# Configuring APIC Accounts

This chapter contains the following sections:



## Adding an APIC Account

**Note** Cisco APIC accounts are not tied to any specific pod.

**Note** You cannot edit a pod associated with an account that is part of a resource group. You cannot delete an account that is part of a resource group.

**Note** When you add an APIC cluster, the controllers in the cluster are automatically discovered. You can view the controller details in the **Summary** tab. To navigate to the **Summary** tab, choose **Physical** > **Network** and choose the APIC account from the **Multi-Domain Managers** list that appears in the left-hand pane.

**Note** To integrate Cisco UCS Director with ACI fabric, ensure that TLSv1 is enabled on ACI fabric (**Fabric Policies > Pod Policies > Policies - Communication**).

**Step 1** On the menu bar, choose **Administration** > **Physical Accounts**.

**Step 2** Click the **Multi-Domain Managers** tab.

**Step 3** Click **Add**.

**Step 4** In the **Add Account** dialog box, choose **APIC** from the **Account Type** drop-down list.

**Step 5** Click **Submit**.

**Step 6** In the **Add Account** dialog box, complete the following fields:

| Name | Description |
|---|---|
| **Account Type** field | The account type is displayed. |
| **Account Name** field | The multi-domain account name. |
| **Description** field | The description of the multi-domain. |
| **Pod** field | The list of available pods. Choose a pod to which you want to add the APIC account. |
| **Server IP** field | The IP address of one of the APIC controllers in the APIC cluster.<br>**Note** Cisco UCS Director will automatically discover the IP address of other APIC controllers in the APIC cluster. |
| **Use Credential Policy** check box | Check this check box to use the policy to assign credentials to the account. |
| **Credential Policy** drop-down list | This field appears only when the **Use Credential Policy** check box is checked. Choose the credential policy.<br>**Note** You cannot connect to the device using the SSH or Telnet protocol. If the SSH or Telnet protocol is specified in the selected device credential policy, you will be prompted to check the protocol defined in the credential policy. |

| Name | Description |
|---|---|
| **Username** field | This field appears only when the **Use Credential Policy** check box is unchecked. The name of the user who manages the APIC account. This account uses the username to access the APIC server. This username must be a valid administration account in the APIC server.<br>**Note** For the LDAP credential, the format of the username must be apic:<LDAP Domain Name>\<LDAP User Name>.<br>**Note** The user must have all the required privileges on the APIC server to access the supported features and perform actions such as view and access reports, and execute workflow tasks in Cisco UCS Director. |
| **Password** field | This field appears only when the **Use Credential Policy** check box is unchecked. This password is associated with the username. |
| **Protocol** drop-down list | This field appears only when the **Use Credential Policy** check box is unchecked. Choose the protocol as **https**. |
| **Port** field | This field appears only when the **Use Credential Policy** check box is unchecked. This port is used to access the APIC account. |
| **Contact** field | The email address of the administrator or person responsible for this account. |
| **Location** field | The location of the device associated with the account. |

**Step 7** Click **Submit**.

**Step 8** Choose the newly created account.

**Step 9** Click **Test Connection** to verify that the account is operational.

Cisco UCS Director tests the connection to the APIC server. If that test is successful, it adds the APIC account and discovers all infrastructure elements in the APIC server. This discovery process and inventory collection takes a few minutes to complete.

# Viewing APIC Resources

After creating an APIC account in Cisco UCS Director, you can view related resources of the APIC account.

**Step 1** On the menu bar, choose **Physical** > **Network**.

**Step 2** In the left pane, click **Multi-Domain Managers**.

**Step 3** Expand **APIC Accounts** and click the APIC account.
Cisco UCS Director displays the system overview and controller of the APIC account.

**Step 4** Click one of the following tabs to view the details of a specific component in the server:

- **Summary** tab—Displays the system overview and summary of the APIC controller.
- **Fabric Nodes** tab—Displays the list of fabric nodes with their details such as the node name, model, vendor, role, serial, and node ID with the status.

  To view more details about fabric nodes, choose a fabric node and click **View Details**. The following tabs appear:

  - **Fabric Chassis**—Displays the fabric name, ID, model, vendor, serial, revision, and operation status of the fabric chassis.
  - **Fan Slots**—Displays the fabric name, slot ID, type, operation status, and inserted-card details of the fan slots.
  - **Physical Interfaces**—Displays the interface details that include the speed, mode, CFG access VLAN, CFG native VLAN, bundle index, operational duplex mode, operational port state, and reason for the current operation state. The operational state of the port can be one of the following: Unknown, Down, Link-up, and Up.
  - **Fabric Routed Vlan Interfaces**—Displays the status and reason for the current operation status of the fabric-routed VLAN interfaces.
  - **Fabric Encapsulated Routed Interfaces**—Displays a list of the fabric-encapsulated routed interfaces.
  - **Fabric Routed Loopback Interfaces**—Displays a list of the fabric-routed loopback interfaces.
  - **Fabric Management Interfaces**—Displays a list of the fabric management interfaces.
  - **Tunnel Interfaces**—Displays the interface, operation state, reason for the current operation state, tunnel layer, tunnel type, and type of the tunnel interface.

- **System** tab—Displays the system details that include the node name, in-band management IP address, out-of-band management IP address, infrastructure IP address, fabric MAC address, ID, role, and serial number.
- **Fabric Memberships** tab—Displays the fabric membership details that include the node name, serial number, node ID, model, role, IP address, decommissioned status, and supported model.
- **Physical Domains** tab—Displays the physical domains in the APIC server. Click **Add** to add a domain.
- **Tenants Health** tab—Displays the health score of tenants.

  To view more details about a tenant's health, choose a tenant and click **View Details**. The following tabs appear:

  - **EPGs Health**—Displays the health score of endpoint groups (EPGs).
  - **Application Health**—Displays the health score of applications.

- **Nodes Health** tab—Displays the health score of nodes.

  To view more details about the health of the nodes, choose a node and click **View Details**. The following tabs appear:

  - **Access Ports Health**—Displays the health score of access ports.
  - **Fabric Ports Health**—Displays the health score of fabric ports.
  - **Line Cards Health**—Displays the health score of line cards.

- **Access Entity Profile** tab—Displays the names and descriptions of the access entity profiles.

  To view more details about the access entity profile, choose an entity profile and click **View Details**. The following tabs appear:

  - **Policy Groups**—Displays the policy groups of an entity profile.
  - **Domain Associated To Interfaces**—Displays a list of domains that are associated with the interfaces.

- **Link Level Policy** tab—Displays the name, automatic negotiation, speed, link debounce interval, and description of the link level policy.
- **VLAN Pool** tab—Displays the VLAN pools that are added in the APIC server. Click **Add** to add a VLAN pool.

  To view more details about a VLAN pool, choose a VLAN pool and click **View Details**. The following tab appears:

  - **VLAN Pool Range**—Displays the VLAN pool name, mode of allocation, and the pool range. Click **Add** to add a VLAN range to the VLAN pool.

- **CDP Interface Policy** tab—Displays the name and description of the Cisco Discovery Prototol (CDP) interface policy, with the administration status.
- **LLDP Interface Policy** tab—Displays the name and description of the Link Layer Discovery Protocol (LLDP) interface policy, with the receive status and transmit status.
- **Leaf Policy Group** tab—Displays the name and description of the leaf policy group.
- **Tenant(s)** tab—Displays the tenants in the APIC server. Click **Add** to add a tenant.

  To view more details about a tenant, choose a tenant and click **View Details**. The following tabs appear:

  - **Summary**—Displays the overview of the tenant.
  - **Application Profile**—Displays the name, tenant, description, and QoS Class of the tenant application profile. Click **Add** to add a tenant application profile. Choose an application profile and click **View Details** to view the EPGs of the application profile.

    Choose an EPG and click **View Details** to view the provided contracts, consumed contracts, Layer 4 to Layer 7 EPG parameters, consumed contract interface, static node, domain, static path, and subnet of the EPG. In the **Consumed Contract Interface** tab, click **Add** to add a consumed contract interface to EPG.
  - **Deployed Service Graph**—Displays the list of service graphs that are deployed in the tenant. Choose a service graph and click **View Details** to view the Layer 4 to Layer 7 deployed service graph parameters.
  - **Filters**—Displays the tenant, name, and description of the filters. To view the tenant filter rules, choose a filter and click **View Details**.

- **External Bridge Network—**Displays the tenant, name, and description of the external bridge network. Choose a network and click **View Details** to view the following tabs:
  - **External Network—**Choose an external network and click **View Details** to view the provided contracts, and consumed contracts details.
  - **Node Profile—**Choose a node profile and click **View Details** to view the interface profile details.
- **External Routed Networks—**Displays the tenant, name, and description of the external routed network. Choose a network and click **View Details** to view the following tabs:
  - **Route Profile—**Choose a route profile and click **View Details** to view the context details.
  - **Logical Node Profile—**Choose a logical node profile and click **View Details**. The following tabs appear:
    - **Logical Nodes** tab**—**Displays the logical nodes. Click **Add** to add a logical node to the logical node profile of the external routed network. Choose a logical node and click **View Details** to view the static routes to the logical node.
    - **Logical Interface Profile** tab**—**Choose a logical interface profile and click **View Details** to view the logical interface and logical OSPF interface. Click **Add** in the Logical OSPF Interface tab to create an interface profile with the OSPF profile data.
    - **BGP Peer Connectivity** tab**—**Displays the BGP peer connectivity of the logical node profile. Click **Add** to add a peer connection to a node profile.
  - **External Network—**Choose an external network and click **View Details** to view the subnet, provided contracts, and consumed contracts details. You can tag an external network and consumed contract using the **Add Tags** option. The tag is used to identify the network and contract that you want to use in the application container deployment.
- **Bridge Domains—**Displays the tenant, name, description, segment ID, unicast traffic, ARP flooding, multicast IP address, customer MAC address, unicast route, and Layer 2 unknown unicast value.

  To view more details about a bridge domain, choose a bridge domain and click **View Details**. The following tabs appear:
  - **DHCP Relay Label—**Displays the tenant, name, description, and scope of the DHCP relay.
  - **Subnet—**Displays the tenant, bridge domain, description, subnet control, and gateway address of the tenant.
- **Private Networks—**Displays the tenant name, name, description, policy control, and segment of the private networks. Click **Add** to add a private network.
- **BGP Timers—**Displays the tenant, name, graceful restart control, hold interval, keepalive interval, and stale interval of the Border Gateway Protocol (BGP) timer.
- **Contracts—**Displays the tenant, name, description, type, QoS, and scope of the contracts.

  To view more details about a contract, choose a contract and click **View Details**. The following tabs appear:
  - **Contract Subject—**Choose a contract subject and click **View Details** to view the filter chain, filter chain for consumer to provider, filter chain for provider to consumer, provided label, and consumed label. Each tab has the **Add** option to add a filter, in term filter, out term filter, provided label, and consumed label to a contract subject.

    - **Exported Tenants—**Displays the contracts of the exported tenants.

- **Taboo Contracts—**Displays the tenant, name, description, and scope of the taboo contracts.
- **Relay Policy—**Displays a list of the relay policies.
- **Option Policy—**Displays a list of the option policies.
- **End Point Retention—**Displays the tenant, name, description, hold interval, bounce trigger, bounce entry aging interval, local endpoint aging interval, remote endpoint aging interval, and move frequency of the tenant.
- **OSPF Interface—**Displays the tenant, name, description, network type, priority, cost of interface, interface controls, hello interval, dead interval, retransmit interval, and transmit delay of the Open Shortest Path First (OSPF) interface. Click **Create** to create an OSPF interface policy.
- **OSPF Timers—**Displays the OSPF timer details.
- **IGMP Snoop—**Displays the IGMP snoop details.
- **Custom QOS—**Displays the custom QoS details.
- **Action Rule Profile—**Displays the action rule profiles of the tenant. Click **Create** to create an action rule profile. In the **Create Action Rule Profile** dialog box, enter the name and description of the action rule profile. To set an action rule based on a route tag, check the **Set Rule Based On Route Tag** check box.
- **L4-L7 Service Graph—**Displays the Layer 4 to Layer 7 service graph details. Choose a service graph and click **View Details** to view the following tabs:
    - **Consumer EPG—**Displays the list of EPGs that are labeled as consumer in tenants. When an EPG consumes a contact, the endpoints in the consuming EPG may start communication with any endpoint in an EPG that is providing that contract.
    - **Provider EPG—**Displays the list of EPGs that are labeled as provider in tenants. When an EPG provides a contract, communication with that EPG can be initiated from other EPGs as long as the communication complies with the provided contract.
    - **Nodes—**Displays the list of nodes in the tenant. Choose a node and click **View Details** to view the node functions and connectors of the node. Choose a node function and click **View Details** to view the Layer 4 to Layer 7 function node parameters.
    - **Connections—**Displays the list of connections in the tenant. Choose a connection and click **View Details** to view the connection terminals in the tenant.

- **Function Profile Group——**Displays the function profile groups of tenants. Choose a function profile group and click **View Details** to view the function profiles of the group. Click **Add** to add a function profile. To view more details about a function profile, choose a function profile and click **View Details**. The following tabs appear:
    - **Function Profile Parameter—**Displays the function profile parameters. In the **Function Profile Parameter** tab, you can add an ACL, an interface, and add a bridge group interface to a function profile, and add a network object to a function profile. Choose a function profile parameter and click **View Details** to view the function profile parameter configuration and function profile parameter level-one folder.
    - **L4-L7 Function Profile Parameters—**Displays the list of Layer 4 to Layer 7 function profile parameters.

- **Function Profile Function Parameter—**Displays the list of function profile function parameters. Click **View Details** to view the function profile function parameter Rel details.

- **Device Clusters—**Displays the device cluster details. To view more details about a device cluster, choose a device cluster and click **View Details**. The following tabs appear:
  - **Device Cluster State—**Displays the cluster name, device state, and configured status of the device.
  - **Concrete Device—**Displays the list of concrete devices. Choose a concrete device and click **View Details** to view the virtual network interface card (vNIC) to concrete interface and the path to concrete interface.
  - **Logical Interface—**Displays the list of logical interfaces in the device cluster. Choose a logical interface and click **View Details** to view the logical interface details.
- **Deployed Device Cluster—**Displays the device clusters that are deployed in the tenant.
- **Logical Device Context—**Displays the logical device context details. Choose the logical device context and click **View Details** to view the logical interface context.

- **L3 Domain** tab—Displays a list of Layer 3 domains in the APIC accounts. To create a Layer 3 domain, click **Create**.

  In the **Create L3 Domain** dialog box, complete the following fields:
  - **L3 Domain** field—Name of the Layer 3 domain.
  - **Associated Attachable Entity Profile** field—Click **Select** and choose an attachable access entry profile that you want to associate with the Layer 3 domain.
  - **VLAN Pool** field—Click **Select** and choose a VLAN pool.

- **L2 Domain** tab—Displays a list of Layer 2 domains in the APIC accounts. To create a Layer 2 domain, click **Create**.

  In the **Create L2 Domain** dialog box, complete the following fields:
  - **L2 Domain** field—Name of the Layer 2 domain.
  - **Associated Attachable Entity Profile** field—Click **Select** and choose an attachable access entry profile that you want to associate with the Layer 2 domain.
  - **VLAN Pool** field—Click **Select** and choose a VLAN pool.

- **VM Networking** tab—Displays the virtual machine (VM) networks with the vendor detail.

  To view more details about a VM network, choose a VM and click **View Details**. The following tab appears:
  - **VMware Domains—**Displays a list of VMware domains with the vendor details. Choose a VMware domain and click **View Details** to view the VMware domain controllers, vCenter credential, and vCenter/vShield. Choose a VMware domain controller and click **View Details** to view the distributed virtual switch (DVS), hypervisors, and virtual machine. Choose a DVS and click **View Details** to view the DVS port groups.

- **L4-L7 Service Device Types** tab—Displays the Layer 4 to Layer 7 service device types with their model, vendor, version, and capabilities.

To view more details about the Layer 4 to Layer 7 service device type, choose a Layer 4 to Layer 7 service device type and click **View Details**. The following tabs appear:

- **L4-L7 Service Device Properties—**Displays the vendor, package name, package version, and logging level of Layer 4 to Layer 7 service device types.
- **L4-L7 Service Device Interface Labels—**Displays a list of interface labels.
- **L4-L7 Service Functions—**Displays a list of service functions. Choose a service function and click **View Details** to view the details of the Layer 4 to Layer 7 service function connectors.

- **Fabric Nodes Topology** tab**—**Displays the topology details of fabric nodes.
- **L2 Neighbors** tab**—**Displays the Layer 2 neighbor details that include the protocol, fabric name, device ID, capability, port ID, local interface, hold time, and platform.
- **Deployed Service Graph** tab**—**Displays the tenant, contract, state, service graph, context name, node function, and description of the APIC account.
- **EPG to Contract Association** tab**—**Displays the details of the contract association with EPGs.
- **Access Port Policy Groups** tab**—**Displays the access port policy group name, link level policy, Cisco Discovery Protocol (CDP) policy, Link Aggregation Control Protocol (LACP) policy, Link Layer Discovery Protocol (LLDP) policy, link aggregation type, and attached entity profile of the accounts in the APIC server.
- **Fabric Interface Profiles** tab**—**Displays the fabric interface profiles of the APIC server.
- **Fabric Configured Switch Interfaces** tab**—**Displays the fabric configured switch interfaces of the APIC server.
- **Fabric Switch Profiles** tab**—**Displays the fabric switch profiles of the APIC server.

# Assigning an APIC Account to a Pod

In the **Converged** menu of the user interface (UI), Cisco UCS Director displays the converged stack of devices for a data center. To display the APIC account in the converged UI, assign the APIC account to a pod.

**Step 1** On the menu bar, choose **Physical** > **Network**.

**Step 2** In the left pane, click **Multi-Domain Managers**.

**Step 3** Expand **APIC Accounts** and click the APIC account.
Cisco UCS Director displays the system overview and controller of the APIC account.

**Step 4** In the right pane, choose an APIC account that you want to assign to a pod.

**Step 5** Click **Assign to Pod**.
The **Assign to Pod** dialog box appears.

**Step 6** From the **Select Pod** drop-down list, choose a pod to which you want to assign the APIC account.

**Step 7** Click **Submit**.

The APIC account appears in the converged UI.

# Handling APIC Failover

APIC controllers are deployed in an APIC cluster. The recommendation is to have a minimum of three APIC controllers per cluster to ensure high availability. When you create an APIC account in Cisco UCS Director, provide the IP address of one of the APIC controllers in the APIC cluster. Cisco UCS Director discovers the other APIC controllers in the APIC cluster and their respective IP addresses.

If the IP address of the controller which was used to manage the APIC device goes down or is not reachable for 45 seconds, Cisco UCS Director tries to use any of the reachable controller IP addresses to interact with the APIC device.

If you have multiple ACI fabrics and each fabric with multiple controllers, one of the controllers of the ACI fabric is used to manage the APIC device. If the controller goes down or is not reachable for 45 seconds, Cisco UCS Director uses the next reachable controller within the ACI fabric.

# Configuring Shared Layer 3 Outside

The shared Layer 3 outside (L3Out) feature offers the ability to use one L3Out to provide external network connectivity across numerous tenants.

To use the shared L3Out feature during the application container deployment, ensure that the following prerequisites are met during tenant onboarding and application profile creation.

1. Configure an L3Out in a common tenant. For example, in the tenant named as Common, configure an external network and contract that you want to use for external network connectivity.
2. Tag the external network in the Common tenant with a tag value (example, sample-tag). For more information, see the explanation of the Tenants > External Routed Network > External Network tab in Viewing APIC Resources, on page 4.

**Note** While tagging the external network, to get the required tag in the **Tag** drop-down list, you must map the APIC External Network as the taggable entity for the tag during the tag creation. To map the taggable entity, check the **Apic External Network** check box under the **Administration** category in the Applicability Rules screen of the **Create Tag** window.

3. Tag the contract in the external network with the same tag value (example, sample-tag) that is used for tagging the external network. For more information, see the explanation of the Tenants > External Routed Network > External Network tab in Viewing APIC Resources, on page 4.

**Note** While tagging the external network, to get the required tag in the **Tag** drop-down list, you must map the APIC Consumed Contracts to External Networks as the taggable entity for the tag during the tag creation. To map the taggable entity, check the **Apic Consumed Contracts To External Networks** check box under the **Administration** category in the Applicability Rules screen of the **Create Tag** window.

4 After onboarding a tenant, update the tagged external network and contract information in the tenant vPOD of the container using the Tenant Resource Allocation task.

   If the IP address overlapping is enabled for the tiers during tenant onboarding, check the **Map to User Input** check box of the **Unique IP Subnet Pool Policy ID** identity in the Tenant Resource Allocation task to set the unique subnet pool. The network tier contacts the shared L3Out using an unique IP address chosen from the unique IP subnet pool. If the IP address overlapping is not enabled during tenant onboarding, the IP subnet pool is used to allocate the IP address to the network tiers.

5 During the application profile creation, choose the same tag for the external network and contract to use the L3Out configuration in the Common tenant. For more information on how to choose the tag for the external network and contract, see the Adding an Application Profile section in the Cisco UCS Director Application Container Guide.

6 Use the application profile in the application container provisioning.

   Cisco UCS Director identifies the external network and contract based on the tag and uses those data for external network connectivity of tenants in the container.