Cisco ACI Virtual Edge Overview

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About Cisco ACI Virtual Edge

Beginning with the Cisco APIC Release 3.1(1), the Cisco Application Centric Infrastructure (ACI) supports the Cisco ACI Virtual Edge. Cisco ACI Virtual Edge is the next generation of the Application Virtual Switch (AVS) for Cisco ACI environments. Cisco ACI Virtual Edge is a hypervisor-independent distributed service VM that leverages the native distributed virtual switch that belongs to the hypervisor. Cisco ACI Virtual Edge runs in the user space, operates as a virtual leaf, and is managed by the Cisco Application Policy Infrastructure Controller (APIC).

If you use Cisco AVS, you can migrate to Cisco ACI Virtual Edge; if you use VMware VDS, you can run Cisco ACI Virtual Edge on top of it. Decoupling the Cisco ACI Virtual Edge from the kernel space makes the solution adaptable to different hypervisors. It also facilitates simple upgrades as Cisco ACI Virtual Edge is not tied to hypervisor upgrades. Cisco ACI Virtual Edge implements the OpFlex protocol for control plane communication. It supports two modes of traffic forwarding: local switching and no local switching.

Cisco ACI Virtual Edge Release 1.1(1a) supports only the VMware hypervisor. It leverages the vSphere Distributed Switch (VDS), which is configured in private VLAN (PVLAN) mode.

When network administrators create a Cisco ACI Virtual Edge VMM domain on Cisco APIC, they must associate the domain with a range of VLANs to be used for PVLAN pair association of port groups on the DVS. Server administrators do not need to associate PVLANs to port groups on vCenter because Cisco APIC automatically associates PVLAN pairs with the endpoint groups (EPGs).

Note EPGs in Cisco APIC are equivalent to port groups in vCenter.

Local Switching Mode

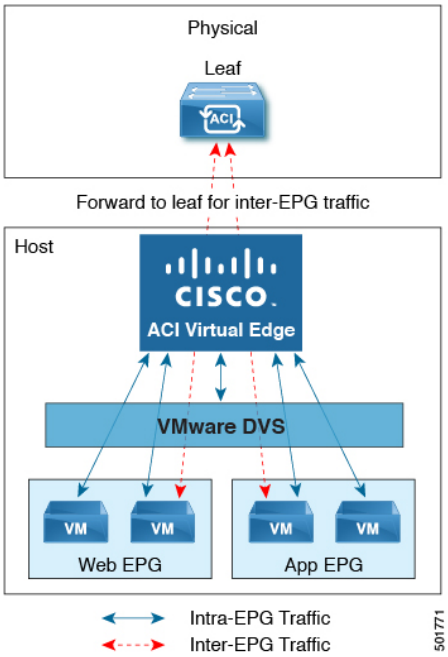
In Local Switching mode, the Cisco ACI Virtual Edge locally forwards all intra-EPG traffic without involving the leaf. All inter-EPG traffic is forwarded through the leaf. In this mode, the Cisco ACI Virtual Edge can

use either VLAN or VXLAN encapsulation—or both—for forwarding traffic to the leaf and back. You choose the encapsulation type during Cisco ACI Virtual Edge VMM domain creation.

You can configure a single VMM domain in Local Switching mode to use VLAN and VXLAN encapsulation.

If you choose VLAN encapsulation, a range of VLANs must be available for use by the Cisco ACI Virtual Edge. These VLANs have local scope in that they have significance only within the Layer 2 network between the Cisco ACI Virtual Edge and the leaf. If you choose VXLAN encapsulation, only the infra-VLAN must be available between the Cisco ACI Virtual Edge and the leaf. This results in a simplified configuration. It is the recommended encapsulation type if there are one or more switches between the Cisco ACI Virtual Edge and the physical leaf.

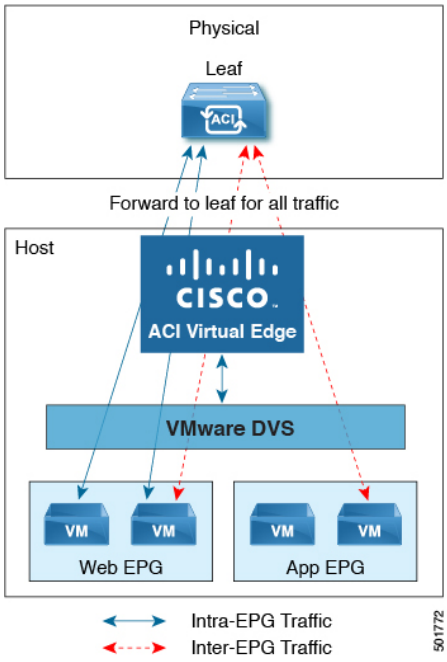
Figure 1: The Cisco ACI Virtual Edge in Local Switching Mode



No Local Switching Mode

In No Local Switching mode, the leaf forwards all traffic. In this mode, VXLAN is the only allowed encapsulation type.

Figure 2: The Cisco ACI Virtual Edge in No Local Switching Mode



Statistics Collection

Statistics collection is enabled on Cisco ACI Virtual Edge by default. You may see Cisco ACI Virtual Edge faults within the Cisco APIC GUI relating to VM resource use.

Troubleshoot those faults in the VMware vCenter because the Cisco ACI only generates these faults based on information it receives from VMware vCenter.

About the Cisco ACI Virtual Edge and the VMware vCenter

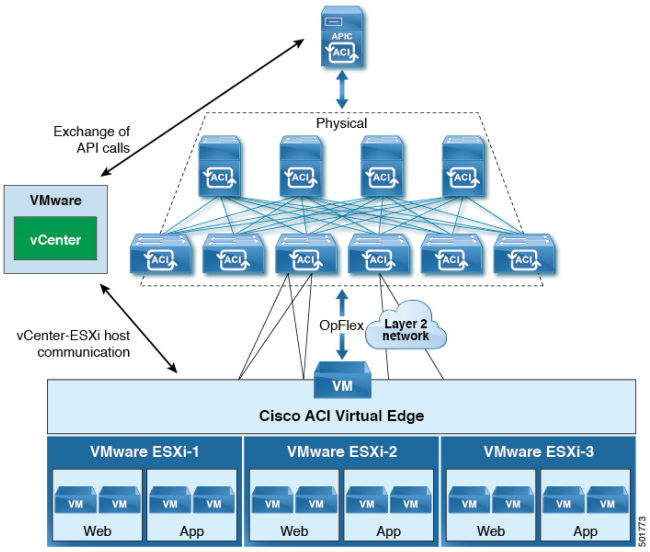
The Cisco ACI Virtual Edge is a distributed virtual switch that extends across many virtualized hosts. It manages a data center defined by the vCenter Server.

The Cisco ACI Virtual Edge is compatible with any upstream physical access layer switch that complies with the Ethernet standard, including Cisco Nexus switches. The Cisco ACI Virtual Edge is compatible with any server hardware listed in the *VMware Hardware Compatibility List* (HCL).

The Cisco ACI Virtual Edge is a distributed virtual switch solution that is fully integrated within the VMware virtual infrastructure, including VMware vCenter for the virtualization administrator. This solution allows the network administrator to configure virtual switch and port groups in order to establish a consistent data center network policy.

The following figure shows a topology that includes the Cisco ACI Virtual Edge with the Cisco APIC and VMware vCenter.

Figure 3: Sample Cisco ACI Virtual Edge Topology



Note If there are multiple vCenters connected to a single Cisco ACI fabric, you should ensure that there are no overlapping MAC address allocation schema across the multiple vCenters while deploying the vCenters instead of the default OUI allocation. Overlaps can cause duplicate MAC address generation. For more information, see VMware documentation.

Cisco ACI Virtual Edge in a Multipod Environment

The Cisco ACI Virtual Edge can be part of a multipod environment. Multipod environments use a single Cisco APIC cluster for all the pods; all the pods act as a single fabric.

Multipod environments enable a more fault tolerant fabric comprising multiple pods with isolated control plane protocols. They also provide greater flexibility in full mesh cabling between leaf and spine switches.

Cisco ACI Virtual Edge does not require any additional configuration to operate in a multipod environment.

For detailed information about multipod environments, see the following documents on Cisco.com:

- *Cisco Application Centric Infrastructure Fundamentals*
- *Cisco APIC Getting Started Guide*
- *Cisco APIC NX-OS Style Command-Line Interface Configuration Guide*

The following features are not supported for Cisco ACI Virtual Edge with multipod in Cisco APIC releases 3.1(1) through 4.0(1):

- L3 Multicast
- Storage vMotion with two separate NFS in two separate PODs
- ERSPAN destination in different PODs

- Distributed Firewall syslog server in different PODs

Required Software

The following table shows the versions of software required for Cisco ACI Virtual Edge to work with the Cisco APIC, VMware vCenter, and VMware ESXi hypervisor:

Component	Description
Cisco ACI Virtual Edge software	Cisco ACI Virtual Edge is supported beginning with Release 1.1(1).
Cisco APIC	Cisco ACI Virtual Edge is supported in Cisco APIC beginning with Release 3.1(1).
VMware vCenter	Cisco ACI Virtual Edge is compatible with release 6.0 and later versions of VMware vCenter Server.
VMware vSphere bare metal	Cisco ACI Virtual Edge is supported as a vLeaf for the Cisco APIC with release 6.0 and later releases of the VMware ESXi hypervisor.