



## Overview

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## About the Cisco Application Policy Infrastructure Controller Enterprise Module

The Cisco Application Policy Infrastructure Controller - Enterprise Module (APIC-EM) is Cisco's SDN Controller for Enterprise Networks (Access, Campus, WAN and Wireless).

The platform hosts multiple applications (SDN apps) that use open Northbound REST APIs that drive core network automation solutions. The platform also supports a number of south-bound protocols that enable it to communicate with the breadth of network devices that customers already have in place, and extend SDN benefits to both greenfield and brownfield environments.

The Cisco APIC-EM platform supports both wired and wireless enterprise networks across the Campus, Branch and WAN infrastructures. It offers the following benefits:

- Creates an intelligent, open, programmable network with open APIs
- Saves time, resources, and costs through advanced automation
- Transforms business intent policies into a dynamic network configuration
- Provides a single point for network wide automation and control

The following table describes the features and benefits of the Cisco APIC-EM.

**Table 1: Cisco APIC Enterprise Module Features and Benefits**

Feature	Description
Network Information Database (NIDB)	The Cisco APIC-EM periodically scans the network to create a “single source of truth” for IT. This inventory includes all network devices, along with an abstraction for the entire enterprise network.
Network topology visualization	The Cisco APIC-EM automatically discovers and maps network devices to a physical topology with detailed device-level data. You can use this interactive feature to troubleshoot your network.
Cisco Plug and Play application	The Cisco Network Plug and Play solution is a converged solution that extends across Cisco's enterprise portfolio. It provides a highly secure, scalable, seamless, and unified zero-touch deployment experience for customers across Cisco routers, switches and wireless access points.
Cisco Intelligent WAN (IWAN) application	The separately licensed IWAN application for APIC-EM simplifies the provisioning of IWAN network profiles with simple business policies. The IWAN application defines business-level preferences by application or groups of applications in terms of the preferred path for hybrid WAN links. This feature saves costs by application experience over any connection and using otherwise inactive or backup links.
Public Key Infrastructure (PKI) server	The Cisco APIC-EM provides an integrated PKI server for Trust manager service. It automates the lifecycle management of issuing, renewing, and revoking the PKI X.509 certificate for applications such as IWAN application. With this feature, the IWAN application greatly simplifies the process of establishing and keeping trust in the network.
Path Trace application	The path trace application helps to solve network problems by automating the inspection and interrogation of the flow taken by a business application in the network.
High Availability (HA)	HA is provided in N+ 1 redundancy mode with full data persistence for HA and Scale. All the nodes work in Active-Active mode for optimal performance and load sharing.
Back Up and Restore	The Cisco APIC-EM supports complete back up and restore of the entire database from the controller GUI.

# Primary Components

The following are the primary components required for a Cisco APIC-EM deployment:

- The Cisco APIC-EM software provided as an ISO image downloaded from the Cisco website (for installation on either a physical server or virtual machine), or pre-installed on a dedicated physical appliance
- Supported Cisco routing and switching platforms

The Cisco APIC-EM ISO image consists of the following components:

- Ubuntu 14.04 LTS 64-bit
- Cisco APIC-EM services
- Grapevine Elastic Services Platform, consisting of a Grapevine root and client template

**Note**

The Cisco APIC-EM services that run on the Grapevine Elastic Services Platform provide the controller with its core functionality. See Chapter 3, *Cisco APIC-EM Services* for additional information about the services.

The Cisco APIC-EM makes use of the Ubuntu operating system environment and Linux containers (LXC). The Grapevine root runs within the host's operating system. The Grapevine clients run in LXC's within the host.

For this release, you can deploy and run the Cisco APIC-EM on the following:

- Server (bare-metal hardware)—This is the recommended platform. The Cisco APIC-EM ISO is installed directly on a server (bare-metal hardware) rather than within a host operating system (OS).
- Virtual machine—Cisco APIC-EM ISO is installed within a virtual machine within a VMware vSphere environment.

## IP Connectivity

The Cisco APIC-EM communicates with its supported platforms using the following protocols:

- SNMPv2c or SNMPv3
- Telnet or SSH

**Note**

Currently, the Cisco APIC-EM supports IPv4 only. IPv6 support is planned for a future release.

# System Requirements

## System Requirements—Server (Bare-Metal hardware)

The following table lists the minimum system requirements for a successful Cisco APIC-EM server (bare-metal hardware) installation. Review the minimum system requirements for a server installation. The minimum system requirements for each server in a multi-host deployment are the same as in a single host deployment, except that the multi-host deployment requires two or three servers and less memory for each individual server. Three servers are required for high availability and redundancy.



### Caution

You must dedicate the entire server for the Cisco APIC-EM. You cannot use the server for any other software programs, packages, or data. During the Cisco APIC-EM installation, any other software programs, packages or data on the server will be deleted.

**Table 2: Minimum System Requirements—Server**

Server Option	Image Format	Bare metal/ISO
<b>Hardware Specifications</b>	CPU (cores)	6
	Memory	64GB <b>Note</b> For a multi-host hardware deployment (2 or 3 hosts) only 32GB of RAM is required for each host.
	Disk Capacity	500GB of available/usable storage after hardware RAID
	RAID Level	Hardware-based RAID at RAID Level 10
	CPU Speed	2.4 GHz
	Disk I/O Speed	200 MBps

	Network Adapter	1 <b>Note</b> A single network adapter or network interface controller (NIC) is the minimum requirement. For security, we recommend that you use and configure two NICs on the server. See <i>Security</i> in the <i>Limitations and Restrictions</i> section of the release notes for additional information.
<b>Networking</b>	Web Access	Required
	Browser	The following browsers are supported when viewing and working with the Cisco APIC-EM: <ul style="list-style-type: none"><li>• Google Chrome, version 46 or later</li></ul>

## System Requirements—Virtual Machine

The following table lists the minimum system requirements for a successful Cisco APIC-EM VMware vSphere installation.


**Note**

You must configure at a minimum 64GB RAM for the virtual machine that contains the Cisco APIC-EM when a single host is being deployed. The single host server that contains the virtual machine must have this much RAM physically available. For a multi-host deployment (2 or 3 hosts), only 32GB of RAM is required for each of the virtual machines that contains the Cisco APIC-EM. Three servers are required for high availability and redundancy.

**Table 3: Minimum System Requirements—Virtual Machine**

<b>Virtual Machine</b>	VMware ESXi Version	5.1/5.5
	Image Format	ISO
<b>Hardware Specifications</b>	Virtual CPU (vCPU)	6

	Memory	64GB <b>Note</b> For a multi-host deployment (2 or 3 hosts) only 32GB of RAM is required for each host.
	Disk Capacity	500GB
	CPU Speed	2.4 GHz
	Disk I/O Speed	200 MBps
	Network Adapter	1 <b>Note</b> A single network adapter or network interface controller (NIC) is the minimum requirement. For security, we recommend that you use and configure two NICs on the server. See <i>Security</i> in the <i>Limitations and Restrictions</i> section of the release notes for additional information.
<b>Networking</b>	Web Access	Required
	Browser	The following browsers are supported when viewing and working with the Cisco APIC-EM: <ul style="list-style-type: none"><li>• Google Chrome, version 46 or later</li></ul>

## Supported Cisco Platforms and Software Releases

For information about the supported Cisco platforms and software releases:

- See the *Release Notes for the Cisco Application Policy Infrastructure Controller Enterprise Module* for the list of supported platforms and software releases for the base controller applications (Discovery, Inventory, Topology, and Path Trace).
- See the *Release Notes for Cisco IWAN on APIC-EM* for the list of supported platforms and software releases for the IWAN application.
- See the *Release Notes for Cisco Network Plug and Play* for the list of supported platforms and software releases for the Cisco Network Plug and Play application.

## Supported Northbound REST APIs

The Cisco APIC-EM provides northbound REST APIs that you can use to that you can use to issue requests to the controller and exchange data with the controller in a platform-agnostic way. For detailed information about supported northbound REST APIs, see the internal, interactive documentation located within the GUI itself. Click the **API** button at the top right of the GUI to view this documentation.

