

Transform Your Existing vSphere Infrastructure to VMware Cloud Foundation the Easy Way

A Best Practice and Validation Guide Optimized for UCP
HC, UCP CI, and VSP-attached VMware ESXi Clusters

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Best Practice and Validation Guide

Introduction

Are you facing the challenge of upgrading your current VMware vSphere infrastructure to VMware Cloud Foundation (VCF)? You are not alone. Many large-enterprise customers that previously were using vSphere Enterprise Plus must now transition to Broadcom's VCF subscription for their renewals. For existing ESXi hosts, such as those running in our customers' UCP CI and UCP HC converged and hyperconverged infrastructure, we have a brownfield ingestion procedure that will help ease the transition from vSphere to VCF, without having to migrate their VM workloads or Virtual Disks!

This technical white paper will show you how this is accomplished, breaking down the requirements and best practices for each supported scenario. Whether your ESXi clusters run on top of Hitachi VSP and VSP One storage, or on VMware vSAN Ready Nodes, there is an easy ingestion method to turn your existing environment into a VMware Cloud Foundation Private or Hybrid Cloud Infrastructure.

For greenfield deployments of VMware Cloud Foundation, and as an expansion of your existing VMware infrastructure, Hitachi Vantara and VMware by Broadcom recommend using UCP RS, a Co-Engineered VMware Cloud Foundation Solution. [UCP RS is the ultimate private cloud solution](#); it is the only VCF Co-Engineered Solution offered by a Broadcom Value-Added OEM (VAO) partner that provides the resilience of a Multi-Availability Zone Failure Domain across three data centers (3DC), a feature only available previously with public hyperscalers.

VSP customers who are not already attached to a UCP system can also bolt-on their existing storage into UCP RS (or get a new VSP storage subsystem with UCP RS). Doing so will allow them to manage their external FC-SAN datastores as seamlessly as with vSAN clusters in their respective VCF Workload Domains, by virtue of the Hitachi Storage VASA Provider's integration into VMware's Storage Policy-Based Management (SPBM) framework, and thanks to Hitachi UCP Advisor's automation framework and security policies. You can read more about the UCP RS VCF Co-Engineered Solution in [this guide](#).

Whether you want to easily deploy VCF in a new environment for a new project, or you need to upgrade your existing vSphere/vSAN clusters into VCF, Hitachi Vantara has the right solution for you.

Solution description

The best and most practical solution for customers who want to renew their support maintenance contract as well as expand their vSphere environment, is to convert their existing vSphere (non-vSAN and vSAN) clusters into a Cloud-ready VMware Cloud Foundation (VCF) platform.

Intent

This paper demonstrates to Hitachi Vantara customers, partners and field engineers that we have thoroughly tested and successfully validated the brownfield ingestion procedures to convert existing UCP HC and UCP CI systems into VCF, thus effectively turning each of them into an equivalent “UCP RS” stack. [UCP RS is our turnkey, greenfield, VCF Co-Engineered Solution](#), and the procedures in this paper help existing UCP customers achieve the same benefits.

Target customers

This paper is intended for Hitachi Vantara customers who are considering adopting VMware Cloud Foundation (VCF), and who are currently running vSphere and vSAN in their environment, for example on UCP HC and UCP CI. This is especially the case for strategic Broadcom accounts, because those customers are only allowed to subscribe to the VCF core bundle going forward, and their existing vSphere | vCenter | vSAN perpetual licenses have expiring support maintenance that cannot be renewed (those nodes must be converted to VCF subscription to continue to receive enterprise support).

Introducing the VCF Import Tool

The VCF Import Tool is a new CLI tool that has been introduced by releasing [VCF version 5.2](#). This import tool enables vSphere Administrators to easily convert existing vSphere and vSAN infrastructures to a Cloud Foundation Private Cloud.

The VCF Import tool enables customers to expedite their move to a modern private cloud by enabling them to quickly implement Cloud Foundation directly on top of their existing vSphere infrastructure.

By using this tool, converting/importing your existing VMware vSphere environment using UCP CI (non-vSAN) or UCP HC (vSAN) clusters into VCF (UCP RS) has never been easier.

In addition to onboarding vSphere environments, VCF Import tool can also prepare the imported vSphere clusters with NSX on vCenter port groups (DVPGs), thereby offering distributed firewalling and other security features available in NSX.

VCF Import Tool key features

The following are some of the key features of VCF Import Tool:

- **Compatibility check:** Basically, it assures you your current workload are compatible with VCF before migration.
- **Automated Workload Migration:** It reduces the complicity and time required for migration.
- **Rollback Capabilities:** The VCF Tool allows you to roll back to your previous environment, in case of any issues.
- **Comprehensive Reporting:** VCF Tool provides detailed reports on the migration process, helping customers to track the progress and to identify any issues.

Supported scenarios

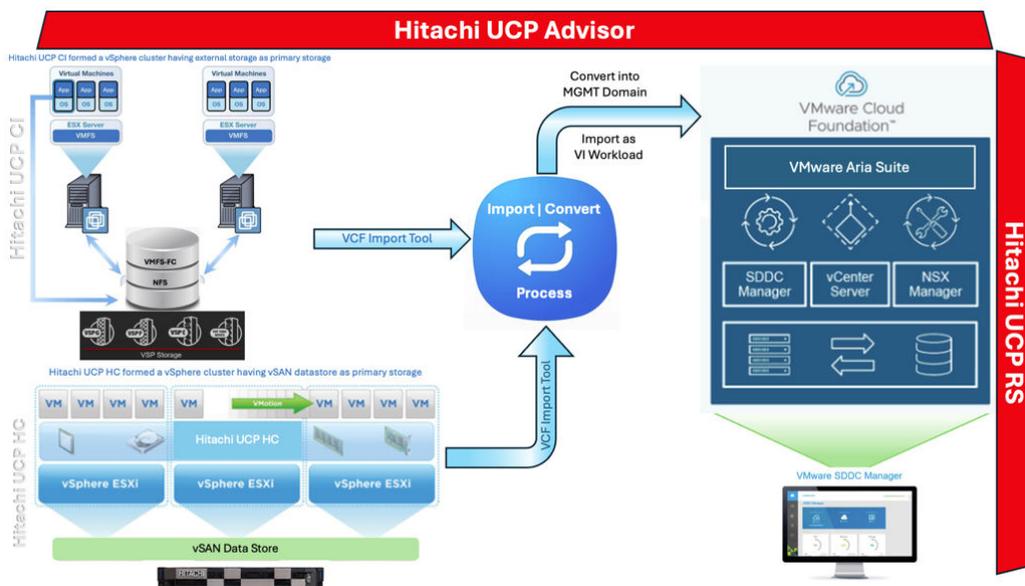
There are two main use cases for using the VCF Import Tool, depending on whether or not you already have SDDC Manager deployed.

Scenario	Description
Scenario A: Convert	Your environment does not have SDDC Manager, and you want to convert your existing vSphere infrastructure to the VMware Cloud Foundation Management Domain
Scenario B: Import	Your environment does have SDDC Manager deployed, and you want to import your existing vSphere infrastructure as VI Workload Domain

In these main use cases, we can consider multiple scenarios with some of the major ones listed as follows.

- Converting | importing vSphere environment with non-vSAN (VMFS) as primary storage
- Converting | importing vSphere environment with vSAN as primary storage
- Converting | importing vSphere environment with both non-vSAN and vSAN datastores
- Converting | importing vSphere environment with or without NSX

The following illustration shows both UCP CI (non-vSAN) and UCP HC (vSAN) clusters that are eligible to be converted into VCF Management Domain.



Conversion process

In general, the requirement for conversion process can be categorized as follows:

Requirements for converting a vSphere cluster to a VCF Management Domain

To convert an existing vSphere environment into a VCF management domain there are two requirements that you need to be aware of

- First, the vSphere environment that you convert needs to be running vSphere 8.0 update 3 or higher. This includes both the vCenter Server instance and the ESX hosts. This is the version of vSphere that is associated with the VCF 5.2 Bill of Materials (BOM). This requirement is due, in part, to the fact that you must first deploy the SDDC manager appliance into the cluster, and the 5.2 version of the SDDC Manager appliance requires vCenter and ESXi version 8.0 update 3 (or above).
- Second, when converting a vSphere environment, the vCenter server must be running on the cluster that is being converted. The documentation refers to this as the vCenter server needing to be “co-located” with the cluster.

Requirements for importing a vSphere cluster to a VCF VI Domain

Similar to converting a new management domain, there are two key requirements that you need to be aware of when importing a vSphere environment into a VCF VI domain:

- First, the supported vSphere versions that can be imported as a VI domain are vSphere 7.0 update 3 (or above). Again, this includes both the vCenter Server instance and the ESXi hosts. Note that the minimum version of 7.0 update 3 is the vCenter and ESXi version that corresponds with the VCF 4.5 Bill of Materials (BOM).
- Second, when importing a vSphere environment, the vCenter server must either be running on the cluster that is being converted (co-located) or running on the cluster in the management domain.

Common requirements when converting and importing vSphere clusters

Along with the requirements noted previously, the following requirements apply to both converting and importing vSphere infrastructure.

- All hosts within a vSphere cluster must be homogeneous. Essentially, all the hosts in a cluster need to be the same in terms of capacity, storage type, and configuration (pNICs, VDS, etc.). Server configurations can be different across clusters, but within a cluster the hosts must be the same.
- Clusters to be converted and imported must be running one of the three supported storage types: vSAN, NFS, or VMFS on Fibre Channel (FC). This is often an area of confusion because when doing a greenfield deployment of VCF using the Cloud Builder appliance the storage for the management domain must always be vSAN. Note that the vSAN requirement does not apply to converted management domains where the storage can be either vSAN, NFS, or VMFS on FC.
- When using vSAN, the minimum number of hosts required for the management domain is always four. However, when using NFS or VMFS on FC the minimum number of hosts required is three. Here again, this is different than when doing a greenfield deployment with the Cloud Builder.

- Enhanced Linked Mode (ELM) is not supported with the VCF Import Tool. Each vCenter Server instance to be converted or imported as a VCF workload domain must be in its own SSO domain. As such, each converted or imported vCenter instance will instantiate an isolated workload domain in VCF. This can be a concern for customers who are accustomed to having a single pane of glass with their VCF environment. Be sure to check out the new dashboards provided by VCF Operations (formerly Aria Operations) because they can help mitigate this change.
- All clusters in the vCenter inventory must be configured with one or more dedicated vSphere Distributed Switches (VDS). Note that vSphere Standard Switches (VSS) are not supported. What's more, if you have a VSS configured in your cluster it will need to be removed before you can import the cluster. Also, it is important to note that a VDSs cannot be shared across vSphere clusters.
- There can be no standalone ESXi hosts in the vCenter inventory. Standalone hosts will need to either be moved to a vSphere cluster or removed from the vCenter inventory.
- All clusters must have DRS enabled in fully automated mode and all hosts must have a dedicated vMotion network configured.
- All vmkernel adapters must have statically assigned IP addresses. As part of the convert/import process, a network pool will be created inside the SDDC Manager using the assigned IPs. After the import is complete, these IP addresses must not change. As such, the IP addresses need to be statically assigned.
- vSphere environments cannot have multiple vmkernel adapters configured for a single traffic type.
- It is highly recommended to configure NTP on all cluster nodes, vCenter, and SDDC manager.

Considerations before converting or importing vSphere cluster

The [VCF Administration Guide](#) is the main referenced to create this technical paper and it describes the supported and unsupported configurations for converting an existing vSphere environment into a VMware Cloud Foundation management domain or importing an existing vSphere environment as a VI workload.

Hitachi UCP Advisor

Hitachi UCP Advisor provides detailed information about the infrastructure components and allows you to manage operations for connected devices.

UCP Advisor simplifies infrastructure operations. Seamless integration allows automated provisioning of the UCP systems—for both the converged and hyperconverged infrastructure. It provides unified management, central oversight, and smart life-cycle management for firmware upgrades, element visibility, and troubleshooting. UCP Advisor simplifies IT management and orchestration for faster and easier deployment of converged and hyperconverged systems.



Note: Hitachi UCP Advisor and its respective software elements remain functional after converting the target cluster into the VCF environment.

Considerations before converting or importing by Domain Type

Category	Management Domain Considerations	VI Workload Domain Considerations	Recommendation
VMware Cloud Foundation Software BOM Alignment	<ul style="list-style-type: none"> Minimum 5.2 vCenter Server & ESXi 8.0U3 	<ul style="list-style-type: none"> Minimum 4.5.0 vCenter Server & ESXi 7.0U3 	<p>Upgrade the domain to the minimum bill of materials.</p> <div style="background-color: #fff9c4; padding: 5px;"> <p>⚠ Caution: vCenter Servers originally deployed at a version below 6.5 may encounter an issue upgrading to 8.0U3. See KB370882 for more details.</p> </div>
Ports & Protocols	<p>Must align with https://ports.esp.vmware.com/home/VMware-Cloud-Foundation</p> <div style="background-color: #fff9c4; padding: 5px;"> <p>⚠ Caution: vCenter Server must be using port 443.</p> </div>		<p>Custom ports for vCenter Server are not currently supported for import. Please wait for a future version of VCF that will support importing vCenter Server using custom ports.</p>
vCenter Server VM Location	Must be co-located	Must be located in the management domain, or co-located	<p>Move the vCenter Server VM to a supported location. See this for more information on cross vCenter vMotion.</p>
Single Sign-On	SSO domain names for imported environments do not need to be unique within a VMware Cloud Foundation instance		
	Each SSO domain should contain only a single vCenter Server. ELM is not supported		<p>Break the ELM ring creating multiple SSO domains</p>

Category	Management Domain Considerations	VI Workload Domain Considerations	Recommendation
Cluster - Storage	<ul style="list-style-type: none"> Default cluster must be one of vSAN, NFS, VMFS-FC. NFS 4.1, FCoE, VVOLs or native iSCSI are not supported. 		Select a cluster with primary storage from the supported list
	Clusters cannot be stretched vSAN		vSAN stretched clusters are not currently supported. Please wait for a future version of VCF that will support importing vSAN stretched clusters.
	<ul style="list-style-type: none"> When using vSAN, all clusters must be 4 nodes minimum. When using NFS or FC the default cluster must be 2 nodes minimum. <div style="background-color: #e0f7fa; padding: 5px; border: 1px solid #000; margin-top: 10px;"> <p> Note: Deploying NSX requires a minimum of 3 nodes.</p> </div>	<ul style="list-style-type: none"> When using vSAN, all clusters must be 3 nodes minimum. When using NFS or FC all clusters must be 2 nodes minimum. <div style="background-color: #e0f7fa; padding: 5px; border: 1px solid #000; margin-top: 10px;"> <p> Note: Deploying NSX requires a minimum of 3 nodes.</p> </div>	Expand the cluster to the minimum number of nodes for the relevant storage type
	When using vSAN, compression only (applicable for OSA) is not supported.		Dedupe and compression are supported together. Either enable dedupe, or disable compression.
Cluster - Network	vCenter Server must not have an existing NSX instance registered		vCenter Servers with existing NSX registrations are not currently supported for import
	LACP not supported		Use teaming options available with vSphere Distributed Switch and N-VDS to provide load balancing and failover

Category	Management Domain Considerations	VI Workload Domain Considerations	Recommendation
	Use vSphere Distributed Switches only. Standard or Cisco virtual switches are not supported		Move to vSphere Distributed Switch. See this procedure .
	VMkernel IP addresses must be statically assigned		Move to statically assigned IP addresses
	Multiple VMkernels for a single traffic type (vSAN , vMotion) are not supported		Reconfigure to a single VMkernel per traffic type
	ESXi hosts must have the same number of physical uplinks (minimum 2) assigned to a vSphere distributed switch. Each uplink must be a minimum of 10Gb		Reconfigure uplinks accordingly
	vSphere distributed switch teaming policies must match VMware Cloud Foundation standards		See here for VMware Cloud Foundation teaming policies
	Dedicated vMotion network must be configured		Configure a dedicated vMotion network
	Each cluster must have a dedicated vSphere distributed switch		Ensure that each cluster has its own vSphere distributed switch
Cluster - Compute	Cluster must not be VxRail managed		VxRail is not currently supported. Please wait for a future version of VCF that will support importing VxRail
	All clusters must be running vSphere 8.0U3	ESXi build number must be consistent within a cluster	Upgrade hosts to align build numbers
	DRS must be fully automated		Enable DRS and set to fully automated
	Standalone hosts are not supported		Remove the standalone host from the vCenter Server inventory.

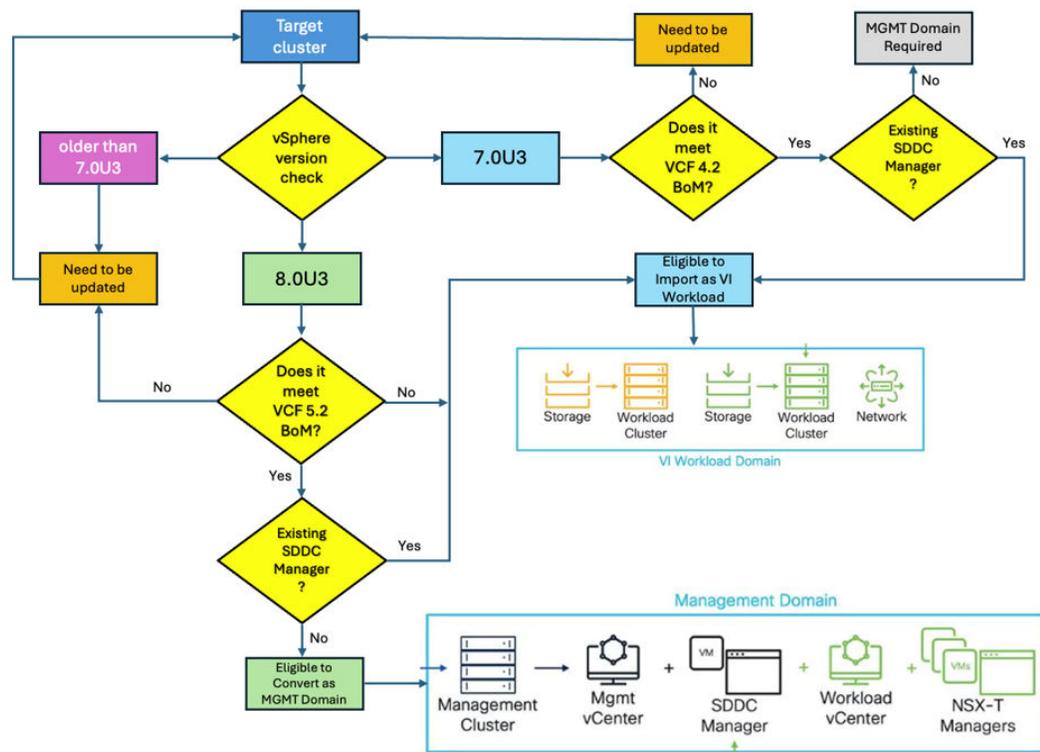
Configurations supported by Domain Type

Configuration	Converted Management Domain	Imported VI Workload Domain	VCF Deployed Management Domain	VCF Deployed VI Workload Domain	Additional Information
Deployment with NSX VLAN Only (no overlay networking)	Yes*	Yes*	No	No**	* NSX deployment requires a minimum of 3 hosts. ** No native UI/API support but can be achieved using the workload domain import scripts.
vSphere networking only (No NSX)	Yes	Yes	No	Yes*	* VCF 5.2 minimum
NSX Edge deployment	No	No	Yes	Yes	
AVN	No	No	Yes	N/A	Requires NSX edge cluster
Aria Lifecycle deployment in VCF aware mode	No	No	Yes	N/A	Requires NSX Overlay networking
Fibre channel storage as primary storage	Yes	Yes	No	Yes	
NFS storage as primary storage	Yes	Yes	No	Yes	

Configuration	Converted Management Domain	Imported VI Workload Domain	VCF Deployed Management Domain	VCF Deployed VI Workload Domain	Additional Information
vCenter Appliances co-located in a workload domain cluster	Yes	Yes	Yes	No	
Non-standard VCF networking, such as link aggregation to the hosts (LACP)	No	No	No	No	
Enhanced Link Mode (ELM)	No	No	Yes	Yes	
NSX Overlay networking	No	No	Yes	Yes	Requires NSX Overlay networking
AVI Load Balancer	No	No	Yes	Yes	Requires NSX Overlay networking
vSAN Stretched Cluster	No	No	Yes	Yes	Requires NSX Overlay networking
WCP Enabled clusters	No	No	Yes	Yes	Requires NSX Overlay networking
L3 vSphere Cluster create/Add Host	No	No	No	Yes	Requires NSX Overlay networking

Configuration	Converted Management Domain	Imported VI Workload Domain	VCF Deployed Management Domain	VCF Deployed VI Workload Domain	Additional Information
vVOL enabled storage	No	No (New clusters can be added post import that utilize vVOL enabled storage)	No (Supplemental only)	Yes	
Multi-Region/DR	No	No	Yes	Yes	Requires NSX Overlay networking
VMware Validated Solutions	No	No	Yes	Yes	
ESXi Host Password management	No	No	Yes	Yes	
Add host to a cluster	Yes*	Yes*	Yes	Yes	* Must be done in vCenter and then perform a sync operation
	Yes*	Yes*	Yes	Yes	* Must be done in vCenter and then perform a sync operation

The following diagram shows vSphere version prerequisites. Based on the type of workloads, the target cluster is designated either for convert or import and needs to meet certain vSphere versioning requirements depending on the migration plan. This means the cluster is either going to be converted to the VCF MGMT Domain or to be imported as a VI workload.



Required resources

Make sure you have enough resources on the target vSphere cluster which is going to be converted to VCF Management Domain. The number of required resources that you will need depends on your convert scenario.

For example; having or not having plan to deploy NSX and VMware Aria or how many VI workload domain you want to add, of course, by considering [VCF configuration limitation](#). For a simple conversion process, you should have enough resources for SDDC Manager appliance.

The following table illustrates approximate required resources (including compute and storage) for some of the VCF components. Please consult the VMware documentation for resource requirements for VCF Operations/Automation/Log Insight (formerly VMware Aria Suite Lifecycle) and other VMware product that you want to deploy on the Management Domain.

Component	vCPU	Memory	Storage
SDDC Manager	4	16 GB	980 GB
vCenter Server (small)	4	19 GB	480 GB
NSXT-T Manager 01 (medium)	6	24 GB	300 GB
NSXT-T Manager 02	6	24 Gb	300 GB
NSXT-T Manager 03	6	24 GB	300 GB

Component	vCPU	Memory	Storage
NSX-T Edge 01 (medium)	4	8 GB	200 GB
NSX-T Edge02	4	8 GB	200 GB

If you do not want to use an existing vSphere production cluster as the VCF Management Domain, whether due to security/isolation considerations, or lack of resource availability, you also have the option to procure a new UCP RS system, which will include a Management Workload Domain with its vSphere cluster pre-allocated and pre-configured for you, and follow the rest of this document to ingest your existing vSphere environment as VI Workload Domains.

Tested scenarios

The following table lists all the tested scenarios including the results for each test case.



Note: All of the following test cases have been done against both Hitachi Advanced Server HA800 series and Hitachi Advanced Server DS series servers. Also, vSphere 7.0U3 is only used on the clusters including DS servers that have been designated to import as a VI Workload because vSphere 7.0U3 is not supported on Hitachi Advanced Server HA800 series.

Environment	Number of nodes	vSphere version	Datastore	NSX Deployment	Converted / Imported to	Out Come Result
UCP CI Cluster	4	8.0U3	VMFS	No	Management Domain	Converted Successfully
UCP HC Cluster	4	8.0U3	vSAN	No	Management Domain	Converted Successfully
vSphere Cluster	4	8.0U3	VMFS + vSAN (Hybrid)	No	Management Domain	Converted Successfully
UCP CI Cluster	2	8.0U3	VMFS	No	Management Domain	Failed: required minimum 4 hosts
UCP CI Cluster	3	8.0U3	VMFS	No	Management Domain	Failed: required minimum 4 hosts

Environment	Number of nodes	vSphere version	Datastore	NSX Deployment	Converted / Imported to	Out Come Result
UCP CI Cluster	2	8.0U3	VMFS	No	VI Workload Domain	Converted Successfully
UCP CI Cluster	2	7.0U3	VMFS	No	VI Workload Domain	Converted Successfully
UCP HC Cluster	4	8.0U3	vSAN	No	VI Workload Domain	Converted Successfully
UCP HC Cluster	4	7.0U3	vSAN	No	VI Workload Domain	Converted Successfully
vSphere Cluster	4	8.0U3	VMFS + vSAN (Hybrid)	No	VI Workload Domain	Converted Successfully
UCP CI Cluster	4	8.0U3	VMFS	Yes	Management Domain	Failed: NSX version mismatched
UCP HC Cluster	4	8.0U3	VMFS	Yes	Management Domain	Failed: NSX version mismatched

Tested software

The following software was used to run the previous multiple scenarios.

Software	Version	Details
ESXi	8.0U3	Convert vSphere cluster into MGMT Domain as well as VI Workload Domain
ESXi	7.0U3	Convert vSphere environment as VI Workload Domain
vCenter	8.0U3	Convert vSphere cluster into MGMT Domain as well as VI Workload Domain
vCenter	7.0U3	Convert vSphere environment as VI Workload Domain.
vSAN	8.0U3	As primary storage as well as secondary storage option
vSAN	7.0U3	As primary storage as well as secondary storage option

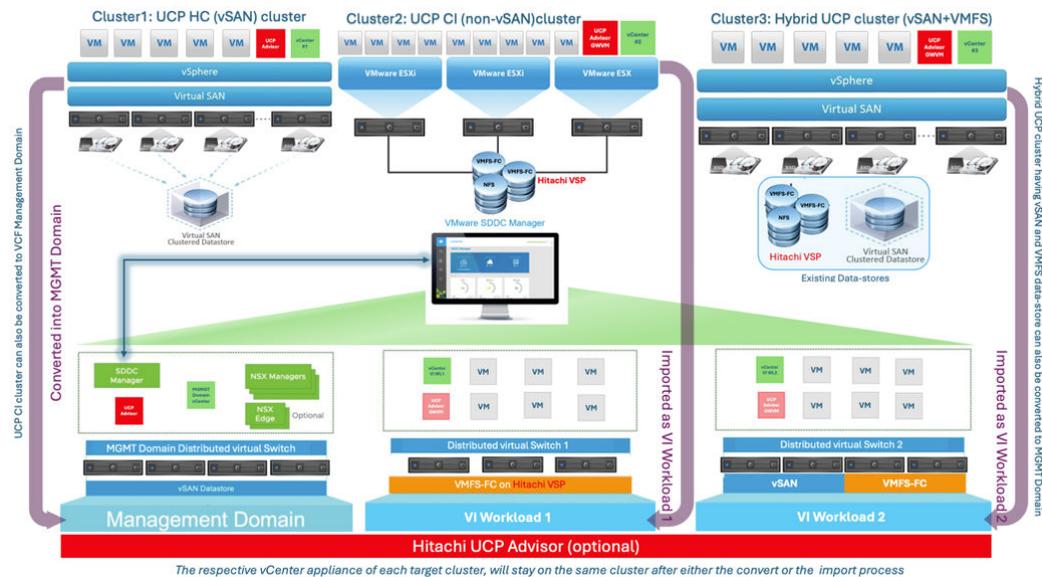
Software	Version	Details
SDDC Manager Appliance	5.2.0.0-24108943	Required for convert, Import and sync workflows.
VCF Import Tool	5.2.0.0-24108578	Required for convert, import, and sync workflows.
NSX_T_Manager	4.2.0.0	Only required for convert or import workflows when you plan to deploy VMware NSX as part of the workflow or if you plan to deploy VMware NSX as a day-N operation for workload domains imported or deployed without NSX.

Tested hardware

The following hardware was used to run the previous multiple scenarios.

Hardware	vSphere version	Details
Hitachi Advanced Server HA810 G3	8.0U3	Tested as MGMT Domain as well as VI Workload Domain
Hitachi Advanced Server DS120 G2	8.0U3	Tested as MGMT Domain as well as VI Workload Domain
Hitachi Advanced Server DS120 G2	7.0U3	Tested as VI Workload Domain
Hitachi VSP28	8.0U3 & 7.0U3	As primary storage on both DS and HA Chassis As external storage beside vSAN
Cisco 93180YC-FX3	N/A	As ToR switches
Brocade FC Switch	G720	As fabric switch

The following diagram illustrates an example of different clusters and workloads, a UCP HC (vSAN Cluster) that is converted as MGMT Domain and it forms a VCF environment which manages by SDDC-Manager, and a UCP CI (non-vSAN) cluster, plus a hybrid cluster (having both vSAN VMFS|NFS datastores) that are also imported to VCF as VI Workloads. Also, a single instance of UCP Advisor which located on MGMT Domain can serve all VCF workloads.



Note: The VCF Import Tool keeps the respective vCenter appliance of each target cluster on the same cluster, and it will not relocate any vCenter from target cluster onto the MGMT Domain after the import and convert process. Unlike VCF greenfield deployment which keeps all vCenters under the MGMT Domain.

Conversion prerequisites

The following criteria must be met before conversion:

- Download required software from Broadcom support portal for converting or importing existing vSphere environment.
- All hosts should be identical.
- All hosts must be registered on vCenter/Cluster using their FQDN (Fully Qualified Domain Name).
- No Standard Switch on any host in cluster (even a Standard Switch without any uplink).
- Distributed virtual switch v.8.0.3 is required on the cluster that designated to be converted into a Management Workload Domain.
- HA must be enabled, and DRS need to be configured fully automated on the designated cluster.
- SFTP must be enabled on vCenter.
- The ESXi upgrade policy needs to be configured on the designated cluster.
- Make sure FIPS has been enabled on vCenter if you plan to use FIPS on SDDC manager.
- It is highly recommended that you Configure vSphere Lifecycle Manager Remediation Settings for Clusters or Standalone Hosts that You Manage with a Single Image instead of the baseline due to the baseline becoming deprecated.
- Network and Compute Requirements:

Component	Network Requirement	Compute Requirement
SDDC Manager (for convert only)	<ul style="list-style-type: none"> ▪ 1 management IP address with corresponding DNS entry ▪ Must be routable to all components 	<ul style="list-style-type: none"> ▪ 4 vCPU ▪ 16 Gb RAM ▪ 908 Gb disk (Thin Provisioned)
NSX Manager (optional)	<ul style="list-style-type: none"> ▪ 4 IP addresses in the same subnet as the associated vCenter Server with corresponding DNS entries <ul style="list-style-type: none"> • 3 × NSX Manager nodes • 1 × NSX Manager VIP 	<ul style="list-style-type: none"> ▪ Compute requirements for NSX will vary depending on the appliance size chosen. Review the NSX documentation for sizing guidance. ▪ For management domain NSX Managers will be deployed in the management domain vCenter Server ▪ NSX deployment requires a minim

Tasks to convert vSphere environments to a Management Domain in VCF

To convert an existing vSphere cluster into a Management Workload Domain in VCF follow the instruction in the following table.

Step	Task Name	Additional Info
1	Copy the VCF Import Tool to the Target vCenter Appliance	
2	Run a Precheck on the Target vCenter Before Conversion	The precheck determines if the environment can be converted to the management domain
3	Remove the VCF Import Tool from vCenter.	The convert operation is run from SDDC Manager, once deployed.
4	Generate an NSX Deployment Specification for Converting or Importing Existing vSphere Environments	Only required if you plan to deploy NSX during the convert operation.
5	Deploy the SDDC Manager Appliance on the Target vCenter	
6	Upload the Required Software to the SDDC Manager Appliance	

Step	Task Name	Additional Info
7	Run a Detailed Check on the Target vCenter Before Conversion or Import	
8	Convert or Import the vSphere Environment into the SDDC Manager Inventory	The workload domain will be marked type: MGMT
9	Add Licenses for Converted or Imported Workload Domains in SDDC Manager	
10	Validate a Converted Management Domain or Imported VI Workload Domain	

Tasks to Import vSphere environment as VI Workload in VCF

Use the following procedure if your environment already has SDDC Manager deployed and you want to import an existing vSphere environment as a VI Workload Domain.

Step	Task Name	Additional Info
1	Upload the Required Software to the SDDC Manager Appliance	
2	Generate an NSX Deployment Specification for Converting or Importing Existing vSphere Environments	Only required if you plan to deploy NSX during the import operation.
3	Run a Detailed Check on the Target vCenter Before Conversion or Import	
4	Convert or Import the vSphere Environment into the SDDC Manager Inventory.	The workload domain will be marked type: VI
5	Add Licenses for Converted or Imported Workload Domains in SDDC Manager	
6	Validate a Converted Management Domain or Imported VI Workload Domain	

Process overview

Convert an existing vSphere environment into a Management Domain

Use this procedure to convert an existing vSphere cluster into a Management Workload Domain in VCF. The following example illustrates the conversion process with the option to skip NSX deployment.

Procedure

1. Copy the VCF import Tool to the target vCenter.
2. Run the Precheck in the Target vCenter before conversion.
 - a. SSH to the vCenter Server VM as user **root**.
 - b. Navigate to the directory where you copied the VCF Import Tool.

For example:

```
cd /tmp/vcfimport/vcf_brownfield
```

- c. Run the following command to precheck the target vCenter:

```
python3 vcf_brownfield.py precheck --vcenter '<my-vcenter-address>' --sso-user '<my-sso-username>' --sso-password '<my-sso-password>'
```

```
root@vcenter: /tmp/vcfimport # cd /tmp/vcfimport/vcf_brownfield-import-8.2.0-2410878/vcf-brownfield-toolset/
root@vcenter: /tmp/vcfimport/vcf_brownfield-import-8.2.0-2410878/vcf-brownfield-toolset # python3 vcf_brownfield.py precheck --vcenter 'vcenter.vcenter.local' --sso-user 'admin@vcenter.local' --sso-password 'root'
[2024-08-30 20:17:19.421] [INFO] vcf_brownfield: Brownfield Import Tool: Version: 8.2.0-2410878
[2024-08-30 20:17:19.423] [INFO] vcf_brownfield: Starting VCF Brownfield precheck script: version 1.0.0...
[2024-08-30 20:17:19.519] [INFO] vcf_brownfield: Connected to vCenter vcenter.vcenter.local in 0.1 seconds
[2024-08-30 20:17:19.520] [INFO] vcf_brownfield: Summary generation for vCenter vcenter.vcenter.local...
[2024-08-30 20:17:19.520] [INFO] vcf_brownfield: [1/10] VC ROM version check... PASS
[2024-08-30 20:17:19.562] [INFO] vcf_brownfield: [2/10] SAN extension check... PASS
[2024-08-30 20:17:19.579] [INFO] vcf_brownfield: [3/10] Supported storage available check... PASS
[2024-08-30 20:17:19.644] [INFO] vcf_brownfield: [4/10] vCenter VM location check... PASS
[2024-08-30 20:17:19.647] [INFO] vcf_brownfield: [5/10] vCenter registration check... PASS
[2024-08-30 20:17:19.741] [INFO] vcf_brownfield: [6/10] SSO-T registration check... PASS
[2024-08-30 20:17:19.773] [INFO] vcf_brownfield: [7/10] Standalone host check... PASS
[2024-08-30 20:17:19.780] [INFO] vcf_brownfield: [8/10] All cluster hosts connected to vDS check... PASS
[2024-08-30 20:17:19.990] [INFO] vcf_brownfield: [9/10] FIM ring topology check... PASS
[2024-08-30 20:17:21.220] [INFO] vcf_brownfield: [10/10] VCF Import check... PASS
[2024-08-30 20:17:21.220] [INFO] vcf_brownfield: All pre-checks passed!
[2024-08-30 20:17:21.220] [INFO] vcf_brownfield: Pre-checks for vCenter vcenter.vcenter.local completed in 1.45 seconds
root@vcenter: /tmp/vcfimport/vcf_brownfield-import-8.2.0-2410878/vcf-brownfield-toolset #
```

3. Remove the VCF Import Tool from vCenter.
4. Generate an NSX Deployment Specification for converting or importing existing vSphere environments. (Deploying NSX Manager is optional. If you do not deploy NSX during a convert or import operation, you can always deploy it later).
 - a. Create a JSON file with the details of your NSX deployment.

```
{
  "license_key": "AAAAA-BBBBBB-CCCCC-DDDDD-EEEEEE",
  "form_factor": "medium",
  "admin_password": "VMw@rel!VMw@rel!",
  "install_bundle_path": "/nfs/vmware/vcf/nfs-mount/bundle/bundle-124941.zip",
  "cluster_ip": "172.16.11.71",
  "cluster_fqdn": "sfo-m01-nsx01.sfo.rainpole.io",
  "manager_specs": [
    {
      "fqdn": "sfo-m01-nsx01a.sfo.rainpole.io",
      "name": "sfo-m01-nsx01a",
      "ip_address": "172.16.11.72",
      "gateway": "172.16.11.1",
      "subnet_mask": "255.255.255.0"
    },
    {
      "fqdn": "sfo-m01-nsx01b.sfo.rainpole.io",
      "name": "sfo-m01-nsx01b",
      "ip_address": "172.16.11.73",
      "gateway": "172.16.11.1",
      "subnet_mask": "255.255.255.0"
    }
  ],
}
```

```
{
  "fqdn": "sfo-m01-nsx01c.sfo.rainpole.io",
  "name": "sfo-m01-nsx01c",
  "ip_address": "172.16.11.74",
  "gateway": "172.16.11.1",
  "subnet_mask": "255.255.255.0"
}]
}
```

- b. Replace the content in the sample JSON with the information for your environment.
 - c. Copy the completed JSON file into the SDDC Manager appliance.
5. Deploy the SDDC Manager appliance on the target vCenter.
 6. Upload the required software to the SDDC Manager appliance.
 - a. SSH to the SDDC Manager appliance as user `vcf`.
 - b. Copy the NSX deployment bundle `bundle-<buildnumber>.zip` to the `/nfs/vmware/vcf/nfs-mount/bundle/` folder.
 - c. Copy the VCF Import Tool to the SDDC Manager appliance.

- i. Create a folder for the VCF Import Tool.

For example:

```
mkdir /home/vcf/vcfimport
```

- ii. Copy `vcf-brownfield-import-<buildnumber>.tar.gz` to the folder.
 - iii. Navigate to the folder and extract the bundle.

```
tar -xvf vcf-brownfield-import-<buildnumber>.tar.gz
```

- iv. Navigate to the `vcf-brownfield-toolset` folder.

```
cd vcf-brownfield-import-<buildnumber>/vcf-brownfield-toolset
```

- v. Verify that the scripts extracted correctly.

```
python3 vcf_brownfield.py --help
```

7. Run a detailed check on the target vCenter before conversion or import.
 - a. SSH to the SDDC Manager appliance as user `vcf`.
 - b. Navigate to the directory where you copied the VCF Import Tool.

For example:

```
cd /home/vcf/vcfimport/vcf-brownfield-import-<software-version>/vcf-brownfield-toolset
```

- c. Run the following command to verify that the vSphere environment can be converted or imported.

```
python3 vcf_brownfield.py check --vcenter '<my-vcenter-address>' --sso-user '<my-sso-username>'
```

```
vcf@addo-mgmt [ ~/vcf-brownfield-import-5.2.0.0-24108578/vcf-brownfield-toolset ]$
vcf@addo-mgmt [ ~/vcf-brownfield-import-5.2.0.0-24108578/vcf-brownfield-toolset ]$ pwd
/home/vcf/vcf-brownfield-import-5.2.0.0-24108578/vcf-brownfield-toolset
vcf@addo-mgmt [ ~/vcf-brownfield-import-5.2.0.0-24108578/vcf-brownfield-toolset ]$ python3 vcf_brownfield.py check --vcenter 'vcsa-ha810.vsphere.local' --sso-user 'administrator@vpsphere.local'
[2024-09-04 22:26:09,478] [INFO] vcf_brownfield: Brownfield Import main version: 5.2.0.0-24108578
Enter vCenter SSO password:
Enter SDDC Manager local admin password:
[2024-09-04 22:26:10,395] [INFO] addc_manager_helper: Generating SDDC Manager public API token
[2024-09-04 22:26:10,445] [INFO] request_helper: Response status from SDDC Manager token generation: 200
[2024-09-04 22:26:10,521] [INFO] request_helper: Response status from retrieving domain: 200
[2024-09-04 22:26:10,521] [INFO] addc_manager_helper: Generating SDDC Manager public API token
[2024-09-04 22:26:10,560] [INFO] request_helper: Response status from SDDC Manager token generation: 200
[2024-09-04 22:26:10,561] [INFO] addc_manager_helper: Retrieving SDDC Manager controller info
[2024-09-04 22:26:10,561] [INFO] addc_manager_helper: Using cached SDDC Manager token header
[2024-09-04 22:26:10,619] [INFO] request_helper: Response status from SDDC Manager controller info retrieval: 200
[2024-09-04 22:26:10,621] [INFO] addc_manager_helper: Generating SDDC Manager public API token
[2024-09-04 22:26:10,659] [INFO] request_helper: Response status from SDDC Manager token generation: 200
[2024-09-04 22:26:10,659] [INFO] addc_manager_helper: Retrieving SDDC Manager trusted certificates
[2024-09-04 22:26:10,900] [INFO] request_helper: Response status from SDDC Manager token generation: 200
[2024-09-04 22:26:10,976] [INFO] request_helper: Response status from retrieving domain: 200
[2024-09-04 22:26:10,976] [INFO] addc_manager_helper: Using cached SDDC Manager token header
[2024-09-04 22:26:11,047] [INFO] request_helper: Response status from retrieving domain: 200
[2024-09-04 22:26:11,063] [INFO] vcf_brownfield: Going to check vCenter vcsa-ha810.vsphere.local
[2024-09-04 22:26:11,064] [INFO] addc_manager_helper: Retrieving SDDC Manager trusted certificates
[2024-09-04 22:26:11,564] [INFO] addc_manager_helper: Generating SDDC Manager public API token
[2024-09-04 22:26:11,566] [INFO] request_helper: Response status from SDDC Manager token generation: 200
[2024-09-04 22:26:11,574] [INFO] request_helper: Response status from retrieving trusted certificates: 200
[2024-09-04 22:26:11,600] [INFO] addc_manager_helper: Importing trusted certificates to SDDC Manager trust store
[2024-09-04 22:26:11,622] [INFO] request_helper: Response status from certificates import: 200
[2024-09-04 22:26:11,680] [INFO] request_helper: Response status from certificates refresh: 200
[2024-09-04 22:26:11,686] [INFO] addc_manager_helper: Retrieving SDDC Manager controller info
[2024-09-04 22:26:11,686] [INFO] addc_manager_helper: Using cached SDDC Manager token header
[2024-09-04 22:26:11,643] [INFO] request_helper: Response status from SDDC Manager controller info retrieval: 200
[2024-09-04 22:26:11,648] [INFO] addc_manager_helper: Retrieving pre-check engine datasource
[2024-09-04 22:26:11,700] [ERROR] request_helper: Result status code from get datasource: 400
[2024-09-04 22:26:11,700] [INFO] addc_manager_helper: Datasource already configured
[2024-09-04 22:26:11,731] [INFO] addc_manager_helper: Using cached SDDC Manager token header
[2024-09-04 22:26:11,778] [INFO] request_helper: Response status from retrieving domain: 200
[2024-09-04 22:26:11,811] [INFO] request_helper: Response status from trigger import guardrails: 202
[2024-09-04 22:26:11,908] [INFO] addc_manager_helper: monitor import guardrails - IN PROGRESS
[2024-09-04 22:26:16,594] [INFO] addc_manager_helper: monitor import guardrails - IN PROGRESS
[2024-09-04 22:26:22,032] [INFO] addc_manager_helper: monitor import guardrails - COMPLETED
[2024-09-04 22:26:22,078] [INFO] check_domain_reporter: local checks: 69, successful checks: 65, failed checks: 0, internal errors: 0
[2024-09-04 22:26:22,075] [INFO] check_domain: For more details, please, check:
failed guardrails YAML: /home/vcf/vcf-brownfield-import-5.2.0.0-24108578/vcf-brownfield-toolset/output/guardrails_report_vcsa-ha810.vsphere.local.yml
failed guardrails CSV: /home/vcf/vcf-brownfield-import-5.2.0.0-24108578/vcf-brownfield-toolset/output/guardrails_report_vcsa-ha810.vsphere.local.csv
All guardrails CSV: /home/vcf/vcf-brownfield-import-5.2.0.0-24108578/vcf-brownfield-toolset/output/guardrails_report_vcsa-ha810.vsphere.local_all.csv
vcf@addo-mgmt [ ~/vcf-brownfield-import-5.2.0.0-24108578/vcf-brownfield-toolset ]$
```

- d. If any checks fail, refer to the guardrails YAML file for information on the failed check. Refer to the troubleshooting section of this guide for more information on remediation.

8. Convert the vSphere environment into SDDC Manager Inventory.



Note: The following instructions skip NSX deployment.

- a. SSH to the SDDC Manager VM as user vcf.
- b. Navigate to the directory where you copied the VCF Import Tool.

For example:

```
cd /home/vcf/vcfimport/vcf-brownfield-import-<software-version>/vcf-brownfield-toolset
```

- c. Run the **vcf_brownfield.py** script and enter the required passwords when prompted.

```
python3 vcf_brownfield.py convert --vcenter '<vcenter-fqdn>' --sso-user '<sso-user>' --domain-name '<wld-domain-name>' --skip-nsx-deployment
```


Import an existing vSphere environment as a VI Workload Domain

The steps to import an existing vSphere environment as a VI Workload domain, are almost the same as the previous steps explained in *Convert an existing vSphere environment into a Management Domain*, except for the following:

- There is no need to deploy SDDC Manager (it must be already deployed).
- You need to run the following on SDDC Manager command to import a vSphere cluster as a VI Workload domain to the VCF environment:

```
python3 vcf_brownfield.py import --vcenter '<vcenter-fqdn>' --sso-user '<sso-user>' --domain-name '<wld-domain-name>' --skip-nsx-deployment
```

[Convert a vSphere Environment to a Management Domain or Import a vSphere Environment as a VI Workload Domain in VMware Cloud Foundation](#) provides more information about how to import an existing vSphere environment as a VI Workload Domain when the SDDC Manager is already deployed.

Common errors

The following is a list of the most common errors that you might face.

- The hosts are not registered with an FQDN on the target cluster.
- Having a Standard Switch even without having any uplink, on any host on the target cluster.
- The ESXi upgrade policy is not correctly configured.
- DRS is not enabled.
- Not having distributed virtual switch v.8.0.3 on the target cluster designated for convert into Management Workload Domain.
- The vSphere Lifecycle Manager remediation setting is not configured.
- There is a FIPS mismatch configuration between the vCenter on the target cluster and SDDC Manager.
- There is a time difference between SDDC Manager and the rest of the cluster members (NTP is not configured).

References

See the following references for more information:

- [VMware Cloud Foundation Administration Guide](#)
- [Introduction to the VMware Cloud Foundation Import Tool](#)
- [Convert a cluster or host that uses baseline into a cluster or a host that uses vSphere Lifecycle manager Images](#)

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