



# Day 0 Operations of Cisco ACI Multi-Site

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## Day 0 Operations Overview

This section describes an end to end day 0 operations. Follow the sections in order.

## Cisco ACI Multi-Site Communication Ports

When configuring your Cisco ACI Multi-Site environment, keep in mind that the following ports are used by the Cisco ACI Multi-Site Orchestrator for network communications within the Cisco ACI Multi-Site environment.

Ports required for network communications between the Cisco ACI Multi-Site Orchestrator and Cisco APICs (Sites):

- TCP Port 80/443 for APIC REST Configuration Deployment

Ports required for network communications between the Cisco ACI Multi-Site Orchestrator nodes:

- TCP port 2377 for Cluster Management Communications
- TCP and UDP port 7946 for Inter-Manager Communication
- UDP port 4789 for Docker Overlay Network Traffic

All control-plane and data-plane traffic between Cisco ACI Multi-Site Orchestrator nodes is encrypted with IPsec's Encapsulating Security Payload (ESP) using IP protocol number 50 to provide security and allow the cluster deployments over a round-trip time distance of up to 150ms. If there is firewall between any Orchestrator nodes, proper rules must be added to allow this traffic.

## Defining the Dataplane TEP For APIC Sites Using the APIC GUI

Before connecting a Cisco APIC cluster (fabric) in a Cisco ACI Multi-Site topology, you must configure the Dataplane Tunnel Endpoint (TEP) in the **Fabric Ext Connection Policy** for each fabric.

The **Create Intrasite/Intersite Profile** panel in the Cisco APIC GUI is used to add connection details for APIC multipod, remote leaf switches connecting to the ACI fabric, and APIC sites managed by Cisco ACI Multi-Site. When the Multi-Site infrastructure has been configured, the Multi-Site system adds the **Intersite Dataplane TEP** to this APIC policy.

To configure the Dataplane TEP in the **Fabric Ext Connection Policy** for each APIC site to be managed by Multi-Site, perform the following steps:

### Procedure

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- Step 1** On the menu bar, click **Tenants > infra**.
  - Step 2** On the navigation pane (prior to Cisco APIC, Release 3.1), expand **Networking** and **Protocol Policies**.
  - Step 3** On the navigation pane (in APIC, Release 3.1 and later), expand **Policies** and **Protocol**.
  - Step 4** Right-click **Fabric Ext Connection Policies** and choose **Create Intrasite/Intersite Profile**.
  - Step 5** Click the + symbol on **Pod Connection Profile**.
  - Step 6** Choose the Pod ID from the list.
  - Step 7** Enter the IP address for dataplane traffic to this pod.
  - Step 8** Click **Update** and **Submit**.
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## Adding Sites Using the Multi-Site GUI

This section describes how to add sites using the Multi-Site GUI.

### Procedure

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- Step 1** Log in to the Multi-Site GUI, in the **Main menu**, click **Sites**.  
If you are logging in for the first time, the default log in is **admin** and password is **welcome!**. Then you are forced to change the password upon initial log in.  
The new password requirements are:
    - At least 6 characters
    - At least 1 letter
    - At least 1 number
    - At least 1 special character apart from \* and space
  - Step 2** In the **Sites List** page, click **ADD SITES**.

- Step 3** In the **Sites Details** page, perform the following actions:
- In the **NAME** field, enter the site name.
  - In the **LABELS** field, choose or create a label.
  - In the **APIC CONTROLLER URL** field, enter the APIC URL. This can be `https://<ip_address>/dns_registered_hostname>` or `http://<ip_address>/dns_registered_hostname>`.  
If you have more than one APIC in a fabric, click the + icon to add additional APICs.
  - In the **USERNAME** field, enter the user name.
  - In the **PASSWORD** field, enter the password.
  - You can turn on the **SPECIFY DOMAIN FOR SITE** switch, if you want to specify a domain name for the site.  
In the **DOMAIN NAME** field, enter the domain name for the site.
  - If the APIC site does not have a site ID, you will receive the following message:  
APIC does not have an apic-site-id configured. Please provide an unique apic-site-id for this site. Once specified the apic-site-id cannot be changed without factory resetting APIC.
    - Click **Ok**.
    - In the **SITE ID** field, enter the site ID.  
The site ID must be an unique identifier of the APIC site. The range must be from 1 to 127.
  - Click **SAVE**.
- Step 4** Repeat these steps to add additional sites.

## Configuring Infra Using the Multi-Site GUI

This section describes how to register sites and configure fabric connectivity infra for the sites using the Multi-Site GUI.

### Before you begin

- Ensure you have at least 2 sites.  
For more information, see [Adding Sites Using the Multi-Site GUI, on page 2](#).
- In APIC, you need to have the Multipod dataplane TEP configured on the POD connection profile.  
For more information, see [Defining the Dataplane TEP For APIC Sites Using the APIC GUI, on page 2](#).
- In APIC, you need to have one POD profile and it must contains a POD policy group. If it does not have a POD policy group you need to create one. To check if the POD profile contains a POD policy group, go to the APIC GUI, **Fabric > Fabric Policies > Pod Policies > Profiles > Pod Profile default**. To create a POD policy group, go to the APIC GUI, **Fabric > Fabric Policies > Pod Policies**, right-click **Policy Groups** and click **Create Pod Policy Group**. Enter the appropriate information and click **Submit**. Assign the new pod policy group to the POD Profile default, go to the APIC GUI, **Fabric > Fabric**

**Policies > Pod Policies > Profiles > Pod Profile default.** Click on the default, choose the new pod policy group and click **Update**.

- Any infrastructure changes such as adding, removing spines or spine node ID changes would require a Multi-Site fabric connectivity site refresh.

## Procedure

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- Step 1** Log in to the Multi-Site GUI, in the **Main menu**, click **Sites**.
- Step 2** In the **Sites List** area, click **CONFIGURE INFRA**.
- Step 3** In the **Fabric Connectivity Infra** page, perform the following actions:
- In the **Master List**, click **General Settings**.
  - In the **Canvas**, in the **BGP PEERING TYPE** area, from the drop-down list, choose either **full-mesh** or **route-reflector**.  
The default is **full-mesh**.
  - In the **KEEPALIVE INTERVAL (SECONDS)** field, enter the keep alive interval seconds.  
The default is **60** seconds.
  - In the **HOLD INTERVAL (SECONDS)** field, enter the hold interval seconds.  
The default is **180** seconds.
  - In the **STALE INTERVAL (SECONDS)** field, enter stale interval seconds.  
The default is **300** seconds.
  - In the **GRACEFUL HELPER** field, choose **ON** or **OFF**.  
The default is **ON**.
  - In the **MAXIMUM AS LIMIT** field, enter the maximum as limit.  
The default is **0**.
  - In the **BGP TTL BETWEEN PEERS** field, enter the BGP TTL between peers.  
The default is **10**.
- Step 4** In the **Property Pane**, in the **OSPF** area, perform the following actions:
- You can either modify the **msec-ospf-policy-default** policy or you can add a new OSPF policy.  
To add a new OSPF, click **ADD POLICY**.
    - In the **POLICY NAME** field, enter the policy name.
    - In the **NETWORK POINT** field, choose either **broadcast**, **point-to-point**, or **unspecified**.  
The default is **broadcast**.
    - In the **PRIORITY** field, enter the priority number.  
The default is **1**.
    - In the **COST OF INTERFACE** field, enter the cost of interface.

The default is **0**.

- In the **INTERFACE CONTROLS** field, choose **advertise-subnet**, **bfd**, **mtu-ignore**, or **passive-participation**.

- In the **HELLO INTERVAL (SECONDS)** field, enter the hello interval in seconds.

The default is **10**.

- In the **DEAD INTERVAL (SECONDS)** field, enter the dead interval in seconds.

The default is **40**.

- In the **RETRANSMIT INTERVAL (SECONDS)** field, enter the retransmit interval in seconds.

The default is **5**.

- In the **TRANSMIT DELAY (SECONDS)** field, enter the transmit delay in seconds.

The default is **1**.

**Step 5** In the **Master list**, choose a site from the **SITE SETTINGS**.

a) In the **Property Pane**, perform the following actions:

**Note** If you add or remove any spines in the APIC GUI, in the **Canvas**, click on the site and click refresh. This will discover any new or removed spines and all site-related fabric connectivity to be re-imported from APIC. Any changes not pushed to APIC will be lost.

- In the **SITE IS MULTI-SITE ENABLED**, turn on the site.
- In the **APIC SITE ID** field, only displays the APIC site ID. You cannot change the site ID.
- In the **DATA PLANE MULTICAST TEP** field, enter the data plane multicast TEP IP address.
- In the **BGP AUTONOMOUS SYSTEM NUMBER** field, enter the BGP autonomous system number or the IP address.
- (Optional) In the **BGP PASSWORD** field, if you have encryption enable then you can set a BGP password.
- If you are running release 1.1(2) or prior: In the **BGP COMMUNITY** field, enter the BGP community. The format example is: **extended:as2-nn4:4:15**. The numbers are variables.
- In the **OSPF AREA ID** field, enter the OSPF area ID or the IP address.

**Note** When configuring the Multi-Site infra OSPF details, Cisco recommends that you use OSPF Area **0**. If you use an Area ID other than 0, in the next step configure it as a **regular** OSPF area type and not a **stub** area type.

- In the **OSPF AREA TYPE** field, choose either **nssa**, **regular**, or **stub**.

The default is **nssa**.

- In the **EXTERNAL ROUTER DOMAIN** field, choose a external router domain that you have created in the APIC GUI.
- In the **IP SUBNETS TO IMPORT** field, click **ADD SUBNET**. You can have more than one subnet.
  - In the **SUBNET** field, enter the subnet. You can either add the IP address or the IP address/netmask.

- Click **SAVE**.

b) In the **Cavans**, click on the POD and perform the following actions:

- In the **Property Pane**, in the **DATA PLANE UNICAST TEP** field, enter the data plane unicast TEP IP address.

c) In the **Cavans**, click on the spine and perform the following actions:

- In the **Property Pane**, click **ADD PORT** and perform the following actions:
  - In the **PORT ID** field, enter the port ID (1/29).
  - In the **IP ADDRESS** field, enter the IP address/netmask.
  - In the **MTU** field, enter the MTU. The range is 576 to 9000 or **inherit**.
  - In the **OSPF POLICY** field, choose the OSPF policy.
- Click **SAVE**.

- Note**
- Multi-Site creates a sub-interface with VLAN 4 with the specified IP ADDRESS under the specified PORT.
  - MTU of the spine port should match MTU on IPN side.
  - OSPF settings under OSPF policy should match on IPN side.
  - Multi-Site does not require to run PIM Bidir inside the IPN.

- (Optional) In the **Property Pane**, turn on **BGP PEERING**.

- In the **CONTROL PLANE TEP** field, enter the control plane TEP IP address.

- (Optional) In the **SPINE IS ROUTE REFLECTOR** field, turn it on if the spine can be route reflected.
- Repeat step 5c for each spine.

d) Repeat step 5 for the other sites.

### Step 6

(Optional) If you are running release 1.2(1) or later: If decide to use the same Data Plane Unicast TEP for Multi-Site.

- In the **Fabric Connectivity Infra**, click on the site.
- Click on the POD.
- In the **Property Pane**, you can add the same Data Plane Unicast TEP for each POD.

For more information, in the **Data Plane Unicast TEP** field, click on the **i** icon.

### Step 7

Click **APPLY**.

- Note**
- If you receive an error message regarding a value that is incorrect in the a field for a particular site, go to that site and correct the value. Then click **APPLY**.

# Adding Tenants Using the Multi-Site GUI

This section describes how to add tenants using the Multi-Site GUI.

## Before you begin

To enable configuring tenants, the APIC administrative user account (with complete read/write privileges) must be available.

Before tenant administrators can configure their tenants, you must create the tenant user accounts in APIC (with read/write privileges limited to their tenant policies). For more information about creating local site user accounts, see the *User Access, Authentication, and Accounting* chapter in *Cisco APIC Basic Configuration Guide, Release 3.x*.

## Procedure

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**Step 1** Log in to the Multi-Site GUI, in the **Main menu**, click **Tenants**.

**Step 2** In the **Tenants List** area, click **ADD TENANTS**.

**Step 3** In the **Tenant Details** pane, perform the following actions:

- a) In the **DISPLAY NAME** field, enter the tenant name.
- b) In the **DESCRIPTION** field, enter the a brief description of the tenant.
- c) In the **Associated Sites** section, choose the sites.
- d) In the **Select Security Domain(s)** field, from the drop-down list, choose the security domains.

**Note** Security domains are created using the APIC GUI and can be assigned to various APIC policies and user accounts to control their access. For more information, see the *Cisco APIC Basic Configuration Guide, Release 3.x*.

- e) In the **Associated Users** section, choose the users.
  - f) Click **SAVE**.
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# Adding Schemas Using the Multi-Site GUI.

This section describes how to add schemas using the Multi-Site GUI.

## Procedure

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**Step 1** Log in to the Multi-Site GUI, in the **Main menu**, click **Schemas**.

**Step 2** In the **Schemas List** area, click **ADD SCHEMA**.

**Step 3** In the **Untitled Schema** pane, perform the following actions:

- a) In the **Untitled Schema** field, enter a new schema name.
- b) Click **To build your schema please click here to select a tenant**, in the **Master List**, click **SELECT A TENANT**, from the drop-down list, choose a tenant.

- c) Click + **Application profile**, in the **Master List**, enter the application profile name.
- d) Click + **Add EPG** field, in the **Master List**, perform the following actions:
  - 1. In the **DISPLAY NAME** field, enter the EPG name.
  - 2. Click **ADD SUBNET**, in the **Add Subnet** pane, perform the following actions:
    - 1. In the **GATEWAY IP** field, enter the gateway IP/netmask.
    - 2. In the **DESCRIPTION** field, enter a brief description.
    - 3. In the **SCOPE** section, choose **Private to VRF** or **Advertised Externally** radio button.
    - 4. In the **SHARED BETWEEN VRF'S** section, place a check in the check box to share between VRF's.
    - 5. In the **NO DEFAULT SVI GATEWAY** section, place a check in the check box to not have a default SVI gateway.
  - 6. Click **SAVE**.
  - 7. Repeat 3d to create another EPG. You should have two EPGs.
- e) In the **BRIDGE DOMAIN** field, from the drop-down list, choose a bridge domain or enter a bridge domain name to create one.
- f) Click + **CONTRACT** field, perform the following actions:
  - 1. In the **CONTRACT** field, from the drop-down list, choose a contract or enter a contract name to create one.
  - 2. In the **TYPE** field, from the drop-down list, choose **consumer**.
  - 3. Click **SAVE**.
- g) Click **ADD CONTRACT** field to add a second contract, perform the following actions:
  - 1. In the **CONTRACT** field, from the drop-down list, choose a contract or enter a contract name to create one.
  - 2. In the **TYPE** field, from the drop-down list, choose **provider**.
  - 3. Click **SAVE**.
- h) Click + **VRF**, in the **Master List**, perform the following actions:
  - 1. In the **DISPLAY NAME** field, enter the VRF name.
- i) Click + **Add Bridge Domain**, in the **Master List**, perform the following actions:
  - 1. In the **DISPLAY NAME** field, enter the bridge domain name.
  - 2. In the **VIRTUAL ROUTING & FORWARDING** field, from the drop-down list, choose a VRF name or enter a VRF name to create one.
  - 3. In the **L2STRETCH** section, place a check in the check box to enable Layer 2 stretch.
  - 4. In the **INTERSITEBUMTRAFFICALLOW** section, place a check in the check box to allow intersite BUM traffic.



5. In the **L2UNKNOWNUNICAST** field, from the drop-down list, choose **proxy** or **flood**.
  6. Click **[+] Add Subnet**, perform the following actions:
    1. In the **GATEWAY IP** field, enter the gateway IP address/netmask.
    2. In the **DESCRIPTION** field, enter a brief description of the subnet.
    3. In the **SCOPE** field, choose **Private to VRF** or **Advertised Externally**.
    4. In the **SHARED BETWEEN VRF'S** section, place a check in the check box to share between VRF's.
    5. In the **NO DEFAULT SVI GATEWAY** section, place a check in the check box to not have a default SVI gateway.
    6. In the **QUERIER** section, place a check in the check box to querier.
    7. Click **OK**.
  - j) Click **Sites +**, place a check in the check box for each site.
  - k) Click **SAVE**.
  - l) Click **Click DEPLOY TO SITES**.
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