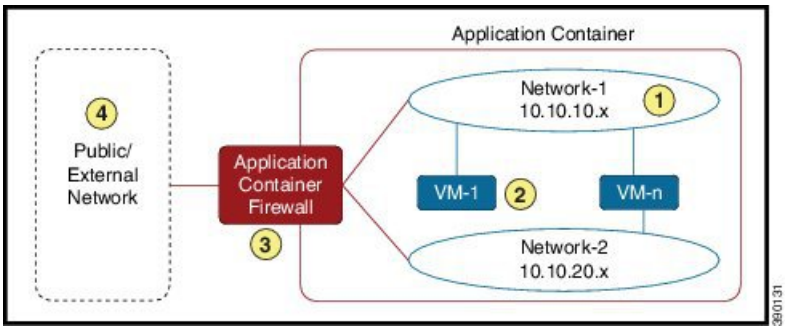
Setting Up a Fenced Virtual Container

This chapter contains the following sections:

Fenced Virtual Container

A fenced virtual container is a collection of virtual machines (VMs) with an internal private network that is created based on rules specified by the administrator. The fenced container can have one or more VMs that are guarded by a fencing gateway to the public or external cloud. Cisco UCS Director provides support for fenced containers and enables you to define container templates with one or more fenced networks and VMs. When a fenced container is created from a template, Cisco UCS Director automatically deploys VMs and configures networks and the firewall. Cisco UCS Director also automatically configures virtual and physical switches for Layer 2 changes.

Figure 1: Fenced Virtual Container - Sample



To create and manage a fenced container, perform the following steps:

1. Define a gateway policy—In the gateway policy, you must define the gateway type for the container and on which cloud account (vCenter) the gateway gets deployed.
2. Define fenced container template—You must perform the following tasks in the template:
    - Define the cloud account on which the container is created

- Configure the network
- Add VMs for the container
- Define port mapping and outbound access control lists (ACLs)
- Choose a gateway policy (created earlier)
- Choose the deployment policies that define VM provisioning
- Choose self-service options for the container
- Choose a workflow (optional)

3. Create a fenced container from the defined container template—A fenced container is created from the template defined in step 2. You must choose a group for which the container is created.
4. Fenced container—After creating the fenced container, you can do various management actions, such as power management of the container, add VMs to a container, clone or delete the container, and open a console for VMs and view reports.

Fenced Virtual Container Prerequisites

The following is the prerequisite for fenced virtual container configuration:

- If you want to use Distributed Virtual Portgroup or Distributed Virtual Portgroup N1K as the virtual network types in the Allocate Container VM Resources task, ensure that you specify primary DVSwitch and alternate DVSwitch names in the Allocate Container VM Resources task. By default, Virtual Network Portgroup is set as the virtual network type.

Fenced Virtual Container Limitations

The following is the limitation of fenced virtual container:

- F5 Load Balancing is supported on fenced virtual containers.

Fenced Virtual Application Container Creation Process

The following process explains the creation of a fenced virtual application container in Cisco UCS Director:

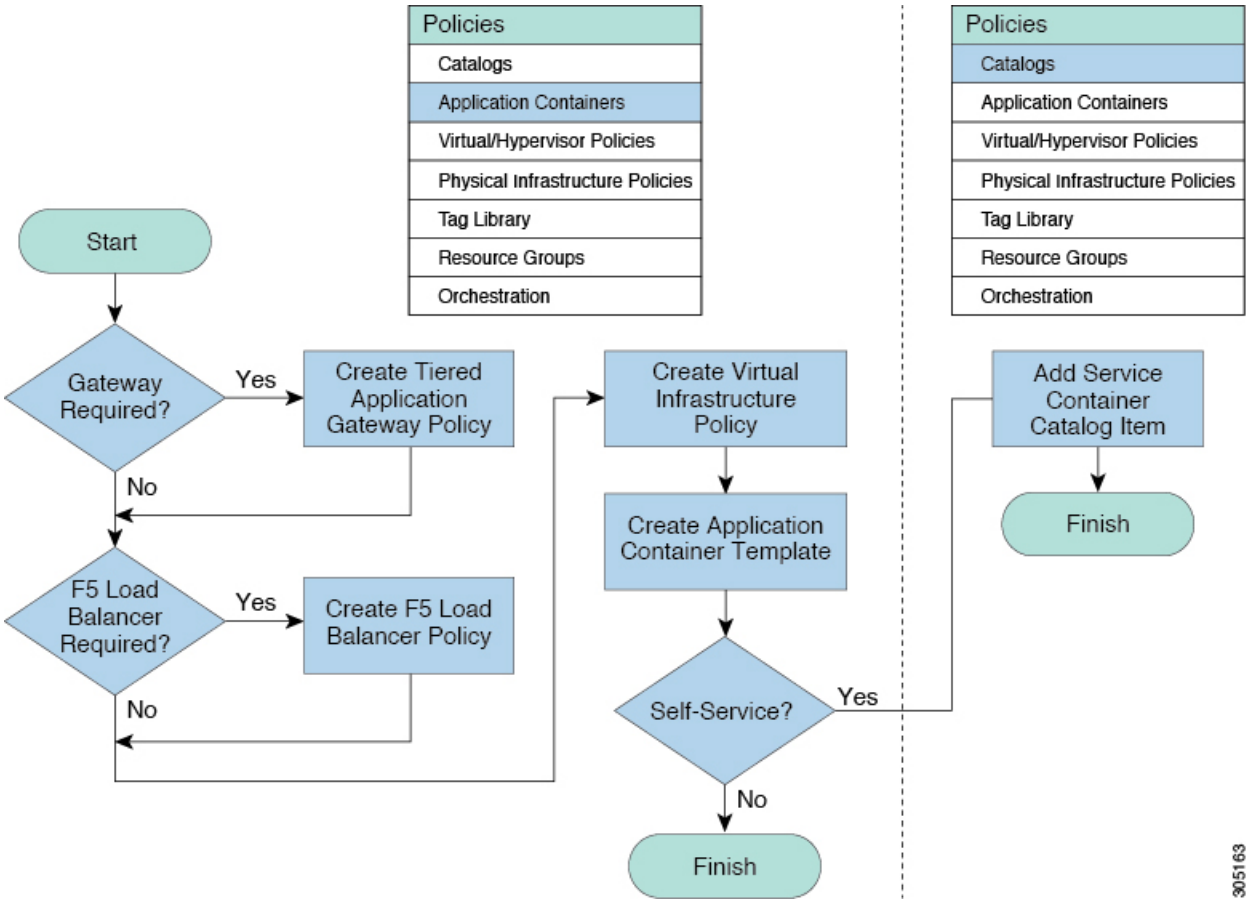
1. If a gateway is required, create a tiered application gateway policy.
2. If a load balancer is required, create a load balancer policy.
3. Create a virtual infrastructure policy to define the cloud account, the type of container and, if appropriate, the tiered application gateway and load balancer policies.
4. Create an application container template.
    1. Add networks (one network per application tier).

2. Add virtual machines and baremetal servers.
3. Add a compute policy, storage policy, network policy, and systems policy. If desired, you can also add a cost model.
4. Add an end user self-service policy and configure the self-service options.
5. Add the container setup workflow required to deliver the service offering to the user as part of a service request. The workflow must consider the type of container and the application to be provisioned.

5. Create a container based on the container template.

The figure illustrates the creation of the fenced virtual application container template within Cisco UCS Director.

Figure 2: Process for Creating a Fenced Virtual Application Container Template



Creating a Virtual Infrastructure Policy for a Fenced Virtual Container

Step 1 Choose **Policies** > **Application Containers**.

Step 2 On the **Application Containers** page, click **Virtual Infrastructure Policies**.

Step 3 Click **Add Policy**.

Step 4 In the **Virtual Infrastructure Policy Specification** page, complete the following fields:

Name	Description
Policy Name field	The name of the policy.
Policy Description field	The description of the policy.
Container Type drop-down list	Choose **Fenced Virtual** as the container type.
Select Virtual Account drop-down list	Choose a virtual account to which you want to apply the virtual infrastructure policy.

Step 5 Click **Next** and follow the wizard prompts.

Step 6 On the **Virtual Infrastructure Policy - Fencing Gateway** screen, complete the following fields:

Name	Description
Gateway Required check box	Check this check box to select a gateway policy, otherwise click **Next**.
Select Gateway Policy drop-down list	If the **Gateway Required** check box is checked, this field allows you to choose a gateway policy for the virtual infrastructure policy.

Step 7 Click **Next**.

Step 8 On the **Virtual Infrastructure Policy - Fencing Load Balancing** screen, complete the following fields:

Name	Description
F5 Load Balancer Required check box	Check this check box to choose an F5 load balancing for the virtual infrastructure policy.
Select F5 Load Balancer Policy drop-down list	If the **F5 Load Balancer Required** check box is checked, this field allows you to choose an F5 load balancing policy.

Step 9 Click **Next**.

Step 10 On the **Summary** page, click **Submit**.

What to do next

Create an application container template for creating a fenced virtual container.

Creating an Application Container Template for Fenced Virtual Container

To create an application container template, you must provide information regarding the following elements. This information is used to create your containers:

- Virtual account (cloud)

- Network configuration
- VM configuration
- Container security
- Select Network, Storage, Compute, and Cost Model policies
- Select the gateway policy, if the **Gateway Required** check box is enabled (optional)
- Options for service end users

Before you begin

Create a virtual infrastructure policy. See Creating a Virtual Infrastructure Policy for a Fenced Virtual Container, on page 3.

Step 1 Choose **Policies** > **Application Containers**.

Step 2 On the **Application Containers** page, click **Application Container Templates**.

Step 3 Click **Add Template**. The **Application Container Template** screen appears. Complete the following fields:

Name	Description
Template Name field	The name of the new template.
Template Description field	The description of the template.

Step 4 Click **Next**

Step 5 On the **Application Container Template - Select a Virtual infrastructure policy** screen, from the **Select Virtual Infrastructure Policy** drop-down list, choose a virtual infrastructure policy that is created for the fenced virtual container type.

Step 6 Click **Next**.

Step 7 On the **Application Container Template - Internal Networks** screen, you can add and configure multiple networks for a container. These networks are applicable to the VM that is provisioned using this template.

Step 8 Click **Add (+)** to add a network. On the **Add Entry to Networks** screen, complete the following fields:

Name	Description
Network Name field	Enter unique network name for the container. You can use a maximum of 128 characters.
Network Type drop-down list	Choose a network type.
Information Source drop-down list	Choose the information source. It can be one of the following: • Inline • Static Pool
VLAN ID Range field	Enter a VLAN ID range.

Name	Description
Network IP Address field	The IP address of the network (for example, 10.10.10.0). A unique subnet is chosen for each internal network.
Network Mask field	The network mask address (for example, 255.255.255.0).
Gateway IP Address field	The IP address of the default gateway for the network. A NIC with this IP address is created on the GW VM.

Step 9 Click **Submit**.

Next, you can add and configure the VM that will be provisioned in the application container.

Step 10 Click **Next**.

Step 11 On the **Application Container Template - VMs**, click **Add (+)** to add a VM. The **Add Entry to Virtual Machines** screen appears. Complete the following fields:

Name	Description
VM Name field	The VM name.
Description field	The description of the VM.
Provision VM using Content Library Template check box	Check to view and choose a VM template from the content library VM templates. If unchecked, you have to choose VM template from VM image templates.
Content Library VM Template field	This field appears only when the **Provision VM using Content Library VM Template** check box is checked. Click **Select** to view a list of available VM templates. Check the check box of the template that you want to use and click **Select**.
VM Image drop-down list	This field appears only when the **Provision VM using Content Library Template** check box is unchecked. Choose the image to be deployed.
Use Linked Clone check box	This check box is enabled only when you choose a VM template with a snapshot. Check this box to deploy new VMs using linked clone feature which enables them to be provisioned faster and storage efficient.
Snapshot field	This field appears only when the **Use Linked Clone** check box is checked. Click **Select** to choose a snapshot that need to be used to provision a new VM using linked clone feature.
Number of Virtual CPUs drop-down list	The number of virtual CPUs to be allocated to the VM.
Memory drop-down list	The memory to be allocated (in MB).
CPU Reservation (MHz) field	The CPU reservation for the VM.

Name	Description
Memory Reservation (MB) field	The memory reservation for the VM.
Disk Size (GB) field	The custom disk size for the VM. To use the template disk size, specify the value of 0. The specified disk size overrides the disk size of the selected image.
VM Password Sharing Option drop-down list	Choose an option for how to share the VM's username and password with the end users. If **Share after password reset** or **Share template credentials** is chosen, the end user needs to specify a username and password for the chosen templates.
Use Network Configuration from Image check box	If checked, the network configuration from the image is applied to the provisioned VM.
Windows License Pool drop-down list	Choose a Windows license version for the image, from the list of licenses that gets populated based on licenses defined in the **OS License** tab (**Policies** > **Service Delivery** > **OS License**). This field appears in one of the following conditions: • When the **Provision VM using Content Library Template** check box is checked. The chosen Windows license version will be considered for the image only when the selected content library VM template has the Windows OS. • When a windows image is chosen in the **VM Image** drop-down list.
VM Network Interface field	Enter the VM network interface information.
Maximum Quantity field	The maximum number of instances that can be added in this container after it is created.
Initial Quantity field	The number of VM instances to provision when the container is created.

Step 12 Click **Submit**.

Step 13 Click **Next**.

Step 14 On the **Application Container Template - External Gateway Security Configuration** screen, click **Add (+)** to add port mappings. On the **Add Entry to Port Mappings** screen, complete the following fields:

Name	Description
Protocol drop-down list	Choose a protocol. It can be one of the following: • TCP • UDP

Name	Description
Mapped Port field	Enter the mapped port.
Remote IP Address field	Enter the IP address
Remote Port field	Enter the remote port field.

Step 15 On the **Application Container Template - External Gateway Security Configuration** screen, click the **Add (+)** to add outbound ACL. On the **Add Entry to Outbound ACLs** screen, complete the following fields:

Name	Description
Protocol drop-down list	Choose a protocol. It can be one of the following: • IP • TCP • UDP • ICMP
Select Network drop-down list	Choose a network.
Source address field	Enter a source address.
Destination address field	Enter a destination address.
Action field	Choose an action. It can be one of the following: • Accept • Drop • Reject

Step 16 Click **Submit**.

Step 17 Click **Next**. The **Application Container Template - Deployment Policies** screen appears.

You must select the compute, storage, network, system policy, and cost model required for VM provisioning. A policy is a group of rules that determine where and how a new VM is to be provisioned within an application container (based on the availability of system resources).

- The network policy is used only to deploy the outside interface of the virtual firewall (container gateway).

  Note If the gateway type is CISCO ASAv for the container, the network policy must first add the ASAv management interface and then the outside interface in the VM networks, in the same order.

- The selected *Portgroup in Network Policy* should be on the host on which the Gateway VM is provisioned.
- The network policy can use either a *Static IP Pool or DHCP*. However, for a container-type VSG the network policy should use a Static IP Pool only. The VSG VM requires IP addresses as input. There is no current provision to specify DHCP for deploying a VSG VM.

- The network adapter settings for a provisioned VM (container gateway) should be similar to the settings in the template. You may or may not have to check the *Copy Adapter from Template* check box in the network policy used for this application container.

Complete the following fields:

Name	Description
Compute Policy drop-down list	Choose a compute policy.
Storage Policy drop-down list	Choose a storage policy.
Network Policy drop-down list	Choose a network policy.
Systems Policy drop-down list	Choose a systems policy.
Cost Model drop-down list	Choose a cost model.

Step 18 Click **Next**. The **Application Container Template - Options** screen appears.

You can select options to enable or disable certain privileges for the self-service end user. Complete the following fields:

Name	Description
End User Self-Service Policy drop-down list	Choose a self-service policy for end users.
Enable Self-Service Deletion of Containers check box	Check to allow end users to delete application containers created with this template.
Enable VNC Based Console Access check box	Check to allow VNC access to VMs on the container host.
Technical Support Email Address field	Enter a comma-separated list of email addresses. Automated notifications are sent to these emails.

Step 19 Click **Next**. The **Application Container Template - Setup Workflows** screen appears. Complete the following field:

Name	Description
Container Setup Workflow drop-down list	Choose a container setup workflow. By default, a workflow is not selected. You can skip this step if the gateway type chosen for this container is **Linux** and the **Virtual Machine Portgroup** is selected in the network policy associated with the container. Choosing a specific workflow is required only if you chose CISCO ASA as the container gateway or **Distributed Virtual Portgroup** as the network policy. For a CISCO ASAv gateway type, choose the **Application Container with ASAv Gateway**. **Note** You must perform some prerequisite steps before you can initiate the task for creating an application container template.

Step 20 Click **Next**. The **Application Container Template - Summary** screen appears, displaying your current settings.

Step 21 Click **Submit** to complete the creation of the application container template.

What to do next

You can customize certain aspects of template using the custom workflow task. See Creating a Custom Workflow for Fenced Virtual Containers, on page 10.

Creating a Custom Workflow for Fenced Virtual Containers

Note For more information about using the orchestration to run workflows, see the Cisco UCS Director Orchestration Guide.

- **Gateway Type: CISCO ASA**—If the gateway type is CISCO ASA for the container, you must specifically choose **Application Container with ASA Gateway** from the list of available workflows. You can search for the workflow and check its check box in order to select it.
- **Distributed Virtual Portgroups**—If you choose the **Distributed Virtual Portgroup** in the network policy that is associated with the container, then you must perform the following steps manually:
  1. Choose **Virtual Network Type** and enter its name as required in a workflow associated with the container.
  2. Choose a specific workflow. This type of workflow depends on which gateway type was associated with the container. For a Linux gateway, choose **Application Container Setup** workflow. For a CISCO ASA gateway type, choose the **Application Container with ASA Gateway**.
  3. Edit or clone the required workflow by going to the Cisco UCS Director Orchestrator application and editing the workflow on the **Workflow Designer** page.
  4. In the workflow window, double-click the **Allocate Container VM Resources** task.
  5. Choose the required virtual network type (either **Distributed Virtual Portgroup** or **Distributed Virtual Portgroup N1K**).
  6. Specify the primary DVSwitch and alternate DVSwitch names.
  7. Click **Save** to save the workflow.