Mixed-Mode Encapsulation

This chapter contains the following sections:

Mixed-Mode Encapsulation Configuration

You can configure a single VMM domain to use VLAN and VXLAN encapsulation. Mixed-mode encapsulation enables you to have a single domain for all EPGs, regardless of encapsulation mode. That makes it easier to track and manage EPGs.

When you create a VMM domain, you can explicitly choose its encapsulation mode: VLAN or VXLAN.

When you create a new EPG for the VMM domain, each EPG for the domain by default uses the VMM domain's encapsulation mode. However, when you create a new EPG and associate it with a domain, you can configure the EPG to override the domain encapsulation mode and use another mode.

For example, you may choose VLAN configuration when you create a VMM domain. When you create a new EPG for the domain, you may configure it to use VLAN—the domain mode—or you may configure it to use VXLAN.

Ensure non overlapping VLAN blocks (internal for AVE and external for DVS) are used for AVE and DVS if AEP remains same for AVE-deployed EPGs in VLAN mode.

Note To use mixed-mode encapsulation, you must configure and assign both a VXLAN pool and a VLAN pool to the VMM domain.

Mixed-mode encapsulation is available for Cisco ACI Virtual Edge in local switching mode only.

Encapsulation Pool Combinations

Your ability to add and delete VLAN and multicast pools for a VMM domain depends on whether EPGs are associated with the domain.

If no EPGs are associated with the VMM domain, you can add and delete VLAN and multicast pools. You can do this regardless of whether the VMM domain default encapsulation mode is VLAN or VXLAN.

If EPGs are associated with the VMM domain, you cannot delete existing VLAN or multicast pools.:

- VLAN—You can configure both VLAN and multicast pools.

  VLAN is the default encapsulation mode for the domain. New EPGs created for this VMM domain use VLAN encapsulation by default. You can configure EPGs to use VXLAN encapsulation if multicast pools are configured in the VMM domain.

  Note Configure the private VLAN as internal in the VLAN pool for internal switching. The VLAN pool used for internal switching is used only on Cisco ACI Virtual Edge and does not need to be allowed on the transit network interfaces.

- VXLAN—You can configure both VLAN and multicast pools. VXLAN is the default encapsulation mode for the domain. New EPGs created for the VMM domain use VXLAN encapsulation by default. You can configure EPGs to use VLAN encapsulation if VLAN pools are configured in the VMM domain.

Check or Change the VMM Domain Encapsulation Mode Using the APIC GUI

You can use the APIC GUI to discover and change the encapsulation mode of a VMM domain.

Note If EPGs are associated to the VMM domain, you cannot change its switching mode. If you want the domain to use a different switching mode, delete and re-create it. However, you can change the switching mode of the VMM domain if no EPGs are associated to it.

Procedure

Step 1 Log in to the Cisco APIC.

Step 2 Go to **Virtual Networking** > **Inventory** > **VMM Domains** > **VMware** > *VMM domain* .

In the VMM domain work pane, in the **Properties** area, the **Default Encapsulation Mode** field highlights **VLAN** or **VXLAN** in blue.

Step 3 If you wish, change the mode in the **Default Encapsulation Mode** by clicking on the preferred mode.

Step 4 If needed, configure a VLAN or multicast pool in the work pane.

In order to change the default mode to **VLAN**, you must have a VLAN pool configured. In order to change the default mode to **VXLAN**, you must have a multicast address and multicast pool configured.

Note	For both VLAN and VXLAN modes, if you have not already done so, you must configure an internal VLAN pool for the private VLAN, which is used for internal switching.

Step 5   Click **Submit**.

Check or Change the VMM Domain Encapsulation Mode Using the NX-OS CLI

You can use the NX-OS CLI to check or change the encapsulation mode of a VMM domain.

Note	If EPGs are associated to the VMM domain, you cannot change its switching mode. If you want the domain to use a different switching mode, delete and re-create it. However, you can change the switching mode of the VMM domain if no EPGs are associated to it.

Procedure

Step 1   Check the VMM domain encapsulation mode.

Example:

```
apic1(config-vmware-ave)# show run
# Command: show running-config vmware-domain mininet1 configure-ave
# Time: Tue Nov 21 07:07:58 2017
  vmware-domain mininet1
    configure-ave
      switching mode vlan
      multicast-address 230.1.2.3
      exit
    exit
apic1(config-vmware-ave)#
```

Step 2   Change the VMM domain encapsulation mode.

Example:

```
apic1# configure
apic1(config)# vmware-domain mininet
apic1(config-vmware)# configure-ave
apic1(config-vmware-ave)# switching mode ?
 vlan      VLAN/SW Mode
 vxlan     VXLAN/SW Mode
 vxlan-ns  VXLAN/HW Mode
```

Check or Change the VMM Domain Encapsulation Mode Using the REST API

You can use the REST API to discover and change the encapsulation mode of a VMM domain.

Note   If EPGs are associated to the VMM domain, you cannot change its switching mode. If you want the domain to use a different switching mode, delete and re-create it. However, you can change the switching mode of the VMM domain if no EPGs are associated to it.

Procedure

Discover and change the encapsulation mode of a VMM domain.

Example:

```
<vmmProvP vendor="VMware">
    <vmmDomP name="mininet" enableAVE="true" enfPref="sw" mcastAddr="225.1.1.1"
encapMode="vxlan" prefEncapMode="vxlan">
</vmmProvP>
```

Override the VMM Domain Encapsulation Mode for an EPG Using the APIC GUI

After you create an EPG and associate it with a VMM domain, you can change the encapsulation mode of the EPG. You can make the encapsulation mode different from or the same as that of the VMM domain.

Before you begin

You must already have created an EPG and have associated it with a VMM domain.

Procedure

Step 1   Log in to the Cisco APIC.

Step 2   Go to **Tenants** > *tenant* > **Application Profiles** > *application profile* > **Application EPGs** > *EPG* > **Domains (VMs and Bare-Metals)**.

Step 3   In the **Domains (VMs and Bare-Metals)** work pane, double-click a domain, ensure that the switching mode is **AVE**, and then choose a mode from the **Encap Mode** drop-down list.

You can choose one of the following encap modes:

- **VXLAN**—This overrides the domain's VLAN configuration, and the EPG uses VXLAN encapsulation. However, a fault is triggered for the EPG if a multicast pool is not configured on the domain.

- **VLAN**—This overrides the domain's VXLAN configuration, and the EPG uses VLAN encapsulation. However, a fault is triggered for the EPG if a VLAN pool is not configured on the domain.

- **Auto**—This causes the EPG to use the same encapsulation mode as the VMM domain. This is the default configuration.

Step 4 Click **Update**.

What to do next

Verify the configuration by checking the endpoints under the EPG for the encapsulation mode.

Override the VMM Domain Encapsulation Mode for an EPG Using the NX-OS Style CLI

After you create an EPG and associate it with a VMM domain, you can change the encapsulation mode of the EPG so it differs from or is the same of the VMM domain encapsulation mode.

Before you begin

You must already have created an EPG and have associated it with a VMM domain.

Procedure

Specify the encapsulation mode for an EPG:

Example:

```
apic1(config)# tenant <tenant name>
apic1(config-tenant)# application <application name>
apic1(config-tenant-app)# epg <epg name>conf
apic1(config-tenant-app-epg)# vmware-domain member <vmm domain name>
apic1(config-tenant-app-epg-domain)# encap-mode auto | vlan | vxlan
apic1(config-tenant-app-epg-domain)# switching-mode AVE
```

You can choose one of the following encapsulation modes:

- **Auto**—This causes the EPG to use the same encapsulation mode as the VMM domain. This is the default configuration.

- **VLAN**—This overrides the domain's VXLAN configuration, and the EPG will use VLAN encapsulation. However, a fault will be triggered for the EPG if a VLAN pool is not configured on the domain.

- **VXLAN**—This overrides the domain's VLAN configuration, and the EPG will use VXLAN encapsulation. However, a fault will be triggered for the EPG if a multicast pool is not configured on the domain.

Override the VMM Domain Encapsulation Mode for an EPG Using the REST API

Procedure

Override the VMM domain encapsulation mode for an EPG.

Example:

```
<polUni>
<fvTenant name="coke">
<fvAp name="sap">
<fvAEPg name="web1">
<fvRsDomAtt resImedcy="immediate"
tDn="uni/vmmp-VMware/dom-mininet"
switchingMode="AVE" encapMode="vxlan"/>
</fvAEPg>
</fvAp>
</fvTenant>
</polUni>
```

For **encapMode=**, you can enter one of the following:

- **auto**—This causes the EPG to use the same encapsulation mode as the VMM domain. This is the default configuration.

- **vlan**—This overrides the domain's VXLAN configuration, and the EPG will use VLAN encapsulation. However, a fault will be triggered for the EPG if a VLAN pool is not configured on the domain.

- **vxlan**—This overrides the domain's VLAN configuration, and the EPG will use VXLAN encapsulation. However, a fault will be triggered for the EPG if a multicast pool is not configured on the domain.