

Feedback

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Thank you!

Revision history

Changes	Date
Azure Local renaming and Arc-UCP-CI-Win2025 support	March 2025
Deploy Azure Stack HC using the ARM Template	October 2024
Initial release	July 2024

Reference Architecture Guide

Executive summary

In today's rapidly, ever evolving cloud computing landscape, driven by digital transformation, the need for agility, and complex IT environments, Hybrid Cloud, and Edge Computing have emerged as a critical strategy.

It's no longer just about connecting on-premises and cloud environments; it's about creating a unified, flexible, and scalable IT ecosystem.

Many organizations are selecting hybrid cloud strategies and implementing hybrid cloud solutions to meet the crucial business needs.

Hybrid cloud solutions augmented data placement by its elasticity, agility and cost management with complex operational overhead.

Microsoft Azure Arc has been introduced by Microsoft as a versatile hybrid cloud solution to simplify governance and management by enabling Azure services to run across edge, on-premises, and hybrid clouds.

What are Azure Arc and Azure Local?

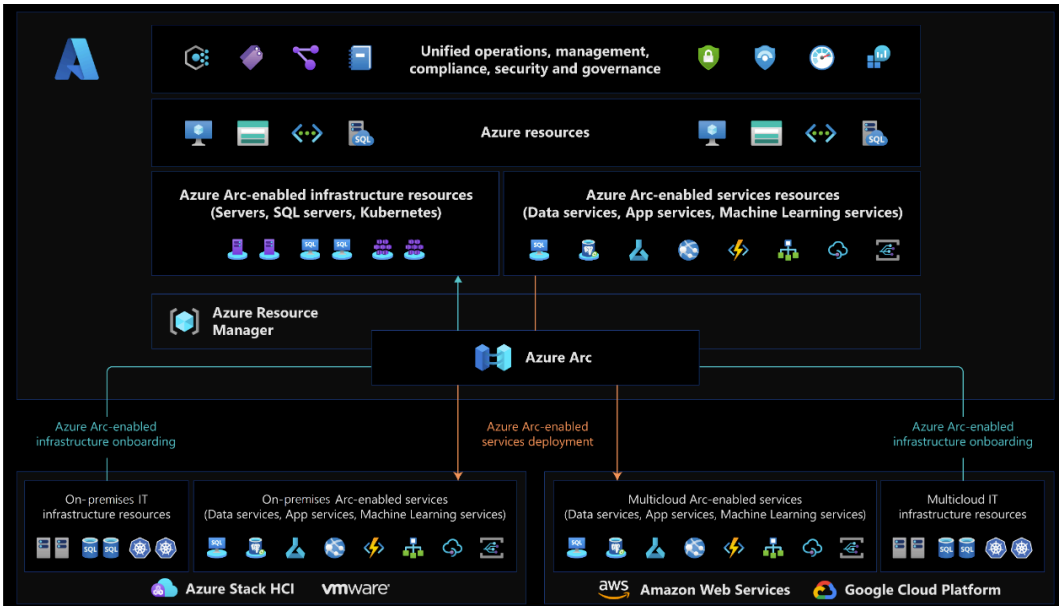
Azure Arc is at the core of the Microsoft hybrid and multi-cloud strategy. It provides a way to run Azure services anywhere - on-premises, at the edge, and on other cloud platforms. Azure Arc connects and extends Azure management and services to infrastructures outside of the Azure cloud.

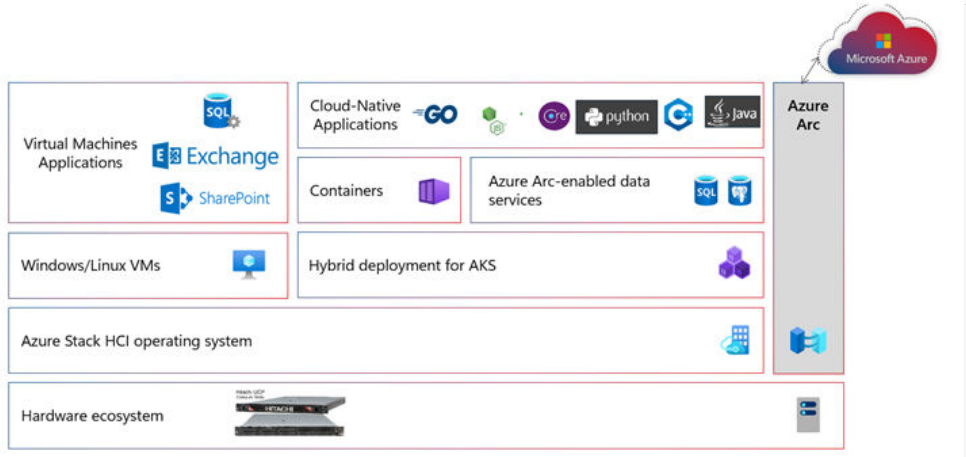
Azure Local, a key part of Azure Arc, enables direct management of HCI clusters from the Azure control plane. It offers unified resource management and a cloud-connected architecture. As an Azure service, it is billed to an Azure subscription and enhances clusters with features like cloud monitoring, Site Recovery, VM backups, and a centralized view of all deployments. It also includes AKS and VDI infrastructure components as part of the deployment.

In short, Azure Arc offers consistent Azure capabilities for managing from Azure:

- Azure Local — Deploy, connect, and managed Azure Local clusters.
- Machines (Servers) — Connect and manage physical and virtual machines across environments.
- Kubernetes Clusters — Deploy applications to integrated Kubernetes clusters across on-prem, edge, and multi-cloud.

- Virtualization Platforms — Enable management of virtualization platforms like VMware vSphere and System Center VMM.
- Data Services — Run Azure data services such as SQL and PostgreSQL on any supported infrastructure.





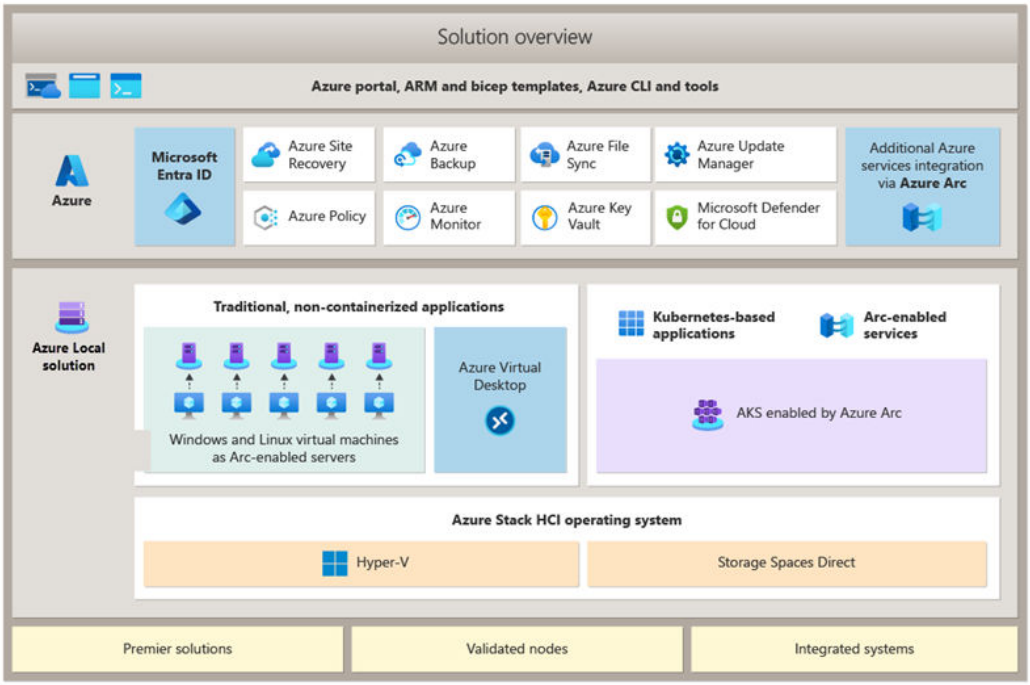
Key benefits of Azure Arc

These are some of the key benefits of Azure Arc:

- Consistent Hybrid Experience — Use familiar Azure tools to manage apps and infrastructure across environments.
- App Mobility — Build apps once, deploy anywhere across on-prem, edge, and multi-cloud.
- Unified Security — Apply consistent Azure security and compliance policies across diverse infrastructures.
- Hybrid Data Insights — Get unified data analytics, monitoring, and governance across cloud and on-prem.

What is Azure Local?

Azure Local (previously known as Azure Stack HCI) is a hyperconverged solution that integrates compute, storage, and networking to facilitate a seamless transition between on-premises environments and the Azure cloud. It enables organizations to run workloads on-premises with the same tools used in Azure, ensuring consistency and ease of management.



https://learn.microsoft.com/en-us/azure/azure-local/overview

Key features

- Hyperconverged Platform — Combines essential datacenter components for simplified architecture.
- Dual Environment Support — Manages workloads on-premises and extends to Azure for cloud capabilities.
- Use Cases — Suits infrastructure modernization, cloud-edge solutions, enterprise virtualization (Windows and Linux VM), GPU tasks, VDI (Azure Virtual Desktop), and workload migration.
- Security and Compliance — Azure Local emphasizes strong security measures and compliance standards.

Comparison with Windows Server

- Windows Server is a multi-functional OS designed for a variety of server roles and features, including traditional server capabilities and direct client connections using CALs.
- Azure Local operates on a specialized OS, based on the Windows Server OS, optimized for virtualization and Azure integration, focusing on virtualization hosting and cloud services extension, without support for direct client connections using CALs.

In essence, Azure Local serves as a dedicated platform for bridging on-premises infrastructure with cloud services, while Windows Server provides a broad range of server functionalities. Microsoft recommends Azure Local for hyperconverged infrastructure needs. At Hitachi Vantara, we offer validated nodes for Azure Local, featuring an Integrated System capability where lifecycle management is integrated while ensuring flexibility.

Why choose Azure Arc for hybrid multi-cloud?

Azure Arc provides a seamless path to hybrid cloud for organizations leveraging Azure. With Arc, you get the best of the Azure public cloud combined with the flexibility to plan and integrate with your infrastructure investments.

- Gradual cloud adoption — Extend Azure selectively rather than wholescale cloud migration.
- Maximize existing investments — Leverage current infrastructure like VMs and Kubernetes clusters.
- Edge computing enablement — Deploy Azure capabilities locally for edge workloads.
- Multi-cloud flexibility — Operate across diverse cloud platforms and the edge.

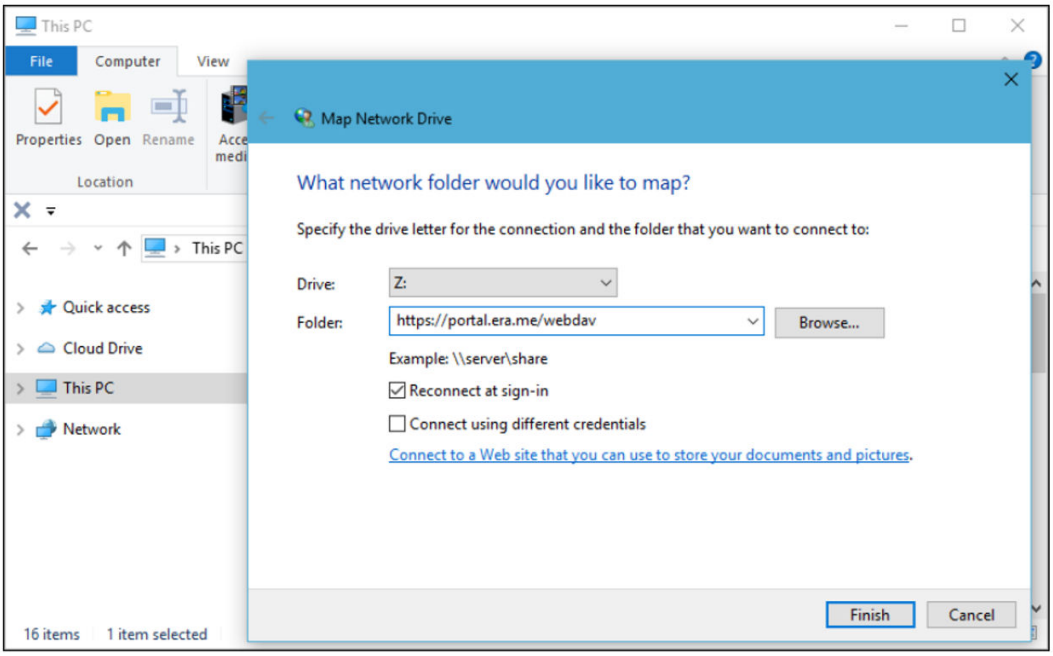
Why choose Hitachi UCP for your Azure hybrid cloud journey?

Hitachi Unified Compute Platform (UCP) is ideal for your Azure hybrid cloud journey, leveraging over 30 years of Hitachi expertise in data management.

Key benefits of UCP

Trust Hitachi UCP for a unified, scalable, and efficient Azure hybrid cloud solution that leverages validated solutions and integrated technologies to meet your business needs.

- Validated Solutions: UCP provides validated Arc-enabled solutions, ensuring reliability and performance for critical workloads. It supports various configurations for Azure Local, Arc-enabled UCP CI with Windows Server 2025, Arc-enabled Kubernetes, and Arc-enabled VMware, ensuring robust performance and scalability tailored to your needs.
- Integration of Hitachi Content Platform (HCP)*: UCP integrates Hitachi's scalable Hitachi Content Platform (HCP), enhancing all UCP offerings for Azure Arc. HCP provides intelligent data management, consolidation, and performance, supporting hybrid and multi-cloud integrations, data lakes, analytics, AI, and IoT.



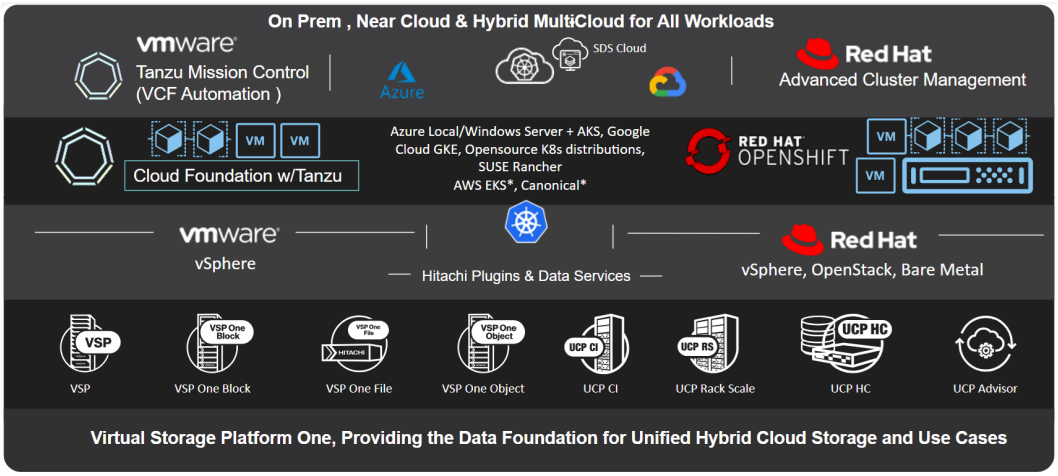
- Support for Modern Workloads: UCP infrastructure is optimized for AI, machine learning, analytics, IoT, and enterprise applications, ensuring high performance and reliability for advanced technologies.
- Flexibility and Scalability: UCP customizable infrastructure solutions support a range of configurations from a catalog of certified building blocks. This flexibility allows for scalable hybrid cloud adoption that can grow with your business.
- Future-Proof IT Strategy: Designed to adapt to evolving technologies, UCP ensures your IT infrastructure supports future innovations and business growth. By integrating with leading data management and analytics solutions, UCP prepares your organization for the next generation of hybrid cloud computing with our data expertise, validated solutions, and global presence.

**Hitachi Content Platform (HCP) provides scalable object storage and file-sharing solutions designed to manage vast amounts of data with high efficiency in distributed environment. HCP provides intelligent data management, including features for consolidation, security, and performance optimization.*

Solution overview

Hitachi Unified Compute Platform Hyperconverged (UCP HC) is a Microsoft HCI validated solution that delivers an integrated IT infrastructure solution optimized for modern workloads and storage for AI, ML, analytics, IoT, enterprise applications, and beyond. It comprises hyperconverged, converged, and software-defined infrastructure offerings that support hybrid cloud environments.

Confidently build your hybrid cloud with Azure and Hitachi UCP, a comprehensive and future-proof solution design by Hitachi Vantara and empowered by Microsoft, tailored for these evolving needs for distributed computing.



UCP Azure Hybrid Cloud portfolio – design for seamless hybrid experience with Azure

The UCP Azure Hybrid Cloud portfolio takes these robust enterprise infrastructure building blocks and integrates them with Azure through comprehensive validations. This creates an unmatched Azure hybrid cloud experience.

The following table lists available Hitachi UCP HC options certified for the Azure Local.

Hitachi HA Family								
UCP	**Chassis**	**Configuration**	**Single-node Support**	**CPU**	**Memory**	**Storage (Min-Max)**	**GPU Support**	**Network Speed**
Hitachi HA810 G3	1U	All-Flash (SAS)	Yes	Intel 4th/5th Gen Xeon Scalable Processors	128 GB-8 TB	1.6 TB-64 TB	Yes	Up to 100 Gbps NVIDIA XonnectX-6
		All-Flash (NVMe)	Yes			1.6 TB-153.6 TB		

Hitachi HA Family								
UCP	**Chassis**	**Configuration**	**Single-node Support**	**CPU**	**Memory**	**Storage (Min-Max)**	**GPU Support**	**Network Speed**
Hitachi HA820 G3	2U	All-Flash (SAS)	Yes	Intel 4th/5th Gen Xeon Scalable Processors	128 GB-8 TB	1.6 TB-153.6 TB	Yes	Up to 100 Gbps NVIDIA XonnectX-6
		All-Flash (NVMe)				1.6 TB-368.6 TB		
Hitachi HA815 G3	1U	All-Flash (NVMe)	Yes	AMD 4th Gen EPYC	128 GB-6 TB	1.6 TB-153.6 TB	Yes	Up to 100 Gbps NVIDIA XonnectX-6
Hitachi HA825 G3	2U	All-Flash (NVMe)	Yes	AMD 4th Gen EPYC	128 GB-8 TB	1.6 TB-368.6 TB	Yes	Up to 100 Gbps NVIDIA XonnectX-6
Hitachi HA820 G2	2U	All-Flash (SAS)	Yes	Intel 3rd Gen Xeon Scalable Processor	64 GB-8 TB	3 TB-230 TB	Yes	Marvell FastLinQ 41xxx NVIDIA ConnectX-5 NVIDIA ConnectX-6
		All-Flash (NVMe)	Yes			3 TB-128 TB		
		Hybrid (NVMe/HDD)	No			5 TB-53 TB		
		Hybrid (NVMe/SSD)	No			5 TB-53 TB		
		Hybrid (SAS/ HDD)	No			4 TB-62 TB		

When architecting your Azure Hybrid Cloud infrastructure, UCP provides flexibility to mix and match from a catalog of certified building blocks:

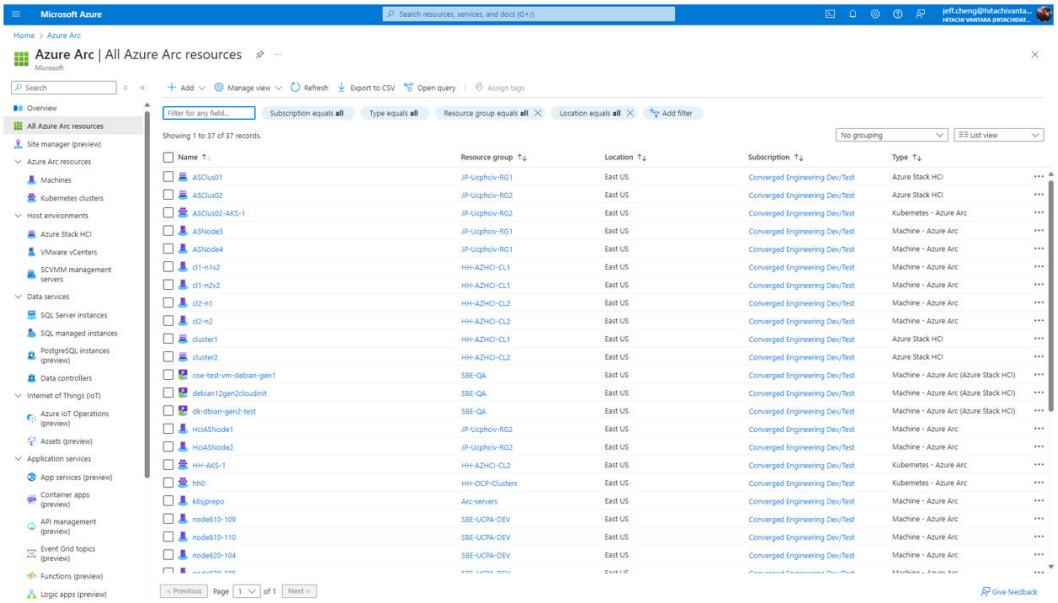
- UCP for Azure Local
  - Validated hyperconverged nodes running the Azure Local OS with high performance configurations that extend Azure management capabilities.
- Arc-enabled UCP offerings
  - UCP Converged Infrastructure with Hyper-V and Hitachi VSP One Block storage.
  - Solutions such as UCP for Red Hat OpenShift, AKS (Azure Kubernetes Service) on UCP for Azure Local, UCP for VMware enabled for Azure Arc management.
  - Arc-enabled Kubernetes
    - UCP for Red Hat OpenShift Kubernetes and AKS on UCP for Azure Local validated to work as Azure Arc-enabled Kubernetes. This allows consistent app deployment and management across Kubernetes clusters spanning on-prem, edge, and multi-cloud.
  - Arc-enabled VMware
    - UCP for VMware solutions integrated with Azure Arc-enabled VMware vSphere. This enables consistent visibility, monitoring, and security for VMware-based workloads across environments from Azure Portal.
  - Certified Arc-enabled data services
    - Azure SQL, PostgreSQL, and Hyperscale deployed on-premises using Arc with Hitachi Unified Content Platform (UCP) solutions.
- Hitachi Content Platform (HCP) solutions
  - HCP Anywhere Enterprise
    - HCP Anywhere Enterprise has three components: the web-based Portal for management and collaboration, Edge Filers for local file access, and Agents for syncing files from user devices to the cloud. It unifies file services across edge, core, and cloud.
  - VSP One Object (formerly HCP for Cloud Scale)
    - A software-defined object storage solution based on a massively parallel microservice architecture, compatible with the Amazon S3 API, and capable of federating S3-compatible storage from any source into a single, globally managed namespace.

Key benefits

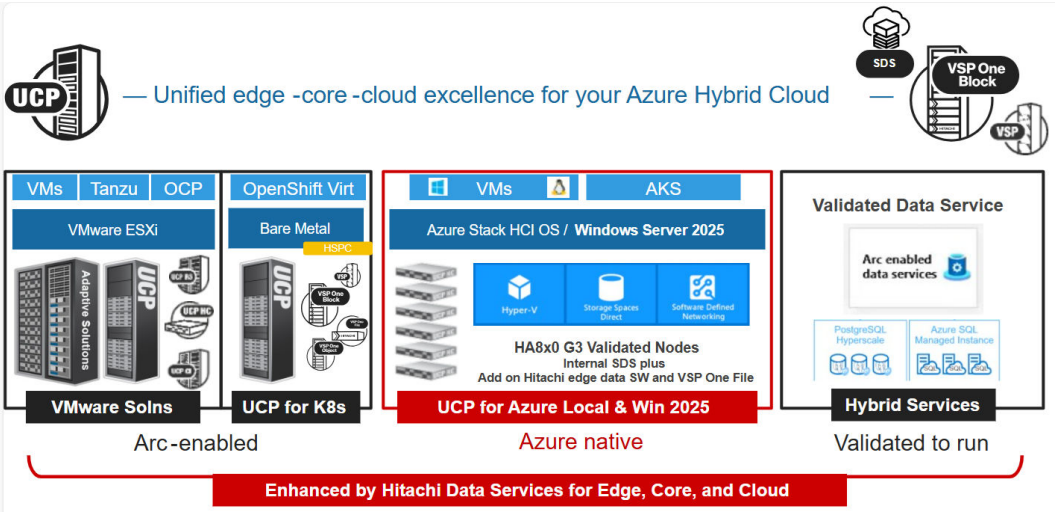
These are some of the benefits of UCP Azure hybrid cloud:

- Validated offerings ensuring consistent processes across Azure and on-premises environments.
- Flexibility to start small and scale hybrid cloud adoption for varying application performance, capacity and location needs.
- Enhanced efficiency through automation, centralized, and GitOps management.
- Integration with leading data management and analytics solutions.

- Hardware innovations such as RDMA networking and high-performance SSD and NVMe drives.
- Unified visibility and management through the Azure portal.



With the UCP purpose-built Azure Hybrid Cloud portfolio, enterprises get a wide range of choices to craft their ideal hybrid IT architecture for their unique applications.



Use cases showcasing the power of Azure Hybrid Cloud, Azure Local, and UCP Converged Infrastructure for Hyper-V

Hitachi Unified Compute Platform, integrated with Azure services and enhanced by Hitachi Content Platform (HCP) for cloud scale, HCP Anywhere Enterprise, and Azure Virtual Desktop (VDI), offers powerful hybrid cloud solutions tailored to various industry needs. This section outlines some key use cases with UCP for Azure Local and UCP Converged Infrastructure for Hyper-V.

Enterprise Virtualization Platform with Azure Local and Windows Server

Benefits:

- Unified Management: Centralized management of virtualized environments using familiar Azure and/or on-premises tools.
- Scalability: Easily scale resources up or down based on demand.
- High Availability: Ensure business continuity with built-in redundancy and failover capabilities.
- Security and Compliance: Apply consistent security policies and meet regulatory requirements across environments.
- Cost Efficiency: Optimize resource utilization and reduce operational costs.

Architecture Components Overview:

- UCP Components
  - Azure Local:
    - Virtualization Capabilities: Provides robust support for Hyper-V based virtual machines (VMs) and containers.
    - Hyperconverged Platform: Combines compute, storage, and networking for simplified architecture.
    - Dual Environment Support: Manages workloads on-premises and extends to Azure for cloud capabilities.
    - Security and Compliance: Emphasizes strong security measures and compliance standards.
  - Windows Server:
    - Virtualization Capabilities: Provides robust support for Hyper-V based virtual machines (VMs) and containers.
    - Integration with Azure: Seamlessly integrates with Azure services for hybrid cloud scenarios via Arc-enablement.
    - Management Tools: Uses tools such as Windows Admin Center for comprehensive management.

Example:

A financial services company can deploy Azure Local and Windows Server to create a scalable and secure virtualization platform. By leveraging Azure Local's hyperconverged infrastructure, the company can manage on-premises workloads with the same tools used in Azure, ensuring consistency and ease of management. Windows Server provides robust support for VMs and containers, enabling the company to run a wide range of applications efficiently.

The company can use Azure Arc to manage the hybrid environment, applying consistent security policies and monitoring performance across both on-premises and cloud resources. This setup ensures high availability, scalability, and compliance with regulatory requirements, while optimizing resource utilization and reducing operational costs.

Regulated industries handling sensitive data

Benefits:

- Data Sovereignty: Ensures data residency with in-region storage capabilities.
- Advanced Security: Multi-layered security features for threat protection.
- Compliance: Standardized controls and auditing to meet regulatory requirements

Architecture Components Overview:

- UCP Components:
  - UCP for Azure Local: For compliant and secure data storage.
    - Azure Arc-enabled Data Services: To run SQL Managed Instance and PostgreSQL on-premises – running on AKS on UCP for Azure Local.
    - Azure Virtual Desktop (VDI): For secure delivery of virtual desktops and applications.
  - HCP Anywhere Enterprise: Facilitates secure content collaboration and data protection across various devices and locations.
- Microsoft Components
  - Azure Security Center: For advanced threat protection and compliance monitoring.

Example:

A healthcare provider can deploy SQL Managed Instances on UCP for Azure Local to keep patient data within the region, ensuring compliance with local data residency laws. Azure Security Center provides continuous assessment and threat detection to safeguard patient information.

HCP Anywhere Enterprise offers additional layers of data protection and compliance management, ensuring secure collaboration and data access. Azure Virtual Desktop can provide secure access to patient records and other sensitive information to authorized personnel.

Large enterprises with complex IT estates

Benefits:

- Unified Visibility: Centralized management across hybrid environments using the Azure portal.
- Resource Optimization: Enhanced resource utilization through insights and automation.
- Standardized Processes: Consistent security and compliance policies across all environments.

Architecture Components Overview:

- UCP Components:
  - UCP for Azure Local: For running virtualized workloads with native Azure integration.
    - Azure Virtual Desktop (VDI): For secure delivery of virtual desktops and applications.
  - UCP for VMware: Integrated with Azure Arc for centralized management of virtualized environments.
  - HCP for cloud scale: Provides scalable object storage and data management, ensuring data accessibility and protection.
- Microsoft Components:
  - Azure Arc-enabled Servers: For unified management of both on-premises and cloud-based servers.
  - Azure Monitor: For monitoring health and performance.
  - Azure Security Center: For securing IT assets.

Example:

A global financial services company can deploy Azure Arc to manage its mix of on-premises servers and virtual machines across different geographies. Using Azure policies, the company can enforce consistent security and compliance standards, while Azure Monitor helps in proactive health and performance monitoring.

HCP CloudScale enhances data management and compliance by providing secure, scalable object storage. Azure Virtual Desktop allows the company to deliver secure and compliant virtual desktops to its employees globally.

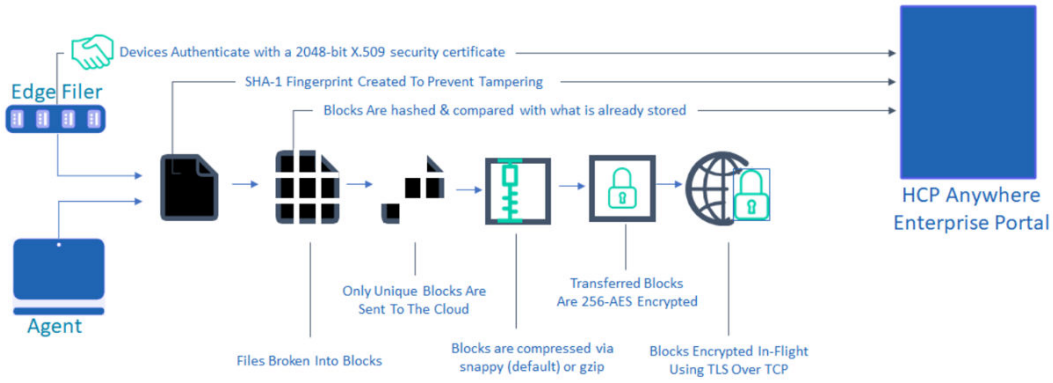
Retail, logistics, and manufacturing that need edge capabilities

Benefits:

- Real-Time Analytics: Optimizes operations and enhances customer experience.
- Distributed ML: Utilizes edge data for targeted insights.
- Low-Latency Performance: Accelerates decision-making with local processing.

Architecture Components Overview:

- UCP Components:
  - UCP for Azure Local: For deploying and managing edge infrastructure.
    - Azure Virtual Desktop (VDI): For providing remote access to applications and data.
  - Arc-enabled Kubernetes (OCP, AKS, K8s) on UCP: For consistent application deployment and management across edge locations.
  - HCP Anywhere Enterprise: Facilitates secure content collaboration and data protection across various devices and locations.
  - HCP for cloud scale: Supports real-time data processing and analytics at the edge
- Microsoft Components:
  - Azure IoT Edge: For connecting and managing IoT devices.



Example:

A logistics company can use Azure Arc-enabled Kubernetes to deploy containerized applications that track shipments and manage inventory in real-time. UCP for Azure Local ensures high availability and performance at distribution centers, while Azure IoT Edge integrates various IoT sensors and devices for comprehensive visibility and control.

HCP CloudScale enhances data management and real-time analytics capabilities. Azure Virtual Desktop can provide remote access to logistics management applications for employees in the field.

Digital transformations of IT infrastructure

Benefits:

- Incremental Cloud Adoption: Smooth modernization through phased cloud integration.
- Legacy System Integration: Bridges legacy and modern systems during transitions.
- Consistent Processes: Maintains consistency across hybrid landscapes to minimize disruption.

Architecture Components Overview:

- UCP Components:
  - UCP for Azure Local: For modernizing IT infrastructure.
  - UCP for Red Hat OpenShift: For deploying containerized applications.
  - HCP Anywhere Enterprise: Facilitates secure data management and collaboration during the transition.
- Microsoft Components:
  - Azure Arc-enabled Servers and Kubernetes: For managing hybrid and multi-cloud environments.
  - Azure DevOps and GitHub: For implementing CI/CD pipelines.
  - Azure Virtual Desktop (VDI): For flexible desktop and application delivery.

Example:

A large enterprise transitioning from on-premises data centers to a hybrid cloud model can use Azure Arc to manage existing VMware environments and new Kubernetes clusters deployed on UCP for Azure Local.

HCP Anywhere Enterprise aids in consolidating data from legacy systems and modern applications. Integration with Azure DevOps enables automated deployments and continuous integration, accelerating the transformation process. Azure Virtual Desktop allows seamless delivery of modern applications to users across different locations.

Maximum business continuity and disaster recovery

Benefits:

- Comprehensive Backup: Ensures backup and restoration across hybrid environments.
- High Availability: Geo-distributed architecture and redundancy for uptime.
- Rapid Recovery: Minimizes downtime with quick failover and disaster recovery solutions.

Architecture Components Overview:

- UCP Components:
  - UCP for Azure Local: For a resilient and high-availability infrastructure.
    - Azure Virtual Desktop (VDI): For continued access to applications and data during disruptions.
  - HCP for cloud scale: Provides robust data protection and efficient backup solutions
- Microsoft Components:
  - Azure Backup and Azure Site Recovery: For data protection and disaster recovery.
  - Azure Arc-enabled Servers: For managing backup and recovery operations.

Example:

A retail chain can use Azure Site Recovery to replicate critical workloads from UCP for Azure Local to Azure, ensuring minimal downtime in case of a disaster. HCP for cloud scale provides secure and efficient backup solutions for on-premises data, managed centrally through Azure Arc. Azure Backup ensures data protection and swift recovery, maintaining business continuity. Azure Virtual Desktop allows employees to access critical applications and data remotely during recovery periods.

Use case summary

Hitachi UCP combined with Microsoft Azure Arc and enhanced by HCP for cloud scale, HCP Anywhere Enterprise, and Azure Virtual Desktop provides a robust, flexible, and secure hybrid cloud solution tailored to meet diverse business needs. This powerful integration allows organizations to leverage existing infrastructure investments while adopting cloud-native capabilities at their own pace.

With unified management, enhanced security, and seamless integration of Azure services, UCP and Azure Arc empower enterprises to optimize operations, ensure compliance, and drive innovation. This comprehensive approach ensures businesses are well-equipped to navigate the complexities of hybrid cloud environments, delivering consistent performance and scalability for future growth.

Migration and adoption considerations

The following two tools provided by Microsoft can assist with your migration journey:

- Azure Migrate (Preview) for Azure Local
- System Center Virtual Machine Manager (SCVMM) for Windows Server 2025 Hyper-V clusters

For migrating to Azure Local using Azure Migrate, start by assessing your current infrastructure and training your team. Azure Migrate allows you to discover, assess, and replicate on-premises VMs to Azure Local, ensuring minimal downtime and seamless integration. For Windows Server 2025 Hyper-V clusters, use SCVMM to manage and migrate VMs, ensuring compatibility and leveraging Azure Arc for centralized management. Both tools enable you to modernize workloads, optimize resources post-migration, and implement robust monitoring, security, and governance practices to ensure a smooth transition and ongoing management.

Transitioning to a hybrid cloud such as Azure Arc and Hitachi UCP requires aligning IT strategy with business goals and minimizing disruptions.

Readiness and Planning:

- Compatibility: Assess if applications need refactoring.
- Network and Security: Align network and conduct a security audit.
- Compliance: Ensure data governance and compliance.

Challenges:

- Legacy Systems: Address integration of critical legacy systems.
- Change Management: Provide effective staff training.

Implementation:

- Phased Approach: Start with less complex systems.
- Expert Support: Use guidance from Microsoft and partners.

Post Migration:

- Monitoring: Regularly review and optimize resources and security.
- Feedback: Refine strategies based on user feedback.

By following these migration and adoption considerations, organizations can effectively transition to a hybrid cloud environment, ensuring alignment with business goals and minimizing operational disruptions. For assistance with your migration and adoption journey, please contact us for expert guidance and support tailored to your specific needs

Leverage expert guidance and implementation services as necessary

While Azure Arc and UCP solutions aim to simplify hybrid cloud adoption, we highly recommend leveraging Hitachi Vantara Global Delivery Services or skilled partners for guidance and implementation services. These implementation experts can provide invaluable assistance in envisioning, assessing readiness, architecting, and executing your hybrid cloud journey. They bring proven methodologies, in-depth technical expertise, and experience from successful deployments worldwide.

- You can use your own preferred system integrators that you already trust and have worked with.
- Hitachi can also bring together our in-house experts along with our network of experienced partners to assist you.
- Professional services help navigate challenges smoothly and minimize business disruption during hybrid cloud migration and adoption.

In summary, complementing Azure and UCP solutions with guidance from knowledgeable professionals and integrators is highly recommended to maximize the effectiveness and smoothness of your hybrid cloud implementation.

Deploy UCP for Azure Local systems

Hitachi UCP for Azure Local delivers hyperconverged infrastructure with native Azure integration, providing a simplified building block for Azure hybrid cloud.

This section includes a simplified workflow for readers to understand the deployment process and choices based on official documentation of Azure Local.

Before proceeding to the workflow, make sure you have planned your Azure Local solution according to Microsoft official documentation *System requirements for Azure Local* at https://learn.microsoft.com/en-us/azure-stack/hci/concepts/system-requirements-23h2.

Overview of planning before deployment

Before deploying UCP for Azure Local, it is essential to engage in detailed planning to ensure a successful implementation. These are some high-level steps and resources.

Procedure

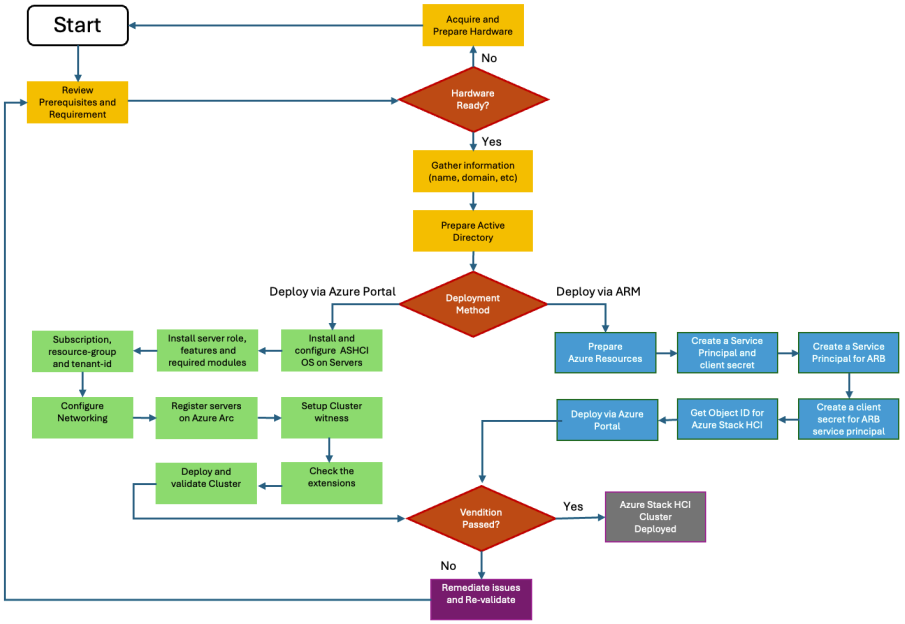
1. Infrastructure Assessment: Evaluate your current IT infrastructure and identify resources that can integrate with Azure Local. Review detailed UCP for Azure Local nodes on Microsoft's site at https://azurestackhcisolutions.azure.microsoft.com/#/catalog?Search=Hitachi+Advanced+Server.
2. Capacity Planning: Refer to the official Microsoft Learning https://learn.microsoft.com/en-us/windows-server/storage/storage-spaces/plan-volumes to plan your storage requirements accurately. Remember, ASHCI solutions, including UCP, support configurations of 1-16 nodes per cluster. A site supports multiple clusters.
3. Network and Security Configuration: Ensure your network setup aligns with Microsoft's certified network settings, which can be found at https://learn.microsoft.com/en-us/azure-stack/hci/concepts/physical-network-requirements. This includes planning for secure connectivity and access controls.
4. Compatibility with Existing Storage: Understand that existing Hitachi external storage can be integrated in various ways, enabling seamless utilization of current assets, or otherwise specified in the Microsoft Learn site: https://learn.microsoft.com/en-us/windows-server/virtualization/hyper-v/storage-architecture.
5. Adherence to Latest Requirements: Always refer to Microsoft's latest requirements and guidelines to ensure compliance and optimal performance.

Result

By following these steps, using the provided resources, and careful examination of Microsoft official documentations, you can effectively plan for a robust UCP for Azure Local deployment. For further assistance, contact us for expert guidance tailored to your specific needs.

Deployment workflow

The following illustration shows the deployment sequence. Before starting deployment, meet all of the following requirements.



https://learn.microsoft.com/en-us/azure-stack/hci/deploy/deploy-via-portal https://learn.microsoft.com/en-us/azure-stack/hci/deploy/deployment-azure-resource-manager-template

Deploy Azure Stack HC using the Azure Portal

Use the following procedure to deploy a multi-node Azure Local cluster using the Azure Portal.

Procedure

1. Verify that the hardware is ready.
   a. You have an Azure Local certified server with enough local storage.

      Note: Hitachi UCP for Azure Local is a certified Azure certified server offering different configurations.

   b. Select the size of your cluster.
   c. Meet the BIOS settings requirement (secure boot and TPM configuration need to be configured).
   d. Install ASHCI OS.
   e. Install required drivers.
   f. Meet all the networking requirements:
      - IPV4 network subnet for management traffic.
      - IPV4 network subnet/subnets for storage as Storage VLAN ID (a minimum of one VLAN is required but assigning two VLANs is recommended).
      - IPV4 network subnets for virtual machines (optional).
      - Outbound connectivity (out-of-band VLAN)

> **Note:** The Hitachi UCP for Azure Local certified chassis comes with a pre-installed ASHCI CoreOS that meets all the hardware and software prerequisites including required drivers for a simplified and quick implementation.

2. Determine the size of your cluster.
   - If the setup is a single node you should deploy your cluster using PowerShell.
   - If the cluster is a multi-node cluster, then you can create your cluster using Azure Portal or an ARM (Azure Resource Manager) template.

     > **Note:** The ARM template method supports deployments at scale and reduces human errors by operating on the Azure Portal.

3. Review prerequisites and requirements including the following:
   a. Azure subscription including subscription ID, tenant ID and region.
      i. Azure subscription including subscription ID, tenant ID and region.

         The Azure Local solution requires an Azure subscription within 30 days of deployment. After the Azure Local cluster is registered, all the hybrid services that are supported as a part of the integration can be used along with the hyper-converged infrastructure services. To complete Azure registration, Azure authentication credentials, subscription ID, and optional tenant ID are required.
      ii. Azure storage account.
      iii. A resource-group.
      iv. Custom location.
   b. Server names should be set.
   c. A dedicated OU on your active directory for each HCI cluster.
   d. A DNS server including all A-Records pointing to server names.
   e. A dedicated VLAN for management traffic.
   f. Dedicated VLAN/VLANs for storage traffic (a minimum of one VLAN is required but assigning two VLANs is recommended).
   g. VLAN/VLANs for virtual machines (optional).
   h. A dedicated VLAN for Outbound management traffic (out-of-band VLAN).
   i. Local administrator credentials.
4. Install ASHCI OS on servers.

   > **Note:** Hitachi UCP for Azure Local, comes with a pre-installed Azure Local OS and all necessary drivers.

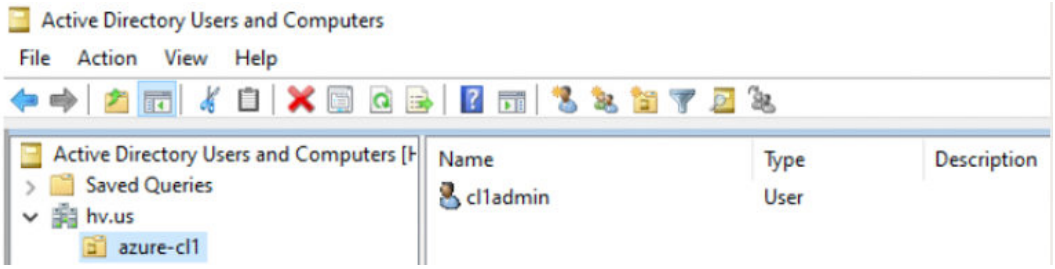
5. Configure the Azure Local CoreOS correctly.
   a. Set a local administrator password (this password will be changed by the Azure Arc agent after cluster formation).
   b. Enable remote management (optional).
   c. Enable remote desktop (you can disable RDF after the deployment is complete).
   d. Configure the network settings.

e. Install required Windows roles.

f. Set the computer name.

6. Active Directory and DNS server configuration.

   Preparing Active Directory is a crucial part of deploying an Azure Local cluster. A dedicated organization unit (OU) is required for each HCI cluster. Also, each server needs to align with a DNS record on a DNS server.



   In addition, you need to create an LCM user which will create your entire cluster. Make sure you store the password of this LCM user correctly. You will use this credential to login the nodes instead of using local Administrator.

   Note: Hitachi UCP for Azure Local automates all the required steps to correctly configure your Active Directory as well as installing required Windows roles.

7. Register servers with Arc and assign permissions.

   a. Register PSGallery as a trusted repository.

      - `Register-PSRepository -Default -InstallationPolicy Trusted`

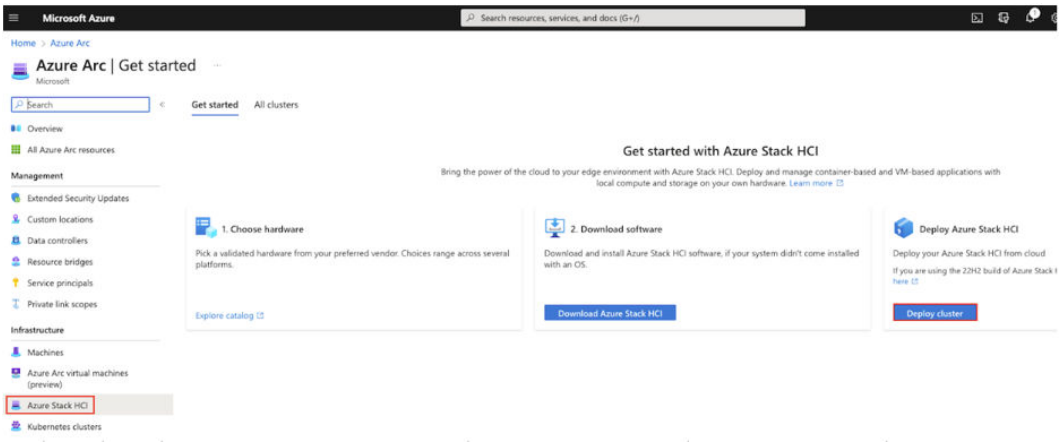
   b. Install the Arc registration script.

      - `Install-Module AzsHCI.ARCinstaller`

   c. Install required PowerShell modules

      - `Install-Module Az.Accounts -Force`
      - `Install-Module Az.ConnectedMachine -Force`
      - `Install-Module Az.Resources -Force`

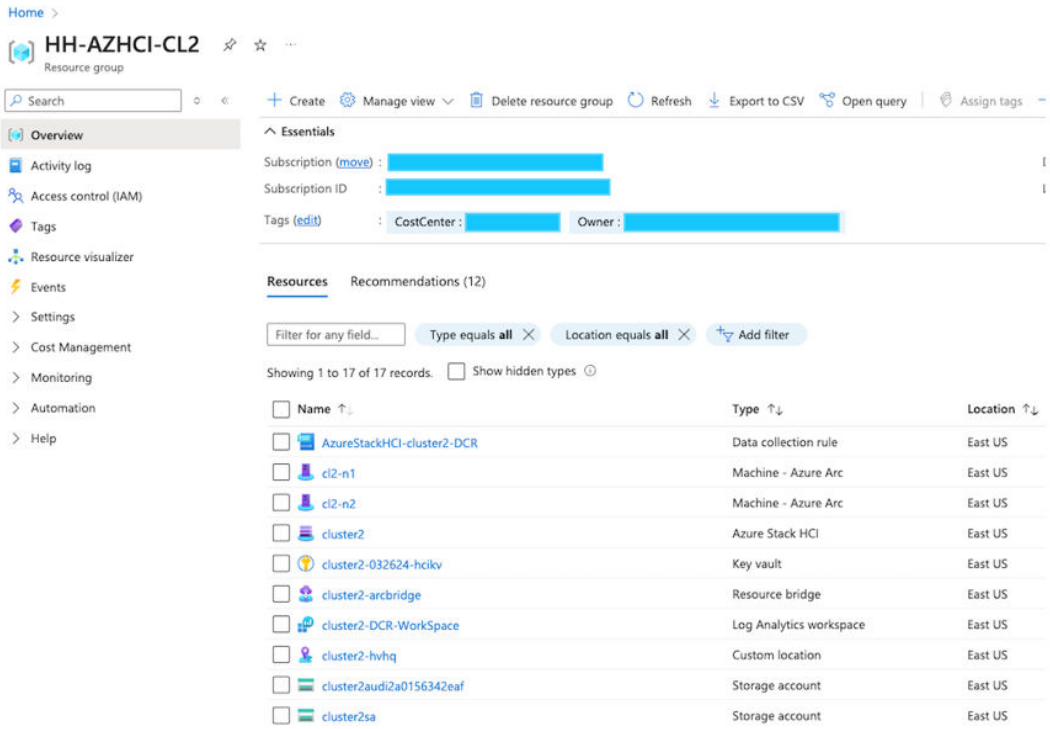
8. Deploy the cluster using either the Azure portal at https://learn.microsoft.com/en-us/azure-stack/hci/deploy/deployment-introduction or ARM template at https://learn.microsoft.com/en-us/azure-stack/hci/deploy/deployment-azure-resource-manager-template.



Result

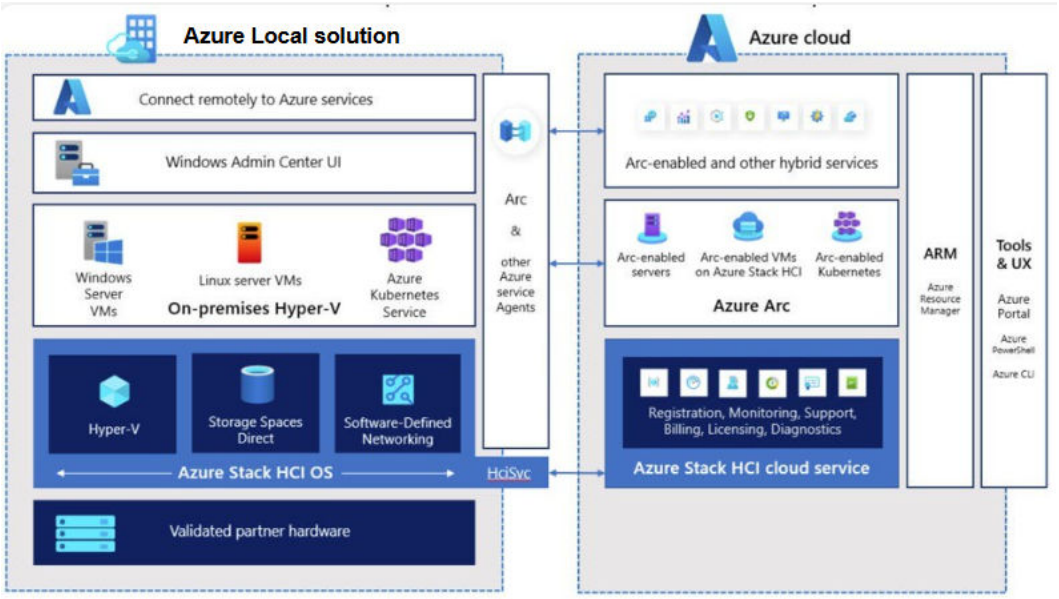
By leveraging Hitachi UCP for Azure HCI, you will be able to establish your on-premises HCI foundation which can be managed by Azure portal. Through the Azure portal, the HCI cluster can now serve workloads and applications that extend to the Azure public cloud.

The following illustration shows the cluster and its respective objects that are created under a particular resource group that can be managed by the Azure portal.



By having an Azure Local cluster built on top of Hitachi UCP, it is integrated with Azure cloud using several cloud service components such as Azure Local cloud service, Azure Arc, and other Azure hybrid services.

Now you can create multiple workloads as well as Azure Kubernetes Services (AKS) or deploy any Linux/Windows-based virtual machines that can be managed through Windows Admin Center that now is integrated with Azure Portal. In addition, by taking advantage of Microsoft Azure Arc, you can integrate and manage any Kubernetes cluster such as Red Hat Open Shift or VMware Tanzu from the Azure portal.



Deploy Azure Stack HC using the ARM template

This procedure applies to Azure Local, version 23H2 and newer versions.

The Microsoft Azure Resource Manager (ARM) template is an alternative way to deploy Azure Local clusters.

Before you begin

The following deployment prerequisites need to be satisfied before deploying an Azure Local cluster using an ARM template:

Procedure

1. Create a service principle and service secret.
2. Create a client secret.
3. Get the object ID for the Azure Local Resource Provider.
4. Create a storage account.
5. Get the Arc node resource ID.

   Follow the steps in the *UCP Advisor Solution Builder Extension (SBE) for Azure Local User Guide* to use a Microsoft ARM template for Azure Local cluster deployment.

After deployment

Ensuring the smooth operation and ongoing management of your Azure Local nodes is crucial after deployment. The following sections provide overviews on how to manage firmware and driver lifecycle and monitor and maintain your infrastructure effectively.

Firmware and Driver Lifecycle Management

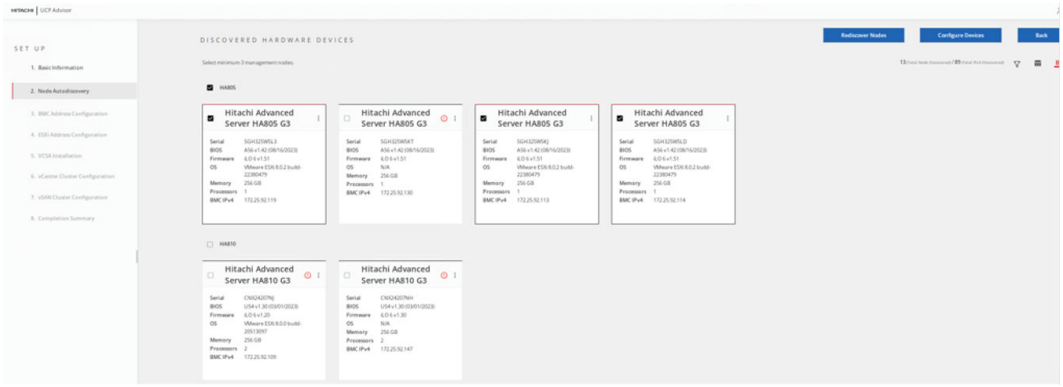
Managing firmware and driver lifecycle is essential for system stability, performance, and security. UCP offers tools to streamline firmware management across your infrastructure.

Currently in preview, Solution Builder Extension Preview (SBE) enhances lifecycle management by providing driver, firmware, and other Hitachi content specific to the system solution. This content is delivered using the Azure Local LCM agent, either along with or independent from Solution (OS) updates. For official information, see the SBE documentation at https://learn.microsoft.com/en-us/azure-stack/hci/update/solution-builder-extension.

Key components of UCP lifecycle management

UCP Advisor

- Simplifies operations for edge, core, and cloud environments with advanced automation, orchestration, and centralized management. UCP Advisor also provides comprehensive visibility, monitoring, and detailed information about the infrastructure, enhancing predictability with guided lifecycle management.



iLO (Integrated Lights-Out)

- Provides remote server control, health monitoring, and firmware updates from a dedicated Ethernet port.

SUM (Smart Update Manager)

- Automates firmware and driver updates for HA800 series G2/G3 servers, offering GUI and CLI options, baseline enforcement, and rollback support.

iSUT (Integrated Smart Update Tools)

- Agent-based tool used with SUM for automated remote updates, handling staging, installation, and activation of updates.

SPV ISO (Service Pack for Vantara ISO)

- An ISO image containing firmware, drivers, and management tools like SUM and iSUT for simplified updates across on-prem infrastructure.

Using these tools and practices, administrators can maintain the performance and reliability of their Azure Local environments, ensuring they meet operational goals and SLAs. For additional support or details, please contact Hitachi Vantara for expert assistance.

Monitoring Your Azure Local Nodes

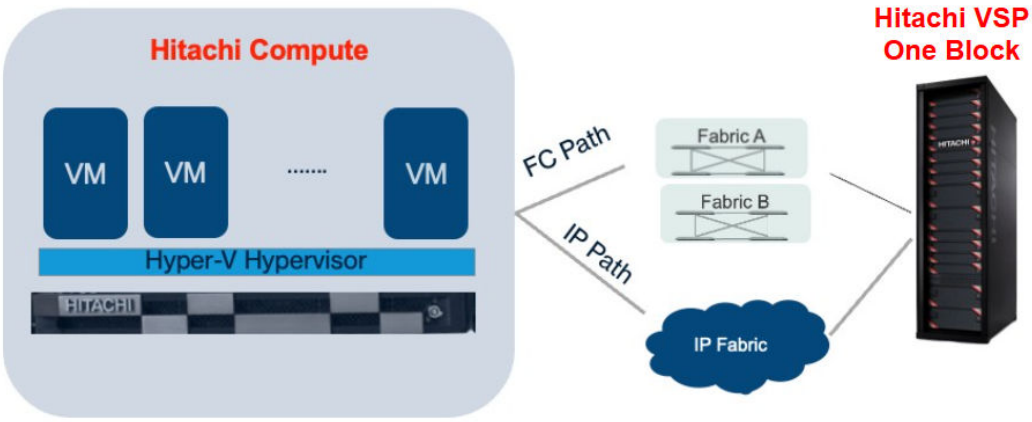
- Check Node Status with UCP Advisor
  - Compute Inventory: View comprehensive details of compute nodes by navigating to the UCP system and selecting Compute.
    - Tile View: Displays general info such as Model, Serial Number, BIOS Version, Firmware, BMC Address and MAC, Host Address, CPLD Version, Label, and Node Type.
    - List View: Offers extended details including Host OS, BIOS/BMC/CPLD Firmware Versions, Server Tags, Onboard Status, and Power Status.
    - Management Actions: Perform actions such as refreshing info, setting boot options, managing power, resetting BMC, editing BMC password, replacing servers, upgrading firmware, and accessing a remote console.
- Monitor with Microsoft Tools
  - Windows Admin Center (WAC): A browser-based tool for managing Azure Local, Windows Servers, and PCs. Deployable on various platforms and integrates with Azure Arc for hybrid management.
    - Key Metrics: Monitors CPU utilization, memory usage, storage performance, network traffic, Hyper-V performance, SDN health, and failover cluster health.
    - Event Logs: Tracks system events, application logs, security logs, and WAC-specific actions.
    - Azure Monitor Integration: Provides VM insights and Azure Update Management for comprehensive monitoring and updates.

For more details, see *Monitor Azure Local clusters from Windows Admin Center* at https://learn.microsoft.com/en-us/azure-stack/hci/manage/monitor-cluster and *What is Azure Local monitoring?* at https://learn.microsoft.com/en-us/azure-stack/hci/concepts/monitoring-overview.

By leveraging these tools and practices, administrators can ensure their Azure Local environments are efficiently monitored and maintained. For further assistance, contact your UCP experts.

Deploy and Arc-enable Windows Server 2025 on UCP Converged Infrastructure

Deploying Windows Server 2025 on Hitachi Unified Compute Platform Converged Infrastructure (UCP CI), integrated with Hitachi Virtual Storage Platform (VSP) and VSP One Block, provides a robust, scalable, and secure solution for enterprise virtualization and hybrid cloud environments. This setup leverages the advanced features of Windows Server 2025 and the high-performance, eco-friendly storage capabilities of Hitachi VSP.



Key benefits:

- Advanced Security: Windows Server 2025 offers multi-layer security features, including enhanced threat protection and compliance capabilities.
- High Performance: The combination of UCP Converged Infrastructure and VSP One Block ensures high performance and low latency for critical workloads..
- Scalability: Easily scale resources to meet growing business demands with the flexible architecture of UCP and VSP One.
- Hybrid Cloud Integration: Seamlessly integrate on-premises environments with Azure services, leveraging hybrid capabilities for greater flexibility and efficiency.
- Sustainability: VSP One Block's eco-friendly design helps reduce energy consumption and carbon footprint.

Procedure

1. Infrastructure Assessment:
   - Evaluate current IT infrastructure and identify resources for integration with UCP Converged Infrastructure and VSP One Block.
   - Plan capacity and network requirements based on current and future workload demands.
2. Deployment the UCP Converged Infrastructure:
   - See the UCP CI Deployment Guide.
3. Install Windows Server 2025:
   - Refer to official Microsoft Learn site for the detailed process:

     https://learn.microsoft.com/en-us/windows-server/get-started/install-windows-server
   - Install Windows Server 2025 on the UCP Converged Infrastructure by using operating system media.
   - Download Service Pack ISO from the Hitachi Vantara Support website (https://support.hitachivantara.com/) and install the driver and firmware updates.

- Enable/Configure Hyper-V for virtualization.
- Use Windows Admin Center and/or SCVMM for comprehensive management and monitoring.

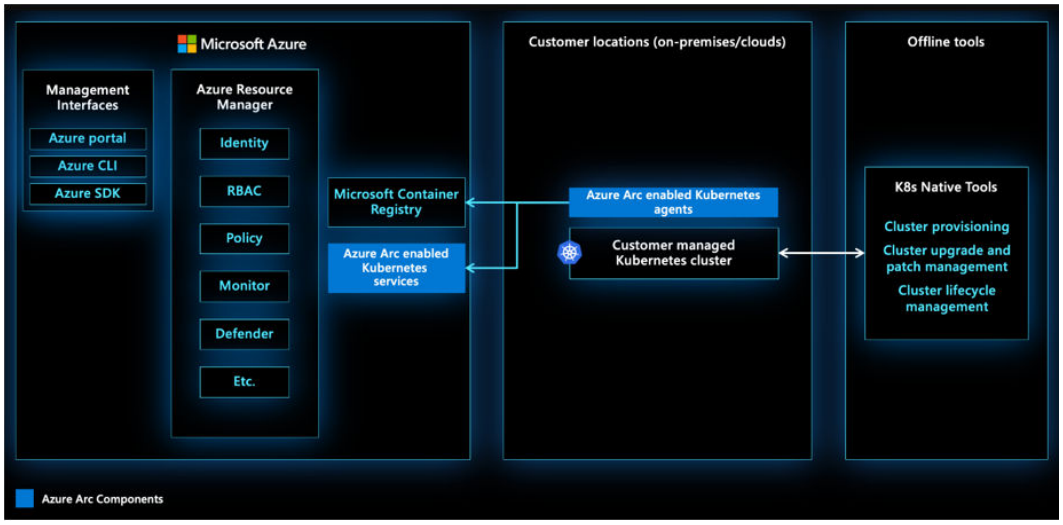
4. Integration with Hitachi VSP and VSP One Block:
   - Understand the storage architectures with Hyper-V: https://learn.microsoft.com/en-us/windows-server/virtualization/hyper-v/storage-architecture.
   - Configure storage settings to optimize performance and ensure data availability.
   - Implement smart data reduction and management features provided by VSP One Block.
5. Arc-enablement - Hybrid Cloud Configuration:
   - Integrate Windows Server 2025 with Azure services using Azure Arc for centralized management and governance.
   - Leverage SCVMM for seamless migration of workloads to the hybrid cloud environment.
6. Monitoring and Maintenance:
   - Use UCP Advisor and Windows Admin Center for ongoing monitoring and management of the infrastructure.
   - Implement Azure Monitor and Azure Security Center for comprehensive monitoring and security management.

Integrate Hitachi UCP OpenShift environments with Azure Arc

Hitachi Unified Compute Platform (UCP) for Red Hat OpenShift combines high-performance compute, storage, and networking resources to provide a robust and scalable foundation for containerized applications. This platform enhances OpenShift deployments with simplified management, improved performance, and increased resilience, making it ideal for enterprise environments that need efficient and reliable orchestration of containerized workloads across hybrid and multi-cloud infrastructures. Additionally, the seamless integration of Hitachi Content Platform (HCP) software, for object storage and file sharing, with UCP offerings ensures users can enjoy an orchestrated Azure Arc experience with Hitachi Vantara.

Azure Arc-enabled Kubernetes allows you to manage and configure Kubernetes clusters running anywhere in Azure. With this feature you can manage Hitachi Unified Compute Platform with Kubernetes solution using the Azure portal. This Arc capability is achieved through the following Azure Arc agents:

- Several agents (operators) run in the Kubernetes cluster within the "azure-arc" namespace.
- These agents collect cluster information and send it to Azure.
- The agents also receive configuration updates from Azure and apply them to the cluster.



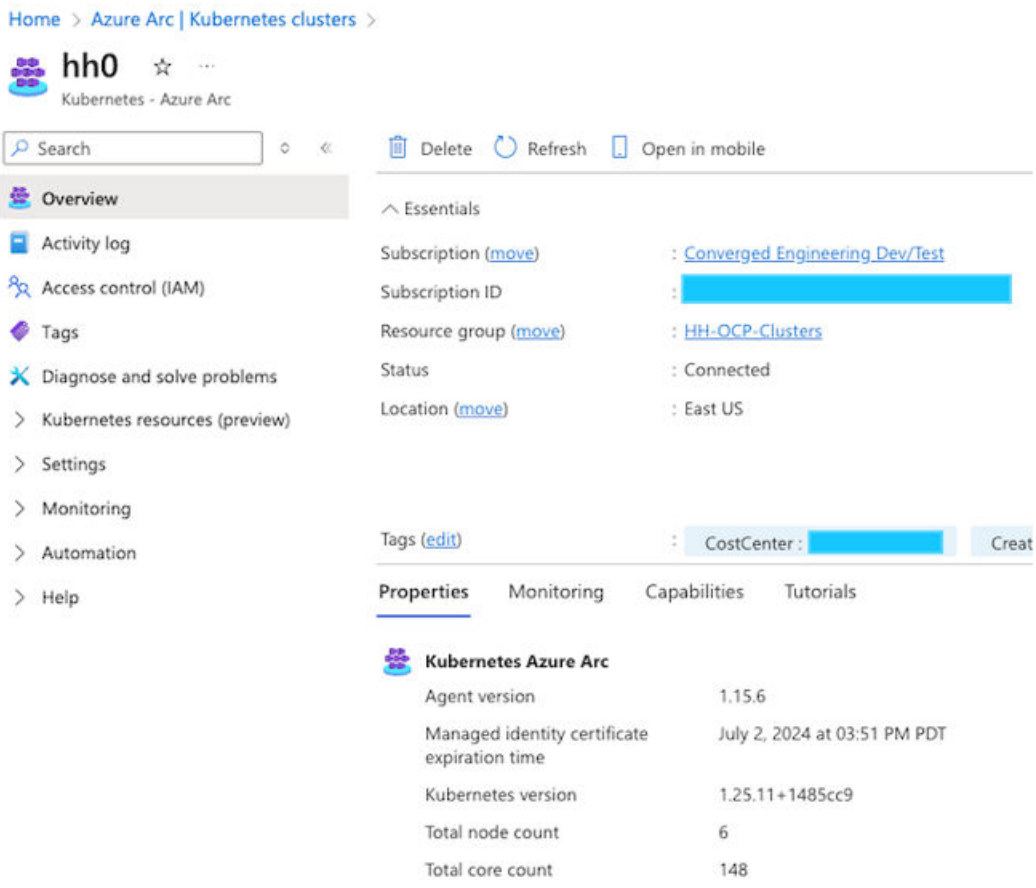
While Red Hat OpenShift is one of the Microsoft validated distributions passed the conformance tests for Azure Arc-enabled Kubernetes, UCP has additionally validated our OpenShift offerings to make sure they can connect to Azure Arc for simplified and unified management using the following main steps.

1. Prerequisites:
   - An up and running Red Hat OpenShift cluster.
   - An Azure account with an active subscription.
   - An identity that can be used to login into Azure CLI and connect to your cluster to Azure Arc.
   - The latest version of the Azure CLI.
   - The latest version of the `connectedk8s` Azure CLI extension.
   - A minimum of 850 MB free space for Arc agents that will be deployed on the cluster.
   - A `kubeconfig file` and context pointing to your cluster.
   - A resource group.
2. Connect your cluster:
   - Run the `az connectedk8s connect` / `New-AzConnectedKubernetes` command with the name, location, and parameters `kubeConfig` and `kubeContext` of your cluster
   - This deploys the Azure Arc agents to the cluster and installs Helm v. 3.6.3 to the deployment machine.
3. Verify the cluster connection:
   - It usually takes 5-10 minutes for the connected clusters to surface on the overview page of the Azure Arc-enabled Kubernetes resource in Azure portal.
   - Run the `az connectedk8s list` / `Get-AzConnectedKubernetes` command to verify that the connected cluster shows on the portal.

4. Extend Azure capabilities to your cluster from Cluster extensions:
   - Install `k8s-extension` for Azure CLI by running `az extension update --name k8s-extension`.
   - Create extension instances by running `az k8s-extension create` with the correct parameters.
   - Here is a list of available extensions for Azure Arc-enabled Kubernetes clusters:
     - Azure Monitor Container Insights: Collects memory and CPU utilization metrics from controllers, nodes, and containers.
     - Azure Policy: Extends Gatekeeper to apply at-scale enforcements and safeguards on your clusters in a centralized, consistent manner.
     - Azure Key Vault Secrets Provider: Integrates Azure Key Vault as a secrets store with a Kubernetes cluster from a CSI volume.
     - Microsoft Defender for Containers: Secures your containers and provides recommendations and threat alerts based on audit log data from the Kubernetes cluster.
     - Azure Arc-enabled Open Service Mesh: A lightweight, extensible, Cloud Native service mesh that allows users to uniformly manage, secure, and get out-of-the-box observability features for highly dynamic microservice environments.
     - Azure Arc-enabled Data Services: Enables you to run Azure data services on-premises, at the edge, and in public clouds using Kubernetes and the infrastructure of your choice.
     - App Service Kubernetes Environment: Allows you to provision an App Service Kubernetes environment on top of Azure Arc-enabled Kubernetes clusters.
     - Event Grid: An event broker used to integrate workloads that use event-driven architectures.
     - Azure API Management Gateway: Enables deploying the API Management gateway component as an extension in an Azure Arc-enabled Kubernetes cluster.
     - Azure Machine Learning: Lets you deploy and run Azure Machine Learning on Azure Arc-enabled Kubernetes clusters
     - GitOps: Uses Flux v2 to help manage cluster configuration and application deployment.
     - Dapr: A portable, event-driven runtime that simplifies building resilient, stateless, and stateful applications that run on the cloud and edge.

By following these steps, your Hitachi UCP OpenShift cluster should be already connected with Azure and ready for workload and unified management from Azure.

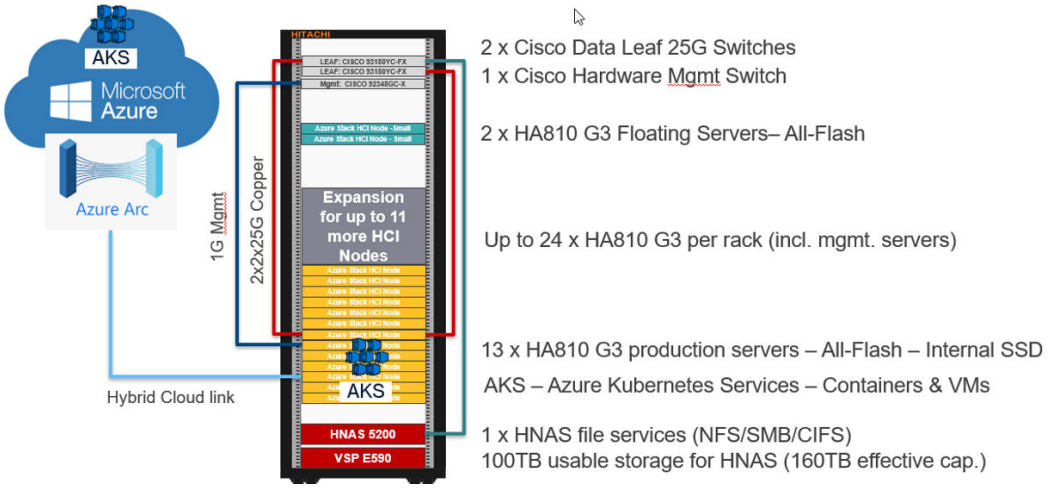
The following figure illustrates a Red Hat OpenShift cluster that is integrated to Azure Arc and can be managed by Arc management functionality.



Azure Kubernetes Service on Hitachi UCP

Azure Kubernetes Service (AKS) is a managed Kubernetes service from Microsoft Azure is a fully managed Kubernetes service that simplifies the deployment and management of Kubernetes clusters. AKS eliminates the complexity of managing and scaling your Kubernetes infrastructure and enables you to focus on building and deploying your applications.

Hitachi UCP for Azure Local enables you to deploy your AKS clusters on prem and manage your environment using Azure.



Azure Kubernetes Service benefits

The following are some of the benefits of AKS:

- Dynamic resource utilization: AKS provides a way to quicky deploy and run containerized services by leveraging elastic infrastructure that scales with demand.
- Faster application development: AKS takes care when patching, auto-upgrading, monitoring, scaling, and self-healing. This benefit frees development teams from daily operational tasks and allows them to concentrate on building services.
- Security and compliance: AKS complies with multiple standards, including PCI-DSS or SOC.

AKS capabilities on Hitachi UCP HC

The following are some of the AKS capabilities on Hitachi UCP HC:

- Cluster Node and POD Scaling: Kubernetes cluster need to scale up and down with demands. This involves both pod and node scaling. The AKS cluster auto scaler can resize Kubernetes clusters automatically by adjusting node counts to satisfy application traffic.
- GPU-Enabled Node: GPU-enabled nodes are ideal for compute-intensive tasks like graphics processing or machine learning. AKS streamlines the provisioning of these node types and their attachment to Kubernetes clusters on demand.
- Storage Volume Support: Most applications need to persist information. Some containerized application might need to access the same storage volume after their pods are scheduled to new nodes. AKS allows workloads to provision static or dynamic volumes for persistent data.
- Cluster Node Upgrades: Kubernetes API versions change frequently, and enterprises running large fleets of Kubernetes clusters can quickly lose track of which versions they are running for different workloads across different environments. AKS supports running multiple Kubernetes versions simultaneously, granting you time to test functionality before upgrading. After you decide to upgrade. AKS takes care of upgrading the cluster and moving workloads to nodes running new versions, which minimizes disruption.

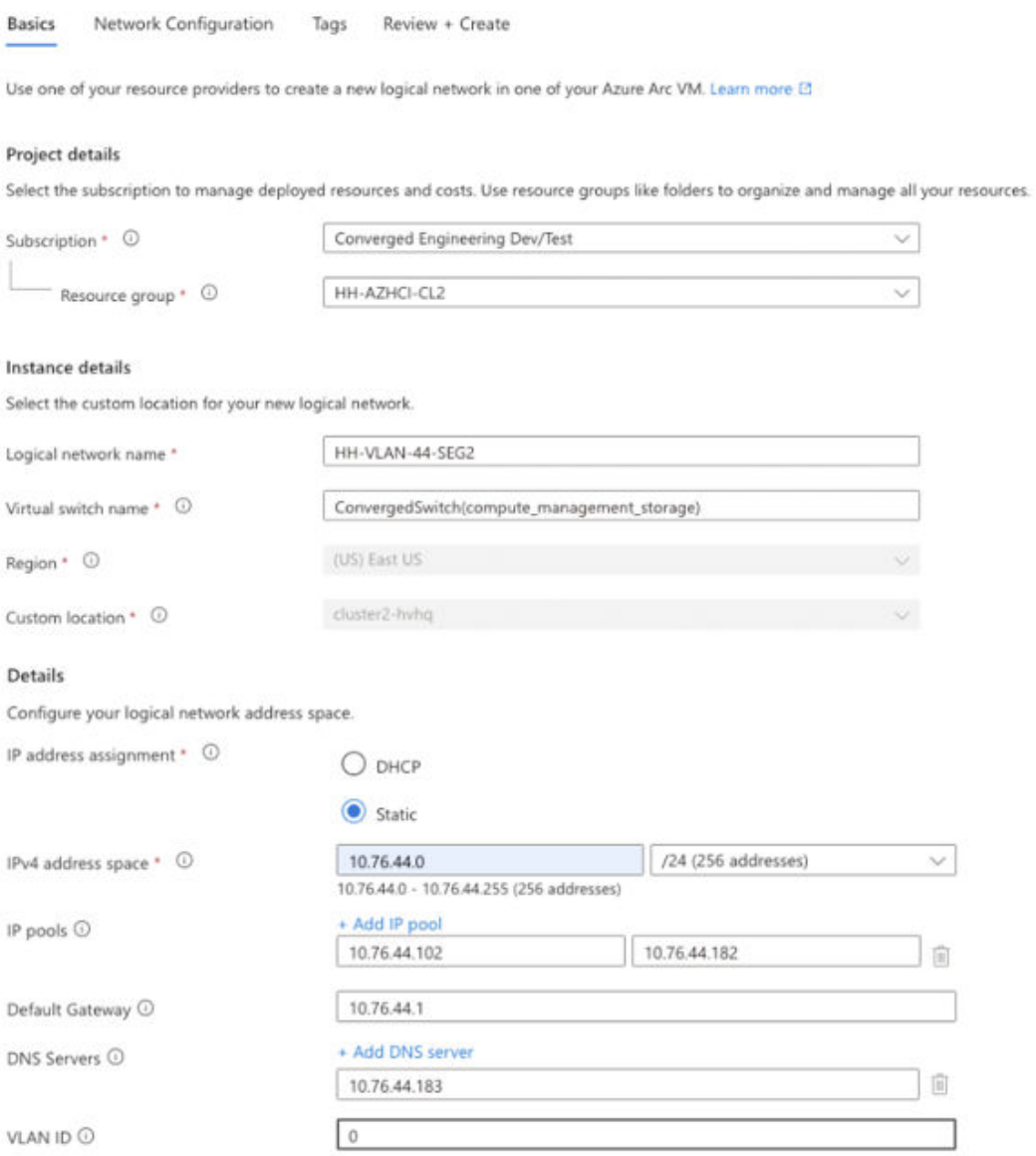
- Azure Virtual Network: AKS offers two network models Kubernet and Azure Container Networking Interface (CNI) networking.
- Entra ID (Azure ID) Integration: AKS offers integration with the Entra ID (formerly Azure ID) service. You can give existing AD users and groups access to the cluster environment through integrated sign-on, simplifying management. You can also secure cluster access for those existing identities.

AKS deployment steps

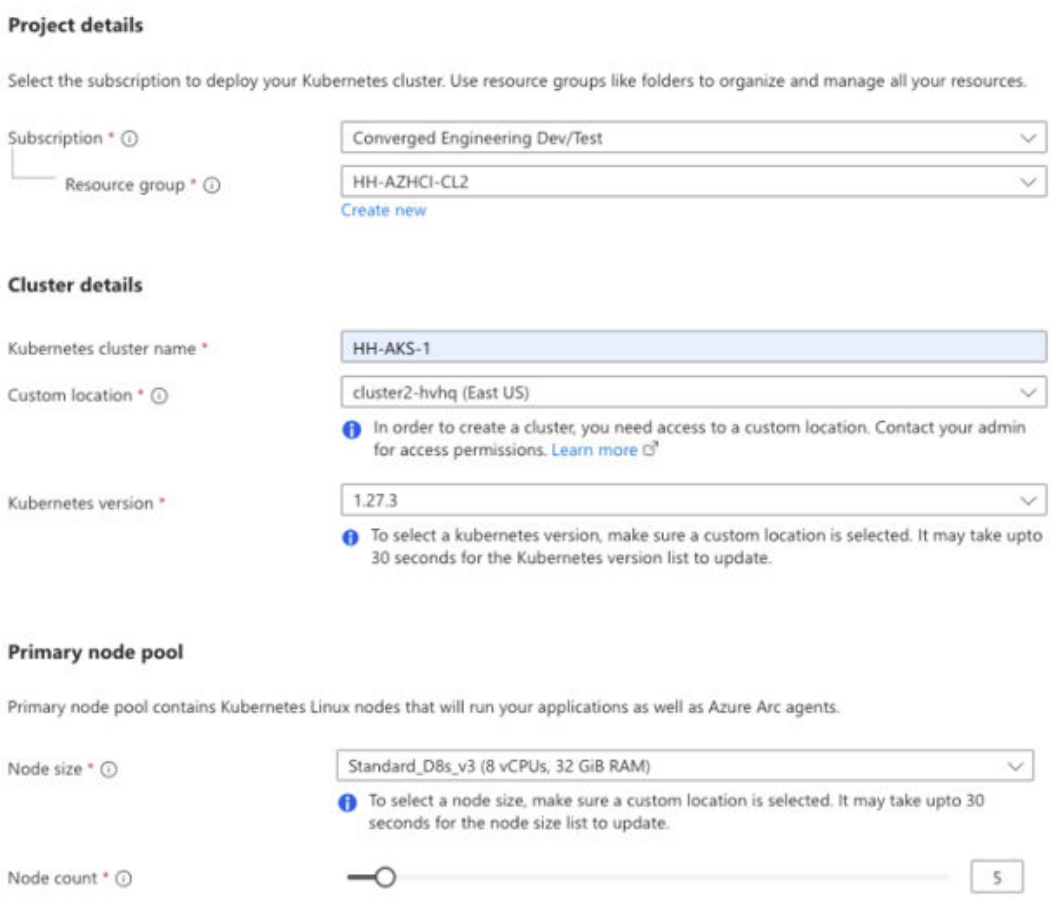
Complete this procedure to deploy Azure Kubernetes Service on top of Azure HCI cluster deployed on Hitachi UCP HC.

Procedure

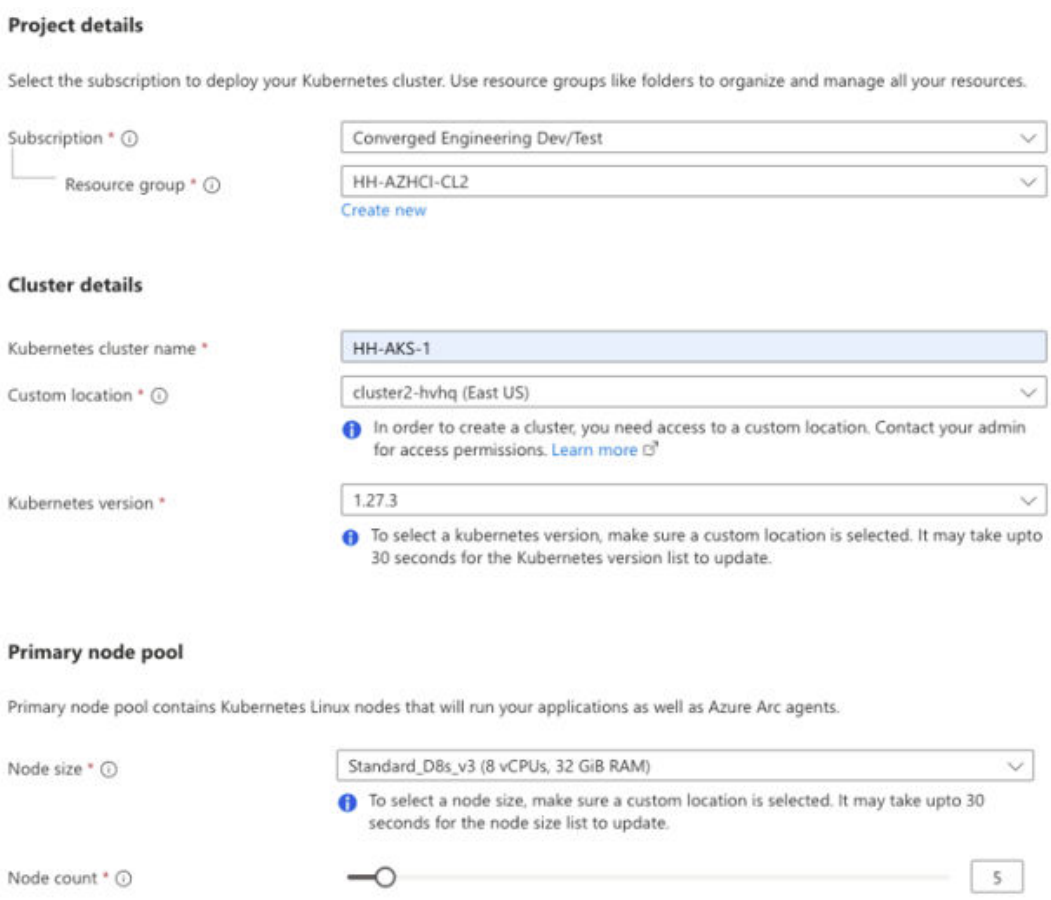
1. Create a Logical Network:
    a. From Azure portal, select your Azure Local.
    b. Under **Resources** select **Logical network** from the left pane.
    c. Select a valid Azure-subscription.
    d. Select a Resource-group.
    e. Enter the logical network name.
    f. Enter your HCI virtual switch name.
    g. Select IP assignment methods (DHCP or Static).
    h. Assign IP pools including enough IP addresses, default gateway and DNS Server, as well as VLAN ID.



2. Create a Kubernetes cluster with Azure Arc:
    a. Select a valid Azure-Subscription.
    b. Select your Resource-group.
    c. Enter the Kubernetes cluster name.
    d. Select Custom location.
    e. Select the Kubernetes version.
    f. Select **Primary Node Pool Node size** and **Node count**.



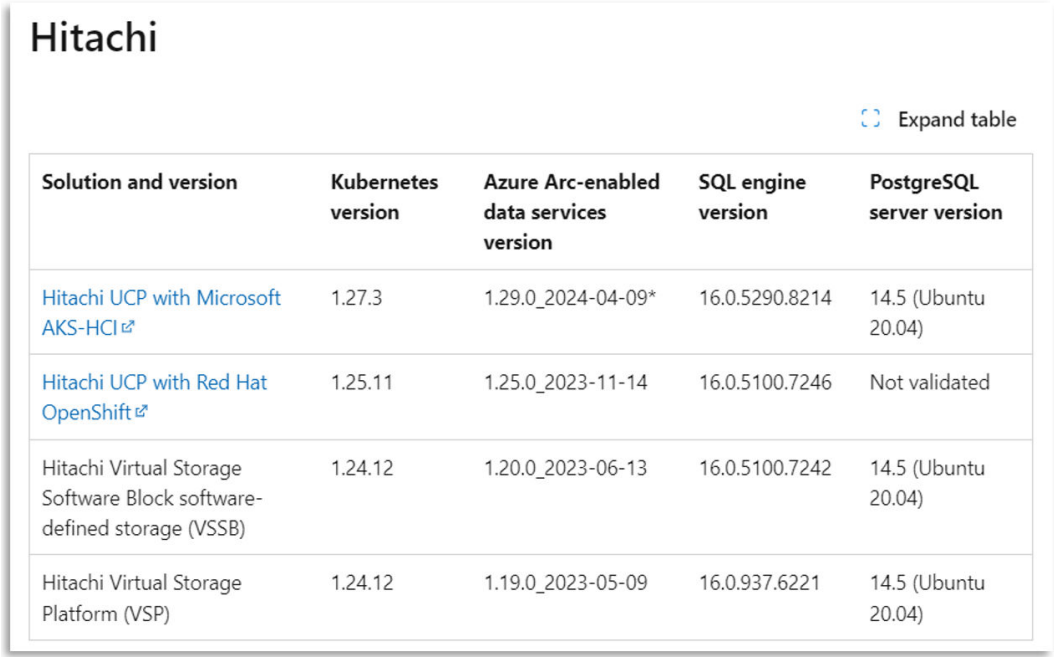
g. Generate a new public key for SSH public source.
h. Enter a Key pair name.
i. Select Control plane node size
j. Enter Control plane node count
k. Review the configuration, and then click **Create cluster**.



Deploy Azure Data Services on Arc-enabled UCP for OpenShift and AKS on UCP for Azure Local

To empower applications with Azure data services deployed on-premises, UCP offers validated options to enable SQL Managed Instance and PostgreSQL Hyperscale through Azure Arc data controller on UCP OCP Cluster and AKS on UCP for Azure Local cluster. A data controller manages Azure Arc-enabled data services for a Kubernetes cluster. To have a data controller installed on your Arc-enabled UCP OCP cluster.

Note: Non-Arc-enabled Kubernetes clusters can have Azure Data Services on it also, using the “in-direct” mode of installation. This is not discussed in this guide.



Hitachi

Expand table

Solution and version	Kubernetes version	Azure Arc-enabled data services version	SQL engine version	PostgreSQL server version
Hitachi UCP with Microsoft AKS-HCI	1.27.3	1.29.0_2024-04-09*	16.0.5290.8214	14.5 (Ubuntu 20.04)
Hitachi UCP with Red Hat OpenShift	1.25.11	1.25.0_2023-11-14	16.0.5100.7246	Not validated
Hitachi Virtual Storage Software Block software-defined storage (VSSB)	1.24.12	1.20.0_2023-06-13	16.0.5100.7242	14.5 (Ubuntu 20.04)
Hitachi Virtual Storage Platform (VSP)	1.24.12	1.19.0_2023-05-09	16.0.937.6221	14.5 (Ubuntu 20.04)

See https://learn.microsoft.com/en-us/azure/azure-arc/data/validation-program#hitachi for the latest version information.

Before deploying Azure Arc-enabled data services on your Arc-enabled UCP OCP cluster, you need to register the Microsoft.AzureArcData provider for your Azure subscription using the Azure CLI with the command `az provider register --namespace Microsoft.AzureArcData`. In addition, make sure you have the client tools installed correctly. See *Install client tools for deploying and managing Azure Arc-enabled data services* at https://learn.microsoft.com/en-us/azure/azure-arc/data/install-client-tools for details.

The following are the two main steps:

1. Prerequisites:
   - Verify that your cluster is Arc-enabled and accessible.
   - Verify that the client tools are installed.

- Verify that the Microsoft.AzureArcData provider is registered.
- Verify that you have following information ready:
  - A name for the Data controller: A descriptive name that meets Kubernetes naming standards.
  - Username and password: For the Kibana/Grafana (to be able to view logs and metrics) administrator user.
  - Name of your Kubernetes namespace: The name of the Kubernetes namespace where you want to create the data controller.
  - Connectivity mode: Direct.
  - An Azure subscription ID: The Azure subscription GUID where you want to create the data controller resource in Azure and get billed to.
  - An Azure resource group name: The name of the resource group where you want to create the data controller resource in Azure. All Arc-enabled data services will also be created in this resource group.
  - A “custom location”: Where the data controller resource metadata will be stored in Azure. To create a custom location, follow the instructions in the Azure documentation *Create and manage custom locations on Azure Arc-enabled Kubernetes* at https://learn.microsoft.com/en-us/azure/azure-arc/kubernetes/custom-locations.

2. Deploy the Arc data controller:
   - Use the Azure Portal or Azure CLI to deploy an Arc data controller by supplying the information prepared earlier.
   - Monitor the status of Azure Arc data controller deployment from your Kubernetes cluster by running the `kubectl` command on your cluster: `kubectl get datacontrollers --namespace arc`.

After the Arc data controller is deployed and verified, you can now deploy instances of “SQL Managed Instance” and “Arc-enabled PostgresSQL” using the Azure CLI, Azure Data Studio, and local Kubernetes tools.

Learn more at: https://techcommunity.microsoft.com/blog/azurearcblog/technology--services-partners-are-jumping-on-the-bandwagon-of-azure-arc/2478102.

Integrate UCP VMware environments with Azure Arc

Azure Arc-enabled VMware extends the Azure management plane to your VMware vSphere environment using Arc integration with vCenter, allowing you to manage and govern your VMs and VMware infrastructure from the Azure portal. It does so through Azure Arc resource bridge:

- `Azure Arc resource bridge` is installed on your vSphere instance that communicates with your vCenter server and Azure.
- These connectors establish a secure communication channel between your vSphere environment and Azure.
- The connectors also collect inventory data and metrics from your VMs and send them to Azure.

To harness the power of Azure from existing on-premises VMware environments, UCP provides seamless integration through Azure Arc-enabled VMware. The following are the main steps:

- Prerequisites: Verify that the following are ready before connecting VMware vCenter Server to Azure Arc:
  - Azure subscription with Owner, Contributor, or Azure Arc VMware Private Clouds Onboarding role.
  - A resource group in Azure subscription.
  - Virtual network in vSphere with internet access and TCP port 443 open.
  - Three free static IP addresses on the network.
  - Resource pool or cluster in vSphere with 16 GB RAM and four vCPUs.
  - Datastore with 100 GB free disk space.
  - vSphere account with read and deploy permissions.
  - A workstation with access to vCenter Server and the Internet.
- Create a resource bridge (prepare the helper script):
  - Provide a unique within your Azure subscription and region for your resource bridge.
  - Select the subscription where you have the Owner, Contributor, or Azure Arc VMware Private Clouds Onboarding role for onboarding.
  - Select the resource group where you want to register your resource bridge and its resources.
  - Select the region where you want to deploy your resource bridge. The region must be supported by Azure Arc.
  - Select the custom location where you want to create Azure resources using your resource bridge. A custom location is a deployment target that maps to different resources for different Azure services.
  - Provide the vCenter name for your VMware vSphere environment that you will connect to Azure Arc. This name must match the name of the vCenter Server instance in your vSphere environment.
  - Download the helper script for your workstation operating system (Windows or Linux). The helper script is an Azure CLI command that helps you deploy the resource bridge and its components on your on-premises infrastructure.
- Run the helper script: Use PowerShell or Bash to run the helper script on your workstation. Provide the inputs for the script, such as vCenter credentials, resource pool name, network name, IP addresses, and proxy settings. Wait for the script to finish and verify the onboarding status.

Conclusion

Hitachi Vantara and Microsoft provide a powerful combination to unlock the promise of hybrid cloud, with validated UCP infrastructure powered by Azure Local, Windows Server, OpenShift, VMware, and enterprise data services - UCP enables Azure consistency and innovation across on-premises environments.

The UCP Azure Hybrid Cloud portfolio represents a significant and robust leap forward in hybrid cloud computing leveraging Azure.

It offers a range of capabilities and benefits that make it an optimal solution for diverse IT ecosystems and workloads. As businesses look towards a future that demands more flexibility, scalability, and integration, UCP with Azure Hybrid Cloud portfolio stands ready to meet these needs and offers a range of capabilities and benefit that make it an optimal solution for diverse IT ecosystems and workloads.

For additional support or details on this documentation, contact Hitachi Vantara for expert assistance.

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