



# Cisco IWAN Application on APIC-EM Release Notes, Release 1.6.1

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## Cisco IWAN Application on APIC-EM Release Notes, Release 1.6.1

These release notes provide a summary of the components in Cisco Intelligent Wide Area Network Application (Cisco IWAN App), Release 1.6.1.

Cisco IWAN App (or the Cisco IWAN on APIC-EM) extends Software Defined Networking to the branch with an application-centric approach based on business policy and application rules. This provides IT centralized management with distributed enforcement across the network.

Cisco IWAN App automates and orchestrates Cisco IWAN deployments with an intuitive browser-based GUI. A new router can be provisioned in a matter of minutes without any knowledge of the Command Line Interface (CLI). Business priorities are translated into network policies based on Cisco best practices and validated designs. Cisco IWAN App dramatically reduces the time required for configuring advanced network services through the use of automation and simple, predefined workflows.

Cisco IWAN App offers a turnkey solution that allows IT to get out of the weeds of managing low-level semantics like VPN, QoS, optimization, ACL policies. Instead, IT can focus on the bigger picture, such as, aligning network resources with business priorities and delivering outstanding user experience that result in better business outcomes.

Cisco IWAN App includes the following features:

- Zero touch provisioning—Plug and play for remote devices without user intervention
- Simple workflows—Use case driven with step-by-step and site-to-site provisioning
- Business level policies—Rules drive network actions, abstraction of underlying policy configuration
- Network monitoring—Status, alerting of network issues

## What's New in Cisco IWAN App Release 1.6.1

The following features are available in Cisco IWAN App Release 1.6.1.

Feature Name	Description
Port range/IP subnet based custom app	Ability to specify a port range or an IP subnet when defining a new NBAR2 custom application.

Feature Name	Description
NAT IP/Custom port enhancement	Ability to specify custom NAT port, and to modify NAT IP and port settings after provisioning (Day N).
Delete service provider address pools	Ability to delete IP address pools when they are not used on any hub or spoke router.
MC selection on branch sites	Ability to select master controller (MC) device during provisioning (Day 0) of a branch site with two routers.
Support for Cisco ISR 900 Series Routers, Cisco 1100 Series ISR, and Cisco ISR 4221 Router	Support added for Cisco 900 Series Industrial Routers, Cisco 1100 Series Integrated Services Router, and Cisco 4221 Integrated Services Router at branch sites.

## Separation of Cisco IWAN Application from APIC-EM Releases

Cisco IWAN app release 1.3.2 introduced a new approach to IWAN app releases. Beginning with this release:

- The IWAN app has been decoupled from the APIC-EM release schedule, and from the APIC-EM installation and upgrade processes.
- IWAN app release numbering is now independent of APIC-EM release numbering.
- Download the IWAN app separately from APIC-EM, then install or upgrade the app using the APIC-EM “App Management” page. See [Cisco IWAN Application on Cisco APIC-EM User Guide, Release 1.6.1](#) for details about deployment.

### Integral Part of APIC-EM

While the release schedule and installation are now handled separately from APIC-EM, Cisco IWAN App continues to be an integral part of APIC-EM and continues to appear in the APIC-EM GUI as before.

System requirements for the APIC-EM continue to apply to Cisco IWAN App.

See [Cisco IWAN App Software Compatibility in Cisco IWAN App Release](#) for information about the software compatible with Cisco IWAN App releases, including APIC-EM and Cisco Prime Infrastructure versions.

## Supported Cisco Platforms and Software Releases in Cisco IWAN App Release 1.6.1

Cisco IWAN App Release 1.6.1 supports the following Cisco router platforms and software releases.

<b>Platform</b>	<b>Models</b>	<b>Software Release</b>
Cisco 4000 Series Integrated Services Routers	ISR 4221 ISR 4321 ISR 4331 ISR 4351 ISR 4431 ISR 4451-X	Cisco IOS XE Everest 16.6.1 Cisco IOS XE Everest 16.6.2 <a href="#">1</a> Cisco IOS XE Denali 16.3.5
Cisco ASR 1000 Series Aggregation Services Routers	ASR1001 ASR 1001-X ASR 1001-HX ASR 1002 ASR 1002-X ASR 1002-HX ASR 1004 ASR 1006 ASR 1006-X	Cisco IOS XE Everest 16.6.1 Cisco IOS XE Everest 16.6.2 Cisco IOS XE Denali 16.3.5

<b>Platform</b>	<b>Models</b>	<b>Software Release</b>
Cisco 1100 Series Integrated Services Routers		Cisco IOS XE Everest 16.6.2

Platform	Models	Software Release
	C1111-4P	
	C1111-4PLTEEA	
	C1111-4PLTELA	
	C1111-4PWA	
	C1111-4PWB	
	C1111-4PWD	
	C1111-4PWE	
	C1111-4PWF	
	C1111-4PWH	
	C1111-4PWN	
	C1111-4PWQ	
	C1111-4PWR	
	C1111-4PWZ	
	C1111-8P	
	C1111-8PLTEEA	
	C1111-8PLTEEAWA	
	C1111-8PLTEEAWB	
	C1111-8PLTEEAWC	
	C1111-8PLTEEAWD	
	C1111-8PLTEEAWE	
	C1111-8PLTEEAWF	
	C1111-8PLTEEAWG	
	C1111-8PLTEEAWH	
	C1111-8PLTEEAWI	
	C1111-8PLTEEAWJ	
	C1111-8PLTEEAWK	
	C1111-8PLTEEAWL	
	C1111-8PLTEEAWM	
	C1111-8PLTEEAWN	
	C1111-8PLTEEAWO	
	C1111-8PLTEEAWP	
	C1111-8PLTEEAWQ	
	C1111-8PLTEEAWR	
	C1111-8PLTEEAWS	
	C1111-8PLTEEAWT	
	C1111-8PLTEEAWU	
	C1111-8PLTEEAWV	
	C1111-8PLTEEAWW	
	C1111-8PLTEEAWX	
	C1111-8PLTEEAWY	
	C1111-8PLTEEAWZ	
	C1111-8PWA	
	C1111-8PWB	
	C1111-8PWE	
	C1111-8PWF	
	C1111-8PWH	
	C1111-8PWN	
	C1111-8PWQ	
	C1111-8PWR	
	C1111-8PWZ	

Platform	Models	Software Release
	C1116-4P C1116-4PLTEEA C1116-4PLTEEAWE C1116-4PWE C1117-4P C1117-4PLTEEA C1117-4PLTEEAWA C1117-4PLTEEAWE C1117-4PLTELA C1117-4PLTELAWZ C1117-4PM C1117-4PMLTEEA C1117-4PMLTEEAWE C1117-4PMWE C1117-4PWA C1117-4PWE C1117-4PWZ	
Virtual Routers	Cloud Services Router 1000V ENCS 5400 (ISRv)	Cisco IOS XE Everest 16.6.1 Cisco IOS XE Everest 16.6.2 Cisco IOS XE Denali 16.3.5

Platform	Models	Software Release
Cisco Integrated Services Routers Generation 2 (ISR-G2) Series Routers—800 Series	C891-24X-K9 C891F-K9 C891FW-A-K9 C891FW-E-K9 C892-FSP-K9 C896VAG-LTE-GA-K9 C896VA-K9 C897VAB-K9 C897VAG-LTE-GA-K9 C897VAG-LTE-LA-K9 C897VAGW-LTE-GAEK9 C897VA-K9 C897VAMG-LTE-GA-K9 C897VA-M-K9 C897VAM-W-E-K9 C897VAW-A-K9 C897VAW-E-K9 C898EAG-LTE-GA-K9 C898EAG-LTE-LA-K9 C898EA-K9 C899G-LTE-GA-K9 C899G-LTE-JP-K9 C899G-LTE-LA-K9 C899G-LTE-NA-K9 C899G-LTE-ST-K9 C899G-LTE-VZ-K9	Cisco IOS 15.7(3)M
Cisco Integrated Services Routers Generation 2 (ISR-G2) Series Routers—1900 Series	ISR 1921 ISR 1941	Cisco IOS 15.7(3)M
Cisco Integrated Services Routers Generation 2 (ISR-G2) Series Routers—2900 Series	ISR 2901 ISR 2911 ISR 2921 ISR 2951	Cisco IOS 15.7(3)M

Platform	Models	Software Release
Cisco Integrated Services Routers Generation 2 (ISR-G2) Series Routers—3900 Series	ISR 3925 ISR 3925E ISR 3945 ISR 3945-E	Cisco IOS 15.7(3)M

<sup>1</sup> Applies to Cisco ISR 4221 Router

## Limitations and Restrictions



### Note

It is recommended that you upgrade to NBAR2 Advanced Protocol Pack 27.0.0 on your devices with the recommended latest Cisco IOS and Cisco IOS XE software releases.

When using EasyQoS and Cisco IWAN App on APIC-EM, you must adhere to the following:

- The network segments for each solution are disjoint. A device controlled by the IWAN solution cannot simultaneously be controlled by the EasyQoS solution. Application are of global scope across APIC-EM and as such, custom applications created in EasyQoS application may show up in the IWAN solution if applicable to the WAN solution.
- You must complete the following tasks on devices claimed by EasyQoS, to bring them in the IWAN workflow:
  - QoS policy tags should be removed prior to being claimed
  - The device must be cleaned of remaining EasyQoS policy or configuration and the device must be brought to greenfield state.

### Hub Router EIGRP Process Downtime During Upgrade

When upgrading to Cisco IWAN App 1.6.1, after clicking the **Upgrade Network** button (a required step in the upgrade process), Cisco IWAN App pushes a series of commands to the hub BR routers, which triggers routing table updates from hub routers to branch site routers. During this update and resynchronization process, the hub router's EIGRP process is inactive. The length of this EIGRP downtime depends on the number of branch site routers undergoing update, and may be several minutes.

This occurs only when operating a network with addressing within one of the following subnets: 10.0.0.0/8, 172.16.0.0/12, 192.168.0.0/16.



## Caveats

### Open Caveats in Cisco IWAN App Release 1.6.1

Caveat ID Number	Description
<a href="#">CSCvg24770</a>	Transit Hub provisioning failed- Internal Error
<a href="#">CSCvg16446</a>	Cannot recover from customer configuration failure
<a href="#">CSCvc46613</a>	Spoke provision failure due to multiple users are defined and the not all of them are tried
<a href="#">CSCvb95745</a>	Unable to add a device that was deleted with the site that failed at business policy config phase
<a href="#">CSCve03315</a>	Custom Config: Repeated appearance of custom-template in form view
<a href="#">CSCvg42688</a>	IWAN App 1.6 and Prime 3.2.1: Issues loading Queue Drop charts when apps are in Critical health
<a href="#">CSCvg46690</a>	PnP 1.6.0: Image upgrade fails for Dual Router deployment via IWAN App

### Resolved Caveats in Cisco IWAN App Release 1.6.1

Caveat ID Number	Description
<a href="#">CSCvh01474</a>	Change spoke metric under route-maps for POP Preference
<a href="#">CSCvg31669</a>	HUB Failed with "Internal Error in IWAN" after upgrading to 1.6 if the MPLS-BR is not reachable
<a href="#">CSCvg28133</a>	Hub provisioning failed as validation allowed VRF configuration on HUB Border Router LAN interface
<a href="#">CSCvg25786</a>	SCALE: Two branches stuck in "In-Progress" when creating new custom application
<a href="#">CSCvh63640</a>	Prompt user before pushing RFC1918 routing changes in IWAN App version upgrades
<a href="#">CSCvh63657</a>	Ensure DC routing prefixes are leaked in certain PfR topologies to avoid blackhole
<a href="#">CSCvh63681</a>	Enable proper MPOL PTQoS checks for Hub BR deployment
<a href="#">CSCvh61137</a>	Redistribute metric changed to 20000 on all Hub BR's after upgrade
<a href="#">CSCvh01474</a>	Change spoke metric under route-maps for USI

## System Requirements

The following sections describe the system requirements for Cisco IWAN App:

### Hardware Requirements

Cisco IWAN App requires a server with the following capabilities/software:

- Server—64-bit x86
- CPU—6 (2.4GHz)
- RAM—32GB

**Note:** For a multi-host hardware deployment (two or three hosts), 32GB RAM is sufficient for each host.

- Storage—500 Gigabytes or preferably 1 Terabyte HDD
- Network Adapter—1x
- 200 MBps Disk I/O speed

### Software Requirements

For Cisco IWAN on APIC-EM, the following software is required on the server:

- Browser
  - Chrome (version 50.0 or higher)
  - Mozilla Firefox (version 46.0 or higher)

### Cisco IWAN App Software Compatibility in Cisco IWAN App Release

The following table describes compatible and recommended software versions for operation with the Cisco IWAN application, running on Cisco APIC-EM.

<b>IWAN App</b>	<b>APIC-EM</b>	<b>Prime Infrastructure</b>	<b>Network Collector - LiveNX</b>	<b>OS on ASR1000 Series, ISR4000 Series, and CSR1000V Series Routers</b>	<b>OS on ISR-G2 Series Routers</b>	<b>Protocol Pack</b>	<b>Plug and Play</b>
1.6.1	1.6.1	3.2.1 with Device Pack-1	6.1.2	Cisco IOS XE Everest 16.6.1  Cisco IOS XE Everest 16.6.2 (Cisco ISR 4221 Router & Cisco ISR 1100 Series Routers)  Cisco IOS XE Denali 16.3.5	15.7(3)M 15.6(3)M3	32.0.0	1.6.1
1.6.0	1.6.0	3.2.1 with Device Pack-1	6.1.2	Cisco IOS XE Everest 16.6.1  Cisco IOS XE Everest 16.6.2 (Cisco ISR 4221 Router & Cisco ISR 1100 Series Routers)  Cisco IOS XE Denali 16.3.5	15.7(3)M 15.6(3)M3	32.0.0	1.6.0
1.5.2	1.5.0	3.2	LiveNX 6.1.2	Cisco IOS XE Denali 16.3.3 <sup>2</sup>	Cisco IOS Release 15.6(3)M2	27.0.0 31.0.0	1.5.0 1.5.1
1.5.1	1.5.0	3.2	LiveNX 6.1.2	Cisco IOS XE Denali 16.3.3 <sup>3</sup>	Cisco IOS Release 15.6(3)M2	27.0.0 31.0.0	1.5.0 1.5.1

IWAN App	APIC-EM	Prime Infrastructure	Network Collector - LiveNX	OS on ASR1000 Series, ISR4000 Series, and CSR1000V Series Routers	OS on ISR-G2 Series Routers	Protocol Pack	Plug and Play
1.4.2	1.4.2 1.5.0	3.1.6	LiveNX 6.1	Cisco IOS XE 3.16.5aS <sup>4</sup>  Cisco IOS XE Denali 16.3.3	Cisco IOS Release 15.6(3)M2	27.0.0	
1.3.2	1.3.2	3.1.4 Update 1	N/A	IOS XE 3.16.4bS (15.5(3)S4)	Cisco IOS Release 15.5(3)M4a		

<sup>2</sup> This release is required on hub devices to support Multi-tunnel Termination [MTT] (multiple WAN links) feature. Hence, Cisco IOS XE Everest 16.4.1 is not supported.

<sup>3</sup> This release is required on hub devices to support Multi-tunnel Termination [MTT] (multiple WAN links) feature. Hence, Cisco IOS XE Everest 16.4.1 is not supported.

<sup>4</sup> Link: <https://software.cisco.com/download/special/release.html?config=684110644675436ad1349ee490ed79ff>

**Note**

If you require a fix for CSCvc99738 and CSCvb66590, choose Cisco IOS XE 3.16.5aS and Cisco IOS release 15.5(3)M5a.

## Firewall Requirements

If there is a firewall between the branch and the APIC-EM controller, please ensure that the following ports are open:

- Branch to the APIC-EM controller:
  - PKI—TCP 80
  - PNP—TCP 80, 443
  - NTP—UDP 123
- APIC-EM controller to branch:
  - SNMP—TCP and UDP ports: 161, 162
  - SSH—TCP 22
- Internet branch to hub routers:

- GRE and IPsec—UDP 500, 4500, IP—50

If there is a firewall between APIC-EM and Prime Infrastructure, ensure that port 443 is open for APIC-EM to access Prime Infrastructure API.

## NetFlow Collectors

NetFlow collector provides Application Visibility. The supported NetFlow collectors for Cisco IWAN App are LiveNX and Cisco Prime. For information about compatible versions of Cisco Prime Infrastructure and other software, see [Cisco IWAN App Software Compatibility in Cisco IWAN App Release](#), on page 10.

## Supported Hub Devices — Required License

See [Platforms and their Roles](#) for details per model.

- ASR 1000 Series
  - License—Image with licenses for Advanced IP Services or Advanced Enterprise Services
- ISR 4451 and 4431
  - License—Appx and Security

The following is a sample configuration that shows how to enable IPsec license and accept the End User License Agreement (EULA) on Cisco ASR 1000 Series Aggregation Services Routers.

```
Router(config)# crypto ipsec profile TEST
Router(ipsec-profile)# exit
Router(config)# interface tunnel 123
Router(config-if)# tunnel protection ipsec profile TEST
```



### Note

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The configuration must be removed after the EULA is accepted.

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## Supported Spoke Devices — Required License

See [Platforms and their Roles](#) for details per model.

- ASR 1000 Series
  - License—Advanced IP Services or Advanced Enterprise Services
- CSR1000v Series
  - License—AX throughput
- ISR 4000 Series
  - License—Appx and Security
- ISR G2 Series

- License—Advanced IP Services (for ISR G2 892-FSP), Data, and Security

## Platforms and their Roles

- ASR 1001—Hub, branch, or dedicated master controller
- ASR 1001-X—Hub, branch, or dedicated master controller
- ASR 1001-HX Router—Branch
- ASR 1002—Branch or dedicated master controller
- ASR 1002-X—Hub, branch, or dedicated master controller
- ASR 1002-HX Router—Hub and branch
- ASR1004—Hub or dedicated master controller
- ASR1006—Hub or dedicated master controller
- ASR1006-X—Hub or dedicated master controller
- CSR 1000v—Branch or dedicated master controller
- ISR 4451-X—Hub, branch, or dedicated master controller
- ISR 4221—Branch
- ISR 4321—Branch
- ISR 4331—Branch
- ISR 4351—Branch
- ISR 4431—Branch
- ISRV 5406—Branch
- ISRV 5408—Branch
- ISRV 5412—Branch
- C891-24X-K9—Branch
- C891F-K9—Branch
- C891FW-A-K9—Branch
- C891FW-E-K9—Branch
- C892FSP-K9—Branch
- C896VAG-LTE-GA-K9—Branch
- C896VA-K9—Branch
- C897VAB-K9—Branch
- C897VA-K9—Branch
- C897VAG-LTE-GA-K9—Branch

- C897VAG-LTE-LA-K9—Branch
- C897VAGW-LTE-GAEK9—Branch
- C897VAMG-LTE-GA-K9—Branch
- C897VA-M-K9—Branch
- C897VAM-W-E-K9—Branch
- C897VAW-A-K9—Branch
- C897VAW-E-K9—Branch
- C898-EA-K9—Branch
- C898EAG-LTE-GA-K9—Branch
- C898EAG-LTE-LA-K9—Branch
- C899G-LTE-GA-K9—Branch
- C899G-LTE-JP-K9—Branch
- C899G-LTE-LA-K9—Branch
- C899G-LTE-NA-K9—Branch
- C899G-LTE-ST-K9—Branch
- C899G-LTE-VZ-K9—Branch
- ISR 1921—Branch
- ISR 1941—Branch
- ISR 2901—Branch
- ISR 2911—Branch
- ISR 2921—Branch
- ISR 2951—Branch
- ISR 3925—Branch
- ISR 3925E—Branch
- ISR 3945—Branch
- ISR 3945-E—Branch
- C1111-4P—Branch
- C1111-4PLTEEA—Branch
- C1111-4PLTELA—Branch
- C1111-4PWA—Branch
- C1111-4PWB—Branch
- C1111-4PWD—Branch
- C1111-4PWE—Branch

- C1111-4PWF—Branch
- C1111-4PWH—Branch
- C1111-4PWN—Branch
- C1111-4PWQ—Branch
- C1111-4PWR—Branch
- C1111-4PWZ—Branch
- C1111-8P—Branch
- C1111-8PLTEEA—Branch
- C1111-8PLTEEAWA—Branch
- C1111-8PLTEEAWB—Branch
- C1111-8PLTEEAWC—Branch
- C1111-8PLTEEAWD—Branch
- C1111-8PLTEEAWE—Branch
- C1111-8PLTEEAWF—Branch
- C1111-8PLTEEAWG—Branch
- C1111-8PLTEEAWH—Branch
- C1111-8PLTEEAWI—Branch
- C1111-8PLTEEAWJ—Branch
- C1111-8PLTEEAWK—Branch
- C1111-8PLTEEAWL—Branch
- C1111-8PLTEEAWM—Branch
- C1111-8PLTEEAWN—Branch
- C1111-8PLTEEAWO—Branch
- C1111-8PLTEEAWP—Branch
- C1111-8PLTEEAWQ—Branch
- C1111-8PLTEEAWR—Branch
- C1111-8PLTEEAWS—Branch
- C1111-8PLTEEAWT—Branch
- C1111-8PLTEEAWU—Branch
- C1111-8PLTEEAWV—Branch
- C1111-8PLTEEAWW—Branch
- C1111-8PLTEEAWX—Branch
- C1111-8PLTEEAWY—Branch
- C1111-8PLTEEAWZ—Branch
- C1111-8PWA—Branch
- C1111-8PWB—Branch
- C1111-8PWC—Branch
- C1111-8PWE—Branch
- C1111-8PWF—Branch
- C1111-8PWH—Branch
- C1111-8PWI—Branch
- C1111-8PWN—Branch
- C1111-8PWQ—Branch
- C1111-8PWR—Branch
- C1111-8PWZ—Branch
- C1116-4P—Branch
- C1116-4PLTEEA—Branch
- C1116-4PLTEEAWC—Branch
- C1116-4PLTEEAWD—Branch
- C1116-4PLTEEAWE—Branch
- C1116-4PWE—Branch
- C1117-4P—Branch



- [C1117-4PLTEEA—Branch](#)
- [C1117-4PLTEEAWA—Branch](#)
- [C1117-4PLTEEAWWE—Branch](#)
- [C1117-4PLTELA—Branch](#)
- [C1117-4PLTELAWZ—Branch](#)
- [C1117-4PM—Branch](#)
- [C1117-4PMLTEEA—Branch](#)
- [C1117-4PMLTEEAWWE—Branch](#)
- [C1117-4PMWE—Branch](#)
- [C1117-4PWA—Branch](#)
- [C1117-4PWE—Branch](#)
- [C1117-4PWZ—Branch](#)

## Related Documentation

Documentation	Description
<a href="#">Cisco IWAN Application on Cisco APIC-EM User Guide, Release 1.6.1</a>	Information about installation, deployment, configuration of Cisco IWAN on APIC-EM. Explains the Cisco IWAN GUI and how to manage connected devices and hosts within your network.
<a href="#">Cisco Application Policy Infrastructure Controller Enterprise Module Deployment Guide</a>	Information about the underlying Cisco APIC-EM product including deployment steps, verification, and troubleshooting.
<a href="#">Cisco IWAN Technology Design Guides</a>	Cisco IWAN designs are explained in the Cisco IWAN technology design guides.
<a href="#">Configuration Guide for Cisco Network Plug and Play on Cisco APIC-EM</a>	Information about Cisco Network Plug and Play solution.
<a href="#">Cisco Prime Infrastructure Documentation</a>	Information about configuration guides, deployment guides, release notes, and other Cisco Prime Infrastructure documentation.
<a href="#">Solution Guide for Cisco Network Plug and Play</a>	Overview of the Plug and Play solution, component descriptions, summary of major use cases, and basic deployment requirements, guidelines, limitations, prerequisites, and troubleshooting tips.
<a href="#">Release Notes for Cisco Network Plug and Play, Release 1.5x</a>	Description of the features and caveats for Cisco Network Plug and Play.

Documentation	Description
<a href="#">Release Notes for Cisco Application Policy Infrastructure Controller Enterprise Module, Release 1.5.0.x</a>	Description of the features and caveats for the Cisco Application Policy Infrastructure Controller Enterprise Module (Cisco APIC-EM).

## Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see [What's New in Cisco Product Documentation](#).

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