Release Notes for Cisco ASR 900 Series Routers, Cisco IOS XE Bengaluru 17.6.x

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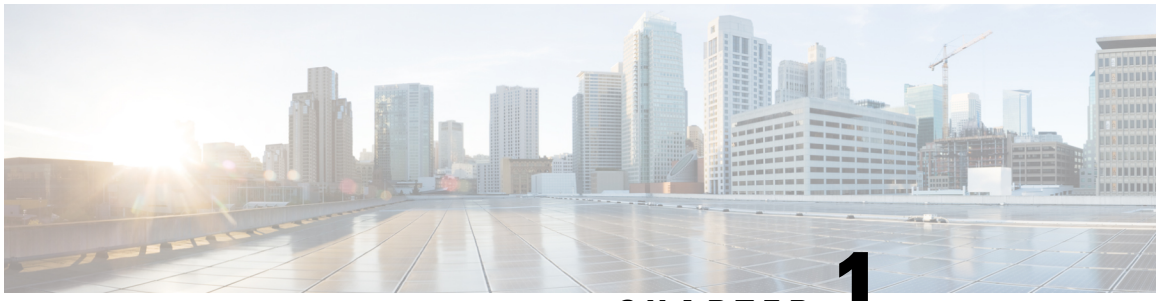


CHAPTER 1

Introduction

The Cisco ASR 900 Series Routers are full-featured, modular aggregation platforms designed for the cost-effective delivery of converged mobile, residential, and business services. This document provides information about the IOS XE software release for the Cisco ASR 900 Series Routers.

Overview of Cisco ASR 900 Series Routers

Cisco ASR 900 Series Router

The Cisco ASR 900 Series Router is a fully-featured routing platform designed for the cost-effective delivery of converged mobile and business services. With full redundancy, shallow depth, low power consumption and high service scale, this 3-rack-unit (3RU) router is optimized for small aggregation and remote point-of-presence (POP) applications. The Cisco ASR 900 Series Router provides a rich and scalable feature set of Legacy, Timing, Carrier Ethernet, Layer 2 VPN (L2VPN) and Layer 3 VPN (L3VPN) services in a compact package.

The Cisco ASR 900 Series Router is a fully modular platform with support for upto 6-Interface Modules (IMs), two Route Switch Processor (RSP) slots, two power supplies and redundant fans, based on the router model. Cisco offers a wide choice of LAN and WAN interfaces available in speeds ranging from nxDS0 to 100 Gigabit Ethernet. The design of the Cisco ASR 900 Series Router delivers in-box hardware redundancy for all hardware components and supports software redundancy with In Service Software Upgrade (ISSU) and Non-Stop Forwarding (NSF) support.

Cisco ASR 902 Router

The Cisco ASR 902 Router is a full-featured aggregation platform designed for cost-effective delivery of converged mobile and business services. With shallow depth, low power consumption, and an extended temperature range, this compact 2-rack unit (2RU) router provides high service scale and flexible hardware configuration.

Cisco ASR 903 Router

The Cisco ASR 903 Series Aggregation Services Router is a Cisco aggregation router product. This router uses an innovative and powerful forwarding technology known as the Cisco Carrier Ethernet ASIC.

The Cisco ASR 903 Series Router is a 6-Interface Module (IM), 3-RU, hardware-redundant chassis with two Route Switch Processor (RSP) slots, and six IM slots. It supports fully redundant RSPs that allow for full RSP hardware redundancy, NSF, ISSU, and future RSP service upgrades.

Cisco ASR 907 Router

The Cisco ASR 907 Router seven-rack (7RU) unit router that belongs to the Cisco ASR90x family of routers. This router complements Cisco's offerings for IP RAN solutions for the GSM, UMTS, LTE and CDMA. Given its form-factor, interface types and Gigabit Ethernet density the Cisco ASR 907 Router can also be positioned as a Carrier Ethernet aggregation platform.

The Cisco ASR 907 Router is a cost optimized, fully redundant, centralized forwarding, extended temperature, and flexible pre-aggregation router.

Cisco ASR 914 Router

The Cisco ASR 914 Router is a 14-rack unit router that belongs to the Cisco ASR 900 family of routers. This router complements Cisco's offerings for IP RAN solutions for the GSM, UMTS, LTE, and CDMA. Given its form-factor, interface types and GigabitEthernet density the Cisco ASR 914 Router can also be positioned as a Carrier Ethernet aggregation platform.

The Cisco ASR 914 Router is a cost optimized, fully redundant, centralized forwarding, extended temperature, and flexible pre-aggregation router.

Feature Navigator

You can use Cisco Feature Navigator to find information about feature, platform, and software image support. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on cisco.com is not required.

Hardware Support

Cisco ASR 902 Supported Interface Modules

A900-RSP2-Supported Interface Modules (ASR 902 Router)

Table 1: A900-RSP2-Supported Interface Modules and Part Numbers

RSP	Interface Modules	Part Numbers	Slots
A900-RSP2A-128 A900U-RSP2A-128	8-port Gigabit Ethernet SFP Interface Module (8x1GE)	A900-IMA8S	All
	8-port Gigabit Ethernet RJ45 (Copper) Interface Module (8x1GE)	A900-IMA8T	
	1-port 10-Gigabit Ethernet XFP Interface Module (1x10GE)	A900-IMA1X	
	16-port T1/E1 Interface Module	A900-IMA16D	
	4-port OC3/STM-1 (OC-3) or 1-port OC12/STM-4 (OC-12) Interface Module	A900-IMA4OS	
	SFP Combo IM—8-port Gigabit Ethernet (8x1GE) + 1-port 10-Gigabit Ethernet (1x10GE)	A900-IMA8S1Z	
	Copper Combo IM—8-port Gigabit Ethernet (8x1GE) + 1-port 10-Gigabit Ethernet Interface Module (1x10GE)	A900-IMA8T1Z	
	2-port 10 Gigabit Ethernet Interface Module (2x10GE)	A900-IMA2Z	
	14-port Serial Interface Module	A900-IMASER14A/S	

RSP	Interface Modules	Part Numbers	Slots
	4-port C37.94 Interface Module	A900-IMA4C3794	
A900-RSP2A-64 A900U-RSP2A-64	1-port 10 Gigabit Ethernet XFP Interface Module (1x10GE)	A900-IMA1X	0-2
	2-port 10 Gigabit Ethernet Interface Module (2x10GE)	A900-IMA2Z	
	4-port OC3/STM-1 (OC-3) or 1-port OC12/STM-4 (OC-12) Interface Module	A900-IMA4OS	
	8-port Gigabit Ethernet SFP Interface Module (8x1GE)	A900-IMA8S	0, 2 and 3
	8-port Gigabit Ethernet RJ45 (Copper) Interface Module (8x1GE)	A900-IMA8T	
	16-port T1/E1 Interface Module	A900-IMA16D	
	32-port T1/E1 Interface Module	A900-IMA32D	
	8-port T1/E1 Interface Module	A900-IMA8D	
	6-port E & M Interface Module	A900-IMA6EM	
	14-port Serial Interface Module	A900-IMASER14A/S	
	4-port C37.94 Interface Module	A900-IMA4C3794	

A900-RSP3C-200-S Supported Interface Modules (ASR 902 Router)

Table 2: A900-RSP3C-200 Supported Interface Modules and Part Numbers

RSP Module	Supported Interface Modules	Part Numbers	Slot
A900-RSP3C-200-S	8-port Gigabit Ethernet SFP Interface Module (8x1GE)	A900-IMA8S	All[1]
	8-port Gigabit Ethernet RJ45 (Copper) Interface Module (8x1GE)	A900-IMA8T	
	1-port 10 Gigabit Ethernet XFP Interface Module (1x10GE)	A900-IMA1X	0 and 1
	SFP Combo IM—8-port Gigabit Ethernet (8x1GE) + 1-port 10 Gigabit Ethernet (1x10GE)	A900-IMA8S1Z	All
	Copper Combo IM—8-port Gigabit Ethernet (8x1GE) + 1-port 10 Gigabit Ethernet Interface Module (1x10GE)	A900-IMA8T1Z	
	2-port 10 Gigabit Ethernet Interface Module (2x10GE)	A900-IMA2Z	
	8-port 10 Gigabit Ethernet Interface Module (8x10GE)	A900-IMA8Z	0
	2-port 40 Gigabit Ethernet QSFP Interface Module (2x40GE)	A900-IMA2F	

[1] There are restrictions using the interface modules in different slots with RSP3 module. Contact Cisco Sales/Support for the valid combinations..

Cisco ASR 903 Supported Interface Modules

A900-RSP2 Supported Interface Modules

A900-IMA2Z IM supports SFP+ and XFP on ports 0 and 1. Either SFP+ or XFP can be connected on each port. If both are connected on the same port, the port will go down.

The combination IMs (A900-IMA8S1Z, A900-IMA8T1Z) are not supported on the A900-RSP2-64 RSP module on the Cisco ASR 903 Router.

The table below is applicable for A900-RSP2A-128 and A900U-RSP2A-128 RSP modules.

Table 3: A900-RSP2A-128 Supported Interface Modules and Part Numbers

Supported Interface Modules	Part Numbers	Slot
1-port OC48/ STM-16 or 4-port OC-12/OC-3 / STM-1/STM-4 + 12-Port T1/E1 + 4-Port T3/E3 CEM Interface Module	A900-IMA3G-IMSG	2,3,4,5
8-port Gigabit Ethernet SFP Interface Module (8x1GE)	A900-IMA8S	All
8-port Gigabit Ethernet RJ45 (Copper) Interface Module (8x1GE)	A900-IMA8T	
1-port 10 Gigabit Ethernet XFP Interface Module (1x10GE)	A900-IMA1X	
16-port T1/E1 Interface Module	A900-IMA16D	
32-port T1/E1 Interface Module	A900-IMA32D	
8-portT1/E1 Interface Module	A900-IMA8D	
4-port OC3/STM-1 (OC-3) or 1-port OC12/STM-4 (OC-12) Interface Module	A900-IMA4OS	
SFP Combo IM—8-port SFP Gigabit Ethernet (8x1GE) + 1-port 10 Gigabit Ethernet (1x10GE)	A900-IMA8S1Z	
Copper Combo IM—8-port 10/100/1000 Gigabit Ethernet (8x1GE) + 1-port 10 Gigabit Ethernet Interface Module (1x10GE)	A900-IMA8T1Z	
2-port 10 Gigabit Ethernet Interface Module (2x10GE)	A900-IMA2Z	
6-port E & M Interface Module	A900-IMA6EM	
14-port Serial Interface Module	A900-IMASER14A/S	
4-port C37.94 Interface Module	A900-IMA4C3794	

The table below is applicable for A900-RSP2A-64 and A900U-RSP2A-64 RSP modules.

Table 4: A900-RSP2A-64 Supported Interface Modules and Part Numbers

Supported Interface Modules	Part Numbers	Slot
1-port 10 Gigabit Ethernet XFP Interface Module (1x10GE)	A900-IMA1X	0-2
2-port 10 Gigabit Ethernet Interface Module (2x10GE)	A900-IMA2Z	
4-port OC3/STM-1 (OC-3) or 1-port OC12/STM-4 (OC-12) Interface Module	A900-IMA4OS	

Supported Interface Modules	Part Numbers	Slot
8-port Gigabit Ethernet SFP Interface Module (8x1GE)	A900-IMA8S	3-5
8-port Gigabit Ethernet RJ45 (Copper) Interface Module (8x1GE)	A900-IMA8T	
16-port T1/E1 Interface Module	A900-IMA16D	
32-port T1/E1 Interface Module	A900-IMA32D	
8-port T1/E1 Interface Module	A900-IMA8D	
6-port E & M Interface Module	A900-IMA6EM	
14-port Serial Interface Module	A900-IMASER14A/S	
4-port C37.94 Interface Module	A900-IMA4C3794	

A900-RSP3C-400-S Supported Interface Modules

The table below is applicable for A900-RSP3C-400-S RSP module.

Note If the **license feature service-offload enable** command is configured, then the following IMs are not supported in the router for RSP3:

- A900-IMA8S
- A900-IMA8T
- A900-IMA8S1Z
- A900-IMA8T1Z

Note There are certain restrictions in using the interface modules on different slots with RSP3 module. Contact Cisco Sales/Support for the valid combinations.

Table 5: A900-RSP3C-400 Supported Interface Modules and Part Numbers

Supported Interface Modules	Part Numbers	Slot
6-port E & M Interface Module	A900-IMA6EM	All
4-port C37.94 Interface Module	A900-IMA4C3794	All
14-port Serial Interface Module	A900-IMASER14A/S	All
8-port Gigabit Ethernet SFP Interface Module (8x1GE)	A900-IMA8S	All

Supported Interface Modules	Part Numbers	Slot
8-port Gigabit Ethernet RJ45 (Copper) Interface Module (8x1GE)	A900-IMA8T	All
1-port 10 Gigabit Ethernet XFP Interface Module (1x10GE)	A900-IMA1X	All
SFP Combo IM—8-port SFP Gigabit Ethernet (8x1GE) + 1-port 10 Gigabit Ethernet (1x10GE)	A900-IMA8S1Z	All
Copper Combo IM—8-port 10/100/1000 Gigabit Ethernet (8x1GE) + 1-port 10 Gigabit Ethernet Interface Module (1x10GE)	A900-IMA8T1Z	All
2-port 10 Gigabit Ethernet Interface Module (2x10GE)	A900-IMA2Z	All
8-port 10 Gigabit Ethernet Interface Module (8x10GE)	A900-IMA8Z	All
1-port 100 Gigabit Ethernet Interface Module (1x100GE)	A900-IMA1C	4 or 5
2-port 100 Gigabit Ethernet (QSFP) Interface Module (2x100GE)	N560-IMA2C/A900-IMA2C	4 and 5[2]
2-port 40 Gigabit Ethernet QSFP Interface Module (2x40GE)	A900-IMA2F	4 or 5
8/16-port 1 Gigabit Ethernet (SFP/SFP) + 1-port 10 Gigabit Ethernet (SFP+) / 2-port 1 Gigabit Ethernet (CSFP) Interface Module	A900-IMA8CS1Z-M	0,3,4 or 5
48-port T1/E1 Interface module	A900-IMA48D-C	All
48-port T3/E3 Interface module	A900-IMA48T-C	All
1-port OC-192 or 8-Port Low Rate CEM Interface Module	A900-IMA8S1Z-CX	2,3,4,5
4-port OC-48/OC-12/OC-3 + 12-Port A900-IMA3G-IMSG T1/E1 + 4-Port T3/E3 CEM Interface Module	A900-IMA3G-IMSG	All

Supported Interface Modules	Part Numbers	Slot

ASR 900 1-Port OC-192 or 8-Port Low Rate CEM 20G Bandwidth Interface Module	A900-IMA1Z8S-CXMS	2, 3, 4, 5[3]
		Note To enable this IM on slot 0 or slot 1, do the following and reload the router:
		`Router# configure t`
		`Router(config)# license feature service-offload enable`

[2] IM supports only one port of 100G with RSP3 as QSFP28 on Port 0 in both slots 4 and 5.
[3] These slots are supported on 10G or 20G mode.

A900-RSP3C-200-S Supported Interface Modules

The table below is applicable for A900-RSP3C-200-S RSP module.

Note If the **license feature service-offload enable** command is configured, then the following IMs are not supported in the router for RSP3:

- A900-IMA8S
- A900-IMA8T
- A900-IMA8S1Z
- A900-IMA8T1Z

Note There are certain restrictions in using the interface modules on different slots with RSP3 module. Contact Cisco Sales/Support for the valid combinations.

Note FAN OIR is applicable every time the IM based fan speed profile is switched to the IMA1C and IMA2F interface modules. Even though the IMs remain in the Out-of-Service state, they are still considered as present in the chassis.

Table 6: A900-RSP3C-200 Supported Interface Modules and Part Numbers

Supported Interface Modules	Part Numbers	Slot
8-port Gigabit Ethernet SFP Interface Module (8x1GE)	A900-IMA8S	All
8-port Gigabit Ethernet RJ45 (Copper) Interface Module (8x1GE)	A900-IMA8T	
1-port 10 Gigabit Ethernet XFP Interface Module (1x10GE)	A900-IMA1X	0, 2 or 4
SFP Combo IM—8-port SFP Gigabit Ethernet (8x1GE) + 1-port 10 Gigabit Ethernet (1x10GE)	A900-IMA8S1Z	1-5[4]
Copper Combo IM—8-port 10/100/1000 Gigabit Ethernet (8x1GE) + 1-port 10 Gigabit Ethernet Interface Module (1x10GE)	A900-IMA8T1Z	0-4
2-port 10 Gigabit Ethernet Interface Module (2x10GE)	A900-IMA2Z	
8-port 10 Gigabit Ethernet Interface Module (8x10GE)	A900-IMA8Z	4
2-port 40 Gigabit Ethernet QSFP Interface Module (2x40GE)	A900-IMA2F	4
4-port OC-48/OC-12/OC-3 + 12-Port A900-IMA3G-IMSG T1/E1 + 4-Port T3/E3 CEM Interface Module	A900-IMA3G-IMSG	2-5[5]
8-Port 10 Gigabit Ethernet (8x10GE) SFP+ Interface Module with Conformal Coating	[6]ASR900-IMA8Z-CC	0

[4] If you have a 1-port 10G IM in slot 0, then SFP combo may not be supported in slot 5.
[5] If slot 0 has 8X10G IM and you want to insert IMA-3G-IMSG to slot 5, then insert 8X10G IM on slot 6, by using the **hw-module subslot 0/0 A900-IMA8Z mode 6-Port** command.
[6] Supported only from release XE-17.13.1 onwards.

Cisco ASR 907 Supported Interface Modules

Supported Interface Modules

Note If the **license feature service-offload enable** command is configured, then the following IMs are not supported in the router for RSP3:

- A900-IMA8S
- A900-IMA8T
- A900-IMA8S1Z
- A900-IMA8T1Z

Note There are certain restrictions in using the interface modules on different slots in the chassis. Contact Cisco Sales and Support for the valid combinations.

Table 7: A900-RSP3 Supported Interface Modules and Part Numbers

RSP Module	Interface Modules	Part Number	Slot
A900-RSP3C-400-W	8-port Gigabit Ethernet SFP Interface Module (8X1GE)	A900-IMA8S	0,1,2,5,6,9,10,13,14,15
	8-port Gigabit Ethernet RJ45 (Copper) Interface Module (8X1GE)	A900-IMA8T	0,1,2,5,6,9,10,13,14,15
	1-port 10 Gigabit Ethernet XFP Interface Module (1X10GE)	A900-IMA1X	Not Supported
	SFP Combo IM—8-port Gigabit Ethernet (8X1GE) + 1-port 10 Gigabit Ethernet (1X10GE)	ASR900-IMA8S1Z	2,5,6,9,10,13,14,15
	Copper Combo IM—8-port Gigabit Ethernet (8X1GE) + 1-port 10 Gigabit Ethernet Interface Module (1X10GE)	ASR900-IMA8T1Z	2,5,6,9,10,13,14,15
	2-port 10 Gigabit Ethernet Interface Module (2X10GE)	ASR900-IMA2Z	3,4,7,8,11,12
	16-port T1/E1 Interface Module	A900-IMA16D	Not Supported
	14-port Serial Interface Module	A900-IMASER14A/S	3,4,7,8,11,12[7]
	8-port T1/E1 Interface Module	A900-IMA8D	Not Supported

RSP Module	Interface Modules	Part Number	Slot
	32-port T1/E1 Interface Module	A900-IMA32D	Not Supported
	1x100G Interface module	A900-IMA1C	7 and 8
	2-port 100 Gigabit Ethernet (QSFP) Interface Module (2X100GE)	A900-IMA2C	7 and 8[8]
	2x40G Interface module	A900-IMA2F	3,4,7,8,11,12
	8x10G Interface module	A900-IMA8Z[9]	3,4,7,8,11,12
	8/16-port 1 Gigabit Ethernet (SFP/SFP) + 1-port 10 Gigabit Ethernet (SFP+) / 2-port 1 Gigabit Ethernet (CSFP) Interface Module	A900-IMA8CS1Z-M	0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15
	1-port OC-192 or 8-Port Low Rate CEM Interface Module	A900-IMA8S1Z-CX	3,4,7,8,11,12 (10 G Mode) 0,1,2,5,6,9,10,13,14,15 (5 G Mode)
	48-port T1/E1 Interface module	A900-IMA48D-C	2,3,4,5,6,7,8,9,10,11,12,13,14,15
	48-port T3/E3 Interface module	A900-IMA48T-C	2,3,4,5,6,7,8,9,10,11,12,13,14,15
	1-port OC48/ STM-16 or 4-port OC-12/OC-3 / STM-1/STM-4 + 12-Port T1/E1 + 4-Port T3/E3 CEM Interface Module	A900-IMA3G-IMSG	3,5,7,9,11,13,15

	ASR 900 1-Port OC-192 or 8-Port Low Rate CEM 20G Bandwidth Interface Module	A900-IMA1Z8S-CXMS	3, 7, 11[10]
			4, 8, 12[11]
			5, 9, 13, 15[12]
			Note To enable this IM on slot 0 or slot 1, do the following and reload the router:
			`Router# configure t`
			`Router(config)# license feature service-offload enable`

	6-port E&M Module	A900-IMA6EM	All slots
	4-port C37.94 Interface Module	A900-IMA4C3794	All slots

[7] The serial IM will not work on slots 11 and 12, if the IMs A900-IMA8T or A900-IMA8S is inserted on any slot in the router.

[8] The IMs A900-IMA6EM, A900-IMASER14A/S, and A900-IMA4C3794 can be installed in slots 3, 4, 7, 8, 11, 12. Slots 3, 4 and 11, 12 have dependency with 1 Gigabit Ethernet IMs. These IMs can be placed in slots 3 only if Gigabit Ethernet IM is not present in slot 5. These IMs can be placed in slots 4 only if Gigabit Ethernet IM is not present in slot 6. These IMs can be placed in slots 11 only if Gigabit Ethernet IM is not present in slots 1, 5, 9, 13, and 15. These IMs can be placed in slots 12 only if Gigabit Ethernet IM is not present in slots 0,2,6,10 and 14.
[9] Six IM slots are supported with various combinations but only five IM slots are functional at a time.
[10] These slots are supported on 10G or 20G mode.
[11] These slots are supported on 10G or 20G mode, only if the adjacent odd slots are empty.
[12] These slots are supported on 10G mode.

Cisco ASR 914 Supported Interface Modules

For information in interface modules supported, see Cisco A900-RSP3C-400-W Supported Interface Modules.

Swapping of Interface Modules

The following Ethernet interface modules support swapping on the Cisco A900-RSP3C-400-W module:

Use the **hw-module subslot default** command before performing a swap of the modules to default the interfaces on the interface module.

- SFP Combo IM—8-port Gigabit Ethernet (8X1GE) + 1-port 10 Gigabit Ethernet (1X10GE)
- 2-port 40 Gigabit Ethernet Interface Module (2X40GE)
- 8-port 10 Gigabit Ethernet Interface Module (8X10GE)
- 1-port 100 Gigabit Ethernet Interface Module (1X100GE)
- OC-192 Interface Module with 8-port Low Rate CEM Interface Module (10G HO / 10G LO)
- 48 T1/E1 TDM Interface Module (48XT1/E1)
- 48 T3/E3 TDM Interface Module (48XT3/E3)

Use of **hw-module subslot default** command is not supported on the following interface modules.

- 1-port OC-192 Interface Module with 8-port Low Rate CEM Interface Module (10G HO / 10G LO)
- 48 T1/E1 TDM Interface Module (48XT1/E1)
- 48 T3/E3 TDM Interface Module (48XT3/E3)
- 1-port OC48/ STM-16 or 4-port OC-12/OC-3 / STM-1/STM-4 + 12-Port T1/E1 + 4-Port T3/E3 CEM Interface Module (A900-IMA3G-IMSG)
- ASR 900 Combo 8-Port SFP GE and 1-Port 10 GE 20G Interface Module (A900-IMA1Z8S-CXMS)

Note If the **license feature service-offload enable** command is configured, then the following IMs are not supported in the router for RSP3:

- A900-IMA8S
- A900-IMA8T
- A900-IMA8S1Z
- A900-IMA8T1Z

Note There are certain restrictions in using the interface modules on different slots in the chassis. Contact Cisco Sales/Support for the valid combinations.

Table 8: Cisco A900-RSP3C-400-W Supported Interface Modules and Part Numbers

RSP Module	Interface Modules	Part Number	Slot
A900-RSP3C-400-W	SFP Combo IM—8-port Gigabit Ethernet (8X1GE) + 1-port 10 Gigabit Ethernet (1X10GE)	A900-IMA8S1Z	2,5,6,9,10,13,14,15
	1x100G Interface module	A900-IMA1C	7,8
	2x40G Interface module	A900-IMA2F	3,4,7,8,11,12
	8x10G Interface module	A900-IMA8Z	3,4,7,8,11,12
	8/16-port 1 Gigabit Ethernet (SFP/SFP) + 1-port 10 Gigabit Ethernet (SFP+) / 2-port 1 Gigabit Ethernet (CSFP) Interface Module	A900-IMA8CS1Z-M	0,1,2,3,4,5,6,7,8,9,10,11,12,13,14, and 15
	OC-192 Interface Module with 8-port Low Rate CEM Interface Module (10G HO / 10G LO)	A900-IMA1Z8S-CX	3,4,7,8,11,12 **Note** Other slots are supported in the 5G mode.
	48XT1/E1 Interface module	A900-IMA48D-C	2,3,4,5,6,7,8,9,10,11,12,13,14, and 15
	48XT3/E3 Interface module	A900-IMA48T-C	2,3,4,5,6,7,8,9,10,11,12,13,14, and 15
	1-port OC48/ STM-16 or 4-port OC-12/OC-3 / STM-1/STM-4 + 12-Port T1/E1 + 4-Port T3/E3 CEM Interface Module	A900-IMA3G-IMSG	2,3,4,5,6,7,8,9,10,13,14, and 15
	2x100G Interface module	NCS560-IMA2C/A900-IMA2C	7, 8

	Combo 8-Port SFP GE and 1-Port 10GE With CEM/iMSG 20G Interface Module	A900-IMA1Z8S-CXMS	0, 1, 2, 5, 6, 9, 10, 13, 14, 15[13]
			3, 4, 7, 8, 11, 12[14]
			Note To enable this IM on slot 0 or slot 1, do the following and reload the router:
			`Router# configure t`
			`Router(config)# license feature service-offload enable`

[13] These slots are supported on 10G mode.
[14] These slots are supported on 20G mode.

Feature Matrix

The feature matrix lists the features that are supported for each platform.

Software Licensing Overview

The router offers the following base licenses:

- Metro Services
- Metro IP Services
- Metro Aggregation Services

Note Starting with Cisco IOS XE Cupertino 17.7.1, licenses are not enabled by default. We recommend that you move to Smart Licensing.

Smart Licensing

Starting with Cisco IOS XE Cupertino 17.7.1, PAK licenses are no longer available. When you purchase the Cisco IOS XE Cupertino 17.7.1 release or later, Smart Licensing is enabled by default. We recommend that you move to Smart Licensing before upgrading to Cisco IOS XE Cupertino 17.7.1 or a higher release, for a seamless experience.

If you are using Cisco IOS XE Bengaluru 17.6.1 or an earlier release version, Smart Licensing is not enabled by default. To enable Smart Licensing, see Software Activation Configuration Guide (Cisco IOS XE ASR 900 Series).

Table 9: Cisco ASR 900 Software Licenses Feature Set

Metro Services	Metro IP Services	Metro Aggregation Services
—	Includes all features in Metro Services	Includes all features in Metro IP Services
QoS, with deep buffers and hierarchical QoS (HQOS)	IP routing (RIP, OSPF, EIGRP, BGP, IS-IS)	MPLS (LDP and VPN)
Layer 2: 802.1d, 802.1q	PIM (SM, DM, SSM), SSM mapping	MPLS TE and FRR
Ethernet Virtual Circuit (EVC)	BFD	MPLS OAM
Ethernet OAM (802.1ag, 802.3ah)	Multi-VRF CE (VRF lite) with service awareness (ARP, ping, SNMP, syslog, trace-route, FTP, TFTP)	MPLS-TP
Multiple Spanning Tree (MST) and Resilient Ethernet Protocol (REP)	IEEE 1588-2008 Ordinary Slave Clock and Transparent Clock	Pseudowire emulation (EoMPLS, CESoPSN, and SAToP)
Synchronous Ethernet	—	VPLS and HVPLS

Metro Services	Metro IP Services	Metro Aggregation Services
IPv4 and IPv6 host connectivity	—	Pseudowire redundancy
—	—	MR-APS and mLACP

The router offers the following additional feature licenses:

- ATM
- IEEE 1588-2008 Boundary Clock/Master Clock
- OCx-overview- Port License

Note These features require a software license to use.

Determining the Software Version

You can use the following commands to verify your software version:

- Consolidated Package—**show version**
- Individual sub-packages—**show version installed** (lists all installed packages)

Upgrading to a New Software Release

Only the latest consolidated packages can be downloaded from Cisco.com; users who want to run the router using individual subpackages must first download the image from Cisco.com and extract the individual subpackages from the consolidated package.

For information about upgrading to a new software release, see the Upgrading the Software on the Cisco ASR 900 Series Routers .

Upgrading the FPD Firmware

FPD Firmware packages are bundled with the software package. FPD upgrade is automatically performed ont the router.

If you like to manually change the FPD Firmware software, use the **upgrade hw-module subslot 0/0 fpd bundle** to perform FPD frmware upgrade.

ROMMON Version

We recommend you to upgrade the ROMMON version to 15.6(49r)S.

For more information on the ROMMON package, see Cisco Software Download.

Note ROMMON upgrade is mandatory to boot RSP3 images.

Supported FPGA, HoFPGA, and ROMMON Versions for Cisco IOS XE 17.6.x Release

Use the **show hw-module all fpd** command to display the IM FPGA version on the router.

The below table lists the FPGA version for the software releases.

Note If there's an FPGA upgrade during ISSU, it causes traffic disruption. TDM interface modules get reset irrespective of FPGA upgrade during the ISSU.

Note Effective Cisco IOS XE 17.3.1, secure ROMMON version of **15.6(42r)S** is supported to boot RSP3 images.

Once you upgrade to the secure BIOS ROMMON version, you can't downgrade to non-secure ROMMON versions (lower than15.6(33r)S). The Cisco IOS XE 17.3.1 release is bundled with 15.6(42r)S ROMMON and the auto upgrade feature upgrades all RSPs running a lower version of ROMMON to Secure 15.6 (**42**r)S ROMMON.

Table 10: IM FPGA Versions for Ethernet Phase 3 IM

Cisco IOS XE Release	IO FGPA	8 x10 FPGA	2x40 FPGA	1x100 FPGA
17.6.8	0x34	0.21	0.22	0.20
17.6.7	0x34	0.21	0.22	0.20
17.6.6a	0x34	0.21	0.22	0.20
17.6.6	0x34	0.21	0.22	0.20
17.6.5	0x34	0.21	0.22	0.20
17.6.4	0x34	0.21	0.22	0.20
17.6.3	0x34	0.21	0.22	0.20
17.6.2	0x34	0.21	0.22	0.20
17.6.1	0x34	0.21	0.22	0.20
17.5.1	0x34	0.21	0.22	0.20

Table 11: CEM and IM FPGA Versions for ASR 903 RSP3 and ASR 907

Category	Release	48-port T1/E1 CEM Interface Module FPGA (A900-IMA48D-C)	48-port T3/E3 CEM Interface Module FPGA (A900-IMA48T-C)	1-port OC-192 Interface Module + 8-port Low Rate Interface Module FPGA (A900-IMA8S1Z-CX)	1-port OC-48/STM-16 or 4-port OC-12/OC-3 / STM-1/STM-4 + 12-port T1/E1 + 4-port T3/E3 CEM Interface Module (A900-IMA3G-IMSG)	Combo 8-Port SFP GE and 1-Port 10GE With CEM/iMSG 20G Interface Module (A900-IMA1Z8S-CXMS)
CEM FPGA	Cisco IOS XE 17.6.8	0x52110052	0x52510052	5G mode: 0x10050065 10G mode: 0x10010079	0x10020076	10G mode: 0x10160051 20G mode: 0x10160051
IM FPGA		1.22	1.22	1.15	2.00	0.93
CEM FPGA	Cisco IOS XE 17.6.7	0x52110052	0x52510052	5G mode: 0x10050065 10G mode: 0x10010079	0x10020076	10G mode: 0x10160051 20G mode: 0x10160051
IM FPGA		1.22	1.22	1.15	2.00	0.93
CEM FPGA	Cisco IOS XE 17.6.6a[15]	0x52110052	0x52510052	5G mode: 0x10050065 10G mode: 0x10010079	0x10020076	10G mode: 0x10160051 20G mode: 0x10160051
IM FPGA		1.22	1.22	1.15	2.00	0.93
CEM FPGA	Cisco IOS XE 17.6.6[16]	0x52110052	0x52510052	5G mode: 0x10050065 10G mode: 0x10010079	0x10020076	10G mode: 0x10160051 20G mode: 0x10160051
IM FPGA		1.22	1.22	1.15	2.00	0.93
CEM FPGA	Cisco IOS XE 17.6.5	0x52110052	0x52510052	5G mode: 0x10050065 10G mode: 0x10010079	0x10020076	10G mode: 0x10160051 20G mode: 0x10160051
IM FPGA		1.22	1.22	1.15	2.00	0.93

Category	Release	48-port T1/E1 CEM Interface Module FPGA (A900-IMA48D-C)	48-port T3/E3 CEM Interface Module FPGA (A900-IMA48T-C)	1-port OC-192 Interface Module + 8-port Low Rate Interface Module FPGA (A900-IMA8S1Z-CX)	1-port OC-48/STM-16 or 4-port OC-12/OC-3 / STM-1/STM-4 + 12-port T1/E1 + 4-port T3/E3 CEM Interface Module (A900-IMA3G-IMSG)	Combo 8-Port SFP GE and 1-Port 10GE With CEM/iMSG 20G Interface Module (A900-IMA1Z8S-CXMS)
CEM FPGA	Cisco IOS XE 17.6.4	0x52110052	0x52510052	5G mode: 0x10050065 10G mode: 0x10010079	0x10020076	10G mode: 0x10160051 20G mode: 0x10160051
IM FPGA		1.22	1.22	1.15	2.00	0.93
CEM FPGA	Cisco IOS XE 17.6.3	0x52110052	0x52510052	5G mode: 0x10050065 10G mode: 0x10010079	0x10020076	10G mode: 0x10160051 20G mode: 0x10160051
IM FPGA		1.22	1.22	1.15	2.00	0.93
CEM FPGA	Cisco IOS XE 17.6.2	0x52110052	0x52510052	5G mode: 0x10050065 10G mode: 0x10010079	0x10020076	10G mode: 0x10160051 20G mode: 0x10160051
IM FPGA		1.22	1.22	1.15	2.00	0.93
CEM FPGA	Cisco IOS XE 17.6.1	0x52110052	0x52520052	5G mode: 0x10090065 10G mode: 0x10070079	0x10030076	10G mode: 0x 10290051 20G mode: 0x 10290051
IM FPGA		1.22	1.22	1.15	2.00	0.93
CEM FPGA	Cisco IOS XE 17.5.1	0x52050052	0x52420052	5G mode: 0x10210063 10G mode: 0x10530078	0x10020076	10G mode: 0x10090051 20G mode: 0x10090051
IM FPGA		1.22	1.22	1.15	2.00	0.93

[15] The FPGA version of the Interface Module A900-IMASER14A/S for this release is 2.6.
[16] The FPGA version of the Interface Module A900-IMASER14A/S for this release is 2.6.

Table 12: FPGA, HoFPGA, and ROMMON Versions for Cisco IOS XE 17.6.1 Release

Platform	Interface Module	FPGA Current Version	FPGA Minimum Required Version	RSP HoFPGA Active	RSP HoFPGA Standby	ROMMON
RSP2-128	A900-IMA2Z	69.22	69.22	0X00030011	0X00030011	15.6(48r)S
	A900-IMA8S	0.75	0.75			
	A900-IMA8T1Z	69.32	69.24			
RSP3-400S	A900-IMA1C	0.20	0.20	40035	40035	15.6(49r)S
	A900-IMA8Z	0.23	0.21			
	A900-IMA8S1Z	**69.24**	**69.24**			
RSP3-400W	A900-IMA1C	0.20	0.20	20040034	20040034	15.6(49r)S
	A900-IMA2Z	**69.22**	**69.22**			

Table 13: FPGA, HoFPGA, and ROMMON Versions for Cisco IOS XE 17.6.2, 17.6.3, and 17.6.4 Releases

Platform	Interface Module	FPGA Current Version	FPGA Minimum Required Version	RSP HoFPGA Active	RSP HoFPGA Standby	ROMMON
RSP2-128	A900-IMA2Z	69.22	69.22	0X00030011	0X00030011	15.6(48r)S
	A900-IMA8S	0.75	0.75			
	A900-IMA8T1Z	69.32	69.24			
RSP3-400S	A900-IMA1C	0.20	0.20	40035	40035	15.6(49r)S
	A900-IMA8Z	0.23	0.21			
	A900-IMA8S1Z	**69.24**	**69.24**			
RSP3-400W	A900-IMA1C	0.20	0.20	20040034	20040034	15.6(49r)S
	A900-IMA2Z	**69.22**	**69.22**			

Documentation Updates

Rearrangement in the Configuration Guides

- The following are the modifications in the CEM guides.

  Introduction of the OCx CEM Interface Module Configuration Guide. This guide covers the features of the following OCx Interface Modules:

  - 1 port OC-48/STM-16 or 4 port OC-12/OC-3 / STM-1/STM-4 + 12 port T1/E1 + 4 port T3/E3 CEM Interface Module (A900-IMA3G-IMSG)

- 1-Port OC-192 or 8-Port Low Rate CEM Interface Module (A900-IMA8S1Z-CX)
- ASR 900 Combo 8-Port SFP GE and 1-Port 10 GE 20G Interface Module (A900-IMA1Z8S-CXMS)
- 1-port OC-192 or 8-port Low rate CEM interface module

This features of the OCx interface modules are combined and reorganized as follows:

- Overview of the interface modules
- SONET and SDH configuration
- Interworking Multiservice Gateway (iMSG) that includes serial interfaces, iMSG ACR, multilink interfaces, and VLAN handoff
- OCx protection that includes Automatic protection switching (APS), Multiplex Section Protection (MSP), Unidirectional Path Switching Ring (UPSR), and Subnetwork Connection Protection (SNCP)
- Data Communication Channel (DCC) and Target Identifier Address Resolution Protocol (TARP)
- Bandwidth for OCx Modules

For more information, see the OCx CEM Interface Module Configuration Guide, Cisco IOS XE 17 (Cisco ASR 900 Series).

MIB Support

The below table summarizes the supported MIBs on the Cisco ASR 900 Series Router.

Table 14: Supported MIBs

Supported MIBs		
BGP4-MIB (RFC 1657)	CISCO-IMAGE-LICENSE-MGMT-MIB	MPLS-LDP-STD-MIB (RFC 3815)
CISCO-BGP-POLICY-ACCOUNTING-MIB	CISCO-IMAGE-MIB	MPLS-LSR-STD-MIB (RFC 3813)
CISCO-BGP4-MIB	CISCO-IPMROUTE-MIB	MPLS-TP-MIB
CISCO-BULK-FILE-MIB	CISCO-LICENSE-MGMT-MIB	MSDP-MIB
CISCO-CBP-TARGET-MIB	CISCO-MVPN-MIB	NOTIFICATION-LOG-MIB (RFC 3014)
CISCO-CDP-MIB	CISCO-NETSYNC-MIB	OSPF-MIB (RFC 1850)
CISCO-CEF-MIB	CISCO-OSPF-MIB	OSPF-TRAP-MIB (RFC 1850)
CISCO-CLASS-BASED-QOS-MIB	CISCO-OSPF-TRAP-MIB	PIM-MIB (RFC 2934)
CISCO-CONFIG-COPY-MIB	CISCO-PIM-MIB	RFC1213-MIB
CISCO-CONFIG-MAN-MIB	CISCO-PROCESS-MIB	RFC2982-MIB
CISCO-DATA-COLLECTION-MIB	CISCO-PRODUCTS-MIB	RMON-MIB (RFC 1757)

CISCO-EMBEDDED-EVENT-MGRMIB	CISCO-PTP-MIB	RSVP-MIB
CISCO-ENHANCED-MEMPOOL-MIB	CISCO-RF-MIB	SNMP-COMMUNITY-MIB (RFC 2576)
CISCO-ENTITY-ALARM-MIB	CISCO-RTTMON-MIB	SNMP-FRAMEWORK-MIB (RFC 2571)
CISCO-ENTITY-EXT-MIB	CISCO-SONET-MIB	SNMP-MPD-MIB (RFC 2572)
CISCO-ENTITY-FRU-CONTROLMIB	CISCO-SYSLOG-MIB	SNMP-NOTIFICATION-MIB (RFC 2573)
CISCO-ENTITY-SENSOR-MIB	DS1-MIB (RFC 2495)	SNMP-PROXY-MIB (RFC 2573)
CISCO-ENTITY-VENDORTYPE-OID-MIB	ENTITY-MIB (RFC 4133)	SNMP-TARGET-MIB (RFC 2573)
CISCO-FLASH-MIB	ENTITY-SENSOR-MIB (RFC 3433)	SNMP-USM-MIB (RFC 2574)
CISCO-FTP-CLIENT-MIB	ENTITY-STATE-MIB	SNMPv2-MIB (RFC 1907)
CISCO-IETF-ISIS-MIB	EVENT-MIB (RFC 2981)	SNMPv2-SMI
CISCO-IETF-PW-ATM-MIB	ETHERLIKE-MIB (RFC 3635)	SNMP-VIEW-BASED-ACM-MIB (RFC 2575)
CISCO-IETF-PW-ENET-MIB	IF-MIB (RFC 2863)	SONET-MIB
CISCO-IETF-PW-MIB	IGMP-STD-MIB (RFC 2933)	TCP-MIB (RFC 4022)
CISCO-IETF-PW-MPLS-MIB	IP-FORWARD-MIB	TUNNEL-MIB (RFC 4087)
CISCO-IETF-PW-TDM-MIB	IP-MIB (RFC 4293)	UDP-MIB (RFC 4113)
CISCO-IF-EXTENSION-MIB	IPMROUTE-STD-MIB (RFC 2932)	CISCO-FRAME-RELAY-MIB
CISCO-IGMP-FILTER-MIB	MPLS-LDP-GENERIC-STD-MIB (RFC 3815)	IF-MIB
CISCO-AAA-SERVER-MIB	—	—

Table 15: Unverified MIBs

Unverified MIBs		
ATM-MIB	CISCO-IETF-DHCP-SERVER-EXT-MIB	EXPRESSION-MIB
CISCO-ATM-EXT-MIB	—	HC-ALARM-MIB
CISCO-ATM-IF-MIB	CISCO-IETF-PPVPN-MPLS-VPN-MIB	HC-RMON-MIB
CISCO-ATM-PVC-MIB	CISCO-IP-STAT-MIB	IEEE8021-CFM-MIB
CISCO-ATM-PVCTRAP-EXTN-MIB	CISCO-IPSLA-ETHERNET-MIB	IEEE8021-CFM-V2-MIB
CISCO-BCP-MIB	CISCO-L2-CONTROL-MIB	IEEE8023-LAG-MIB
CISCO-CALLHOME-MIB	CISCO-LAG-MIB	INT-SERV-GUARANTEED-MIB

CISCO-CIRCUIT-INTERFACE-MIB	CISCO-MAC-NOTIFICATION-MIB	INTEGRATED-SERVICES-MIB
CISCO-CONTEXT-MAPPING-MIB	CISCO-MEMORY-POOL-MIB	MPLS-L3VPN-STD-MIB (RFC 4382)
CISCO-EIGRP-MIB	CISCO-NHRP-EXT-MIB	MPLS-LDP-ATM-STD-MIB (RFC 3815)
CISCO-ERM-MIB	CISCO-NTP-MIB	MPLS-LDP-MIB
CISCO-ETHER-CFM-MIB	CISCO-PING-MIB	MPLS-TE-STD-MIB
CISCO-ETHERLIKE-EXT-MIB	CISCO-RESILIENT-ETHERNET-PROTOCOL-MIB	MPLS-VPN-MIB
CISCO-EVC-MIB	CISCO-RTTMON-ICMP-MIB	NHRP-MIB
CISCO-HSRP-EXT-MIB	CISCO-RTTMON-IP-EXT-MIB	RFC2006-MIB (MIP)
CISCO-HSRP-MIB	CISCO-RTTMON-RTP-MIB	RMON2-MIB (RFC 2021)
CISCO-IETF-ATM2-PVCTRAP-MIB	CISCO-SNMP-TARGET-EXT-MIB	SMON-MIB
CISCO-IETF-ATM2-PVCTRAP-MIBEXTN	CISCO-TCP-MIB	VRRP-MIB
CISCO-IETF-BFD-MIB	CISCO-VRF-MIB	—
CISCO-IETF-DHCP-SERVER-MIB	ETHER-WIS (RFC 3637)	—

MIB Documentation

The following resources provide more detail about MIBs on the Cisco ASR 900 Series Router:

- Cisco ASR 900 Series Router MIB Guide—For information about the Cisco ASR 903 Series Router product implementation of the MIB protocol, see *Cisco ASR 903 Series Aggregation Services Router MIB Specifications Guide* at the following location:

  http://www.cisco.com/c/en/us/td/docs/wireless/asr_900/mib/guide/asr903mib.html

- MIB Locator—To locate and download MIBs for selected platforms, Cisco IOS and Cisco IOS XE releases, and feature sets, use Cisco MIB Locator found at the following location:

  http://tools.cisco.com/ITDIT/MIBS/servlet/index

Additional References

Product Information

- Cisco ASR 900 Series Aggregation Services Routers Data Sheets

Hardware Installation Guides

- Cisco ASR 900 Series Aggregation Services Routers Hardware Guides

Software Configuration Guides

- Cisco ASR 900 Series Aggregation Services Routers Configuration Guides

Regulatory Compliance and Safety Information

- Regulatory Compliance and Safety Information for the Cisco ASR 900 Series Aggregation Services Routers

Field Notices and Bulletins

- Field Notices—We recommend that you view the field notices for this release to determine whether your software or hardware platforms are affected. You can find field notices at http://www.cisco.com/en/US/support/tsd_products_field_notice_summary.html.
- Bulletins—You can find bulletins at http://www.cisco.com/en/US/products/sw/iosswrel/ps5012/prod_literature.html.

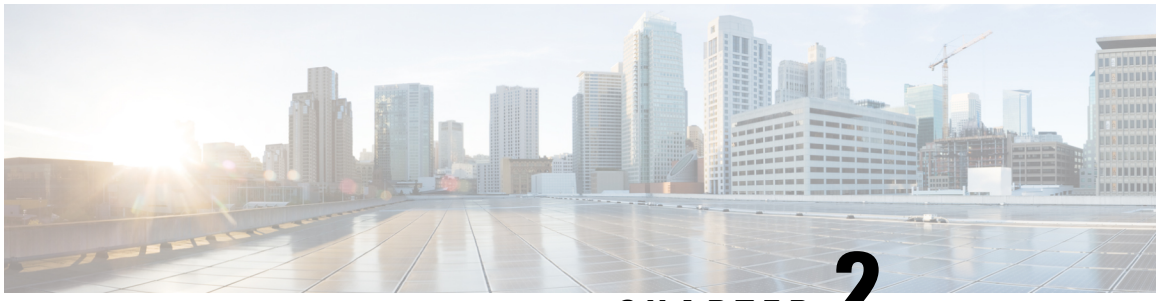
Accessibility Features in the Cisco ASR 900 Series Routers

For a list of accessibility features in Cisco ASR 900 Series Routers, see the Voluntary Product Accessibility Template (VPAT) on the Cisco website, or contact accessibility@cisco.com.

All product documents are accessible except for images, graphics, and some charts. If you would like to receive the product documentation in audio format, braille, or large print, contact accessibility@cisco.com.

End-of-Life and End-of-Sale Notices

For End-of-Life and End-of-Sale Notices for the Cisco ASR 900 Series Routers, see https://www.cisco.com/c/en/us/products/routers/asr-903-series-aggregation-services-routers/eos-eol-notice-listing.html.



CHAPTER 2

What's New for Cisco IOS XE Bengaluru 17.6.x

This chapter describes the new hardware and software features supported in Cisco IOS XE Bengaluru 17.6.x.

For information on features supported for each release, see Feature Compatibility Matrix.

What's New in Software for Cisco IOS XE Bengaluru 17.6.8

There are no software features for this release.

What's New in Hardware for Cisco IOS XE Bengaluru 17.6.8

There are no hardware features for this release.

What's New in Software for Cisco IOS XE Bengaluru 17.6.7

There are no software features for this release.

What's New in Hardware for Cisco IOS XE Bengaluru 17.6.7

There are no hardware features for this release.

What's New in Software for Cisco IOS XE Bengaluru 17.6.6a

There are no new features in this release. This release provides a fix for CSCwh87343: Cisco IOS XE Software Web UI Privilege Escalation Vulnerability. For more information, see cisco-sa-iosxe-webui-privesc-j22SaA4z.

What's New in Hardware for Cisco IOS XE Bengaluru 17.6.6a

There are no hardware features for this release.

What's New in Software for Cisco IOS XE Bengaluru 17.6.6

There are no software features for this release.

What's New in Hardware for Cisco IOS XE Bengaluru 17.6.6

There are no hardware features for this release.

What's New in Software for Cisco IOS XE Bengaluru 17.6.5

There are no software features for this release.

What's New in Hardware for Cisco IOS XE Bengaluru 17.6.5

There are no hardware features for this release.

What's New in Software for Cisco IOS XE Bengaluru 17.6.4

There are no software features for this release.

What's New in Hardware for Cisco IOS XE Bengaluru 17.6.4

There are no hardware features for this release.

What's New in Software for Cisco IOS XE Bengaluru 17.6.3

There are no software features for this release.

What's New in Hardware for Cisco IOS XE Bengaluru 17.6.3

There are no hardware features for this release.

What's New in Software for Cisco IOS XE Bengaluru 17.6.2

Feature	Description
T3/E3 CEM Interface Module	
Channelize the T3 interface into E1 lines	Support for the T3 interface to be channelized into 21 E1 lines.
Quality of Service	
Inter-cos bursting support	This feature introduces color-blind mode of policer operation that is supported on routers with single-rate policer (1R2C) and two-rate policer (2R3C) policing types. With this feature, all policers are supported on color-blind mode with the new template.

What's New in Hardware for Cisco IOS XE Bengaluru 17.6.2

There are no hardware features for this release.

What's New in Hardware for Cisco IOS XE Bengaluru 17.6.1

The 14-port serial interface module (A900-IMASER14A/S) is supported with additional slots on the Cisco A900-RSP3C-400-S, A900-RSP3C-200-S, A900-RSP2A-128 and A900-RSP2A-64 platforms.

For more information, see the Cisco ASR 903 and ASR 903U Aggregation Services Router Hardware Installation Guide and Cisco ASR 907 Router Hardware Installation Guide.

What's New in Software for Cisco IOS XE Bengaluru 17.6.1

Feature	Description
LAN Switching	
G.8032 Support for IEEE 802.1Q EFPs	This feature supports G.8032 Ethernet ring protection for IEEE 802.1Q Ethernet Flow Points (EFPs). Prior to this release, G.8032 Ethernet ring protection for IEEE 802.1Q was supported only for Trunk Ethernet Flow Points (TEFPs).
Layer 2	
802.1AE WAN MACsec for 1GE and 10GE A900-IMA8CS1Z-M	The WAN MACsec and MKA feature introduce MACsec support on WAN and uplink support and pre-shared key support for the MACsec Key Agreement protocol (MKA). The WAN MACsec supports 1GE and 10GE interfaces for A900-IMA8CS1Z-M interface module.
IP Routing: BFD	
Micro BFD over LAG Convergence Optimization	Starting with 17.6.x release, the convergence for port-channel failures with Fast Reroute (FRR) is less than 50 milliseconds, when min-links is configured and equal to the total-links available under the port-channel. This feature is supported on the Cisco RSP3 module.
MPLS Layer 2 VPNs	
Remote LFA for MLDP	Remote Loop-Free Alternate (RLFA) based Fast Reroute (FRR) improves LFA coverage. When used with Multicast Label Distribution Protocol (MLDP) for IPv4, there is no need for an extra protocol in the control plane.
First Hop Redundancy Protocols	
Support for BFD, sub-second fast hello for VRRPv3 convergence and re-convergence	This feature supports VRRP failover such that the fault is detected by the VRRP-BFD client within the configured value – when the connection to the remote interface IP address fails. This feature is supported on both the Cisco RSP2 and RSP3 modules.
CEM Generic	
Test Access Port (TAP) or Test Access Digroup (TAD)	Support for Test access port or digroup (TAP/TAD) in the following aspects: • Non-intrusive monitoring for both receive and transmit directions. • Split and terminate cross connection for intrusive testing in both directions. The TAP feature helps in monitoring and debugging purpose.
Support for TSoP SSFP Dejitter Buffer Tuning	TSoP SSFP Dejitter Buffer Tuning is applicable only for T1 smart SFP.
Network Management	

Feature	Description
Ingress and Egress Flexible NetFlow	Flexible NetFlow allows you to monitor the traffic from access circuit on an L2VPN and L3VPN network. In addition to monitoring traffic in routed and ethernet service interfaces, you can now monitor traffic in VRF enabled L2 VFI (virtual forwarding interfaces) and cross-connect services. This feature is not supported with the RSP3 module. It is only supported with the RSP2 module.
Upgrading the Software on the Cisco ASR 900 Series Routers	
Secure eUSB Configuration	Use the **platform secure-cfg** command to provide enhanced security to the routers.
IP Routing	
Establish GRE Tunnel over VRF Routes	This feature establishes GRE tunnels over Virtual Route Forward (VRF) routes. This feature is not supported with the Cisco RSP3 module. It is only supported with the Cisco ASR RSP2 module.
System Logging	
Cisco Secure Development Lifecycle—Factory Reset	This feature removes all the customer-specific data that stored on the device since the time of its shipping. Data erased includes configurations, log files, boot variables, core files, and credentials like FIPS-related keys. Cisco Secure Development Lifecycle (CSDL) is a repeatable and measurable proces designed to increase Cisco product resiliency and trustworthiness. The following new commands are introduced: • **factory-reset all** • **factory reset keep-licensing-info** • **factory-reset all secure 3-pass DoD 5220.22-M** For information on the commands, Cisco IOS Configuration Fundamentals Command Reference.
Segment Routing	
EVPN-IRB DHCP v4 and v6 Relay over Segment Routing	This feature introduces a specialised implementation of DHCP packets to support DHCPv4 and DHCPv6 in an EVPN Fabric with Distributed Anycast Gateways (DAGs) on the same Virtual Routing and Forwarding (VRF). It also avoids DHCP discovery packet floods across the fabric. The flooding suppression feature is also enhanced to intercept multicast or broadcast DHCP packets when DHCP relay is configured on the DAG to perform the required action and localize the scope of the service. This feature is not supported with Cisco ASR RSP3 module. It is only supported with Cisco ASR RSP2 module.

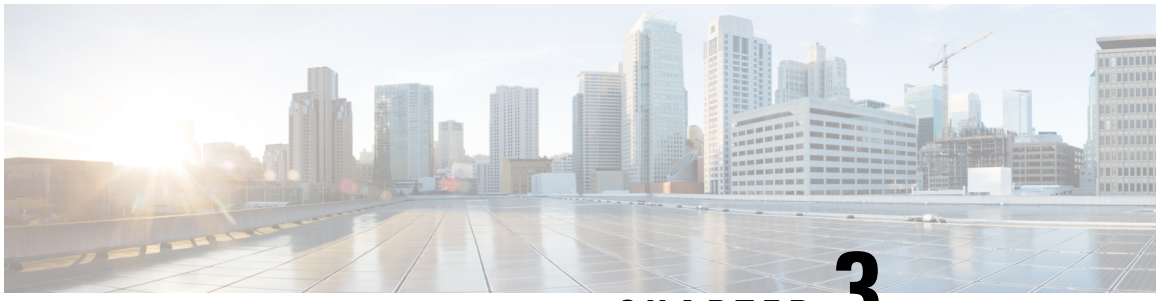
Feature	Description
IS-IS Flexible Algorithm Include Affinity Support	This feature supports "include-any" and "include-all" affinities in IS-IS. Prior to Cisco IOS XE Bengaluru 17.6.1 release, only Flexible Algorithm affinity "exclude-any" was supported.
OSPF Flexible Algorithm (Ph2): Topology-Independent Loop-Free Alternate (TI-LFA) Path	This feature allows you to configure the Loop-Free Alternate (LFA) and TI-LFA backup or repair paths for a Flexible Algorithm. The backup path is computed based on the constraints and metrics of the primary path. Prior to Cisco IOS XE Bengaluru 17.6.1, OSPF Flexible Algorithm supported only the primary path.
SR-PCE: Enabling SR PM Delay or Liveness for PCE-Initiated Policies	This feature enables the Path Computation Element (PCE) that can provision a Segment Routing Traffic Engineering (SR-TE) policy to mitigate link congestion. Prior to this release, you could only enable PM link and delay measurement using CLI-based policies. Starting with this release, you can also use PCE to enable PM link and delay measurement.
Stitching of Subnet Route from EVPN to L3VPN	This feature introduces the collpased spine and border leaf node in the network topology of single homing DAGs with symmetric IRB, inter-subnet layer 3 traffic within fabric and inter-subnet layer 3 stitching through layer 3 border gateway. The hosts participating in fabric IRB are directly attached with the collapsed spine and border leaf node. This feature is not supported with Cisco ASR RSP3 module. It is only supported with Cisco ASR RSP2 module.
Programmability	
FQDN Support for gRPC Subscriptions	With the introduction of the FQDN Support for gRPC Subscriptions feature, along with IP addresses, FQDN can also be used for gRPC subscriptions. Platforms: Cisco Catalyst 9200 Series Switches, Cisco ASR 900 Series Aggregation Services Routers (RSP2) Cisco Catalyst 9800-40 Series Wireless Controllers, Cisco Catalyst 9800-80 Series Wireless Controllers
YANG Model Support for **show mpls ldp neighbor** Command	This feature enables you to display the status of LDP sessions from YANG models.
YANG Model support for **show mpls tr tunnel** command	This feature enables you to verify the show mpls traffic engineering tunnel command to check the status from YANG models.
YANG Model support for RSVP Commands	You can use the interface BDI 10 and ip rsvp bandwidth percent 4 commands to configure the RSVP bandwidth on a BDI interface from YANG. You can configure, modify and verify different bandwidth values using these commands.
YANG Model support for IPSLA Operating Model for Y1731	You can check the history interval statistics of delay operations like DMM, DMMv1 and 1DM, and loss operations like LMM and SLM using the Netconf-yang command to enable YANG data collection.

Feature	Description
YANG Model support for QoS Overhead Accounting	QoS Overhead Accounting feature enables a particular port to consider a particular number of bits that are removed from the packet when the egress packet is re-edited. The traffic scheduler allows more bits than the configured rate at the port, without exceeding the number of bytes that is configured on a port. Yang QOS Overhead accounting configuration model supports the configuration on the router accounting on router from yang/Netconf protocol.
YANG Model support for alarm profile configurations	This feature enables you to configure the alarm profile on the interface through native YANG models that run on Cisco IOS XE.
YANG Model support for Shared Risk Link Groups (SRLG) Group Identification (GID) configurations	Shared Risk Link Groups (SRLG) Group Identification (GID) configurations can be enabled on YANG using the srlg gid command. Multiple groups and interfaces can be enabled on the interface mode.

YANG Data Models—For the list of Cisco IOS XE YANG models available with this release, navigate to https://github.com/YangModels/yang/tree/master/vendor/cisco/xe/1761

Revision statements embedded in the YANG files indicate if there has been a model revision. The README.md file in the same GitHub location highlights changes that have been made in the release.

For more information, see *Programmability Configuration Guide, Cisco IOS XE Bengaluru 17.6.x*.



CHAPTER 3

Caveats

This chapter describes open and resolved severity 1 and 2 caveats and select severity 3 caveats:

- The "Open Caveats" sections list open caveats that apply to the current release and may apply to previous releases. A caveat that is open for a prior release and is still unresolved applies to all future releases until it is resolved.
- The "Resolved Caveats" sections list caveats resolved in a specific release, but open in previous releases.

The bug IDs are sorted alphanumerically.

Note The Caveats section includes the bug ID and a short description of the bug. For details on the symptoms, conditions, and workaround for a specific caveat you must use the Bug Search Tool.

Open Caveats – Cisco IOS XE Bengaluru 17.6.8

There are no open caveats in this release.

Resolved Caveats – Cisco IOS XE Bengaluru 17.6.8

There are no resolved caveats in this release.

Open Caveats - Cisco IOS XE Bengaluru 17.6.7

There are no open caveats in this release.

Resolved Caveats – Cisco IOS XE Bengaluru 17.6.7

Identifier	Headline
CSCwh64181	After losing primary master, T-BC stuck in HOLDOVER state though secondary master is reachable.
CSCwh85621	ASR903-RSP3 : \"sh pla ha cef ip/ipv6\" command is displaying partial output for POCH interface
CSCwj06370	Serial cease traffic when configuring module other port

Open Caveats - Cisco IOS XE Bengaluru 17.6.6a

There are no open caveats in this release.

Resolved Caveats – Cisco IOS XE Bengaluru 17.6.6a

Identifier	Headline
CSCwh87343	Cisco IOS XE Software Web UI Privilege Escalation Vulnerability

Open Caveats - Cisco IOS XE Bengaluru 17.6.6

Identifier	Headline
CSCwf77316	MPLS L3VPN PE not able to connect remote CE
CSCwd87661	Fan running at high speed and creating noise (Fan PID A903-FAN-H)
CSCwh12668	Standard loopback is not working when applied on both the ends on a back to back link
CSCwh15596	HW Mcirobfd is flapping with Interop tests on RSP3

Open Caveats – Cisco IOS XE Bengaluru 17.6.6 - Platform Independent

Identifier	Headline
CSCvy92900	Crash seen TILFA Flex algo Any cast address during config replace
CSCvy87800	Remote LInk Failure notification is disabled when configuring through YANG
CSCwb43369	Traceback seen when default made on all core intfs.
CSCvy94083	Running configuration syn to the NETCONF running data store takingmor time
CSCuv05226	VRF is not deleted after replacing default config
CSCvy04053	Connect CLI used for local connect needs to take care of monitor session also
CSCvy54819	If show controller cli is executed immediately after l2vpn xconnect config w/o exit, leads to iosd
CSCwd89397	micro bfd: registry call to get encap type of a service instance

Resolved Caveats – Cisco IOS XE Bengaluru 17.6.6

Identifier	Headline
CSCwf40403	T3: DCR: cem id not displayed correctly under "sh recovered-clock"
CSCwe38959	rs232 ASYNC PW service with full scale seeing packet and byte drops intermittently
CSCwf40953	DS3_ADMIN_DOWN gets cleared after IM OIR
CSCwe82657	VIN P2/0, VOUT P2/2, VIN P4/0 & VOUT P4/2 alarms upon SSO

Identifier	Headline
CSCwd16666	Ony in 3GMS OC3 port with network loop Bert pattern is not syncing
CSCwf86864	CEM traffic flow is dropped in one direction due to DEI bit set from 4202
CSCwe19162	ASR903:RSP3: After SSO: False Alarm on CNAAP
CSCwh02460	with x.21 configured observing underruns in cem counters
CSCwf49426	PAIS alarm get reported after IM OIR.
CSCvy81362	Controllers are down due to LP-LOP alarm After CE reboots
CSCwf07736	cem interface counters momentarily report error when x21 xconnect is cleared and re-established
CSCwe10460	Power sensor threshold warning alarms in EPNM
CSCwf54249	With CPG, STS1e configuration is giving %ERROR: Standby doesn't support this command
CSCwe13024	ASR900-RSP2: All readings for Power supply unit reflect as zero though the unit is functional
CSCwd67723	In IMA32D/IMA8D card, sometimes change in E1 controller config(after ctrlr flap)results in IM reboot
CSCwf71463	with traffic ON, when speed lowered on ASYNC port, SYNC port CEM traffic gets impacted
CSCwe98227	"show version" does not display details of T1/E1 interfaces for 8D and 32D IMs
CSCwf90667	ASR903:IMA8Z:frequent reloads of IM due to high temp- FAN speed mismatch

Resolved Caveats – Cisco IOS XE Bengaluru 17.6.6 - Platform Independent

There are no resolved caveats in this release.

Open Caveats - Cisco IOS XE Bengaluru 17.6.5

Identifier	Headline
CSCwd90840	mcast data traffic is getting dropped over vpls
CSCwd66728	RSP-3C - uea_mgr crash seen with uea_brcm_update_hw_stats
CSCwd87661	Fan running at high speed and creating noise (Fan PID A903-FAN) - SW version 17.03.04

Identifier	Headline
CSCwd16666	Ony in 3GMS OC3 port with network loop Bert pattern is not syncing
CSCwc77502	Unexpected reload due to MLDPv6
CSCwd67723	IOMD Crash and IMA32D/IMA8D card reboot when change E1 config during E1 interface flapping
CSCwd05362	Performance issue on router platform

Open Caveats – Cisco IOS XE Bengaluru 17.6.5 - Platform Independent

Identifier	Headline
CSCwc55520	Traceback and IDB leak noticed when a RSP3 setup performs a switchover
CSCwb43369	Traceback seen when default made on all core intfs
CSCvy94083	Running configuration syn to the NETCONF running data store takes more time
CSCvy87800	Remote Link Failure notification is disabled when configuring through YANG

Resolved Caveats – Cisco IOS XE Bengaluru 17.6.5

Identifier	Headline
CSCwc41135	Continuous assertion and clear of LAIS on protect channel causing IPC failure
CSCwc80493	APS - K2 byte not reflecting proper value during LRDI and LAIS conditions.
CSCwc25182	Synchronization Status Messaging (S1) Processing and Generation issue
CSCwc41115	APS 1+1 Uni - Tx K2 to reflect Rx K1 channel number
CSCwd04198	A900-IMASER14A/S: when configurations are pasted in a specific order, line config is missing
CSCwd44817	After router reload E1 framing gets changed to unframed in SDH VC12 mode with channe-group config
CSCwd48164	EVPN statd resource leak after protocol flaps
CSCwb90111	17.9 : APS-ACR config/unconfig results in traffic drop
CSCwc34663	FPD: Failure to downgrade the firmware of card 0/0
CSCwd11926	Need support for dual options in CLI for setting clock rate for x21

Identifier	Headline
CSCwb69025	Change in SD-BER threshold value to 10e-9 causes SD alarm assertion
CSCwc65971	RSP3: MPLS pseudowirte - Incorrect label stack pushed to packet
CSCwd60521	ToD state is down with gnss module
CSCwc53354	Alarm assertion/clearing not happening for port x+1 when complete sonet config for port x is removed
CSCwc79322	Memory leak on ptpd_uea process
CSCwd26357	rs485 with half-duplex configuration when reloaded, it gets into default full-duplex mode
CSCwd40870	RSP2 crashes when entering "ip prefix" list

Resolved Caveats – Cisco IOS XE Bengaluru 17.6.5 - Platform Independent

Identifier	Headline
CSCwd66936	RSP2 UDP pseudowire stuck in Activating
CSCwc21402	Invalid BGP update when add-paths negotiated only for label (SAFI 4) and not unicast (SAFI1)
CSCwb91762	RSP3: MSPW VC down points to Error Local access circuit is not ready for label advertise
CSCwb77093	A BGP speaker may advertise a next-hop set to self when advertising an eBGP route to an iBGP peer.

Open Caveats - Cisco IOS XE Bengaluru 17.6.4

Identifier	Headline
CSCwc34663	FPD: Failure to downgrade the firmware of card 0/0
CSCvz02262	TCAM corruption happening at bank boundary when one of the bank is full.

Open Caveats – Cisco IOS XE Bengaluru 17.6.4 - Platform Independent

There are no open caveats in this release.

Resolved Caveats - Cisco IOS XE Bengaluru 17.6.4

Identifier	Headline
CSCwb07758	Convergence is > 50ms during RSP SSO and Core flap with 2 pot-channel interface.
CSCwb60002	ASR900 may experience an unexpected reset when configuring or using interface BDI >= 4097
CSCwb01224	Multihop BFD transit packets getting droppedn on ASR920 after upgrade to 17.3.3
CSCwb46702	MLPPP: Traffic Drop seen after the addition of 2 or more member links
CSCvz91746	ASR903: Tengig interface remained DOWN after ISSU upgrade from 17.04.01 to 17.7.1 throttle
CSCwb33605	Problem with CISCO-ENTITY-SENSOR-MIB SNMP on ASR903 router
CSCwa95194	ASR903 serial IM interfaces stay down using media-type rs422

Resolved Caveats – Cisco IOS XE Bengaluru 17.6.4 - Platform Independent

Identifier	Headline
CSCwb77396	G.8032: Ring brief output doesnt display the Block port flag in Idle state
CSCwb66047	RSP3/ASR920/RSP2:node crashed @ l2rib_obj_peer_tbl_cmd_print

Open Caveats - Cisco IOS XE Bengaluru 17.6.3

Identifier	Headline
CSCvz02262	TCAM corruption happening at bank boundary when one of the bank is full.

Open Caveats – Cisco IOS XE Bengaluru 17.6.3 - Platform Independent

Identifier	Headline
CSCwb04551	FRR is not calculating backup route due to "primary_update_complete_pending:" flag set to 1.
CSCwa30653	MVPN Profile 14: Data MDT traffic not flowing with 2 paths when OSPF cost configured on 1 path.
CSCwa36608	RSP3 ICCP stuck on the CONNECTING state after RSP SO on Active PoA.

Resolved Caveats - Cisco IOS XE Bengaluru 17.6.3

Identifier	Headline
CSCvz42622	TPOP T1 SATOP : Cable length range needs to be changed to be consistent with the IMA48D/IMA3G
CSCvy78284	The router crashes when zeroised RSA key is regenerated
CSCwa99837	RSP3: Implement show command to display voq that failed during delete voq
CSCwa35351	Raw-socket config-event use all the iomem when L1 is down
CSCvy34396	MAC table inconsistency due to parity error.
CSCvz61352	ASR907: when IOT IM is inserted in slot 4, gigEth traffic on slot 14 fails
CSCwa79398	rs232 service on port8 gives SLIP errors when databits is set on other ports
CSCwa41670	Cylon_mgr crash @adjmgr_get_nh_flag with 16.9.4 image
CSCwa09302	iMSG serial interfaces bitrate/sec data is displayed incorrectly in show command output
CSCwa04795	Interfaces are showing up in SNMP polling while associated Hardware Does not Exists on System
CSCvy92074	MTU programming for mpls l2 vc may fail after interface flaps
CSCvz27117	linux_iosd_image crash seen during router reload
CSCvz33447	STS1e card protection - Recovered clock status is shown as NA for work and protect ports
CSCwa59045	Need to support few line level CLIs with "no" even without any cable attached.
CSCwa41638	The MAC Table and L2VPN EVPN Table out of sync

Identifier	Headline
CSCwa54842	RSP3: QOSMGR-4-QUEUE_ExCEEDING_HW: VOQs exceeded hardware limit
CSCwb06353	Router crashed with IP SLA configuration which is not supported.
CSCwa94444	F2B chassis: show env does not display the fan speed.

Resolved Caveats – Cisco IOS XE Bengaluru 17.6.3 - Platform Independent

Identifier	Headline
CSCwa37283	RSP failover on router showing several seconds of outage for L2VPN services.

Open Caveats - Cisco IOS XE Bengaluru 17.6.2

Caveat ID Number	Description
CSCvy78284	The router goes down when zeroised RSA key is regenerated.
CSCvz02262	TCAM corruption happening at bank boundary when one of the bank is full.
CSCvz52848	Raw-socket config-event uses all the iomem if connected device L1 signals are down

Resolved Caveats - Cisco IOS XE Bengaluru 17.6.2

Caveat ID Number	Description
CSCvy08425	With 30 clock ports there are PTP flaps and deselection of current master.
CSCvy51848	Active RP HW goes down during an IO FPGA Upgrade and Standby started booting in Loop.
CSCvy64788	LLC frames are getting looped back due to autonomic networking.
CSCvy74356	In CT3 E1 and CT3 mode, the loopback local is not getting applied, and controller goes down.
CSCvy82376	IMs on slots 13, 14, and 15 out of service on ASR-907 chassis
CSCvy91436	Egress QoS classification issues with Service instance 2 configuration on CE facing interfaces
CSCvz07477	DWDM SFPs threshold Value set to 0.0 dbm for RX/TX and -0.0 C for temperature.

Caveat ID Number	Description
CSCvz19022	ASR 903 RSP3C - Ping issue with MTU greater than 1508.
CSCvz20710	ASR903/ASR907 A900-IMA1Z8S-CXMS EIGRP flapping on framing SDH Serial interface.
CSCvz26979	DHCP packets are not forwarded from Client to Server when DHCP snooping is enabled globally.
CSCvz57242	ASR90x-RSP3: IP MTU incorrectly programmed in ASIC after removing/reconfiguring the IP address.
CSCvz79672	HQoS on egress TenGig interface is not working properly.
CSCvz49032	APS ACR scale: traffic goes down after router reload egress counters are 0.
CSCvz37014	Incorrect timestamping: registry to use/update receive timestamp for RSP3 platform.
CSCvz62438	RSP3: BDI routing frames corrupted on deletion and recreation of EFP.
CSCvz09447	IMA1Z8S-CX-MS Protection switching on LOS condition disrupts service for greater than 200 msec.
CSCvz10220	DS3 card protection - iosd crash upon no mode T3.
CSCvz49468	APS:ACR traffic fails after ISSU from 16.12 to 17.3
CSCvz07855	PTP Source port IDs are different in Sync and Announce, Delay-resp packets from the master.
CSCvv65012	Drop tunneled packets for protocols for which tunnel is configured locally.

Resolved Caveats – Cisco IOS XE Bengaluru 17.6.2 - Platform Independent

Caveat ID Number	Description
CSCvz66346	New Bridge-Domain are not added dynamically to POCH when TEFP-encap from-bd is configured.

Open Caveats - Cisco IOS XE Bengaluru 17.6.1

Caveat ID Number	Description
CSCvy74356	In T3 controller-CT3 E1 and CT3 mode the loopback local is not getting applied, controller stays down
CSCvy82376	IMs on slots 13, 14 and 15 out of service on ASR-907 chassis

Caveat ID Number	Description
CSCvy91369	IOS-XE : IPSLA ICMP-Jitter over L3VPN results incorrect jitter value.
CSCvy92074	MTU programming for mpls l2 vc may fail after interface flaps
CSCvy64388	TAP:Hard IM OIR and router reload causing OBJ_DOWNLOAD_FAIL when multiple modes are enabled
CSCvz02352	Error objects are seen mlist area
CSCvz04388	The pubd process crashed during ISSU from 17.6.1 to 17.3_throttle

Resolved Caveats - Cisco IOS XE Bengaluru 17.6.1

Caveat ID Number	Description
CSCvh63374	TCAM related commands don't return values on RSP3
CSCvs50029	Interface flaps and input errors seen with optics GLC-FE-100BX-D in ASR920-12CZ
CSCvu78738	T3 counter names to be as per GR-820 standard names
CSCvv21542	Command to change from dynamic to static FAN algorithm for ASR-920-24SZ-M variant
CSCvv35215	IP IW XC Scenario - From ethernet to tdm side, IGP label is NOT pushed
CSCvv42595	REP flapping randomly and frequently due to port down
CSCvv44747	SLOS alarm not reported in console and show facility-alarm
CSCvv47918	Block SATOP when controller is looped remotely (far end) for acr/upsr/cpg/sts1e
CSCvv51145	Crash seen on **show plat hard pp active feature multicast database ipv4 table label <> eos <>**
CSCvv55842	DEI bit on C-TAG is not being preserved for Double tag to Double tag svc even if there is no rewrite
CSCvv59385	CTL:DS3 PM interval counters showing wrong data
CSCvv62123	FPGA TX tables are not programmed for microbfd session after router reload in 17.4.1 release
CSCvv73275	Applique type, syslog are misleading when a path configured with t3 is over-written with STSnC mode
CSCvv74342	VPLSoBKPW:MAC not flushed/withdrawn in remote peer on VC swichover from active to standby.
CSCvv74638	IMA1X frequent link down

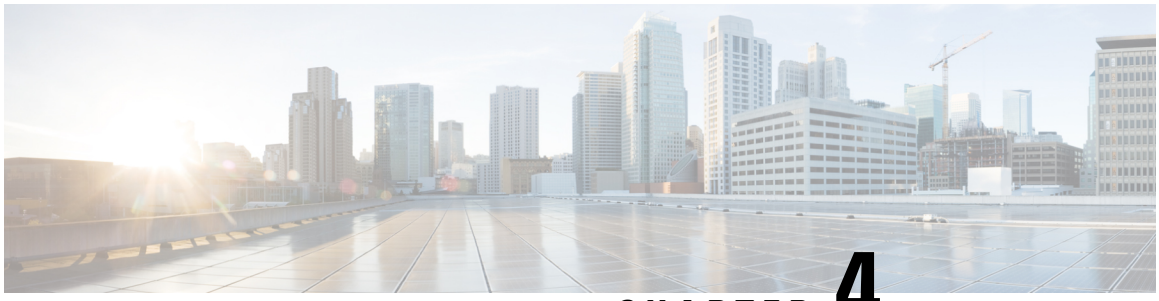
Caveat ID Number	Description
CSCvv76949	Op state and Ad state showing NA for all slot with Bandwidth command
CSCvv83093	OBFL updation with valid time after NTP Sync in RTC failure case (Rework of CSCvq07399)
CSCvv94214	**no Loopback remote iboc csu/fac1/fac2** not brings remote end out of loop
CSCvv95745	Crash of standby supervisor because of QoS Overhead Accounting
CSCvv99456	ACL entries with FRAGMENT keywords are not working on the ASR920 platform
CSCvw00749	sensor_state_change TDL message create validation missing
CSCvw02841	IOMD Crash on Work or Prot IM after SSO with UPSR config
CSCvw04366	UEA: Display GNSS Chassis SN instead of PCB SN in show CLI's
CSCvw08879	EVPN-IRB:Complete traffic drop seen in 1 direction after intf flap on Spine/leaf with XE-XR interop
CSCvw09881	RX-S1S0 bytes are not updated in **show controller sonet**
CSCvw32263	ASR-920-24SZ-IM system not going for shutdown when device booted without fan tray
CSCvw48885	IM OIR as part of ISSU resulted in IOSD Crash for T3E3 RSP3 IM
CSCvw56612	**show lic** CLI does not show port details
CSCvw57114	[RSP3 / PoCh-Mcast]: igmp queries are dropped entering a Poch
CSCvw59531	Auto negotiation failing when CU SFP connected to 100m port
CSCvw82333	Continuous PCI role logging to trace file
CSCvx41010	Failed to marshal xcvr_sync message: Bad address

Resolved Caveats – Cisco IOS XE Bengaluru 17.6.2 - Platform Independent

Caveat ID Number	Description
CSCvz66346	New Bridge-Domain are not added dynamically to POCH when TEFP-encap from-bd is configured.

Cisco Bug Search Tool

Cisco Bug Search Tool (BST), the online successor to Bug Toolkit, is designed to improve effectiveness in network risk management and device troubleshooting. You can search for bugs based on product, release, and keyword, and aggregates key data such as bug details, product, and version. For more details on the tool, see the help page located at http://www.cisco.com/web/applicat/cbsshelp/help.html



CHAPTER 4

Restrictions and Limitations

Note The error message "PLATFORM-1-NOSPACE: SD bootflash : no space alarm assert" may occur in the following scenarios:

- Any sector of SD Card gets corrupted
- Improper shut down of router
- power outage.

This issue is observed on platforms which use EXT2 file systems.

We recommend performing a reload of the router. As a result, above alarm will not be seen during the next reload due to FSCK(file systems check) execution.

However, If the error persists after a router reload, we recommend to format the bootflash or FSCK manually from IOS.

- From the Cisco IOS XE 16.5.1 and 16.6.1 releases, In-Service Software Upgrade (ISSU) is not supported on the router to the latest releases. For more information on the compatible release versions, see ISSU Support Matrix.
- ISSU is not supported between a Cisco IOS XE 3S release and the Cisco IOS XE Bengaluru 17.6.x release.
- The port restriction on 1-port OC-192 or 8-port low rate CEM interface module is on port pair groups. If you have OC48 configured on a port, the possible port pair groups are 0-1, 2-3, 4-5, 6-7. If one of the port within this port group is configured with OC48 rate, the other port cannot be used.
- RS422 pinout works only on ports from 0 to 7.
- The **ip cef accounting** command is *not* supported on the router.
- Configuration sync does *not* happen on the Standby RSP when the active RSP has Cisco Software Licensing configured, and the standby RSP has Smart Licensing configured on the router. If the active RSP has Smart Licensing configured, the state of the standby RSP is undetermined. The state could be pending or authorized as the sync between the RSP modules is not performed.
- Evaluation mode feature licenses may not be available to use after disabling, and enabling the smart licensing on the RSP2 module. A reload of the router is required.

- Ingress counters are not incremented for packets of the below format on the RSP3 module for the 10 Gigabit Ethernet interfaces, 100 Gigabit Ethernet interfaces, and 40 Gigabit Ethernet interfaces:

  Packet Format

  MAC header---->Vlan header---->Length/Type

  When these packets are received on the RSP3 module, the packets are not dropped, but the counters are not incremented.

- T1 SAToP, T3 SAToP, and CT3 are supported on an UPSR ring only with local connect mode. Cross-connect configuration of T1, T3, and CT3 circuits to UPSR are not supported.
- PTP is not supported when 8-port 10 Gigabit Ethernet interface module is in oversubscribed mode.
- The frame drops may occur for packets with packet size of less than 100 bytes, when there is a line rate of traffic over all 1G or 10G interfaces available in the system. This restriction is applicable only on RSP2 module, and is not applicable for RSP3 module.
- Effective with Cisco IOS XE Everest 16.6.1, the VPLS over Port-channel (PoCH) scale is reduced from 48 to 24 for Cisco ASR 903 RSP3 module.

Note The PoCH scale for Cisco ASR 907 routers is 48.

- One Ternary Content-Addressable Memory (TCAM) entry is utilized for Segment Routing Performance Measurement. This is required for the hardware timestamping to function.
- NAT/PAT feature not supported
- Port channel 61-64 is not supported in the 16.11.1a release. The range of configurable port channel interfaces has been limited to 60.
- While performing an auto upgrade of ROMMON, only primary partition is upgraded. Use the **upgrade rom-mon filename** command to upgrade the secondary partition of the ROMMON during the auto upgrade. However, the router can be reloaded during the next planned reload to complete the secondary rommon upgrade. This is applicable to ASR 903 and ASR 907 routers.
- In the Cisco IOS XE 17.1.1 release, the EVPN EVI type is VLAN-based by default, and while configuring for the EVPN EVI type, it is recommended to configure the EVPN EVI type as VLAN-based, VLAN bundle and VLAN aware model.
- For Cisco IOS XE Gibraltar Release 16.9.5, Cisco IOS XE Gibraltar Release 16.12.3, and Cisco IOS XE Amsterdam 17.1.x, a minimum diskspace of 2 MB is required in the boot flash memory file system for a successful ROMMON auto upgrade process. For a diskspace lesser than 2 MB, ROMMON auto upgrade fails and the router reboots. This is applicable to Cisco ASR 903 and Cisco ASR 907 routers.
- In the Cisco IOS XE 16.12.1, 17.1.1, and 17.2.1 releases, IPSec is not supported on the Cisco RSP3 module.
- CEM circuit provisioning issues may occur during downgrade from Cisco IOS XE Amsterdam 17.3.1 to any lower versions or during upgrade to Cisco IOS XE Amsterdam 17.3.1 from any lower versions, if the CEM scale values are greater than 10500 APS/UPSR in protected CEM circuits. So, ensure that the CEM scale values are not greater than 10500, during ISSU to or from 17.3.1.

- Some router models are not fully compliant with all IETF guidelines as exemplified by running the pyang tool with the **lint** flag. The errors and warnings exhibited by running the pyang tool with the **lint** flag are currently non-critical as they do not impact the semantic of the models or prevent the models from being used as part of the toolchains. A script has been provided, "check-models.sh", that runs pyang with **lint** validation enabled, but ignoring certain errors. This allows the developer to determine what issues may be present.

  As part of model validation for the Cisco IOS XE Amsterdam 17.3.1 release, "LEAFREF_IDENTIFIER_NOT_FOUND" and "STRICT_XPATH_FUNCTIONS" error types are ignored.

- Test Access Port (TAP) is not supported when the iMSG VLAN handoff feature is enabled on the same node.

- Effective with Cisco IOS XE Bengaluru 17.6.1 release, if IGP protocols (IS-IS and OSPF) are running in the core interfaces of Cisco ASR 903 with RSP3 module, when flapping happens on the core interface, you may see the error message `%FMFP-3-OBJ_DWNLD_TO_DP_FAILED: F0/0: fman_fp_image: adj 0xf8000236, Flags Midchain download to DP failed` in the console, and in the meantime there is no pending objects and error objects in the output of the **show platform software object-manager fp active statistics** command. There is no service impact in this case, you can ignore the message.

- SF and SD alarms are not supported on T1 and T3 ports for the following interface modules:

  - A900-IMA3G-IMSG
  - A900-IMA48D-C
  - A900-IMA48T-C