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Integrate Hitachi Virtual Storage Platform with VMware Cloud Foundation

Reference Architecture Guide

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Revision history

Changes	Date
Fixed minor errors.	March 2024
Updated for VCF 5.0.	October 2023
Initial release	December 2019

Reference Architecture Guide

Use this reference architecture guide to design and configure your Hitachi Unified Compute Platform RS system, integrating the following:

- Hitachi Unified Compute Platform HC

- Hitachi Virtual Storage Platform (optional)

- VMware Cloud Foundation

As you demand ever-faster delivery of new business services, there is the complexity and cost of deploying and managing the technology resources to support them. Many IT departments spend almost a quarter of their time and resources evaluating and installing increasingly disparate hardware components. Furthermore, the lack of a unified management framework and the need for highly specialized individuals who can design, configure, optimize, test, and manage each component increases your cost, complexity and risk.

Hitachi Vantara and VMware have collaborated to address these challenges by introducing Hitachi Unified Compute Platform RS (UCP RS) using VMware Cloud Foundation. This solution includes Hitachi Unified Compute Platform HC (UCP HC) powered by VMware vSAN to help you run all virtualized workloads and business applications. With its pre-validated building blocks of compute, storage, and networking, the architecture is guaranteed to work together and deliver a hybrid cloud environment with predictable high performance. It is a simple, low-risk, and reliable path to private cloud, as well as a first step for transforming a traditional data center into a modernized software-defined data center.

In addition, VMware Cloud Foundation, which provides the benefits of VMware vSAN software-defined storage, provides external storage support. Hitachi Vantara integrates Hitachi Virtual Storage Platform (VSP) with Hitachi Unified Compute Platform RS using Hitachi Unified Compute Platform HC nodes to provide the flexibility of using the right storage platform for deploying hybrid cloud for your business needs.

Hybrid cloud with a disaggregated hyperconverged storage architecture allows autonomy to resize your compute and storage independently to better serve your IT strategy. Hitachi Unified Compute Platform Advisor with VMware SDDC Manager automates provisioning, management, and life-cycle management of software and hardware on Hitachi Unified Compute Platform RS.

> 📄 **Note:** —Testing of this configuration was in a lab environment. Many factors affect production environments beyond prediction or duplication in a lab environment. Follow the recommended practice of conducting proof-of-concept testing for acceptable results in a non-production, isolated test environment that otherwise matches your production environment before your production implementation of this solution.

Solution overview

To simplify your hybrid cloud journey, Hitachi Unified Compute Platform RS provides a turnkey solution that reduces total cost of ownership (TCO) and improves security through VMware Cloud Foundation and Hitachi infrastructure.

VMware Cloud Foundation has the following core components:

- VMware vSphere

- VMware vCenter Server

- VMware vSAN

- VMware SDDC Manager (software-defined data center platform manager)

- VMware NSX

This integrated software stack combination provides automated lifecycle management and a single platform for on-premises or public cloud consumption.

The rack-scale Unified Compute Platform RS series combines the hyperconverged Hitachi Unified Compute Platform HC series systems, based on industry-leading VMware vSAN with NSX network virtualization and SDDC Manager. The Hitachi Vantara integrated hyperconverged infrastructure used by VMware vSAN provides wide configuration options for vSphere private and public cloud deployment.

The Hitachi infrastructure in this solution includes the following:

- Hitachi Unified Compute Platform HC

- Hitachi Virtual Storage Platform

- Hitachi Unified Compute Platform Advisor

- Hitachi Data Instance Director, the storage recovery adapter for VMware Site Recovery Manager

- VMware vRemote Operations, VMware vRealize Log Insight, VRO connector

Hitachi external Fibre Channel SAN storage is supported on Unified Compute Platform HC with VMware Cloud Foundation on a Unified Compute Platform RS solution. It can be used with VMware vSAN on Unified Compute Platform HC independently.

Map the LUNs to all the hosts under any workload domain to create SAN-based datastore to expand storage capacity.

Add Fibre Channel SAN storage datastore as secondary storage besides the vSAN datastore. Also, the Fibre Channel SAN-based datastore can be used as the principle datastore on any workload domain, except the management domain.

The following are the main use cases to have a Virtual Storage Platform datastore on this solution:

- For use as an additional capacity expansion, in case more capacity is required than available in the vSAN.

- In case of workload migration, where existing VMDK images containing operating systems or databases are moved from an older VMware vSphere infrastructure into a new VMware Cloud Foundation workload domain, minimizing any data migration impact.

- When you need a separated storage tier. For example, have the VMware vSAN datastore host the virtual machine's operating system VMDK disks for easier patch and upgrade, while the Virtual Storage Platform hosts VMDKs on a VMFS datastore or P-RDMS for mission-critical applications. This is when you have more trust on Virtual Storage Platform for either high performance or higher availability and resiliency.

- For use as a principle, reliable, and high performance datastore for mission critical applications.

VMware Cloud Foundation requires VMware vSAN to be used for the management domain. For the workload domain, any of these storage options can be used in this Hitachi Unified Compute Platform RS solution:

- Option1 — VMware vSAN datastore

- Option 2 — VMware vSAN datastore with secondary storage (Fibre Channel storage) available for any workload domain

- Option 3— Principle storage (Fibre Channel datastore) available for any workload domain except the management domain

This solution also includes Hitachi Unified Compute Platform Advisor, which is comprehensive management and automation software that simplifies infrastructure management and operations. Seamless integration allows automated provisioning of the Unified Compute Platform systems, providing the following:

- Unified management

- Central oversight

- Smart life cycle management for firmware upgrade

- External storage provisioning

- Element visibility and troubleshooting

Unified Compute Platform Advisor provides pertinent information, allowing you to manage operations for connected devices.

Solution benefits

Hitachi Unified Compute Platform RS provides the following advancements and benefits:

- Deploy private cloud on top of advanced Hitachi Vantara Unified Compute Platform HC as a key component, delivering and simplifying growth with a wide range of CPU and memory configurations to meet your workload needs.

- Automate software-defined storage deployment with VMware vSAN.

- Automate software-defined networking deployment with VMware NSX.

- Accelerate time to market.

- Lower total cost of ownership.

- Future-proof your infrastructure to run any application on virtualized, cloud native, or artificial intelligence or machine learning workloads.

- Support external SAN storage on Hitachi Virtual Storage Platform.

- Have complete end-to-end management, including compute nodes, storage, and networking, with Hitachi Unified Compute Platform Advisor.

- Optimize performance and eliminate over-provisioning costs with a highly configurable and integrated infrastructure.

- Support high availability and reliability with enterprise-class hardware components and preconfigured resilient architectures.

- Achieve data resilience and scalability using VMware vSAN and the industry-leading Hitachi Virtual Storage Platform with hybrid and all-flash arrays.

Hitachi Unified Compute Platform Advisor provides end-to-end management with the following benefits:

- Upgrade the compute BIOS and upgrade the BMC and component (NIC, HBA, and controller) firmware by an automatic process.

- Provision compute nodes, storage, Ethernet, and Fibre Channel from a single, unified management interface for federated system management.

- Upgrade your switch configuration, management settings, and firmware.

- Integrate with VMware products, such as VMware vRealize Orchestration and VMware vRealize Log Insight, manage a multi-site VMware infrastructure, and link multiple VMware vCenter Server installations.

- Provision and manage external storage.

New features in VCF version 5.0

The following are new features in VCF 5.0:

- VCF5.0 does not require a separate license key for SDDC Manager because it is part of the VCF solution in this version.

- It supports in-place version upgrade from VCF 4.3.x/4.4.x/4.5/4.5.x directly to VCF 5.0.

- This release includes isolated SSO workload domains that allow administrators to manage operations from SDDC Manager.

- Licenses for all VCF components can be updated from SDDC Manager.

- NSX Security has been enhanced.

- You can upgrade 10 clusters across 5 workload domains simultaneously.

- Starting from VCF4.0 VMware NSX-T Data Center is rebranded as VMware NSX.

- Interoperability data checks of Bill of Materials (BOM) components are available in SDDC Manager.

See the VCF5.0 Release Notes at https://docs.vmware.com/en/VMware-Cloud-Foundation/5.0/rn/vmware-cloud-foundation-50-release-notes/index.htmlfor a list of relevant components included in the BOM for additional information.

The following figure shows the combination of Hitachi Unified Compute Platform RS with VMware Cloud Foundation.
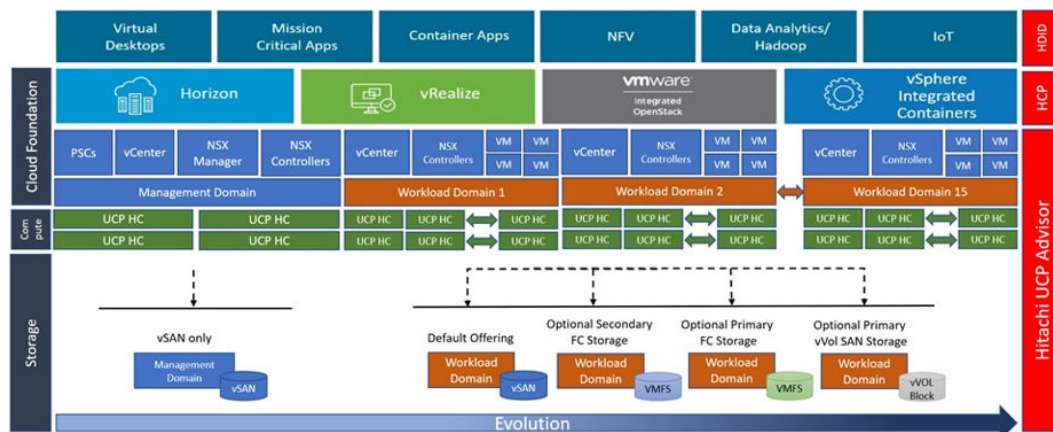
Solution design

Hitachi Unified Compute Platform RS can start as a single rack but can be extended to support multi-rack scenarios. One of the advantages of Unified Compute Platform RS is that it has no limit as to how many racks and nodes can be supported, as long as it complies with VMware maximums.

Each rack can accommodate the following:

- Up to a maximum of 32 Hitachi Unified Compute Platform HC V120 systems as compute nodes

- 2 leaf switches to provide network connectivity for all the hosts on each rack

- Spine switches to provide inter-rack connectivity and to connect the entire solution to your corporate network

- A management network on each rack to handle all out-of-band traffic

One benefit of Unified Compute Platform RS is flexibility. To cover all your requirements, it supports mixed and matched compute nodes. For example, to have separated clusters, which have more VMware vSAN capacity space besides high performance all-flash all-NVMe clusters, add a Unified Compute Platform HC hybrid system to this solution. You can leverage Hitachi Unified Compute Platform HC V225G for workload domains that require graphic resources into a Hitachi Unified Compute Platform RS solution that already contains all-flash and hybrid Hitachi Unified Compute Platform HC systems.

Another benefit of Unified Compute Platform RS is the ability to have SAN-based datastores on this solution. VMware Cloud Foundation offers VMware vSAN storage by default. By adding an HBA to Unified Compute Platform HC compute nodes, this solution seamlessly supports Hitachi Virtual Storage Platform, not only for extending storage space along with available vSAN capacity, but also offering separated storage tiers for different datastores. For example, use a vSAN datastore to keep the VMDK files containing operating systems, and use a Virtual Storage Platform datastore for mission-critical applications.

This SAN-based advantage helps you measure your storage requirements by type and size so that you have a variety of options for your underlying storage layer. You have more freedom to select the storage space you need based on the type of workload domains.

Hitachi Virtual Storage Platform offers all-NVMe, all-flash, and hybrid SAN-based datastore options to support a broad range of needs. The storage rack holds either a Virtual Storage Platform F or VSP G series system. Using Virtual Storage Platform in Hitachi Unified Compute Platform RS is optional.

From a networking perspective, two leaf switches provide network connectivity for hosts on the top of each rack. Spine switches in this solution provide inter-rack connectivity and connect the entire solution to your corporate network using uplink ports. Manage all out-of-band management traffic using a management switch on each rack.

For example, in a 4+1 rack scenario, there are four compute racks plus one rack with Hitachi Virtual Storage Platform:

- The maximum number of supported compute nodes in a 4+1 rack scenario is 128 (4 × 32).

- Add a required HBA to the Unified Compute Platform HC compute nodes to have access to the Fibre Channel external storage. They are connected to the Virtual Storage Platform using Fibre Channel connections through two SAN switches for redundancy.

- There are 8 leaf switches, 2 on the top of each rack, to provide network connectivity for all the hosts.

- There is a pair of spine switches to provide inter-rack connectivity plus connectivity to your corporate network.

In general, a Hitachi Unified Compute Platform RS solution can add more racks with more compute nodes. The only limitation is how many racks and nodes can be supported, depending on VMware specifications and maximums.

The following figure shows the logical view of the Hitachi Unified Compute Platform RS hardware architecture.
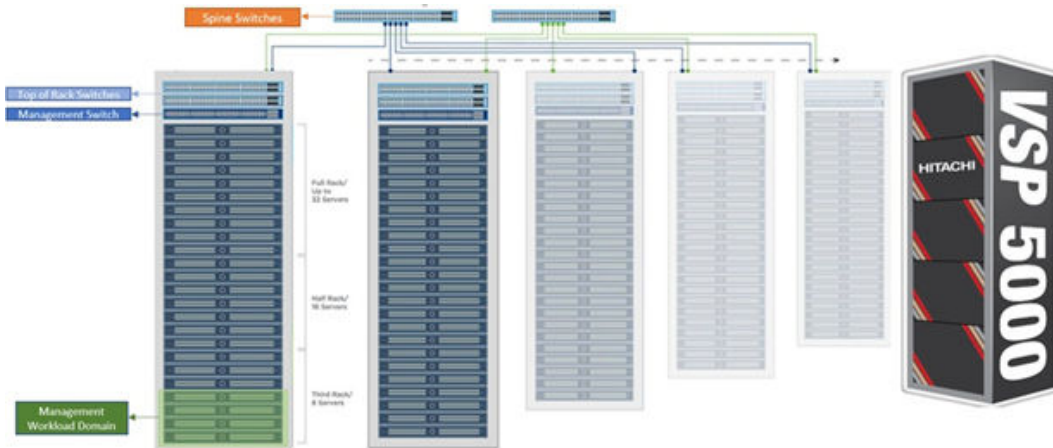
The following figure shows high availability and redundancy in a Hitachi Unified Compute Platform RS solution.
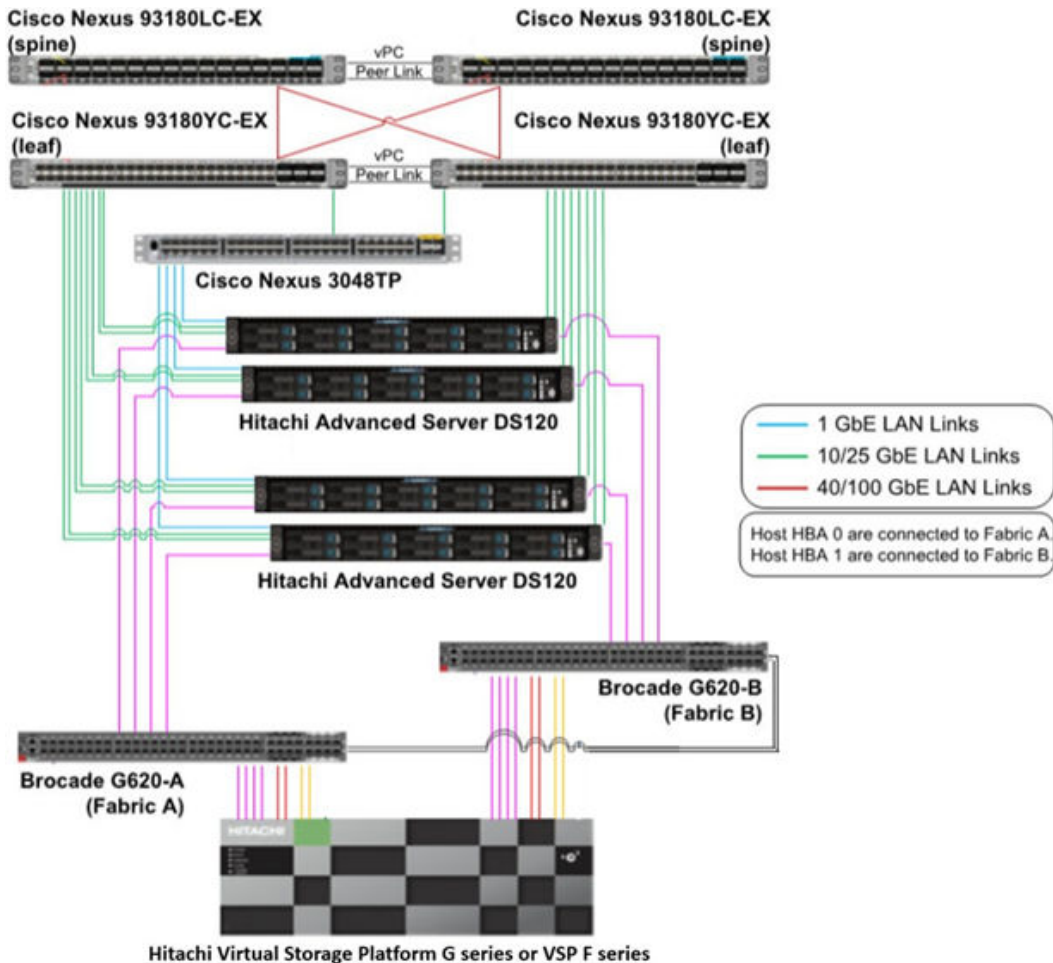
Fibre Channel storage as a secondary datastore

VMware Cloud Foundation supports Hitachi Virtual Storage Platform as external storage. In a Hitachi Unified Compute Platform RS solution, Fibre Channel storage can be used as the following:

- As secondary storage for any type of workload domain

- As principle storage for all types of workload domains except the management domain, where VMware Cloud Foundation requires VMware vSAN to be used

Add Fibre Channel storage to Hitachi Unified Compute Platform HC

To have access to datastores residing on Hitachi Virtual Storage Platform, Hitachi Unified Compute Platform HC systems must be configured with Fibre Channel HBAs and connected to Virtual Storage Platform using Brocade Fibre Channel switches. Carve out suitable LUNs on Virtual Storage Platform and present those LUNs to the Hitachi Unified Compute Platform HC nodes.

Provision Fibre Channel storage

After deploying VMware Cloud Foundation and creating the management domain, create a new workload domain. This new cluster will have a datastore on Hitachi Virtual Storage Platform.

To create a SAN-based datastore, configure Virtual Storage Platform in advance. Connect selected hosts to Virtual Storage Platform redundantly using SAN switches. Configure aliases and zoning on both SAN switches. Do all SAN switch configuration, storage provisioning, and management either using the Hitachi Unified Compute Platform Advisor central control panel or manually as follows:

1. Add HBAs to Unified Compute Platform HC compute nodes.
2. Connect Unified Compute Platform HC compute nodes to SAN switches redundantly.
3. Configure SAN switches.
4. Create Fibre Channel zones for the workload domain.
5. Provision storage.

Configure SAN switches and storage

The following table lists the steps to be completed on each SAN switch and Hitachi Virtual Storage Platform.

Task	SAN Switch Level	Storage Level	VMware vSphere Level
1. Configure ports.	Yes	No	No
2. Create new aliases.	Yes	No	No
3. Create Zones and enable zone configuration.	Yes	No	No
4. Create host groups.	No	Yes	No
5. Configure host mode option.	No	Yes	No
6. Create parity groups.	No	Yes	No
7. Create LDEVs.	No	Yes	No
8. Create dynamic provisioning pools.	No	Yes	No
9. Create virtual volumes.	No	Yes	No
10. Add LUN paths.	No	Yes	No

Configure a workload domain

Complete these steps from the VMware SDDC Manager dashboard.

Procedure

1. Commission designated hosts for the new workload domain.
2. Create a new workload domain from commissioned hosts.
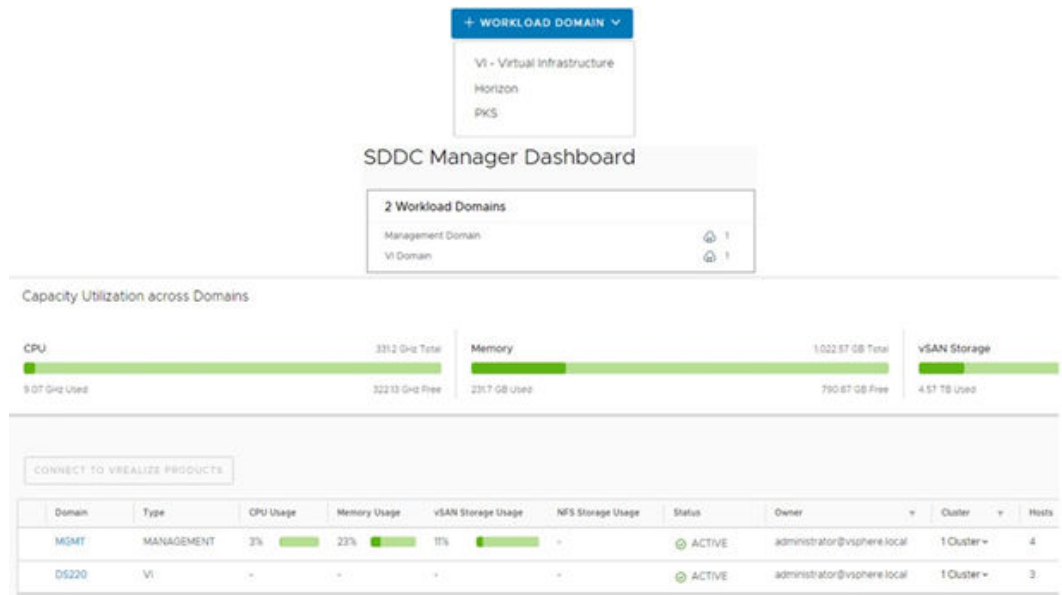
Configure storage with VMware vCenter

To configure the storage, complete this procedure from VMware vCenter on the cluster level.

Procedure

1. Rescan storage on the cluster that belongs to the newly created workload domain from vCenter to discover Hitachi Virtual Storage Platform storage as a connected device to vmhba.

    a. Right-click the node on the compute node.

    b. Click **Storage**.

    c. Click **Rescan Storage**.

    You can also do this step on the cluster level.
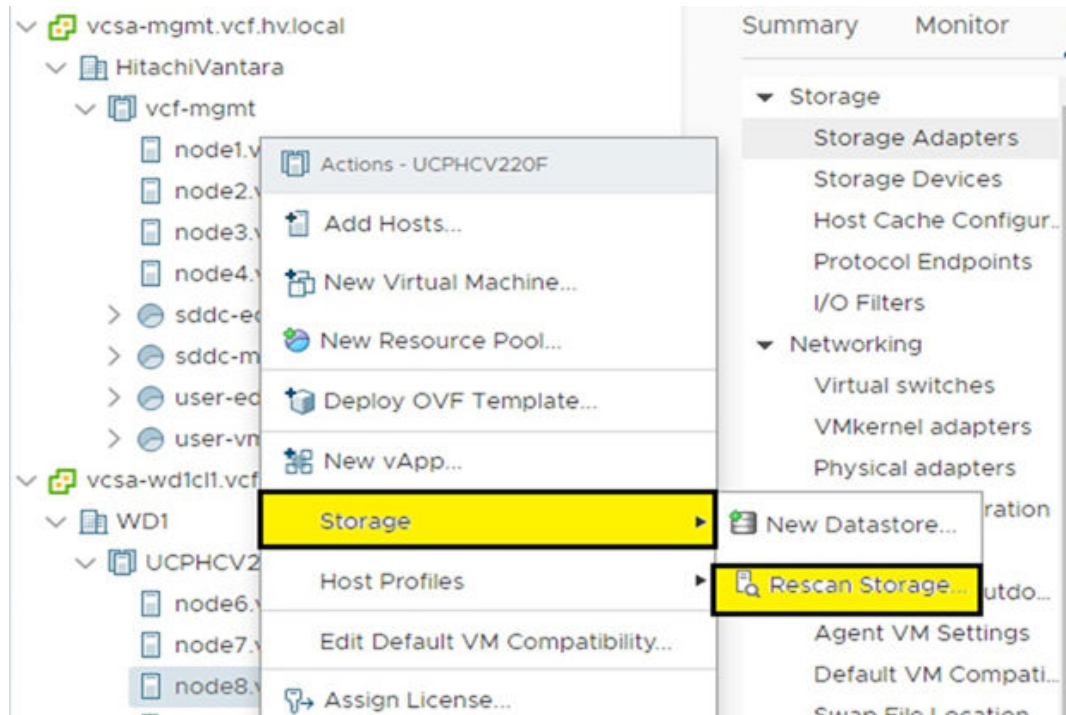
2. Create a new VMFS datastore on Hitachi Virtual Storage Platform for the workload domain.

   a. Right-click the node on Hitachi Unified Compute Platform.

   b. Click **Storage**.

   c. Click **New Datastore**.
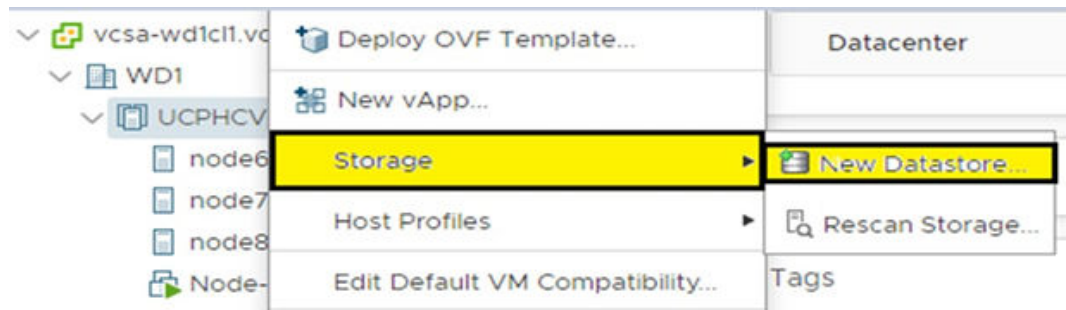
3. Control and change the new VMFS datastore's parameters.

   a. Verify that the new VMFS datastore was created correctly.

   b. Change the multipathing polices to match your environment if needed.

   The following figure shows external Fibre Channel storage on Virtual Storage Platform and both active paths.
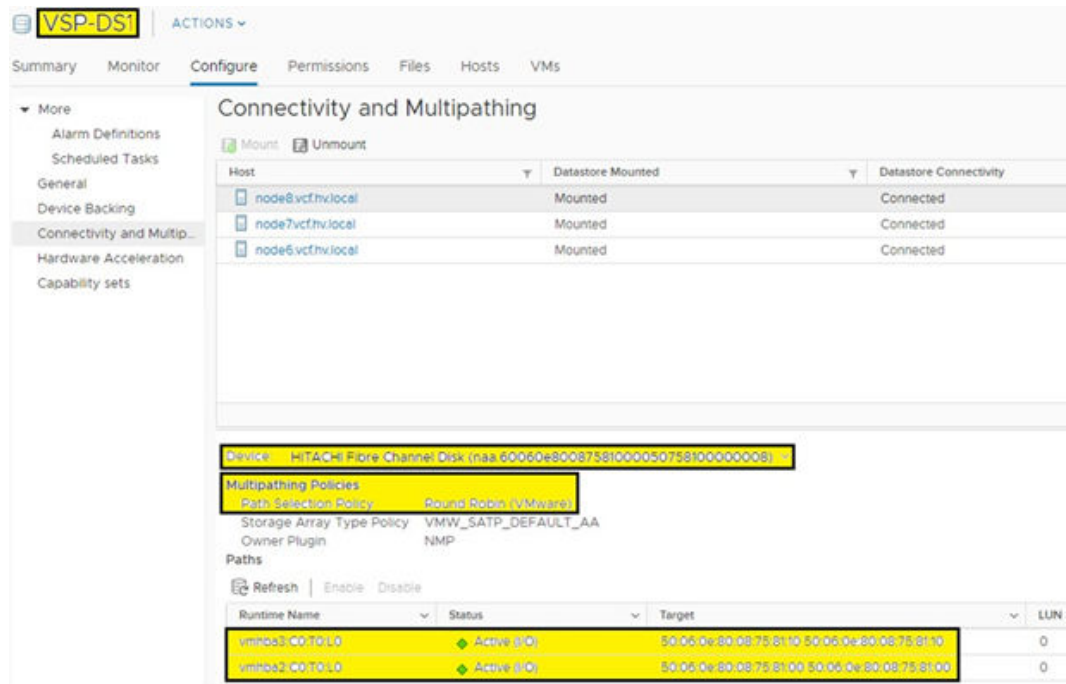
4. Select your multipathing policy.

    The following figure shows the host with a Hitachi Virtual Storage Platform datastore as a secondary datastore and a VMware vSAN datastore.
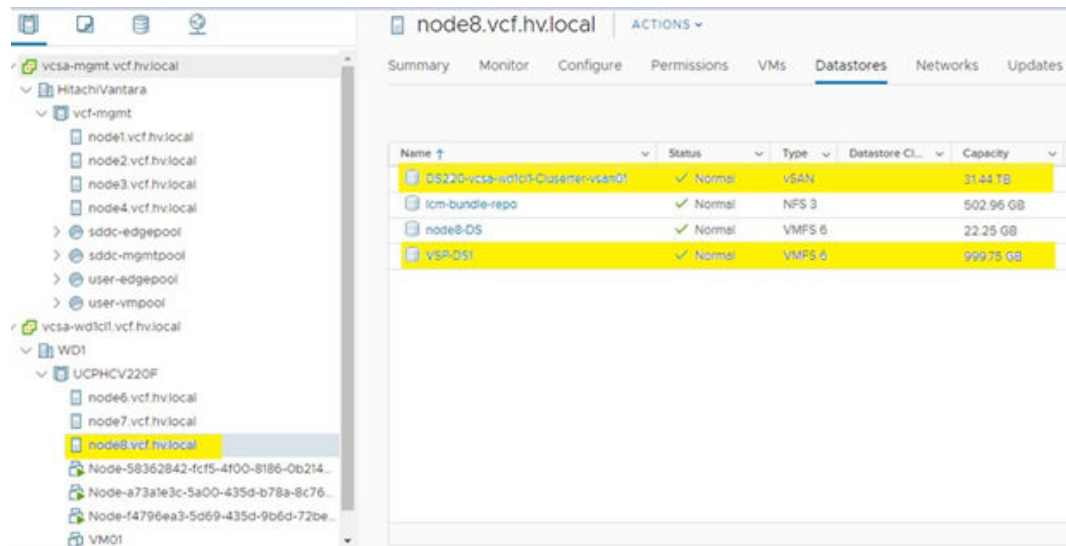
Manage Fibre Channel storage

In contrast with VMware vSAN, which is managed from within VMware SDDC Manager, manage Fibre Channel storage and the SAN switch configuration independently outside of SDDC Manager. Complete all Fibre Channel storage provisioning and management operations, plus SAN switch configuration, with Hitachi Unified Compute Platform Advisor:

- Configure Fibre Channel switches.

- Create aliases and zoning.

- Create a host group.

- Create dynamic provisioning pools and LDEVs.

- Create, map, un-map, and delete LUNs.

Unified Compute Platform Advisor provides a single control panel to manage these crucial tasks and many other useful capabilities.

Fibre Channel storage as the principle datastore

Hitachi Virtual Storage Platform can be used as the principle datastore for all the workload domains except the management domain. There is no VMware vSAN datastore on the workload domains that have Fibre Channel storage as principle storage.

All configurations and provisioning steps are like using Virtual Storage Platform as a secondary datastore. The only difference is there is an option to choose commissioning hosts not having a vSAN datastore instead having a VMFS datastore residing on Virtual Storage Platform.

Here is a summary of the steps used to configure Fibre Channel storage as the principle datastore:

- Add Fibre Channel storage by adding HBAs to Hitachi Unified Compute Platform HC compute nodes.

- Provision Fibre Channel storage:

  1. Connect Unified Compute Platform HC compute nodes to SAN switches redundantly.
  2. Configure the SAN switch.

     a. Configure ports.
     b. Create new aliases.
     c. Create zones and enable zone-configurations.

  3. Create Fibre Channel zones for the workload domain.
  4. Provision storage.

     a. Create a host group.
     b. Configure host mode option.
     c. Create parity groups.
     d. Create LDEVs.
     e. Create dynamic provisioning pools.
     f. Create virtual volumes.
     g. Add LUN paths.

Configure a workload domain

To configure a workload domain from the VMware SDDC Manager dashboard, do the following.

Procedure

1. Create a network pool.

2. Commission hosts that do not have local drives that instead have access to Hitachi Virtual Storage Platform (external Fibre Channel storage) for the new workload domain.

Host Addition and Validation ⓘ

∨ Add Hosts

You can either choose to add host one at a time or download JSON template and perform bulk commission.

● Add new   ○ Import

Host FQDN	node8.vcf.hv.local
Storage Type	○ VSAN ○ NFS ● VMFS on FC
Network Pool Name ⓘ	FC-networkpool ∨
User Name	root
Password	•••••••••••• 👁

ADD

3. Create a new workload domain with access to Hitachi Virtual Storage Platform.

   The following figure shows creating a principle datastore that resides on Fibre Channel external storage for a VI workload domain.

VI Configuration

1 Name

2 Compute

3 Networking

4 Storage

5 Host Selection

6 License

7 Object Names

8 Review

Storage ⓘ

VMFS on FC Datastore

Datastore Name ⓘ   VSP-DS1

4. Name the principle datastore.

Storage ⓘ

VMFS on FC Datastore

Datastore Name ⓘ   VSP-DS1

The following figure shows a non-vSAN cluster with Fibre Channel storage as the principle datastore.
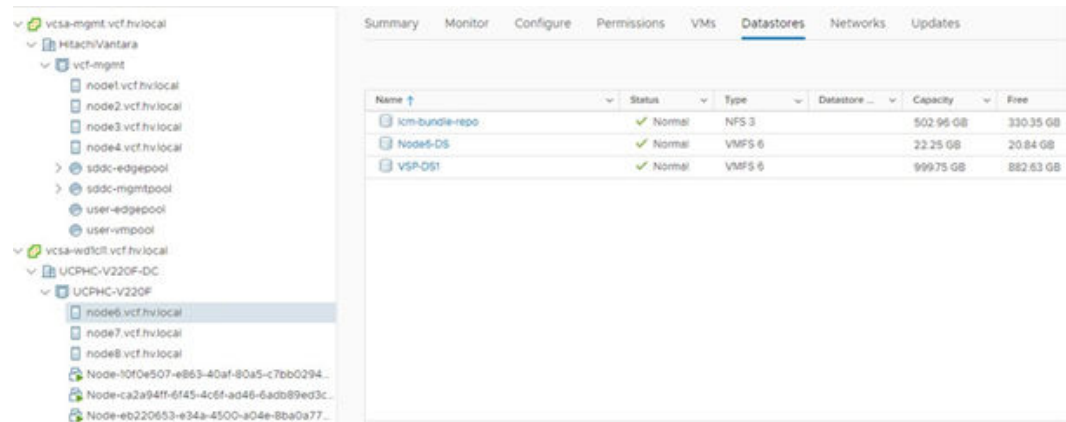
Hitachi Unified Compute Platform Advisor requirements

Hitachi Unified Compute Platform Advisor has the following virtual machines, each with different resource requirements:

- UCP Advisor controller virtual machine — the following table shows the controller virtual machine resource requirements.

Resource	Minimum Requirement
Operating system	CentOS 7.6
RAM	6 GB
CPU	2 vCPUs (default)
Disk	100 GB (thin provisioned disk)
Network	1 vNIC (connect to management VLAN VMXNET3)

- UCP Advisor gateway virtual machine — the following table shows the gateway virtual machine resource requirements.

Resource	Minimum requirement
Operating system	CentOS 7.6
RAM	2 GB (default)
CPU	2 vCPUs (default)
Disk	40 GB (thin provisioned disk)
Network	1 vNIC (connect to management VLAN VMXNET3)

Hitachi Unified Compute Platform HC configuration

Hitachi Unified Compute Platform HC is used as the building block for Hitachi Unified Compute Platform RS. Also, Unified Compute Platform HC offers a broad range of compute and storage components that can be scaled and configured independently to eliminate over-provisioning. Storage can be SSD, hybrid, all flash, or all NVMe. It supports GPUs.

📄 **Note:** By default, Hitachi Unified Compute Platform HC does not come with an HBA. To have access to Hitachi Virtual Storage Platform as SAN storage in a certified feature supported by VMware, you must add a Fibre Channel HBA to Unified Compute Platform HC. This can come pre-configured or pre-packaged with Hitachi Virtual Storage Platform and Brocade Fibre Channel switches.

The following table lists available local drive options on Hitachi Unified Compute Platform HC.

Hitachi Unified Compute Platform HC Family	Chassis	Hitachi Unified Compute Platform HC Model	Cache	Capacity
Hitachi Unified Compute Platform HC V120 series	1U	UCP HC V120 (hybrid)	SATA SSD	SAS HDD
		UCP HC V120F (all flash)	NVMe	SATA SSD
		UCP HC V121F (all flash)	SATA SSD	SATA SSD
		UCP HC V123F (all flash)	Optane	SATA SSD
		UCP HC V124F (all flash)	Optane	SATA SSD
Hitachi Unified Compute Platform HC V220 series	2U	UCP HC V220 (hybrid)	SATA SSD	SAS III
		UCP HC V220F (all flash)	Optane	SAS SSD

Hitachi Virtual Storage Platform options

You can use Hitachi Virtual Storage Platform as a secondary storage option when you need more storage capacity on any workload domain other than VMware vSAN storage.

It can even go further, using Virtual Storage Platform as the principle datastore if the workload domain is not the same as the management domain. VMware Cloud Foundation mandates the use of VMware vSAN for the management domain.

To have datastores reside on SAN storage with Virtual Storage Platform, you must order an HBA with Hitachi Unified Compute Platform HC as a certified feature. You can then connect Hitachi Unified Compute Platform HC nodes to Hitachi Virtual Storage Platform using Brocade G620/720 Fibre Channel switches. When setting up your system, carve out the LUNs on Virtual Storage Platform and present those LUNs to the Hitachi Unified Compute Platform HC nodes.

While technically you can present the LUNs to all available hosts in the Hitachi Unified Compute Platform RS environment, Fibre Channel storage connectivity is not typical for the hosts in the management domain. Access to Hitachi Virtual Storage Platform using Fibre Channel is the main use case for virtual infrastructure workload domains and VMware Horizon virtual machines.

The following table shows supported Fibre Channel SAN storage with Hitachi Virtual Storage Platform on Hitachi Unified Compute Platform RS.

Storage	Direct Connect	Dedicated	Shared	Sold With	Bolt-on
VSP G200	No	Yes	No	Yes	No
VSP G350, VSP F350	No	Yes	No	Yes	No
VSP G370, VSP F370	No	Yes	No	Yes	No
VSP G400, VSP F400	Yes	Yes	Yes	Yes	Yes
VSP G600, VSP F600	Yes	Yes	Yes	Yes	Yes
VSP G700, VSP F700	Yes	Yes	Yes	Yes	Yes
VSP G900, VSP F900	No	Yes	Yes	Yes	Yes
VSP G1000	No	Yes	Yes	No	Yes
VSP G1500, VSP F1500	No	Yes	Yes	Yes	Yes

Hitachi Unified Compute Platform Advisor use

All Fibre Channel storage operations are done outside of VMware SDDC Manager, so are not integrated with SDDC Manager. Therefore, those LUNs are not managed by VMware Cloud Foundation. An advantage of a Hitachi Unified Compute Platform RS with Hitachi Virtual Storage Platform configuration is in provisioning and management using Hitachi Unified Compute Platform Advisor. This includes creating, presenting, and removing LUNs and the Fibre Channel or network switch configuration along with many other configuration and provisioning options using the Unified Compute Platform Advisor central panel.

Unified Compute Platform Advisor can unregister the LUNs when a host is decommissioned by VMware SDDC Manager. All LUNs presented to that host must be removed when it is decommissioned, either using the Unified Compute Platform Advisor central panel or manually.

When removing LUNs, the existing data is kept on Hitachi Virtual Storage Platform. It will not be deleted and will be accessible by commissioning new hosts and presenting those LUNs to those commissioned hosts.

Network switches

All listed leaf, spine, and management switches in this solution can be replaced by any other VMware vSphere-supported network switches from vendors such as Cisco, Arista, and Extreme.

This reference architecture design is not to maximum scale, but it is well-balanced for a typical enterprise-scale deployment. The choice of switch models is based on a scale of five racks, each containing 32 dual-ported 10 Gb/s NICs on Hitachi Unified Compute Platform HC. Network speed, inter-rack bandwidth, maximum node per rack, and maximum number of racks may differ with the leaf and spine switch models and the required port configuration.

You can select alternative switches to create a well-balanced building block as described in the following selection. Also, the building blocks can be expanded to more racks so there are more compute nodes by using larger spine switches with more ports and bandwidth. There is no limit to how many racks you can have and nodes that can be supported from a hardware perspective. Hitachi Unified Compute Platform RS is only limited by VMware maximum specifications.

Solution components

These are the key software and hardware components used to implement the Hitachi Unified Compute Platform RS solution with VMware Cloud Foundation.

Key software components

These are the key software components used in this environment.

VMware software components

Use VMware Cloud Foundation to deploy and run a private cloud on top of Hitachi Unified Compute Platform HC with VMware vSAN. It provides an integrated cloud infrastructure (compute, storage, networking and security) and cloud management service to run enterprise applications in private and public cloud environments.

See https://docs.vmware.com/en/VMware-Cloud-Foundation/index.html to learn more about VMware Cloud Foundation.

The following table shows the VMware Cloud Foundation software stack and versions.

Software Component	Version	Build Number
VMware Cloud Builder VM	5.0	21822418
VMware SDDC Manager	5.0	21822418
VMware vCenter Appliance	8.0 Update 1a	21815093
VMware ESXi	8.0 Update 1a	21813344
VMware vSAN	8.0 Update 1	21495797
VMware NSX-T Data Center	4.1.0.2	21761691
VMware vRealize Suite Lifecycle Manager	8.10 Patch 1	21331275
VMware Horizon	7.9.0	13956742

Hitachi Unified Compute Platform Advisor

The following figure shows an example with a detected management domain and two VI workload domains from Hitachi Unified Compute Platform Advisor.
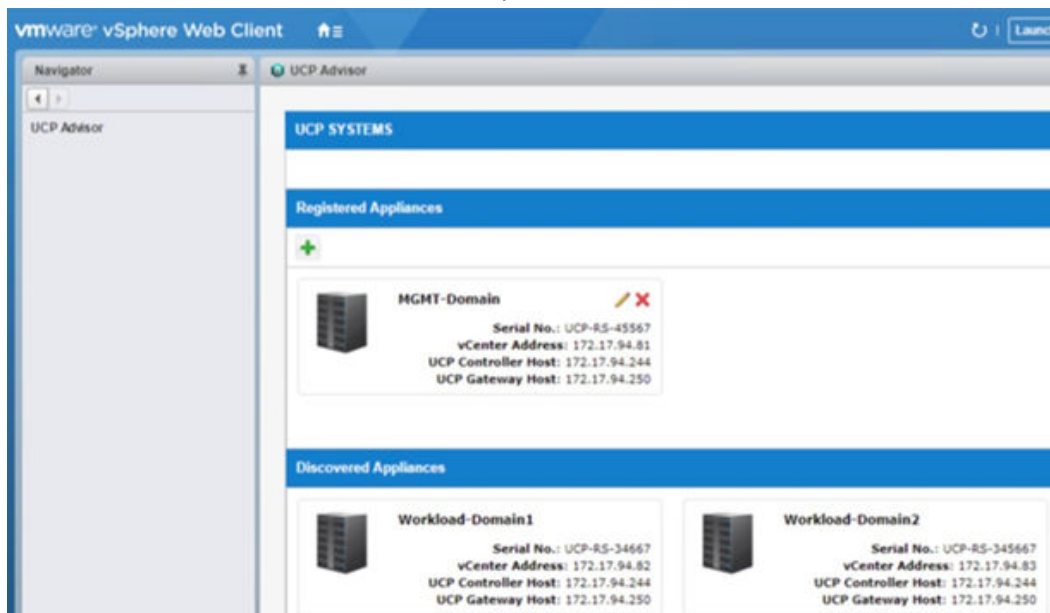
Hardware components

These are the key hardware components that this solution uses.

- Compute

  - Hitachi Unified Compute Platform HC is an integrated, hyperconverged system for compute.

  - Hitachi Unified Compute Platform RS supports a mix and match with Hitachi Unified Platform HC.

- Networking

  - Cisco Nexus 92348GC-X Switch management switch

  - Cisco Nexus 93180YC- FX3 LAN switches as leaf switches

  - Cisco Nexus Spine 93600CD-GX Switch as spine switches

  - Brocade G620/G720 Fibre Channel SAN switches

- Optional Fibre Channel SAN storage

  - One Hitachi Virtual Storage Platform G200, VSP G400, VSP F400, VSP G600, VSP F600, VSP G800, VSP F800, VSP G1500, VSP F1500, or VSP 5000

Solution validation

The following VMware feature test cases were run to validate this Hitachi Unified Compute Platform RS solution:

- Create and delete virtual machines

- Make and delete a clone and snapshot from virtual machines on SAN-based datastores

- Clone a virtual machine that resides on a VMware vSAN datastore and save it on a Hitachi Virtual Storage Platform datastore

- Clone a virtual machine residing on Virtual Storage Platform and save it on a VMware vSAN datastore

- Use VMware vSphere storage vMotion to migrate virtual machines between a vSAN datastore and Virtual Storage Platform datastore and reverse

- Commission and Decommission an additional host to the cluster

The following table lists the test scenarios completed to validate the solution.

Test Scenarios	VMware vSAN Datastore	Virtual Storage Platform Datastore	Observed Behavior
Create and delete workload domain	Yes	Yes	Workload domain created, deleted successfully.
Create and delete cluster	Yes	Yes	Cluster created, deleted successfully.
Create and delete virtual machines	Yes	Yes	Virtual machines created, deleted on both datastores successfully.
Make and delete clone and snapshot	Yes	Yes	Snapshots created, deleted on both datastores successfully.
Clone a virtual machine from a VMware vSAN datastore to Hitachi Virtual Storage Platform datastore	Yes	Yes	Done successfully.
Clone a virtual machine from a Virtual Storage Platform datastore to vSAN datastore	Yes	Yes	Done successfully.
Migrate virtual machines located on a vSAN datastore to a Virtual Storage Platform datastore using Storage vMotion	Yes	Yes	Virtual machines migrated from a vSAN datastore to a Virtual Storage Platform datastore successfully.
Commission and decommission additional hosts to workload domains.	Yes	Yes	Prepare the additional node for commission and add to the cluster through SDDC Manager and decommission post validation checks.
Migrate virtual machines located on Virtual Storage Platform datastore to vSAN datastore using Storage vMotion	Yes	Yes	Virtual machines migrated from Virtual Storage Platform datastore to vSAN datastore successfully.

Product descriptions

The following products are used in this solution.

Unified Compute Platform HC

Unified Compute Platform HC (UCP HC) is an integrated turnkey appliance that combines compute, storage, and optional network switching to deliver certainty for edge to core to cloud operations. This market-proven Hitachi solution provides a scalable, seamless, and simplified cloud foundation for enterprise and mid-market customers. Advanced automation and intelligence for day 0-2 operations accelerate innovation and improve productivity while lowering the TCO.

Unified Compute Platform RS

To simplify your hybrid cloud journey, Hitachi Unified Compute Platform (UCP RS) provides a turnkey solution that reduces total cost of ownership (TCO) and improves security. The software-defined data center solution accelerates the time to market with a natively integrated cloud infrastructure stack. It comes prepackaged with management software, to provide automated, policy-based IT operations.

Unified Compute Platform RS has automation that enables the deployment of an entire cloud infrastructure in hours, not weeks or months. There is rapid and repeatable application deployment.

Move your workload across data centers to meet changing business needs. Manage your applications across private and public cloud from a common toolset. Scale your data center without increasing IT headcount. Automate your data center with policies.

Hitachi Virtual Storage Platform F Series family

Use Hitachi Virtual Storage Platform F series family storage for a flash-powered cloud platform for your mission critical applications. This storage meets demanding performance and uptime business needs. Extremely scalable, its 4.8 million random read IOPS allows you to consolidate more applications for more cost savings.

Hitachi Virtual Storage Platform F series family delivers superior all-flash performance for business-critical applications, with continuous data availability.

Hitachi Virtual Storage Platform G series family

The Hitachi Virtual Storage Platform G series family enables the seamless automation of the data center. It has a broad range of efficiency technologies that deliver maximum value while making ongoing costs more predictable. You can focus on strategic projects and consolidating more workloads while using a wide range of media choices.

The benefits start with Hitachi Storage Virtualization Operating System RF. This includes an all new enhanced software stack that offers up to three times greater performance than our previous midrange models, even as data scales to petabytes.

Hitachi Virtual Storage Platform G series offers support for containers to accelerate cloud-native application development. Provision storage in seconds, and provide persistent data availability, all the while being orchestrated by industry leading container platforms. Move these workloads into an enterprise production environment seamlessly, saving money while reducing support and management costs.

Cisco Nexus switches

The Cisco Nexus switch product line provides a series of solutions that make it easier to connect and manage disparate data center resources with software-defined networking (SDN). Leveraging the Cisco Unified Fabric, which unifies storage, data, and networking (Ethernet/IP) services, the Nexus switches create an open, programmable network foundation built to support a virtualized data center environment.

Brocade switches from Broadcom

Brocade and Hitachi Vantara have partnered to deliver storage networking and data center solutions. These solutions reduce complexity and cost, as well as enable virtualization and cloud computing to increase business agility.

Brocade Fibre Channel switches deliver industry-leading performance, simplifying scale-out network architectures. Get the high-performance, availability, and ease of management you need for a solid foundation to grow the storage network you want.

Hitachi Vantara