Managing Virtual SAN Clusters

This chapter contains the following sections:

- About Virtual SAN Clusters, page 2
- Creating Virtual SAN Pods, page 2
- Viewing Virtual SAN Pod Reports, page 3
- Viewing Virtual SAN Cluster Reports, page 4
- Configuring Virtual SAN settings at the Pod Level, page 4
- Creating Virtual SAN Clusters, page 5
- Expanding Virtual SAN Clusters, page 6
- Virtual SAN Clusters from a Bare Metal Server, page 6
- Assigning Virtual SAN Clusters to a Pod, page 10
- Enabling HA on Virtual SAN Clusters, page 11
- Disabling HA on Virtual SAN Clusters, page 11
- Enabling DRS on Virtual SAN Clusters, page 12
- Disabling DRS on Virtual SAN Clusters, page 12
- Viewing Virtual SAN Storage Profile Reports, page 13
- Creating Virtual SAN Storage Profiles, page 13
- Viewing Virtual SAN UCS Service Profile Templates, page 13
- Claiming Virtual SAN Disks, page 14
- Adding Disks to a Virtual SAN Disk Group, page 14
- Viewing Virtual SAN Disk Groups, page 15
- Viewing Virtual SAN Qualification Policy Reports, page 16
- Creating Virtual SAN Qualification Policies, page 16
- Qualifying Virtual SAN Capable Servers, page 16
- Viewing Virtual SAN Qualified Servers, page 17
About Virtual SAN Clusters

A virtual storage area network (Virtual SAN) cluster is a collection of virtualized local physical storage resources. A Virtual SAN cluster provides isolation among devices that are physically connected to the same fabric by abstracting them into storage pools.

Cisco UCS Director allows you to create a Virtual SAN storage profile to define the storage requirements for the files and disks of a virtual machine by specifying a set of required storage capabilities.

In Cisco UCS Director you can create Virtual SAN qualification policies. A Virtual SAN qualification policy allows you to filter a unique list of servers based on defined requirements that include server model, storage controller model, and a minimum number of solid state drives and hard disk drives. After creating a Virtual SAN qualification policy, you can use the policy to qualify Virtual SAN-capable servers based on the defined requirements.

Cisco UCS Director supports the following Virtual SAN features:

- Setup of Virtual SAN clusters for manually configured EXi nodes
- Inventory of existing Virtual SAN clusters
- Management of Virtual SAN clusters under the Cisco UCS Director tabs
- Creation of Virtual SAN storage profiles
- Mechanism to select virtual machine storage profiles
- Ability to select datastores matching storage profiles
- Virtual machine provisioning with Virtual SAN capable datastores

Creating Virtual SAN Pods

A Virtual SAN pod lets you manage your Virtual SAN with the addition of a VMware Cloud account and Cisco UCS Manager. The Virtual SAN Pod Wizard lets you create one pod. Each pod is limited to one VMware Cloud account and one Cisco UCS Manager account.
### Procedure

**Step 1** Choose Administration > Guided Setup.

**Step 2** Double-click the Virtual SAN Pod Configuration icon.

**Step 3** Click Next.

**Step 4** On the Pod screen, create or choose an existing pod.

**Step 5** Click Next.

**Step 6** On the Cisco UCS Manager screen, create a new Cisco UCS Manager account to add to the pod or choose an existing Cisco UCS Manager account.

You can use an existing Cisco UCS Manager account if you want the pod to reference an account that exists in Cisco UCS Director within another pod.

**Step 7** Click Next.

**Step 8** On the VMware screen, create a new VMware account to add to the pod or choose an existing VMware account.

You can use an existing VMware account if you want the pod to reference an account that exists in Cisco UCS Director within another pod.

While adding the VMware account, choose the Use SSO option and provide SSO credentials. SSO credentials are required for VM provisioning using storage profiles on the Virtual SAN cluster.

**Step 9** At the final wizard screen, review the summary information.

**Step 10** Click Submit.

### Viewing Virtual SAN Pod Reports

**Procedure**

**Step 1** Choose Hyper Converged > Virtual SAN.

**Step 2** On the Virtual SAN page, click Pods.

**Step 3** Click the row with the Virtual SAN pod for which you want to view the report.

**Step 4** Click View Details.

The Virtual SAN pod report provides information on Virtual SAN Clusters, Storage Profile, Service Profile Templates, Qualification Policies, and System Tasks. Alternately you can also view the Virtual SAN pod report by choosing the Virtual SAN pod on the Converged screen.
Viewing Virtual SAN Cluster Reports

Procedure

Step 1  Choose Hyper Converged > Virtual SAN.
Step 2  On the Virtual SAN page, click Pods.
Step 3  Click the row with the pod associated with the Virtual SAN cluster for which you want to view a report.
Step 4  Click View Details.
        All the Virtual SAN clusters related to the selected pod are displayed on the Clusters screen.
Step 5  Click the row with the Virtual SAN cluster for which you want to view a report.
Step 6  Click View Details to see the details of the Virtual SAN cluster.
        By default, the Summary screen appears. The Virtual SAN cluster report includes the Service Request,

Configuring Virtual SAN settings at the Pod Level

You can configure Virtual SAN settings at the pod level by editing the pod settings. You can select a bare
metal agent server, a UCS service profile template, a LAN boot policy, a scrub policy, and various networking
policies at the pod level. The selected defined networking policies are applied while creating the cluster in
the pod. The UCS service profile template, bare metal agent, LAN boot policy, and scrub policy are required
to support bare metal installation of ESXi on UCS servers.

Procedure

Step 1  Choose Hyper Converged > Virtual SAN.
Step 2  On the Virtual SAN page, click Pods.
Step 3  Click on the row with the Virtual SAN pod for which you want to configure the pod settings.
Step 4  Click Pod Settings.
Step 5  On the Pod Settings screen, select the bare metal agent servers, and select one or more UCS service profile
templates, LAN boot policies, and the scrub policies.
Step 6  Click Next.
Step 7  On the Network Policies screen, select one or more networking policies to apply at the pod level.
Step 8  Click Submit.
Creating Virtual SAN Clusters

Before You Begin

• Configure Virtual SAN pod settings.
  See Configuring Virtual SAN settings at the Pod Level, on page 4.

• Ensure that the Virtual SAN pod is associated with a VMware account and a Cisco UCS Manager account.

Procedure

Step 1 Choose Hyper Converged > Virtual SAN.
Step 2 On the Virtual SAN page, click Pods.
Step 3 Click the row with the Virtual SAN pod on which you want to create the Virtual SAN cluster.
Step 4 Click View Details.
Step 5 Click Virtual SAN Clusters.
Step 6 Click Create Virtual SAN Cluster.
Step 7 On the Create Virtual SAN Cluster screen, complete the fields for the host.
If you are creating a Virtual SAN cluster from a bare metal server, choose UCS Server or UCS Server Pool to install ESXi. Otherwise, choose ESXi Host.
If you choose ESXi Host, you must provide the host node IP addresses in a comma-separated list.
The Claim Disk Mode drop-down list lets you expand the cluster by adding disks. If automatic mode is selected, eligible disks from all hosts will be claimed automatically to contribute to the Virtual SAN datastore capacity. Manual mode creates a Virtual SAN cluster with a capacity of 0 GB, and you will have to manually add disks to the cluster.
Step 8 Click Next.
Step 9 Leave the DV Switch field empty, and click Next.
Note If you already have a Virtual SAN cluster created using Cisco UCS Director and would like to use the DV Switch created for it, select the existing DV Switch.
Step 10 Complete the fields for the data center and cluster name, and check Enable HA and Enable DRS if you want to enable HA or DRS on the Virtual SAN cluster.
Step 11 Click Next.
Step 12 Select the RAID mode and choose the MTU size.
  The default RAID mode is JBOD, and the default MTU size is 1500.
Step 13 Click Next.
Step 14 On the Summary screen, review the Service Profile Template Compliance report.
The compliance report verifies if the pre-requisites were met and if the UCS service profile template was configured properly. The compliance report verifies network configuration requirements, boot policy requirements, LAN boot policy requirements, scrub policy requirements, BIOS policy requirements, and local disk configuration policy requirements.
  If any of the fields are not compliant, you should edit the corresponding policy in the UCS service profile template so that they are compliant with all requirements.
Step 15 Click Submit.

The Virtual SAN cluster appears on the Virtual SAN Clusters screen of the Virtual SAN pod report.

Expanding Virtual SAN Clusters

When expanding a Virtual SAN Cluster, the HA and DRS settings will reflect those of the existing cluster.

For information on enabling or disabling HA on a Virtual SAN cluster, see Enabling HA on Virtual SAN Clusters, on page 11 and Disabling HA on Virtual SAN Clusters, on page 11.

For information on enabling or disabling DRS on a Virtual SAN cluster, see Enabling DRS on Virtual SAN Clusters, on page 12 and Disabling DRS on Virtual SAN Clusters, on page 12.

Procedure

Step 1 Choose Hyper Converged > Virtual SAN.
Step 2 On the Virtual SAN page, click Pods.
Step 3 Click the row with the Virtual SAN pod associated with the Virtual SAN Cluster that you want to expand.
Step 4 Click View Details.
   All the Virtual SAN clusters associated with the pod are displayed.
Step 5 Click the row with the Virtual SAN cluster that you want to expand.
Step 6 Click Expand Virtual SAN Cluster.
Step 7 In the Expand Virtual SAN Cluster screen, complete the fields for the UCS Server, UCS Server Pool, or ESXi host.
   If you are expanding a Virtual SAN cluster from a bare metal server, choose UCS Server or UCS Server Pool to install ESXi. Otherwise, choose ESXi Host.
   By default, the RAID mode and MTU size values are automatically populated from the values selected during the initial cluster configuration.
Step 8 Click Next, and click Submit.

Virtual SAN Clusters from a Bare Metal Server

Prerequisites for Creating a Virtual SAN from a Bare Metal Server

Before you create a Virtual SAN from a bare metal server, you must meet the following prerequisites.

VMware Virtual SAN Controller Requirements

For CISCO UCS 240 M3 Rack Servers, the storcliExtractor.sh script will automatically create a virtual RAID 0 drive for each physical HDD that VMware Virtual SAN uses.
To configure virtual RAID 0 with the LSI controller:

- Download the MegaRAID StorCLI software from the Avago Technologies website.
  For more information, see http://www.avagotech.com/support/download-search/.
- Run the `storcliExtractor.sh` script located in the `opt/scripts` directory.
  The `storcliExtractor.sh` script extracts the downloaded MegaRAID StorCLI software and makes it available for use. The script is available with the Cisco UCS Director Bare Metal Agent, Release 5.2 patch.

**UCS Service Profile Template Configuration Requirements**

The following UCS service profile template configuration is required for bare metal server actions and workflows.

This configuration does not include all Cisco UCS service profile settings. The settings shown here are specific to an implementation of Cisco UCS with VMware Virtual SAN.

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**Note**

You must create a new UCS service profile template. Cisco UCS with VMware Virtual SAN implementation does not support updating an existing UCS service profile template.

When creating a Virtual SAN UCS service profile template, the template should not be associated with any server pool. You can select the **Assign Later** option in the server pool template, to assign the server pool to the Virtual SAN service profile.

For more information on creating a Virtual SAN UCS service profile template, see About Virtual SAN UCS Service Profile Templates.

**BIOS Policy Requirements**

Cisco UCS C240 M3 servers require a BIOS policy with the USB UI, USBPort:SDCard advanced setting set to Enable.

**Network Configuration Requirements**

Make sure that three vNICs are defined in the template. Cisco UCS Director Virtual SAN workflows define the management on the first vNIC during the ESXi installation. The next two vNICs are used in explicit failover order for the Virtual SAN traffic.

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**Note**

If the vNICs have different VLANs specified, make sure that the vNICs are ordered, and that the first vNIC satisfies the PXE VLANs requirement.

Virtual SAN requires that multicast is enabled on the network. You must define a multicast policy and make sure that the Virtual SAN VLAN is set to use the defined multicast policy.

You can configure jumbo Maximum Transition Unit (MTU) end-to-end across Cisco Data Center devices in a network.

For more information on setting up Cisco uplink switches, see:


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VLANs and MAC pools must be created and configured prior to service profile creation, and the VLAN must have a multicast policy enabled. You must create the boot policy with a Secure Digital (SD) card as the preferred boot option, and dedicated VMkernel ports are used for VSAN and vMotion traffic.

**Boot Policy Requirements**

Cisco UCS Director Virtual SAN workflows support installing ESXi with an SD card. The UCS service profile template should specify the SD card as a boot device in the boot order. You must define a boot policy with the boot order SD card and set boot policy to the UCS service profile template.

**Local Disk Configuration Policy Requirements**

Different Mode settings are required based on the server and storage controller RAID Mode.

To use an SD card, the FlexFlash state must be set to Enable.

**LAN Boot Policy Requirement for Virtual SAN**

You must define a boot policy with the LAN on the first vNIC defined in the UCS service profile template configuration set first in the boot order.

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**Creating Virtual SAN Clusters from a Bare Metal Server**

You can create a Virtual SAN cluster from a bare metal server.

**Before You Begin**

- Create a Virtual SAN pod with Cisco UCS Manager and VMware accounts.
- Add a Cisco UCS Director Bare Metal Agent account, configure DHCP, and start services.
- Configure the pod settings with bare metal agent, UCS service profile template, and policies.
- Complete the prerequisites for creating a Virtual SAN from a bare metal server.
- Download the ESXi images and run the `isoExtractor.sh` script.

You must select ESXi 5.5 VSAN template as the OS type. The OS catalog names created are selected when creating a Virtual SAN cluster form a bare metal server.

For more information about adding a Cisco UCS Director Bare Metal Agent account, see the *Cisco UCS Director Bare Metal Agent Installation and Configuration Guide*. 
Procedure

Step 1  Choose Hyper Converged > Virtual SAN.

Step 2  On the Virtual SAN page, click Pods.

Step 3  Click the row with the Virtual SAN pod on which you want to create the Virtual SAN cluster.

Step 4  Click View Details.

Step 5  Click Virtual SAN Clusters.

Step 6  Click Create Virtual SAN Cluster.

Step 7  On the Create Virtual SAN Cluster screen, complete the fields for the host. Choose UCS Server or UCS Server Pool to install ESXi on the bare metal server. The Claim Disk Mode drop-down list lets you expand the cluster by adding disks. If automatic mode is selected, eligible disks from all hosts will be claimed automatically to contribute to the Virtual SAN datastore capacity. Manual mode creates a Virtual SAN cluster with a capacity of 0 GB, and you will have to manually add disks to the cluster.

Step 8  Select an existing DV Switch, choose the network policies you want to use.

Note  The selection of an existing DV Switch is optional. If a DV Switch is not selected, a new DV Switch will be created as part of the cluster.

Step 9  Click Next.

Step 10  Complete the fields for the data center and cluster name, and check Enable HA and Enable DRS if you want to enable HA or DRS on the Virtual SAN cluster.

Step 11  Click Next.

Step 12  Select the RAID mode, and click Next.

The default RAID mode is JBOD.

Step 13  In the Summary pane, review the Service Profile Template Compliance report. The compliance report verifies if the pre-requisites were met and if the UCS service profile template was configured properly. The compliance report verifies network configuration requirements, boot policy requirements, LAN boot policy requirements, scrub policy requirements, BIOS policy requirements, and local disk configuration policy requirements.

If any of the fields are not compliant, you should edit the corresponding policy in the UCS service profile template so that they are compliant with all requirements.

Step 14  Click Submit.

The Virtual SAN cluster appears on the Clusters screen of the Virtual SAN pod report.

Expanding Virtual SAN Clusters from a Bare Metal Server

When expanding a Virtual SAN Cluster from a bare metal server, the HA and DRS settings will reflect those of the existing cluster.

For information on enabling or disabling HA on a Virtual SAN cluster, see Enabling HA on Virtual SAN Clusters, on page 11 and Disabling HA on Virtual SAN Clusters, on page 11.
For information on enabling or disabling DRS on a Virtual SAN cluster, see Enabling DRS on Virtual SAN Clusters, on page 12 and Disabling DRS on Virtual SAN Clusters, on page 12.

### Procedure

<table>
<thead>
<tr>
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</tr>
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<td>Choose <strong>Hyper Converged &gt; Virtual SAN</strong>.</td>
</tr>
<tr>
<td>Step 2</td>
<td>On the <strong>Virtual SAN</strong> page, click <strong>Pods</strong>.</td>
</tr>
<tr>
<td>Step 3</td>
<td>Click the row with the Virtual SAN pod associated with the Virtual SAN Cluster that you want to expand.</td>
</tr>
<tr>
<td>Step 4</td>
<td>Click <strong>View Details</strong>. All the Virtual SAN clusters associated with the pod are displayed.</td>
</tr>
<tr>
<td>Step 5</td>
<td>Click the row with the Virtual SAN cluster that you want to expand.</td>
</tr>
<tr>
<td>Step 6</td>
<td>Click <strong>Expand Virtual SAN Cluster</strong>.</td>
</tr>
<tr>
<td>Step 7</td>
<td>On the <strong>Expand Virtual SAN Cluster</strong> screen, complete the host details field. Choose <strong>UCS Server</strong> or <strong>UCS Server Pool</strong> to install ESXi on the bare metal server. By default, the RAID mode and MTU size values are automatically populated from the values selected during the initial cluster configuration. You have the option to change the RAID mode from the drop-down menu. <strong>Note</strong> A warning message appears if you change the RAID mode to a value different from the RAID mode selected during the initial cluster configuration.</td>
</tr>
<tr>
<td>Step 8</td>
<td>Click <strong>Next</strong>, and click <strong>Submit</strong>.</td>
</tr>
</tbody>
</table>

### Assigning Virtual SAN Clusters to a Pod

You can discover existing Virtual SAN clusters and assign them to an existing Virtual SAN pod.

#### Procedure

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<td>Step 2</td>
<td>On the <strong>Virtual SAN</strong> page, click <strong>Pods</strong>.</td>
</tr>
<tr>
<td>Step 3</td>
<td>Click the row with the Virtual SAN pod to which you want to assign a Virtual SAN cluster.</td>
</tr>
<tr>
<td>Step 4</td>
<td>Click <strong>View Details</strong>.</td>
</tr>
<tr>
<td>Step 5</td>
<td>Click <strong>Virtual SAN Clusters</strong>.</td>
</tr>
<tr>
<td>Step 6</td>
<td>Click <strong>Assign Cluster(s) to Pod</strong>. The <strong>Assign Cluster(s) to Pod</strong> screen displays all Virtual SAN clusters discovered from existing VMware vCenter accounts added in Cisco UCS Director.</td>
</tr>
<tr>
<td>Step 7</td>
<td>In the <strong>Assign Cluster(s) to Pod</strong> screen, select one or more Virtual SAN clusters and click <strong>Submit</strong>. The assigned Virtual SAN cluster appears on the <strong>Virtual SAN Clusters</strong> details screen for the selected pod.</td>
</tr>
</tbody>
</table>
Enabling HA on Virtual SAN Clusters

Cisco UCS Director lets you enable VMware vSphere HA on Virtual SAN Clusters. You can enable HA when creating a new Virtual SAN cluster, or enable HA on an existing Virtual SAN cluster. When enabling HA on an existing Virtual SAN cluster, host monitoring and admission control are automatically enabled by default to ensure that there are sufficient resources available in a cluster when recovering from a failure.

Procedure

Step 1 Choose Hyper Converged > Virtual SAN.
Step 2 On the Virtual SAN page, click Pods.
Step 3 Click the row with the Virtual SAN pod associated with the Virtual SAN cluster on which you want to enable HA.
Step 4 Click View Details.
   All the Virtual SAN clusters associated with the pod are displayed.
Step 5 Click the row with the Virtual SAN cluster on which you want to enable HA.
Step 6 Click Enable HA.
Step 7 In the Enable HA screen, choose the Host Isolation Response, VM Monitoring, and Datastore Heartbeating options.
Step 8 Click Submit.

Disabling HA on Virtual SAN Clusters

Procedure

Step 1 \nStep 2 Choose Hyper Converged > Virtual SAN.
Step 3 On the Virtual SAN page, click Pods.
Step 4 Click the row with the Virtual SAN pod associated with the Virtual SAN cluster on which you want to disable HA.
Step 5 Click View Details.
   All the Virtual SAN clusters associated with the pod are displayed.
Step 6 Click the row with the Virtual SAN cluster on which you want to disable HA.
Step 7 Click Disable HA.
Step 8 In the Disable HA screen, click Submit.
Enabling DRS on Virtual SAN Clusters

Cisco UCS Director lets you enable VMware Distributed Resource Scheduler (DRS) on Virtual SAN Clusters. You can enable DRS when creating a new Virtual SAN cluster, or enable DRS on an existing Virtual SAN cluster. When enabling DRS on an existing Virtual SAN cluster you can specify the DRS automation level.

For more information on using DRS affinity rules and automation levels, see About VMware Distributed Resource Scheduler.

Procedure

Step 1 Choose Hyper Converged > Virtual SAN.
Step 2 On the Virtual SAN page, click Pods.
Step 3 Click the row with the Virtual SAN pod associated with the Virtual SAN cluster on which you want to enable DRS.
Step 4 Click View Details.
   All the Virtual SAN clusters associated with the pod are displayed.
Step 5 Click the row with the Virtual SAN cluster on which you want to enable DRS.
Step 6 Click Enable DRS.
Step 7 In the Enable DRS screen, check the Enable DRS checkbox and select the DRS automation level.
Step 8 Click Submit.

Disabling DRS on Virtual SAN Clusters

Procedure

Step 1 Choose Hyper Converged > Virtual SAN.
Step 2 On the Virtual SAN page, click Pods.
Step 3 Click the row with the Virtual SAN pod associated with the Virtual SAN cluster on which you want to disable DRS.
Step 4 Click View Details.
   All the Virtual SAN clusters associated with the pod are displayed.
Step 5 Click the row with the Virtual SAN cluster on which you want to disable DRS.
Step 6 Click Disable DRS.
Step 7 In the Disable DRS screen, click Submit.
Viewing Virtual SAN Storage Profile Reports

Procedure

Step 1 Choose Hyper Converged > Virtual SAN.
Step 2 On the Virtual SAN page, click Pods.
Step 3 Click the row with the Virtual SAN pod for which you want to view the storage profile.
Step 4 Click View Details.
Step 5 Click Storage Profile. All the Virtual SAN storage profiles displayed in Cisco UCS Director are at cloud-level and are associated with a selected pod.
Step 6 Click the row with the Virtual SAN storage profile you want to view.
Step 7 Click View Details to see the details of the Virtual SAN storage profile.

Creating Virtual SAN Storage Profiles

Procedure

Step 1
Step 2 Choose Hyper Converged > Virtual SAN.
Step 3 On the Virtual SAN page, click Pods.
Step 4 Click the row with the Virtual SAN pod.
Step 5 Click View Details.
Step 6 Click Storage Profile.
Step 7 Click Create Virtual SAN Storage Profile.
Step 8 In the Create Storage Profile screen, enter the storage profile name, the storage profile description, and complete the rule-set fields based on vendor-specific capabilities.
Step 9 Click Submit.

Viewing Virtual SAN UCS Service Profile Templates

Before You Begin
Create a Virtual SAN UCS service profile template.
See About Virtual SAN UCS Service Profile Templates.
See Creating Virtual SAN UCS Service Profile Templates.
### Procedure

**Step 1** Choose Hyper Converged > Virtual SAN.

**Step 2** On the Virtual SAN page, click Pods.

**Step 3** Click the row with the Virtual SAN pod for which you want to view the UCS Virtual SAN service profile templates.

**Step 4** Click View Details.

**Step 5** Click the Service Profile Template.

**Step 6** Click the row with the Virtual SAN UCS service profile template.

**Step 7** Click View Details.

By default, the Summary screen appears. You can also view related local disk configuration policy, boot policy, vNIC, scrub policy and BIOS policy details, respectively, by clicking Local Disk Configuration Policies, Boot Policies, vNICs, Scrub Policy, or BIOS Policy.

### Claiming Virtual SAN Disks

At the Virtual SAN cluster level, you can claim disks to create shared storage across multiple hosts.

**Procedure**

**Step 1** Choose Hyper Converged > Virtual SAN.

**Step 2** On the Virtual SAN page, click Pods.

**Step 3** Click the row with the Virtual SAN pod associated with the Virtual SAN cluster.

**Step 4** Click View Details.

**Step 5** Click the row with the Virtual SAN cluster.

**Step 6** Click Claim Disk.

The dialog box displays all of the hosts with available unused data disks.

**Step 7** In the Claim Disk screen, choose the disks you want to claim, and click Submit.

The all disks will appear on the Disks screen under the selected Virtual SAN cluster report.

### Adding Disks to a Virtual SAN Disk Group

You can add a disk group to a Virtual SAN disk group.
### Procedure

**Step 1** Choose Hyper Converged > Virtual SAN.
**Step 2** On the Virtual SAN page, click Pods.
**Step 3** Click the row with the Virtual SAN pod associated with the Virtual SAN host.
**Step 4** Click View Details.
   All the Virtual SAN clusters associated with the pod are displayed.
**Step 5** Click the row with the Virtual SAN cluster.
**Step 6** Click View Details.
**Step 7** Click Disk Groups.
   All of the disk groups associated with the Virtual SAN cluster are displayed.
**Step 8** Click Add Disks to Disk Group.
**Step 9** In the Add disks to Disk Group screen, select the disks to add to the Virtual SAN disk group.
**Step 10** Click Submit.

### Viewing Virtual SAN Disk Groups

**Procedure**

**Step 1** Choose Hyper Converged > Virtual SAN.
**Step 2** On the Virtual SAN page, click Pods.
**Step 3** Click the row with the Virtual SAN pod associated with the Virtual SAN cluster.
**Step 4** Click View Details.
   All the Virtual SAN clusters associated with the pod are displayed.
**Step 5** Click the row with the Virtual SAN cluster.
**Step 6** Click View Details.
**Step 7** Click Disk Groups to view the details for the disk groups associated with the Virtual SAN cluster.
Viewing Virtual SAN Qualification Policy Reports

**Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Choose <strong>Hyper Converged &gt; Virtual SAN</strong>.</td>
</tr>
<tr>
<td>2</td>
<td>On the <strong>Virtual SAN</strong> page, click <strong>Pods</strong>.</td>
</tr>
<tr>
<td>3</td>
<td>Click the row with the Virtual SAN pod for which you want to view the Virtual SAN qualification policy report.</td>
</tr>
<tr>
<td>4</td>
<td>Click <strong>View Details</strong>.</td>
</tr>
<tr>
<td>5</td>
<td>Click <strong>Qualification Policies</strong>. All the Virtual SAN qualification policies associated with the pod are displayed.</td>
</tr>
</tbody>
</table>

Creating Virtual SAN Qualification Policies

You can create and define a qualification policy at the pod level. You can create new qualification policies with different combinations of server qualifications depending on your requirements.

**Procedure**

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</tr>
<tr>
<td>2</td>
<td>On the <strong>Virtual SAN</strong> page, click <strong>Pods</strong>.</td>
</tr>
<tr>
<td>3</td>
<td>Click the row with the Virtual SAN pod on which you want to create the Virtual SAN qualification policy and then click <strong>View Details</strong>.</td>
</tr>
<tr>
<td>4</td>
<td>Click <strong>Qualification Policies</strong>.</td>
</tr>
<tr>
<td>5</td>
<td>Click <strong>Create Virtual SAN Qualification Policy</strong>.</td>
</tr>
<tr>
<td>6</td>
<td>On the <strong>Create Virtual SAN Qualification Policy</strong> screen, in the <strong>Standard Policy</strong> drop-down menu, choose <strong>None</strong>, <strong>Standard M3 Policy</strong>, or <strong>Standard M4 Policy</strong>, and complete the fields for the qualification policy. If you choose <strong>Standard M3 Policy</strong> or <strong>Standard M4 Policy</strong>, the <strong>Server Model PID (Regex)</strong>, <strong>Storage Controller Model (Regex)</strong>, <strong>SSD count</strong>, and <strong>HDD Count</strong> fields are automatically populated.</td>
</tr>
<tr>
<td>7</td>
<td>Click <strong>Submit</strong>.</td>
</tr>
</tbody>
</table>

Qualifying Virtual SAN Capable Servers

After you create a Virtual SAN qualification policy, perform the following procedure to qualify any Virtual SAN-capable servers.
**Procedure**

**Step 1** Choose Hyper Converged > Virtual SAN.

**Step 2** On the Virtual SAN page, click Pods.

**Step 3** Click the row with the Virtual SAN pod for which you want to qualify any Virtual SAN-capable servers.

**Step 4** Click View Details.

**Step 5** Click Qualification Policies.

**Step 6** Click Run Qualification Task.

**Step 7** On the Run Qualification Task screen, click Submit.

The Virtual SAN-qualified servers are added to the server pool.

---

**Viewing Virtual SAN Qualified Servers**

**Procedure**

**Step 1** Choose Physical > Compute.

**Step 2** Expand the pod and then click the Cisco UCS Manager account.

**Step 3** Click Organizations.

**Step 4** Click the row with the organization that contains the server pool.

**Step 5** Click View Details.

**Step 6** Click Server Pools.

**Step 7** Click the row with the server pool to which you have added the qualified Virtual SAN servers.

**Step 8** Click View Details.

**Step 9** Click UCS Servers to view all Virtual SAN servers qualified using the Virtual SAN qualification policy.

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**Adding Virtual SAN Qualified Servers to a Virtual SAN Cluster**

After you qualify any Virtual SAN capable servers, you can add the discovered servers to a Virtual SAN cluster.
**Viewing Virtual SAN System Tasks**

**Procedure**

**Step 1** Choose Hyper Converged > Virtual SAN.

**Step 2** On the Virtual SAN page, click Pods.

**Step 3** Click the row with the Virtual SAN pod on which you want to create the Virtual SAN cluster.

**Step 4** Click View Details.

**Step 5** Click Virtual SAN Clusters.

**Step 6** Click Create Virtual SAN Cluster.

**Step 7** On the Create Virtual SAN Cluster screen, choose UCS Server Pool from the Scope drop-down menu.

**Step 8** Click the Select button to select the discovered Virtual SAN qualified servers to add to the Virtual SAN cluster.

**Step 9** Complete the fields for the host, data center, cluster details, and RAID mode. The default RAID mode is JBOD.

**Step 10** Click Submit.

---

**Viewing Virtual SAN Hardware Topologies**

You can view the hardware topology for a Virtual SAN cluster. This topology view displays the connectivity between the cluster, hosts, and VMs.

---

**What to Do Next**

For more information on executing, enabling, and disabling system tasks, see the Cisco UCS Director Administration Guide.
**Procedure**

**Step 1** Choose Hyper Converged > Virtual SAN.

**Step 2** On the Virtual SAN page, click Pods.

**Step 3** Click the row with the Virtual SAN pod associated with the Virtual SAN cluster.

**Step 4** Click View Details.

All the Virtual SAN clusters associated with the pod are displayed.

**Step 5** Click the row with the Virtual SAN cluster.

**Step 6** Click View Details.

**Step 7** Click Topology.

**Step 8** Click the row with the topology.

**Step 9** Click Sync Topology, and click Submit and Ok to refresh the topology report.

The Sync Status column displays the current status of the topology sync.

**Step 10** Click View Connectivity.

The Topology View - Host VM Mapping screen displays the Virtual SAN cluster and associated hosts, and the VMs associated with the host.

**Step 11** If desired, you can modify the following view options:

- **View Mode** drop down list -- Adjusts the spacing and positioning of the devices. The mode determines which options are available for you to customize the topology view. You can choose between the following view modes:
  - Hierarchical
  - Concentric
  - Circular
  - Force Directed

- **Allow Item Spacing** check box -- Increases the distance between devices for the Hierarchical view mode.

---

**Moving Virtual SAN Hosts to Maintenance Mode**

Cisco UCS Director lets you move Virtual SAN hosts to the following maintenance modes:

- **Ensure accessibility** -- This is the default host maintenance mode. All accessible virtual machines on the host remain accessible when the host is either powered off or removed from the cluster. Partial data migration is performed.

- **Full data migration** -- This host maintenance mode consumes the most time and resources. VMware Virtual SAN moves all data to other hosts in the cluster and fixes availability compliance for the affected components in the cluster. This option can be used to permanently migrate a host. The host cannot enter maintenance mode if a virtual machine object has data on the host, and is not accessible and cannot be
fully migrated. When migrating data from the last host in the cluster, you must make sure that you migrate the virtual machines to another datastore, and then put the host in maintenance mode.

• No data migration -- This host maintenance mode does not migrate any data from the host. If the host is powered off or removed from the cluster, some virtual machines may become inaccessible.

Before You Begin
Before you move a Virtual SAN host to maintenance mode, you must note the following:

• All associated virtual machines should be powered off. The task fails if any associated virtual machines are not powered off.
• The task moves all the virtual machines to other hosts in the cluster.
• The virtual machines should migrate storage to other hosts in the cluster. You should verify the data before and after moving the host to maintenance mode.

Procedure

Step 1 On the menu bar, choose HyperConverged > Virtual SAN.
Step 2 Choose Hyper Converged > Virtual SAN.
Step 3 On the Virtual SAN page, click Pods.
Step 4 Click the row with the Virtual SAN pod associated with the Virtual SAN host.
Step 5 Click View Details.
All the Virtual SAN clusters associated with the pod are displayed.
Step 6 Click the row with the Virtual SAN cluster that you want to move to maintenance mode.
Step 7 Click Move Host To Maintenance Mode.
Step 8 On the Move Host To Maintenance Mode screen choose the Host Node, and in the Maintenance Mode drop-down menu, choose Ensure accessibility, Full data migration, or No data migration.
Step 9 Click Submit.

Decommissioning Virtual SAN Hosts
Cisco UCS Director lets you decommission a Virtual SAN host from a Virtual SAN cluster. The Decommission Host action completely removes a host from a cluster by performing the following tasks:

• Puts the Virtual SAN host node into maintenance mode.
• Removes the Virtual SAN host from any associated DV Switch.
• Removes the Virtual SAN host from the Virtual SAN cluster and VMware vCenter.

In the Decommission Host screen, you can also select the following decommission options:

• Disassociate UCS Service Profile - This option lets you decommission the Virtual SAN host from the Virtual SAN cluster, and also disassociates the respective UCS Service profile from Cisco UCS Manager.
• Delete UCS Service Profile - This option lets you decommission the Virtual SAN host from the Virtual SAN cluster, and also disassociates and deletes the respective UCS Service profile from Cisco UCS Manager.

**Note**

You cannot decommission a Virtual SAN host from a Virtual SAN cluster that is running with the minimum number of required nodes.

**Procedure**

**Step 1** Choose Hyper Converged > Virtual SAN.
**Step 2** On the Virtual SAN page, click Pods.
**Step 3** Click the row with the Virtual SAN pod associated with the Virtual SAN host.
**Step 4** Click View Details.
All the Virtual SAN clusters associated with the pod are displayed.
**Step 5** Click the row with the Virtual SAN cluster from which you want to decommission the Virtual SAN host.
**Step 6** Click View Details.
**Step 7** Click Hosts.
All the Virtual SAN hosts associated with the cluster are displayed.
**Step 8** Click the row with the Virtual SAN host that you want to decommission from the Virtual SAN cluster.
**Step 9** Click Decommission Host.
**Step 10** On the Decommission Host screen, enter the host password and check one of the following options:

- Decommission Host
- Disassociate UCS Service Profile
- Delete UCS Service Profile

**Step 11** Click Submit.

**Decommissioning Virtual SAN Clusters**

Cisco UCS Director lets you decommission a Virtual SAN cluster from VMware vCenter. The Decommission Cluster action completely removes a Virtual SAN cluster from VMware vCenter by performing the following tasks:

- Turns off the Virtual SAN host.
- Cleans up the Virtual SAN host.
- Removes the Virtual SAN host from any associated DV Switch.
- Deletes any associated DV Switch and DV port group.
- Deregisters the host and removes the Virtual SAN cluster from VMware vCenter.
• Disassociates and deletes any associated UCS service profiles from Cisco UCS Manager.

Note
You cannot decommission a Virtual SAN cluster from VMware vCenter if any VMs exist on the Virtual SAN Cluster.

Procedure

Step 1 Choose Hyper Converged > Virtual SAN.
Step 2 On the Virtual SAN page, click Pods.
Step 3 Click the row with the Virtual SAN pod associated with the Virtual SAN cluster that you want to decommission from VMware vCenter.
Step 4 Click View Details.
All the Virtual SAN clusters associated with the pod are displayed.
Step 5 Click decommission Cluster.
Step 6 Click Decommission Cluster.
Step 7 On the Decommission Cluster screen, enter the host password and check one of the following options:
  • Decommission Hosts
  • Disassociate UCS Service Profiles
  • Delete UCS Service Profiles

Note
All of the hosts in the cluster should have the same host password.
Checking Disassociate UCS Service Profiles also checks the Decommission Hosts option. Checking Delete UCS Service Profiles also checks the Disassociate UCS Service Profiles and Decommission Hosts options.
Step 8 Check Delete DVS Switch to delete any associated DV Switch and DV port group.
Step 9 Click Submit.

Managing Infrastructure as a Service for Virtual SAN

You can manage all of your Virtual SAN infrastructure resources on the IaaS screen. By viewing the details of a Virtual SAN pod, you can manage the following:
  • Virtual Machines (VMs)
  • Virtual Data Centers (VDCs)
  • Catalogs
Procedure

**Step 1** Choose Hyper Converged > Virtual SAN.
**Step 2** On the Virtual SAN page, click IaaS.
**Step 3** Click the row with the Virtual SAN pod.
**Step 4** Click View Details.

By default, the VMs page appears. You can power on, power off, or view the details of an associated VM. You can also view the VDC and catalog details by clicking vDC and Catalog. All VM-level actions are supported.

Creating a Virtual SAN Virtual Data Center

You can create a Virtual SAN Virtual Data Center (VDC) that combines Virtual SAN resources, operation details, rules, and policies to manage specific Virtual SAN group requirements. The Virtual SAN VDC creation wizard enables you to configure the policies required to provision Virtual SAN VMs in the private cloud associated with the selected pod.

**Before You Begin**
Ensure that you have added a virtual account in the Virtual SAN pod.

Procedure

**Step 1** Choose Hyper Converged > Virtual SAN.
**Step 2** On the Virtual SAN page, click IaaS.
**Step 3** Click the row with the Virtual SAN pod.
**Step 4** Click View Details.

By default, the VMs page appears. All the VMs associated with the Virtual SAN pod are displayed.
**Step 5** Click vDC.
**Step 6** Click Virtual SAN vDC Creation Wizard.

Using the wizard, you can create VDC virtual policies, and configure the service delivery policies. By default, this wizard automatically creates standard VDC compute, network, and storage policies for the Virtual SAN cluster. You can also select an existing or create a new system, computing, and networking policy for the Virtual SAN cluster.

If you check the Use Linked Clone check box to use a linked clone, the linked clone is set in the storage policy automatically created for the Virtual SAN vDC.

To edit the policies for your specific needs, choose Policies > Virtual/Hypervisor Policies.

**What to Do Next**
Once you create the Virtual SAN VDC, you can select or modify the VDC.
Creating Virtual SAN Catalogs

You can create a Virtual SAN standard catalog solely for the cloud that is associated with the selected pod. The Virtual SAN Add Catalog screen provides the same functionality as the Add Catalog screen available under Policies, but displays only VMware standard catalogs and it associates the catalog with the selected pod.

For more information on adding a catalog, see the Cisco UCS Director Administration Guide.

Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Choose Hyper Converged &gt; Virtual SAN.</td>
</tr>
<tr>
<td>Step 2</td>
<td>On the Virtual SAN page, click IaaS.</td>
</tr>
<tr>
<td>Step 3</td>
<td>Click the row with the Virtual SAN pod.</td>
</tr>
<tr>
<td>Step 4</td>
<td>Click View Details. All the VMs associated with the Virtual SAN pod are displayed.</td>
</tr>
<tr>
<td>Step 5</td>
<td>Click the Catalog.</td>
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<tr>
<td>Step 6</td>
<td>Click Add.</td>
</tr>
<tr>
<td>Step 7</td>
<td>On the Basic Information screen, complete the required fields and click Next. The standard catalog type and cloud name are pre-selected. You can also choose to provision new VMs using an ISO image.</td>
</tr>
<tr>
<td>Step 8</td>
<td>On the Application Details screen, complete the fields, and click Next.</td>
</tr>
<tr>
<td>Step 9</td>
<td>On the User credentials screen, specify the VM user credential access options, and click Next.</td>
</tr>
<tr>
<td>Step 10</td>
<td>On the Customization screen, specify customization options and custom actions, and click Next.</td>
</tr>
<tr>
<td>Step 11</td>
<td>On the VM Access pane, specify whether end users will have access to the VM, and click Next.</td>
</tr>
<tr>
<td>Step 12</td>
<td>On the Summary pane, review the catalog information and click Submit.</td>
</tr>
</tbody>
</table>

What to Do Next

Once you create the Virtual SAN catalog, you can select the catalog and create a service request or modify the catalog.

Provisioning VMs using Virtual SAN VDC Policies

Once you create a Virtual SAN catalog, you can create a service request to provision VMs on the Virtual SAN cluster using the VDC policies defined for the cluster. The Create Service dialog lets you provision VMs based on values specific to the Virtual SAN clusters and VDC policies that are defined at the pod level.

For more information on creating a service request, see the Cisco UCS Director Administration Guide.
**Procedure**

**Step 1** Choose **Organizations > Service Requests**.

**Step 2** On the **Service Requests** page, click **Service Requests**.

**Step 3** Click **Create Request**.

**Step 4** Choose the catalog type, and click **Submit**.

**Step 5** On the **Create Service** screen, complete the required fields and choose the Virtual SAN catalog.

**Step 6** Click **Next**.

**Step 7** On the **Provisioning Configuration** screen, choose the Virtual SAN VDC and complete the required fields.

**Step 8** Click **Next**.

**Step 9** Review the summary for the service request.

**Step 10** Click **Submit**.
Provisioning VMs using Virtual SAN VDC Policies