

# Cisco Application Policy Infrastructure Controller

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## About Cisco ACI

The Cisco® Application Centric Infrastructure (Cisco ACI®) is part of our intent-based networking framework to enable agility in the datacenter. It captures higher-level business and user intent in the form of a policy and translates this into the network constructs necessary to dynamically provision network, security, and infrastructure services.

Built on top of the industry-leading Cisco Nexus® 9000 platform, Cisco ACI uses a holistic systems-based approach, with tight integration between hardware and software, between physical and virtual elements, an open ecosystem model, and innovative Cisco Application-Specific Integrated Circuits (ASICs) to enable unique business value for modern data centers.

Cisco ACI is the industry's most secure, open, and comprehensive Software-Defined Networking (SDN) solution.

ACI enables automation that accelerates infrastructure deployment and governance, simplifies management to easily move workloads across a multifabric, multicloud framework, and proactively secures against risk arising from anywhere. It radically simplifies, optimizes, and expedites the application deployment lifecycle.

Modern data centers are dynamic. IT operations must meet the expectation of quality-of-service business needs in a rapidly changing environment. ACI transforms IT operations from reactive to proactive with a highly intelligent set of software capabilities that analyzes every component of the data center to ensure business intent, guarantee reliability, and identify performance issues in the network before they happen.

As application usage gets more pervasive across an enterprise's network, IT professionals are looking to build solutions for consistent policy and encryption from the campus to the datacenter. With ACI integrations with SDA/DNA Center and SD-WAN, customers can now automate and extend policy, security, assurance, and insights across their entire networking ecosystem.

## Cisco ACI components

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

- Cisco Application Policy Infrastructure Controller (APIC).
- Cisco Nexus 9000 Series spine and leaf switches for Cisco ACI.
- Cisco ACI Multi-Site Orchestrator.
- Cisco Cloud APIC.

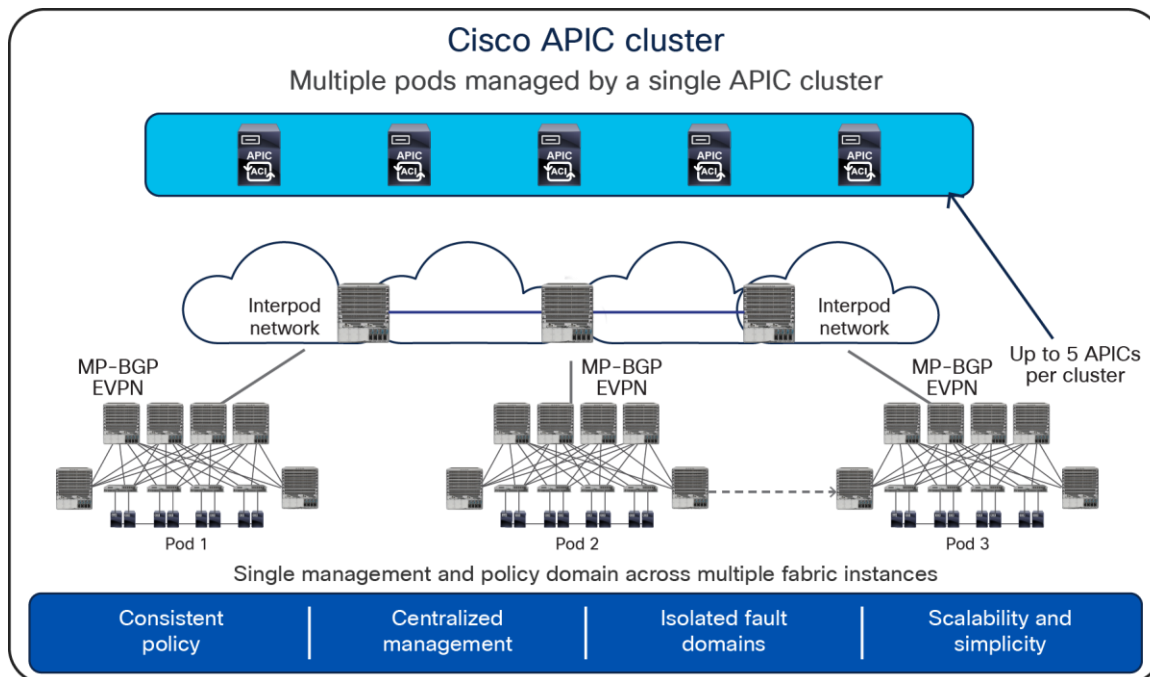


- Open Virtual Switch (OVS) and OpenStack.
- Kubernetes, RedHat OpenShift, Docker Enterprise.
- Image management (spine and leaf).
- Cisco ACI inventory and configuration.
- Implementation on a distributed framework across a cluster of appliances.
- Health scores for critical managed objects (tenants, application profiles, switches, etc).
- Fault, event, and performance management.
- Cisco Application Virtual Edge, 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.



**Figure 2.**  
Cisco APIC cluster

## APIC appliance product specifications

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

**Table 1.** Cisco APIC sizes

Cisco APIC configuration	Part number	Description
Medium M3	APIC-M3	APIC with medium-size CPU, hard drive, and memory configurations (up to 1200 edge ports)
Large L3	APIC-L3	APIC with large CPU, hard drive, and memory configurations (more than 1200 edge ports)
Medium cluster M3	APIC-CLUSTER-M3	Cluster of 3 APIC-M3 with medium-size CPU, hard drive, and memory configurations (up to 1200 edge ports)
Large cluster L3	APIC-CLUSTER-L3	Cluster of 3 APIC-L3 with large CPU, hard drive, and memory configurations (more than 1200 edge ports)
Medium M4	APIC-M4	APIC with medium-size CPU, hard drive, and memory configurations (up to 1200 edge ports)
Large L4	APIC-L4	APIC with large CPU, hard drive, and memory configurations (more than 1200 edge ports)
Medium cluster M4	APIC-CLUSTER-M4	Cluster of 3 APIC-M4 with medium-size CPU, hard drive, and memory configurations (up to 1200 edge ports)
Large cluster L4	APIC-CLUSTER-L4	Cluster of 3 APIC-L4 with large CPU, hard drive, and memory configurations (more than 1200 edge ports)

**Table 2.** Specifications of the APIC M3 and L3 appliance. Note that at least three appliances need to be configured as a cluster.

	Cisco APIC appliance Medium configuration: M3		Cisco APIC appliance Large configuration: L3	
	Description	Default units	Description	Default units
<b>Processor</b>	1.7 GHz Xeon Scalable 3106/85W 8C/11MB Cache/DDR4 2133M	2	2.1 GHz Xeon Scalable 4110/85W 8C/11MB Cache/DDR4 2400MHz	2
<b>Memory</b>	16GB DDR4-2666-MHz RDIMM/PC4-21300/single rank/x4/1.2v	6	16GB DDR4-2666-MHz RDIMM/PC4-21300/single rank/x4/1.2v	12
<b>Hard Drive</b>	1 TB 12G SAS 7.2K RPM SFF HDD	2	2.4 TB 12G SAS 10K RPM SFF HDD (4K)	2
<b>PCI Express (PCIe) slots</b>	Cisco UCS VIC 1455 Quad Port 10/25G SFP28 CNA PCIE	1	Cisco UCS VIC 1455 Quad Port 10/25G SFP28 CNA PCIE	1

	Cisco APIC appliance Medium configuration: M3		Cisco APIC appliance Large configuration: L3	
	Description	Default units	Description	Default units
<b>Power supply</b>	770W power supply	1	770W power supply	1

**Table 3.** Cisco APIC M3 and L3 Physical and Environmental Specs

Cisco APIC M3 and L3 Physical and Environmental Specs	
Overview	Description
<b>Physical dimensions (H x W x D)</b>	1 Rack Unit (1RU): 1.7 x 16.9 x 28.5 in. (4.32 x 43 x 72.4 cm)
<b>Temperature: Operating</b>	32 to 104° F (0 to 40° C) (operating, at sea level, with no fan fail and no CPU throttling, and with turbo mode)
<b>Temperature: Nonoperating</b>	-40 to 158° F (-40 to 70° C)
<b>Humidity: Operating</b>	10 to 90% noncondensing
<b>Humidity: Nonoperating</b>	5 to 93% noncondensing
<b>Altitude: Operating</b>	0 to 10,000 ft (0 to 3000m); maximum ambient temperature decreases by 1° C per 300m
<b>Altitude: Nonoperating</b>	0 to 40,000 ft (12,000m)

**Table 4.** Specifications of the APIC M4 and L4 appliance. Note that at least three appliances need to be configured as a cluster



APIC-M4



APIC-L4

	Medium configuration: M4		Large configuration: L4	
	Description	Default units	Description	Default units
<b>Processor</b>	AMD 3.0GHz 7313P 155W 16C/128MB Cache DDR4 3200MHz	1	AMD 2.85GHz 7443P 200W 24C/128MB Cache DDR4 3200MHz	1
<b>Memory</b>	16GB RDIMM SRx4 3200 (8Gb)	6	32GB RDIMM DRx4 3200 (8Gb)	6
<b>Hard Drive</b>	480GB 2.5in Enterprise Performance 6GSATA SSD (3X endurance) 960GB 2.5in Enterprise performance 6GSATA SSD (3X endurance)	1 each	480GB 2.5in Enterprise Performance 6GSATA SSD(3X endurance) 1.6TB 2.5in U.2 WD SN840 NVMe Extreme Perf. High Endurance	1 each

	Medium configuration: M4		Large configuration: L4	
	Description	Default units	Description	Default units
<b>PCI Express (PCIe) slots</b>	Intel E810XXVDA2 2x25/10 GbE SFP28 PCIe NIC Intel X710T2LG 2x10 GbE RJ45 PCIe NIC	None-Configurable Options	Intel E810XXVDA2 2x25/10 GbE SFP28 PCIe NIC Intel X710T2LG 2x10 GbE RJ45 PCIe NIC	None-Configurable Options
<b>Power supply</b>	1050W (AC and DC) and 1600 W	1	1050W (AC and DC) and 1600 W	1
<b>FAN</b>	Eight hot-swappable fans			
<b>Airflow</b>	Front to rear cooling			

**Table 5.** Cisco APIC M4 and L4 Physical and Environmental Specs

Overview	Description
<b>Physical Specifications</b>	1 Rack Unit (RU), Height (43.2 mm), Width 16.9 in. (429.0 mm), Depth (length) Server only: 29.5 in. (740.3 mm)
<b>Temperature: Operating</b>	10° C to 35° C (50° F to 95° F) with no direct sunlight
<b>Temperature: Nonoperating</b>	Below -40° C or above 65° C (below -40° F or above 149° F)
<b>Humidity (RH): Operating</b>	8 to 90% and 24° C (75o F) maximum dew-point temperature, non-condensing environment
<b>Humidity (RH): Nonoperating</b>	Below 5% or above 95% and 33o C (91o F) maximum dew-point temperature, non-condensing environment
<b>Altitude: Operating</b>	0 to 10,000 feet
<b>Altitude: Nonoperating</b>	0 to 40,000 feet

**Table 6.** Cisco medium form factor virtual APIC requirements

To use the APIC controller as a virtual form-factor or in AWS cloud, a DCN-vAPIC license is required. A minimum of three licenses are required for a cluster, and additional licenses can be ordered for expanding the cluster.

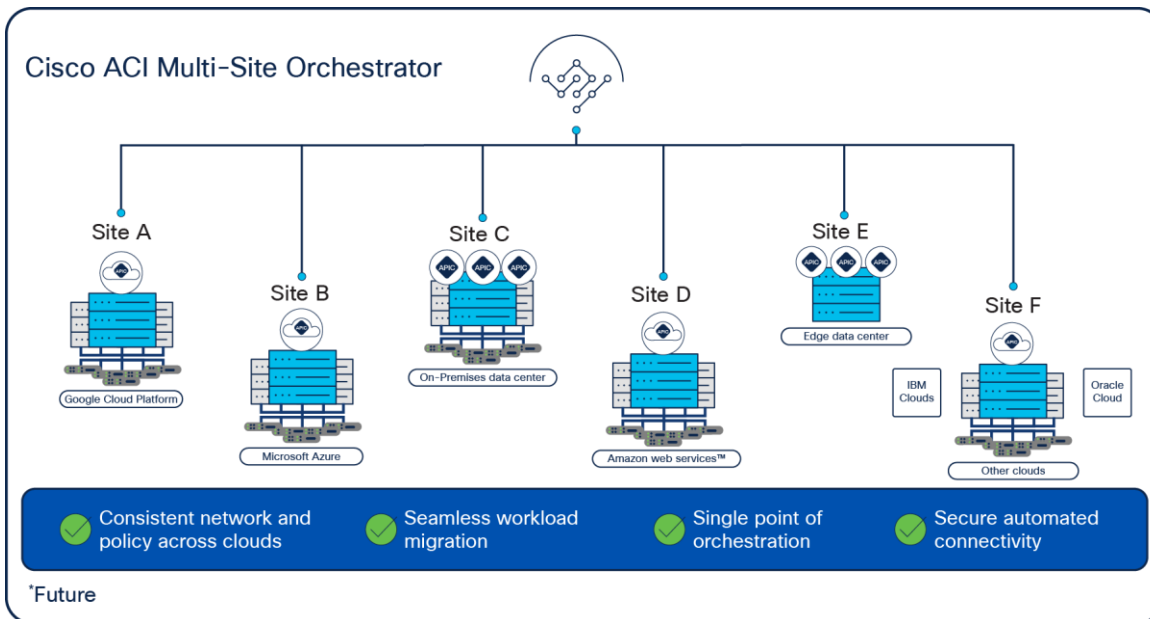
	Cisco Virtual APIC Requirements
	Description
<b>Processor</b>	16 vCPU of 3 GHz or Higher
<b>Memory</b>	96 GB of RAM



	Cisco Virtual APIC Requirements
	Description
<b>DiskSpace</b>	Disk 1: SSD or NVMe – 120GB (root disk) Disk 2: SSD or NVMe – 360GB (data disk) I/O latency of 20ms
<b>ESxi</b>	7.0

## Cisco Network Controller Product Specifications

The Cisco Cloud Network Controller is a virtual appliance deployed in public cloud environments for Cisco Cloud ACI deployments. The Cisco Cloud Network Controller virtual appliance will provide policy translation, multicloud connectivity, and cloud-networking functionalities.



**Figure 3.**  
Cisco Cloud Network Controller

The Cisco Cloud Network Controller is available on the Amazon Web Services (AWS) Marketplace as an AMI image. A single instance of the Cisco Cloud Network Controller can provide networking, visibility, and policy-translation functionalities for workloads deployed across multiple AWS regions and availability zones. This enables IT organizations to simplify their operations and governance in multicloud environments. The solution enables ease of application deployment across any location and any cloud. The Cisco Cloud Network Controller specifications are listed in tables 3 and 4.

**Table 7.** Cisco Cloud Network Controller requirements for Amazon Web Services (AWS) public cloud

AWS native resources	Cisco Cloud APIC requirements
	Description
Amazon EC2 Instance Type	m5.2xlarge (recommended), m4.x2large
Amazon Elastic Block Store (EBS)	100G gp2 SSD, 300G gp2 SSD
Amazon Simple Storage Service (S3)	Standard S3 storage
AWS CloudTrail	Management events. Single copy.

**Table 8.** Cisco Cloud Network Controller requirements for Azure public cloud

Azure Resource Name	Resource Type	Minimum Requirement
Instance type	Compute	D8S_V3
Virtual Networks	Network	2
Static Public IP Addresses	Network	9
Total Public IP Addresses (Static Public IP Addresses and Dynamic Public IP Addresses)	Network	12
Network Security Groups	Network	5
Application Security Groups	Network	5
Application Gateways	Network	1
Virtual Machines	Compute	8
Standard DSv2 Family vCPUs	Compute	16
Standard DSv3 Family vCPUs	Compute	8
Premium Storage Managed Disks	Compute	4

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## Cisco environmental sustainability

Information about Cisco’s environmental sustainability policies and initiatives for our products, solutions, operations, and extended operations or supply chain is provided in the “Environment Sustainability” section of Cisco’s [Corporate Social Responsibility](#) (CSR) Report.

Reference links to information about key environmental sustainability topics (mentioned in the “Environment Sustainability” section of the CSR Report) are provided in the following table:

Sustainability topic	Reference
Information on product material content laws and regulations	<a href="#">Materials</a>
Information on electronic waste laws and regulations, including products, batteries, and packaging	<a href="#">WEEE compliance</a>

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## For more information

Use the following links for additional information:

- Cisco ACI solution data sheet: [Click here](#).
- Cisco Cloud ACI solution brief: [Click here](#).
- Cisco ACI ordering guide: [Click here](#).
- Cisco Nexus 9000 Series Switches data sheet: [Click here](#).
- Cisco Application Services Engine data sheet: [Click here](#).
- Cisco ACI Virtual Edge data sheet: [Click here](#).
- 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](#).
- Download Cisco ACI software: [Click here](#).

## Document history

New or Revised Topic	Described In	Date
<b>Remove XS Cluster, Medium Spare and Large Spare PIDs. Update the table with APIC-M4/L4 PIDs</b>	Table 1	February 1, 2023
<b>Change the heading to "Cisco APIC M3 and L3 Physical and Environmental Specs</b>	Table 1	February 1, 2023
<b>Added additional specs</b>	Table 2-6	February 1, 2023
<b>Revised name for Cisco Cloud APIC to Cisco Cloud Network Controller</b>	Cisco Network Controller Product Specifications	February 1, 2023

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