# Cisco Application Centric Infrastructure (ACI) Simulator

## Cisco Application Centric Infrastructure Overview

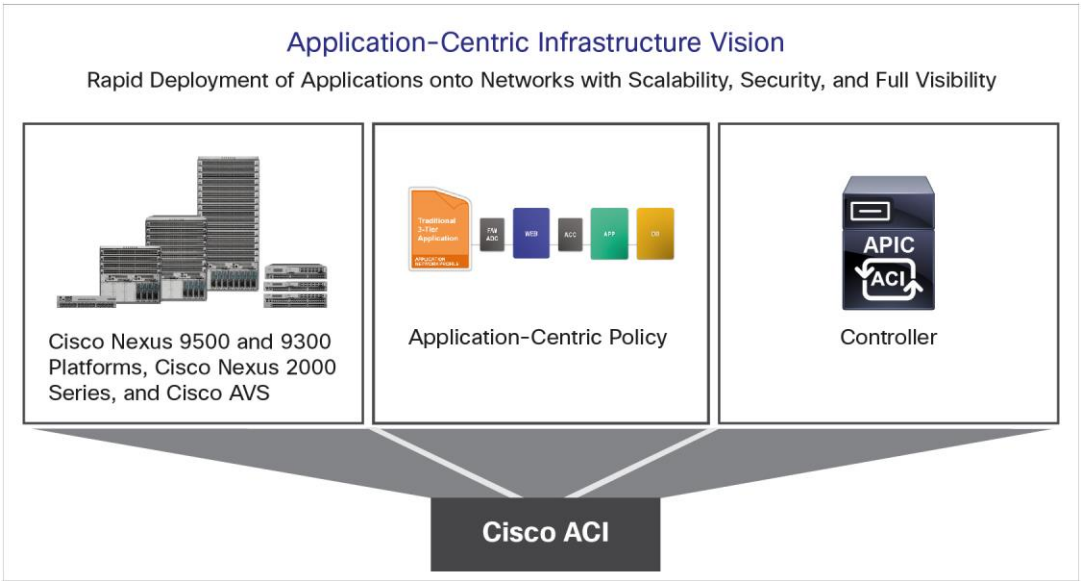
Cisco® Application Centric Infrastructure (ACI) is an innovative architecture that radically simplifies, optimizes, and accelerates the entire application deployment lifecycle.

Cisco ACI uses a holistic systems-based approach, with tight integration between physical and virtual elements, an open ecosystem model, and innovation-spanning application-specific integrated circuits (ASICs), hardware, and software. This unique approach uses a common policy-based operating model across network and security elements ready to support Cisco ACI (computing and storage elements are planned for the future), overcoming IT silos and drastically reducing costs and complexity.

The Cisco ACI fabric consists of three major components (Figure 1):

- Cisco Application Policy Infrastructure Controller (APIC)
- Cisco Nexus 9000 Series Switches (Cisco ACI spine and leaf switches), Cisco Nexus® 2000 Series Fabric Extenders, and Cisco Application Virtual Switch (AVS)
- Cisco ACI ecosystem

**Figure 1.** Cisco ACI Vision



## Cisco ACI Simulator Product Overview

The Cisco ACI is the unifying point for automation, management, monitoring, and programmability for the Cisco ACI fabric. Cisco ACI Simulator provides centralized access to all fabric information, optimizes the application lifecycle for scale and performance, and supports flexible application provisioning across physical and virtual resources.

The Cisco ACI Simulator is a physical appliance that provides a simulated Cisco ACI environment.

The Cisco ACI Simulator provides full-featured Cisco APIC controller software along with a simulated fabric infrastructure of leaf switches and spine switches in one physical server. Because the Cisco ACI Simulator includes Cisco APIC instances with real production software, you can use it to understand features, exercise APIs, and initiate integration with third-party orchestration systems and applications. The native GUI and command-line interface (CLI) of Cisco APIC use the same APIs that are published for third parties.

The Cisco ACI Simulator includes simulated switches, so you cannot validate a data path. However, some of the simulated switch ports have been mapped to the front-panel server ports, which allows you to connect external management entities such as VMware ESX servers, VMware vCenter, VMware vShield, and bare-metal servers; Layer 4 through 7 services; authentication, authorization, and accounting (AAA) systems; and other physical and virtual service appliances. In addition, the Cisco APIC Simulator allows simulation of faults and alerts to facilitate testing and demonstrate features.

## Topology Supported by Cisco ACI Simulator

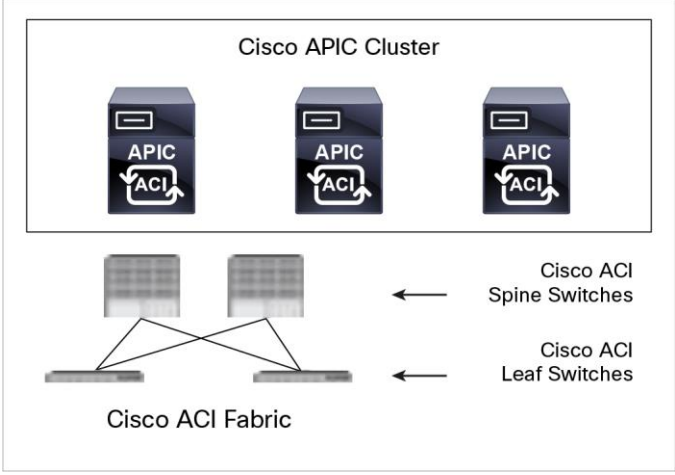
The Cisco ACI Simulator enables you to simulate the Cisco ACI fabric, including the Cisco Nexus 9000 Series Switches supported in a leaf-and-spine topology, to take full advantage of an automated, policy-based, systems management approach.

Table 1 and Figure 2 show the supported configuration for the Cisco APIC Simulator.

**Table 1.** Supported Configuration

| | |
|---|---|
| **Cisco APIC cluster** | 3 controllers |
| **Cisco ACI spine** | 2 switches |
| **Cisco ACI leaf** | 2 switches |

**Figure 2.** Cisco ACI Simulator Topology



## Capabilities: Cisco ACI Simulator

The Cisco ACI Simulator supports the same feature set that is supported on Cisco APIC and Cisco ACI fabric. The only difference is that in the Cisco ACI Simulator, the data plane is simulated.

Table 2 summarizes the main capabilities supported on the Cisco ACI Simulator.

**Table 2.** Main Capabilities

| | Domain | Capabilities |
|---|---|---|
| 1 | **Fabric management** | • Perform fabric discovery<br>• Register leaf and spine switches<br>• Show topology view |
| 2 | **Creation of network constructs** | • Build a tenant<br>• Build a private Layer 3 network<br>• Build a bridged domain |
| 3 | **Specification of Cisco ACI policy parameters** | • Create filters<br>• Create contracts |
| 4 | **Application deployment** | • Create endpoint groups (EPGs)<br>• Create application network profile<br>• Set provider contract<br>• Set consumer contract |
| 5 | **Virtualization: VMware integration** | • Create VMM domain<br>• Create VLAN pool<br>• Create distributed virtual switch (DVS)<br>• Add VMware ESXi hosts to DVS<br>• Associate EPG with VMware vCenter domain<br>• Associate virtual machine with endpoint port groups |
| 6 | **Layer 4 through 7 services** | • Deploy a service graph with application network profile |
| 7 | **Monitoring and troubleshooting** | • View faults using GUI<br>• View events using GUI<br>• Set log retention policies<br>• Capture API interchange for inspection<br>• Show graphical view of managed objects |
| 8. | **APIC Northbound API clients** | • Python<br>• REST with JSON and XML bindings<br>• PowerShell |

**Note:** Refer to the Cisco ACI compatibility matrix for a full list of supported capabilities (virtualization, automation, management, orchestration, Layer 4 through 7 services, security, etc.) with Cisco APIC and Cisco APIC Simulator.

### Connectivity discovery

The simulator appliance supports discovery of devices directly connected to the appliance, Hypervisors, bare metal servers, external switch/routers, L4-7 service devices that are connected to the appliance via both CDP and LLDP mechanisms.

### Configurable faults and delays

Since the hardware is simulated, faults/alerts/delays are artificially injected.

## Cisco ACI Simulator Specifications

The Cisco ACI simulator appliance is available in a small form factor (Table 3),

**Table 3.** Cisco APIC Simulator Product Specifications

| Cisco APIC Simulator Configuration | Part Number | Description |
|---|---|---|
| **Small** | APIC-SIM-S | Cisco APIC Simulator for small configurations, with medium-size CPU, hard drive, and memory configurations: 2 spine switches, 2 leaf switches, and 3 APIC controllers (cluster) |
| **Small (spare)** | APIC-SIM-S= | Cisco APIC Simulator for small configurations, with medium-size CPU, hard drive, and memory configurations: 2 spine switches, 2 leaf switches, and 3 APIC controllers (cluster) |

Table 4 lists the specifications of the Cisco APIC appliance.

**Table 4.** Cisco ACI Simulator Appliance Specifications

| Cisco APIC Appliance (Small-Size Configuration) | | |
|---|---|---|
| | **Description** | **Default Units** |
| **Processors** | 2.10-GHz Intel® Xeon® processor E5-2620 v2, with 80 watts (W), 6 cores, 15-MB cache, DDR3, and 1600 MHz | 2 |
| **Memory** | 16-GB DDR3 1866-MHz RDIMM PC3-14900, dual rank, x4, and 1.5V | 4 |
| **PCI Express (PCIe) slots** | One of the following:<br>• Cisco UCS® Virtual Interface Card (VIC) 1225 dual-port 10-Gbps Enhanced Small Form-Factor Pluggable (SFP+) converged network adapter (CNA)<br>• Cisco UCS VIC 1225T dual-port 10GBASE-T CNA | 1 |
| **Power supply** | 650W power supply | 1 |
| **Solid-state drive (SSD)** | 100-GB 2.5 inch Enterprise Value SSD | 1 |
| **Trusted Platform Module (TPM)** | TPM | 1 |
| **PCIe cards** | One of the following:<br>• Cisco UCS VIC 1225 dual-port 10-Gbps SFP+ CNA<br>• Cisco UCS VIC 1225T dual-port 10GBASE-T CNA | 1 |

| Cisco ACI Simulator (Small Configuration) | |
|---|---|
| **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) (at sea level, no fan fail, no CPU throttling, and using 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) |

## Cisco ACI Ecosystem Integration

The Cisco APIC Simulator enables ecosystem interoperability with Cisco ACI. It enables interoperability between a Cisco ACI environment and management, orchestration, virtualization, and Layer 4 through 7 services from a broad range of vendors.

The Cisco APIC Simulator provides centralized access to your Cisco ACI deployment through an object-oriented Representational State Transfer (REST) API framework with XML and JavaScript Object Notation (JSON) binding. It also supports a modernized, user-extensible CLI and GUI. APIs have full read and write access to Cisco ACI, providing tenant- and application-aware programmability, automation, and system access.

Table 5 summarizes Cisco ACI integration with ecosystem products.

**Table 5.** Cisco ACI Integration with Other Products

| Cisco ACI Ecosystem Integration Category | Vendor | Supported Products |
|---|---|---|
| **Virtualization integration** | VMware | VMware ESXi, vCenter, and vShield<br>• VMware vSphere 5.1 and 5.5 and vShield 5.1 |
| | Cisco | Cisco AVS 1.0 |
| **Layer 4 through 7 services integration** | F5 | F5 BIG-IP (physical) and BIG-IP Virtual Edition 11.4.1 |
| | Citrix | • Citrix NetScaler MPX, SDX, and VPX (Release 10.1 or later)<br>• Citrix NetScaler 1000v on VMware ESXi 5.0 (with Cisco vPath disabled)<br>• Physical and virtual |
| | Cisco | Cisco ASA 5585-X Adaptive Security Appliance Release 9.1.2 and Cisco Adaptive Security Virtual Appliance (ASAv) Release 9.2.1 |

## Cisco ACI Simulator Ordering Information

Table 6 presents ordering information for the Cisco ACI Simulator.

**Table 6.** Ordering Information

| Part Number | Product Description |
|---|---|
| **Cisco Application Centric Infrastructure Simulator** | |
| **APIC-SIM-S** | APIC Simulator (small configuration: 2 spines, 2 leafs |
| **APIC-SIM-S=** | APIC Simulator (small configuration: 2 spines, 2 leafs) - SPARE |

## Service and Support

Cisco offers a wide range of services to help accelerate your success in deploying and optimizing the Cisco ACI solution in your data center. The innovative Cisco Services offerings are delivered through a unique combination of people, processes, tools, and partners and are focused on helping you increase operation efficiency and improve your data center network. Cisco Advanced Services uses an architecture-led approach to help you align your data center infrastructure with your business goals and achieve long-term value. Cisco SMARTnet™ Service helps you resolve mission-critical problems with direct access at any time to Cisco network experts and award-winning resources. With this service, you can take advantage of the Cisco Smart Call Home service capability, which offers proactive diagnostics and real-time alerts on your Cisco ACI deployment. Spanning the entire network lifecycle, Cisco Services offerings help increase investment protection, optimize network operations, support migration operations, and strengthen your IT expertise.

## For More Information

For more information about Cisco ACI, please visit http://www.cisco.com/go/aci.

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