Cisco Application Policy Infrastructure Controller

About Cisco ACI

Cisco® Application Centric Infrastructure (Cisco ACI™) is the industry's most secure, open, and comprehensive Software-Defined Networking (SDN) solution. It radically simplifies, optimizes, and accelerates infrastructure deployment and governance and expedites the application deployment lifecycle.

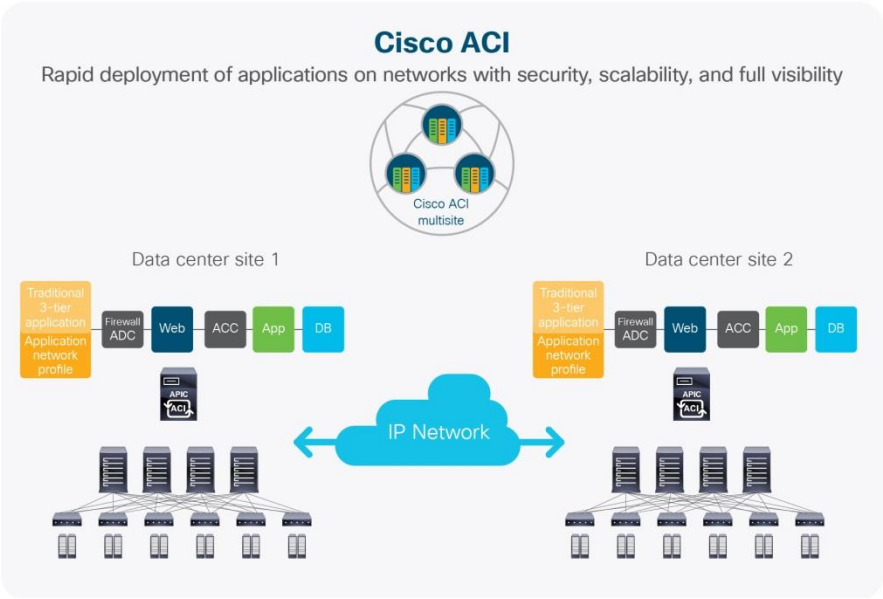
Cisco ACI implements Cisco's intent-based networking framework. It captures higher-level business and user intent in the form of a policy and converts this intent into the network constructs necessary to dynamically provision the network, security, and infrastructure services. It uses a holistic systems-based approach, with tight integration between hardware and software and physical and virtual elements, an open ecosystem model, and innovative Cisco customer Application-Specific Integrated Circuits (ASICs) to enable unique business value for modern data centers. This unique approach uses a common policy-based operating model across the network, drastically reducing the cost and complexity of operating your network.

Cisco ACI building blocks

The Cisco ACI solution consists of the following building blocks (Figure 1):

- Cisco Application Policy Infrastructure Controller (APIC)
- Cisco ACI multisite virtual appliance
- Cisco Nexus® 9000 Series spine and leaf switches for Cisco ACI
- Cisco Application Virtual Switch Next Generation (AVS-NG)

Figure 1. Cisco ACI architectural building blocks



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Cisco Application Policy Infrastructure Controller features

The infrastructure controller is the main architectural component of the Cisco ACI solution. It is the unified point of automation and management for the Cisco ACI fabric, policy enforcement, and health monitoring. The APIC appliance is a centralized, clustered controller that optimizes performance and unifies the operation of physical and virtual environments. The controller manages and operates a scalable multitenant Cisco ACI fabric.

The main features of the APIC include the following:

- Application-centric network policies
- Data-model-based declarative provisioning
- Application and topology monitoring and troubleshooting
- Third-party integration
  - Layer 4 through Layer 7 (L4-L7) services
  - VMware vCenter and vShield
  - Microsoft Hyper-V, System Center Virtual Machine Manager (SCVMM), and Azure Pack
  - Open Virtual Switch (OVS) and OpenStack
  - Kubernetes
- Image management (spine and leaf)
- Cisco ACI inventory and configuration
- Implementation on a distributed framework across a cluster of appliances
- Health scores for critical managed objects (tenants, application profiles, switches, etc.)
- Fault, event, and performance management
- Cisco Application Virtual Switch (AVS), which can be used as a virtual leaf switch

The controller framework enables broad ecosystem and industry interoperability with Cisco ACI. It enables interoperability between a Cisco ACI environment and management, orchestration, virtualization, and L4-L7 services from a broad range of vendors.

Cisco APIC cluster

The APIC appliance is deployed as a cluster. A minimum of three infrastructure controllers are configured in a cluster to provide control of the scale-out Cisco ACI fabric (Figure 2). The ultimate size of the controller cluster is directly proportionate to the size of the Cisco ACI deployment and is based on the transaction-rate requirements. Any controller in the cluster can service any user for any operation, and a controller can be transparently added to or removed from the cluster.

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Figure 2. Cisco APIC cluster

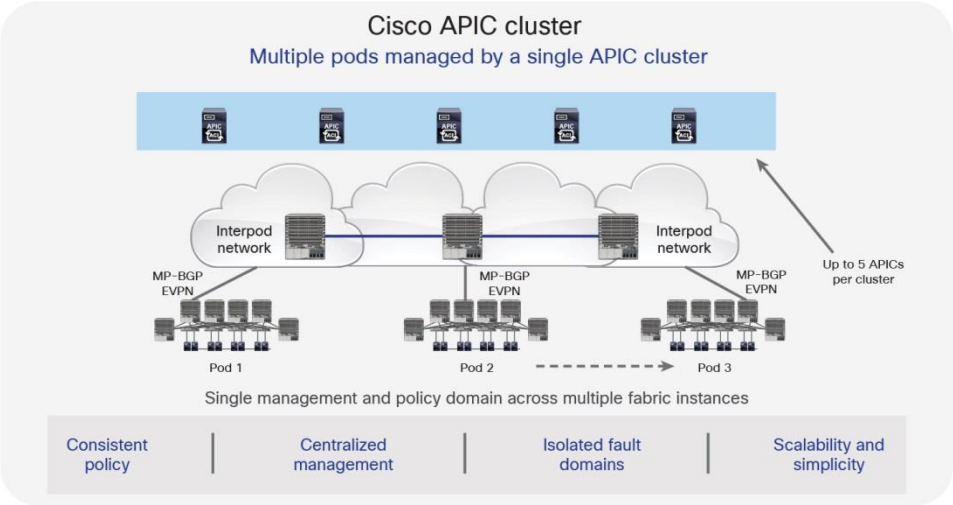

Figure 3 shows front and back views of the APIC appliance.

Figure 3. Cisco APIC appliance front and back views

APIC front panel	
APIC back panel	

APIC appliance product specifications

The APIC appliance is available in two form factors (Table 1):

- Medium configuration
- Large configuration

Table 1. Cisco APIC sizes

Cisco APIC configuration	Part number	Description
Medium	APIC-M2	APIC with medium-size CPU, hard drive, and memory configurations (up to 1000 edge ports)
Large	APIC-L2	APIC with large CPU, hard drive, and memory configurations (more than 1000 edge ports)
XS Cluster	APIC-CLUSTER-XS	1 APIC with medium-size CPU, hard drive, memory and 2 Virtual APICs
Medium cluster	APIC-CLUSTER-M2	Cluster of 3 APIC devices with medium-size CPU, hard drive, and memory configurations (up to 1000 edge ports)
Large cluster	APIC-CLUSTER-L2	Cluster of 3 Cisco APIC devices with large CPU, hard drive, and memory configurations (more than 1000 edge ports)
Medium (spare)	APIC-M2=	APIC with medium-size CPU, hard drive, and memory configurations (up to 1000 edge ports)
Large (spare)	APIC-L2=	APIC with large CPU, hard drive, and memory configurations (more than 1000 edge ports)

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Table 2 lists the specifications of the APIC appliance. Note that at least three appliances need to be configured as a cluster.

Table 2. Cisco APIC appliance specifications

	Cisco APIC appliance Medium configuration: M2		Cisco APIC appliance Large configuration: L2	
	Description	**Default units**	**Description**	**Default units**
Processor	1.90-GHz Intel® Xeon® processor E5-2609 v3 with 85 watts (W), 6 cores, 15-MB cache, DDR4, and 1600 MHz	2	2.40-GHz Intel Xeon processor E5-2620 v3 with 85W, 6 cores, 15-MB cache, DDR4, and 1866 MHz	2
Memory	16-GB DDR4 2133-MHz RDIMM PC4-17000, dual-rank x4 with 1.2V	4	16-GB DDR4 2133-MHz RDIMM PC4-17000 dual-rank x4 with 1.2V	8
PCI Express (PCIe) slots	Cisco UCS® Virtual Interface Card (VIC) 1225 dual-port 10-Gbps Enhanced Small Form-Factor Pluggable (SFP+) Converged Network Adapter (CNA) Or Cisco UCS VIC 1225T dual-port 10GBASE-T CNA	1	Cisco UCS VIC 1225 dual-port 10-Gbps SFP+ CNA Or Cisco UCS VIC 1225T dual-port 10GBASE-T CNA	1
Power supply	770W power supply	1	770W power supply	1

Cisco APIC Medium and Large configurations	
Physical dimensions (H x W x D)	1 Rack Unit (1RU): 1.7 x 16.9 x 28.5 in. (4.32 x 43 x 72.4 cm)
Temperature: Operating	32 to 104°F (0 to 40°C) (operating, at sea level, with no fan fail and no CPU throttling, and with turbo mode)
Temperature: Nonoperating	–40 to 158°F (–40 to 70°C)
Humidity: Operating	10 to 90% noncondensing
Humidity: Nonoperating	5 to 93% noncondensing
Altitude: Operating	0 to 10,000 ft (0 to 3000m); maximum ambient temperature decreases by 1°C per 300m
Altitude: Nonoperating	0 to 40,000 ft (12,000m)

Table 3. Cisco Virtual APIC Requirements (Note: These are minimum requirements and will be updated closer to ACI 4.0 release)

	Cisco Virtual APIC Requirements
	Description
Processor	8vCPUs
Memory	32 GB
DiskSpace	100G SSD 500G HDD

For more information

Use the following links for additional information:

- Cisco ACI solution data sheet: Click here. - Click here.
- Cisco ACI ordering guide: Click here.
- Cisco Nexus 9000 Series Switches data sheet: Click here.
- Cisco AVS data sheet: Click here.

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- Cisco ACI solution general details: Click here.
- Technical white papers: Click here.
- Case studies: Click here.
- Solution overviews: Click here.
- YouTube video tutorials: Click here.
- Release notes for Cisco ACI and APIC solutions: Click here.
- Release notes for Cisco Nexus 9000 Series Switches: Click here.
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