Release Notes for Cisco ASR 900 Series Routers, Cisco IOS XE Fuji 16.8.x

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Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

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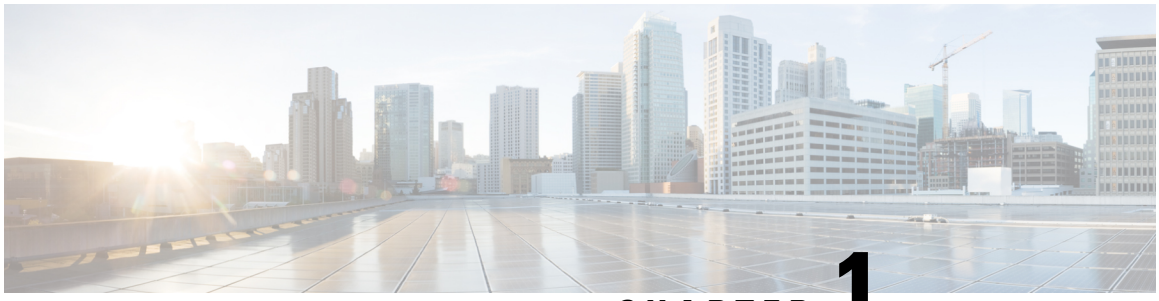

CHAPTER 1

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 beginning with Release Cisco IOS XE Fuji 16.8.x.

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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 10 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

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	
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 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
8-port Gigabit Ethernet SFP Interface Module (8x1GE)	A900-IMA8S	All
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]

Supported Interface Modules	Part Numbers	Slot
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
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

Combo 8-Port SFP GE and 1-Port 10GE With CEM/iMSG 20G 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 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]
4-port C37.94 Interface Module	A900-IMA4C3794	4
6-port E & M Interface Module	A900-IMA6EM	4
14-port Serial Interface Module	A900-IMASER14AS	4

[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.

Cisco ASR 907 Supported Interface Modules

Supported Interface Modules

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[6]
	8-port T1/E1 Interface Module	A900-IMA8D	Not Supported
	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[7]
	2x40G Interface module	A900-IMA2F	3,4,7,8,11,12
	8x10G Interface module	A900-IMA8Z[8]	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
		A900-IMA3G-IMSG	3,5,7,9,11,13,15

RSP Module	Interface Modules	Part Number	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		

	Combo 8-Port SFP GE and 1-Port 10GE With CEM/iMSG 20G Interface Module	A900-IMA1Z8S-CXMS	3, 7, 11[9]
			4, 8, 12[10]
			5, 9, 13, 15[11]
			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

6 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.
7 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.
8 Six IM slots are supported with various combinations but only five IM slots are functional at a time.
9 These slots are supported on 10G or 20G mode.
10 These slots are supported on 10G or 20G mode, only if the adjacent odd slots are empty.
11 These slots are supported on 10G mode.

Cisco ASR 914 Supported Interface Modules

Swapping of Interface Modules

The following Ethernet interface modules support swapping on the Cisco A900-RSP3C-400-W 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 the **hw-module subslot default** command before performing a swap of the modules to default the interfaces on the interface module.

- 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
- NCS 4200 Combo 8-Port SFP GE and 1-Port 10 GE 20G Interface Module

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[12]
			3, 4, 7, 8, 11, 12[13]
			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`

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

Feature Matrix

The feature matrix lists the features supported for each platform. For more information, see the Cisco ASR 900 Series Aggregation Services Routers Feature Compatibility Matrix on Cisco.com.

The cumulative Feature Compatibility Release Matrix is available on Content Hub.

Software Licensing Overview

The router offers the following base licenses:

- Metro Services
- Metro IP Services
- Metro Aggregation Services

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
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
- OC-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 Cisco IOS XE Fuji 16.8.1 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 Cisco ASR 900 Series Router Configuration Guide.

ROMMON Version

We recommend you to upgrade the ROMMON version to 15.6(20r)S.

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

Supported FPGA Versions

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

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

Note If there is an FPGA upgrade during ISSU, it will cause traffic disruption. TDM interface modules get reset irrespective of FPGA upgrade during the ISSU.

Table 10: IM FPGA Versions for all Ethernet Phase 1 and Phase 2 IMs

Cisco IOS XE Release	Gigabit Ethernet Interface Module (Phase 1) FPGA	Gigabit Ethernet Interface Module (Phase 2) FPGA	TDM Interface Module FPGA	RSP2 Module HoFPGA
16.8.1	• A900-IMA2Z — 0.47 • A900-IMA8T / A900-IMA8S — 0.47	• A900-IMA2Z — 69.22 • A900-IMA8T / A900-IMA8S — 69.24	—	0X00030005

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

Category	48-port T1/E1 CEM Interface Module FPGA	48-port T3/E3 CEM Interface Module FPGA	1-port OC-192 Interface Module + 8-port Low Rate Interface Module FPGA	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
CEM FPGA	0x46470046	0x46470046	5G mode: 0x10780059 10G mode: 0x10670075	0x10380039
IM FPGA	1.22	1.22	1.15	2.00

MIB Support

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

Table 12: 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 13: 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

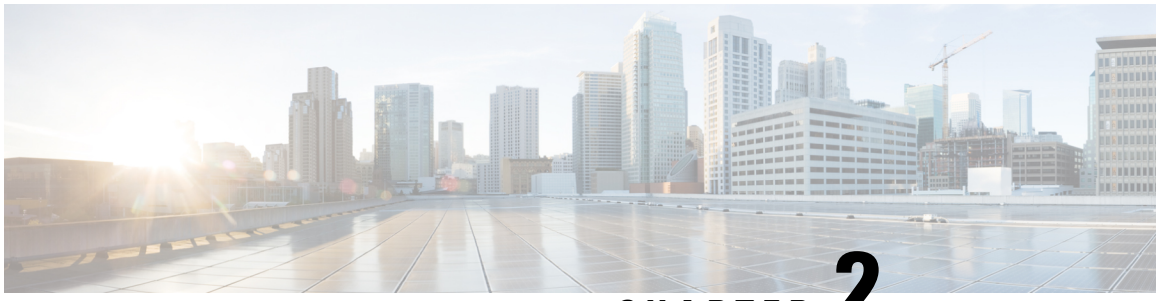
The following resources provide more detail about MIBs on the Cisco ASR 900 Series Router:

- 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



CHAPTER 2

New Features

This chapter describes the new hardware and software features supported on the Cisco ASR 900 Series routers in the following releases:

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

- New Hardware and Software Features in Cisco IOS XE Fuji 16.8.1c, on page 21
- New Hardware Features in Cisco IOS XE Fuji 16.8.1b, on page 21
- New Software Features in Cisco IOS XE Fuji 16.8.1b, on page 21

New Hardware and Software Features in Cisco IOS XE Fuji 16.8.1c

Not applicable for this release.

New Hardware Features in Cisco IOS XE Fuji 16.8.1b

Not applicable for this release.

New Software Features in Cisco IOS XE Fuji 16.8.1b

- **16K EFP Support on Port Channel**

  16K EFPs on port channel are supported on the Cisco ASR 900 RSP3 module.

  For more information, see Quality of Service Configuration Guidelines, Cisco IOS XE Fuji 16.8.x (Cisco ASR 900 Series).

  The following new command is introduced for this feature:

  - platform port-channel members-asic-id

  For more information on the new command, see the Cisco IOS Quality of Service Solutions Command Reference.

- **Far-end Performance Monitoring Support**

The far-end counters for performance monitoring counters are supported for the following interface modules:

- 48-Port T1/E1 CEM Interface Module
- 48-Port T3/E3 CEM Interface Module
- 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
- 1-Port OC-192 or 8-Port Low Rate CEM Interface Module

The output for the **show controllers** commands are updated for far-end counters.

For more information on performance monitoring, see:

- 48-Port T1/E1 CEM Interface Module Configuration Guide
- 48-Port T3/E3 CEM Interface Module Configuration Guide
- 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 Configuration Guide
- 1-Port OC-192 or 8-Port Low Rate CEM Interface Module Configuration Guide

The following commands are updated for this feature:

- show controllers t1
- show controllers e1
- show controllers t3
- show controllers e3
- show controllers sonnet

For more information on the commands, see the Cisco IOS Interface and Hardware Component Command Reference

- **IPv6 QoS support for SDM Template**

  SDM template is supported for IPv6 QoS features on the Cisco ASR 900 RSP2 module. The resources supported for the IPv6 QoS SDM template are updated in the table detailing Feature Resources Allowed by Each SDM Template (RSP2).

  For more information on IPv6 QoS SDM template, see Cisco ASR 900 Router Series Configuration Guide.

- **Loopback Remote on T1 and T3 Interfaces**

  The Cisco ASR 903 and Cisco ASR 907 now support loopback remote configuration. The loopback remote configuration attempts to put the far-end T1 or T3 interfaces into a loopback. The loopback remote setting loops back the far-end at line or payload, using inband bit-orientated CDE (IBOC) or the ESF loopback codes to communicate the request to the far-end. This feature is supported on the following interface modules:

  - 48-Port T1/E1 CEM Interface Module
  - 48-Port T3/E3 CEM Interface Module

- 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
- 1-Port OC-192 or 8-Port Low Rate CEM Interface Module

For more information on loopback remote configuration, see:

- 48-Port T1/E1 CEM Interface Module Configuration Guide, Cisco IOS XE Fuji 16.8.x (Cisco ASR 900 Series)
- 48-Port T3/E3 CEM Interface Module Configuration Guide, Cisco IOS XE Fuji 16.8.x (Cisco ASR 900 Series)
- 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 Configuration Guide, Cisco IOS XE Fuji 16.8.x (Cisco ASR 900 Series)
- 1-Port OC-192 or 8-Port Low Rate CEM Interface Module Configuration Guide, Cisco IOS XE Fuji 16.8.x (Cisco ASR 900 Series)

The following new command is introduced for this feature:

- Loopback remote

For more information on the new command, see the Cisco IOS Interface and Hardware Component Command Reference.

- **Multi EFPs for Single BDI Support on Cisco RSP3 Module**

  The Cisco ASR 900 RSP3 module now supports multiple EFPs with a single BDI.

  For more information, see the Carrier Ethernet Configuration Guide, Cisco IOS XE Fuji 16.8.x (Cisco ASR 900 Series).

- **Programmability**
  - Model-Based AAA— Implements the NETCONF Access Control Model (NACM). NACM is a form of role-based access control (RBAC) specified in RFC 6536.
  - NETCONF Global Session Lock and Kill Session—Provides a global lock and the ability to kill non-responsive sessions in NETCONF. During a session conflict or client misuse of the global lock, NETCONF sessions can be monitored via the show netconf-yang sessions command, and non-responsive sessions can be cleared using the **clear configuration lock** command.
  - NETCONF and RESTCONF Debug commands—Commands for debugging were added.
  - NETCONF and RESTCONF IPv6 Support—Data model interfaces (DMIs) support the use of IPv6 protocol. DMI IPv6 support helps client applications to communicate with services that use IPv6 addresses. External facing interfaces will provide dual-stack support; both IPv4 and IPv6.
  - 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/1681

    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 on the Programmability features, see the Programmability Configuration Guide, Cisco IOS XE Fuji 16.8.x.

- **Support for Alarm Profiling**

  The alarm profiling feature enables you to create a unique alarm profile for chassis, card or interface module, and port. Each alarm profile, for example, chassis alarm profile, is defined with an alarm name. Each alarm profile is classified based on controller types such as SONET, SDH, DS1, and DS3. For each controller type, there are a set of alarms defined with default severity. You can overwrite the default severity using the alarm profile and suppress the syslog facility based on your preference. By default, the syslog facility is enabled for the alarm profile.

  For more information on performance monitoring, see:

  - 48-Port T1/E1 CEM Interface Module Configuration Guide
  - 48-Port T3/E3 CEM Interface Module Configuration Guide
  - 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 Configuration Guide
  - 1-Port OC-192 or 8-Port Low Rate CEM Interface Module Configuration Guide

  The following new commands are introduced for this feature:

  - alarm-profile
  - alarm-profile attach
  - attach profile-name
  - show alarm-profile

  For more information on the new commands, see the Cisco IOS Interface and Hardware Component Command Reference.

- **Support for Seven Level Priority Queues on Cisco RSP2 Module**

  The Cisco ASR 900 RSP2 module now supports seven priority levels: level 1 (high) to level 7 (low). The device places traffic with a high-priority level on the outbound link ahead of traffic with a low-priority level. High-priority packets, therefore, are not delayed behind low-priority packets.

  For more information, see the QoS: Congestion Management Configuration Guide, Cisco IOS XE Fuji 16.8.x (Cisco ASR 900).

- **Support of DS1 Framed Structure-Agnostic TDM over Packet (SAToP)**

  Framed Structure-Agnostic TDM over Packet (SAToP) detects an incoming AIS alarm in the DS1 SAToP mode. Framed SAToP helps in the detection of a packet drop and enhances performance by detecting the alarm earlier in the network. This feature is supported on the following interface modules:

  - 48-Port T1/E1 CEM Interface Module
  - 48-Port T3/E3 CEM Interface Module
  - 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
  - 1-Port OC-192 or 8-Port Low Rate CEM Interface Module

Note BERT is not supported in system direction for framed SAToP.

For more information on loopback remote configuration, see:

- 48-Port T1/E1 CEM Interface Module Configuration Guide, Cisco IOS XE Fuji 16.8.x (Cisco ASR 900 Series)
- 48-Port T3/E3 CEM Interface Module Configuration Guide, Cisco IOS XE Fuji 16.8.x (Cisco ASR 900 Series)
- 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 Configuration Guide, Cisco IOS XE Fuji 16.8.x (Cisco ASR 900 Series)
- 1-Port OC-192 or 8-Port Low Rate CEM Interface Module Configuration Guide, Cisco IOS XE Fuji 16.8.x (Cisco ASR 900 Series)

The **cem-group group-number** command is updated with the new keyword framed as follows:

- cem-group *group-number framed*

For more information on the command, see the Cisco IOS Interface and Hardware Component Command Reference.

- **Support of DS3 Circuit Emulation over Packet (CEP)**

  DS3 Circuit Emulation over Packet (CEP) feature is introduced to achieve STS-1 or VC4 CEP configuration on the interface module. Here, T3 or E3 can be mapped to either STS-1 or VC4 to be emulated on a packet network.

  This feature is supported on the following interface module:

  - 48-Port T3/E3 CEM Interface Module
  - 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

  For more information on loopback remote configuration, see:

  - 48-Port T3/E3 CEM Interface Module Configuration Guide, Cisco IOS XE Fuji 16.8.x (Cisco ASR 900 Series)
  - 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 Configuration Guide, Cisco IOS XE Fuji 16.8.x (Cisco ASR 900 Series)

  The **show controllers t3** command is updated with the new keyword path as follows:

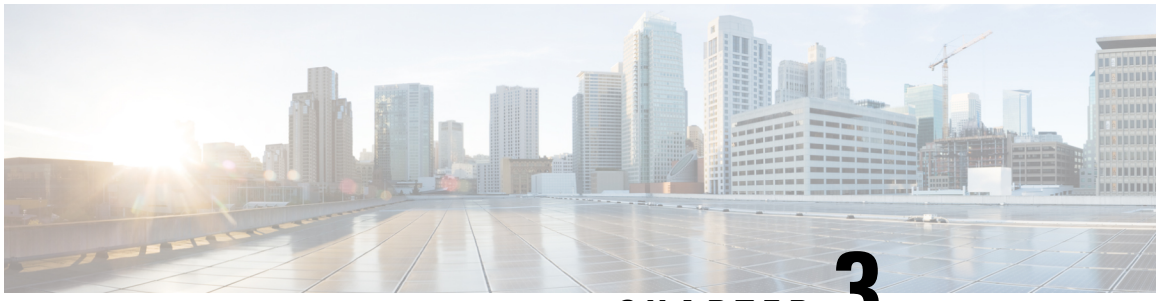
  - show controllers t3 *path*

  For more information on the command, see the Cisco IOS Interface and Hardware Component Command Reference.

- **VPLS over Backup Pseudowire**

Pseudowire redundancy allows you to detect any failure in the network and reroute the Layer 2 service to another endpoint that can continue to deliver service by providing additional backup pseudowire. This feature enables recovery from a failure of either the remote provider edge (PE) router or the link between the PE and customer edge (CE) routers.

For more information, see the MPLS Layer 2 VPNs Configuration Guide, Cisco IOS XE Fuji 16.8.x (Cisco ASR 900 Series).



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.

- Cisco Bug Search Tool, on page 27
- Open Caveats – Cisco IOS XE Fuji 16.8.1c, on page 27
- Open Caveats – Cisco IOS XE Fuji 16.8.1b, on page 28
- Resolved Caveats – Cisco IOS XE Fuji 16.8.1b, on page 30

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

Open Caveats – Cisco IOS XE Fuji 16.8.1c

Caveat ID Number	Description
CSCvg00947	Serial IM LEDs shows inconsistent behavior while performing SSO
CSCvg75263	RSP3 SYSTEM PCS - Abnormal logging messages seen in RSP3 devices
CSCvg84653	PCIE_INTERRUPT_PIN set to 0 in RSP3

Caveat ID Number	Description
CSCvi15065	RSP2: IOSXE-1-PLATFORM: R1/0: kernel: related logs post reload and SSO on RSP2 node
CSCvi56083	Last reload reason shown as poweron after kernel crash in active and standby RSP2
CSCvi58231	OC3 IOMD Crashes Many Times on ISSU from V167 To V168_1 build
CSCvi72321	THS : Ping for 1G on 10G fails on device with 1G on 10G mode
CSCvi81829	The rs232 raw-socket, serial IM: CPU-HOG Traceback seen while performing ISSU and SSO
CSCvi88157	Traceback pointing to "celebrn_geim_set_port_enable" seen after port sh/no shut
CSCvj28545	The rs422 service is not working on ports 0 to 3
CSCvj30845	In rs422 only 8 databits works, for other values traffic is broken

Open Caveats – Cisco IOS XE Fuji 16.8.1b

Caveat ID Number	Description
CSCvb99102	MH BFD session flaps on shutting interface of no relevance to BFD session.
CSCvi48029	IOT: Device crashes after upgrade to 16.8.1
CSCvd50734	RSP3-200:Router Crash while trying to delete label uea_oce_base_delete uea_mpls_label_delete_async
CSCvd58258	IOS-XE display issue show hw-module subslot X/X transceiver X idprom detail
CSCvf79613	silent crash seen due to machine check exception on IM OIR/RELOAD intermittently
CSCvf96598	RSP2 : ~15sec loss traffic for /HSPW service on ISSU/sso
CSCvg06222	RSP3: ~30sec traffic loss for EOMPLS services during ReOpt after TE Node Protection trigger
CSCvg10313	Cu clock source still squelched on interface bring up after two SSOs
CSCvg23724	QOS fails to secure teleprotection traffic on MLPPP interface
CSCvg84664	ASR903 Port does not come up with hard loopback inserted
CSCvg98953	1691: UEA_MGR Crash@uea_asic_mpls_lentry_modify seen during stressed soak run
CSCvh05198	Class-map association to policy-map dynamically throws debug errors on logging
CSCvh07238	Unable to copy image from TFTP to RSP3C bootflash with higher block size

Caveat ID Number	Description
CSCvh15762	RSP3: IOSd Crash in FastPath Thread during Punt Packet Buffer Dequeue on ARP Flaps Soak
CSCvh24638	BDIs static MAC removed after BD shut/no shut while MAC limit is exceeded
CSCvh52483	RSP2: Switchover Reason in "show redundancy switch history" is incorrect on the latest polaris image
CSCvh52708	RSP3: LAG LB is not working based on VC label
CSCvh55399	T1 Service Latency is Asymmetric in a Simple Linear Topology
CSCvh59859	RSP2: TCAM threshold feature config fails to sync to standby with reload
CSCvh67272	Delay in handing over the packets to UDP in ASR920 back-to-back setup with IPSLA config/packets.
CSCvh67863	Standby IOMD crash is bringing the active IOMD down with PCIE error.
CSCvh77376	Chassis Fails to drop to rommon after a crash
CSCvh79267	RSP3: Hundredgig interface goes down with reload with SR10 H/W settings
CSCvh88811	RSP2 GRE:PIM neighbor ship fails to come up on VRF instance when outgoing interface is BDI
CSCvh90836	Striker - Kernel - "Unknown" OBFL crash due to "swapper" task process
CSCvh94635	[RSP3-QOS]:broadcast packets not being honored by cfg'ed policer
CSCvi04483	EOMPLS traffic drop - Imposition FID and Disposition label is set to "NULL"
CSCvi06300	RSP3: Pending issues seen when converting from Access EFP's to Trunk EFP's
CSCvi06358	Label & outgoing interface programmed wrongly for prefix in RSP3
CSCvi10095	UDLD Err Disable (Admin down) observed on performing reload operations
CSCvi11914	BGP PIC/Max-paths:150K scale device stuck with pending issues for huge time with network changes
CSCvi18644	ASR903 - BFD flaps during SSO
CSCvi25777	VID-84-Several Parameter Counters in "sh interfaces gigabitEthernet x/x/x" do not function in 4202
CSCvi34203	RSP2: 10G Controller mode change WAN --> LAN triggers LF on Peer resulting port in down state.
CSCvi85648	CPAK 100G LR4 optics are not coming up with latest Dev image

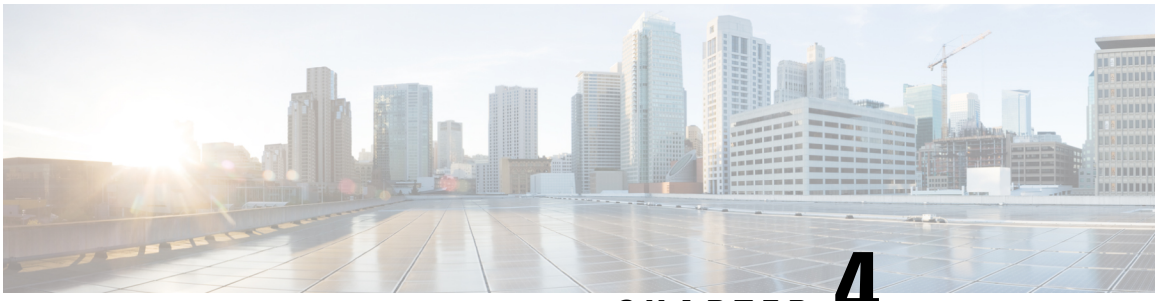
Resolved Caveats – Cisco IOS XE Fuji 16.8.1b

Caveat ID Number	Description
CSCvc27630	Tx Packets or Tx Bytes generated is always lesser than configured rate-steps
CSCvd13823	Storm control - L3 Mcast Traffic :: Not all packets are dropped
CSCvd38391	Standby Router: uea_mgr crashed @ ml2vpn_provision_pw_and_ac
CSCvd75495	Wrong marking for locally generated packet of BFD,LDP, and BGP
CSCvd87285	Display issue - Egress i/f and L2 stats shows "unknown" and no packet drops
CSCvd89421	RMEP failure due to CFM HW table corruption
CSCve05859	Exxx EIN: G.8275.1 testing: Clock loop forming between synce and ptp
CSCve10095	Traffic is getting dropped in both direction due to hw programming went for toss
CSCve52155	RSP3: BFD Session Between 2 RSP3s Down on Reloading 1 RSP3
CSCve75491	TE auto-bw: Incorrect bandwidth requested on soaking with traffic
CSCvf03157	RSP3:PC stays in suspended state on IM OIR
CSCvf03246	RSP3-CFM : CFM design change to overcome issues with increased MAC add per slot for Celeborn
CSCvf10783	Arbitrary File Overwrite Vulnerability
CSCvf16468	RSP3-QIP: CFM H/w offloaded sessions over xconnect affecting S/w sessions configured over BD
CSCvf21368	RSP3: UEA_Mgr Crash on Checking IPv6 Multicast Flow in the Platform while Flows are Flapping
CSCvf34496	RSP3-QIP:Error objects on Stby cfm_mp_ifh 16794673 sid 3001 download to CPP failed seen upon IM-OIR
CSCvf49124	Mgmt default gateway not reachable with 16.6.1 image
CSCvf55327	CLNS interop with ONS not working
CSCvf60263	APS-ACR Scale Issue:For 8K Scale Config, PW-GROUP not bound on Arrive CEM FPGA during Copy Config
CSCvf64393	After BD MAC limit is exceeded on Trunk EFP Learning gets enabled after adding/removing an encap
CSCvf66442	MPLS IP support over Routed VPLS.
CSCvf68605	DHCP Snooping Database restore/renew failing on all ASR903 variants

Caveat ID Number	Description
CSCvf69983	Packets not looped back 100% for LLF-external when Responder present in MIP
CSCvf72154	RSP3 - PIM neighborship down on BDI interface due to packets ASIC loop.
CSCvf76449	Observing Object Download Failure on Shut/NO shut with CFM Config
CSCvf77295	MAC limit EXCEED is not received and MAC learning is not disabled after BD shut/no shut
CSCvf79693	RSP3: BGP support over Router PW.
CSCvf80056	MAC-FLAP-Syslog-Not generated for TEFP BDs
CSCvf80724	VPLS A-S PW : Complete traffic drop (imp and disp) over VPLS Act PW
CSCvf82589	MPLSoRPW: Traceroute not working over Routed PW interface
CSCvf82663	ASR903/RSP3C crashed at dl_callback
CSCvf85222	[RSP3] CFM over PC scale to be reduced to free up 1 Port Scheduler from each ARAD
CSCvf85227	After soak triggers with traffic ipv4 bfd packets take base queue instead on control queue
CSCvf91437	Ping to the loopback IP of remote fails with explicit null configuration.
CSCvf99074	Ping Loss on Built-in Te 0/0/10 or 0/0/11 Port and CRC / MAC Errors at Peer End
CSCvg03308	[RSP3-DHCP-Relay]:unicast dhcp relay is getting dropped in transparent case with HSRP/VRRP/GLBP
CSCvg04717	FPGA: DDR Busy and Calibration handling in FPGA software driver
CSCvg06788	RSP3:3-10sec traffic loss for FlexLsp Tunnels (unidirectional) from HE to TE on Active path cutover
CSCvg14825	Require varbind entSensorPrecision,Scale & Type along with trap entSensorThresholdNotification
CSCvg21893	Unexpected traffic was sent out from router access port from REP ring
CSCvg21899	Traffic forwarding not happening for VLANs added via "encap dot1q add" command in TEFP
CSCvg23956	RSP2: VPLS Backup PW: Enable member bdi CLI under l2vpn xconnect context
CSCvg26930	Ten Gig interface going into admin down state after one gig shut down
CSCvg28351	VPLS with Segment Routing not flowing traffic.
CSCvg28721	RSP3:uea-mgr crashed while trying to install a label entry in kbp(update case)
CSCvg31959	MLPQ does not work on dynamic modification of queue-limit in higher priority level class.

Caveat ID Number	Description
CSCvg35782	MPLSoRPW: Console msg "RPW's exceeded supported limit 128"
CSCvg36200	IPv4 deny ACL applied in the BDI is blocking L2 switched traffic under certain conditions
CSCvg36419	LLF internal in RSP2 is not working properly
CSCvg42691	RSP3- P node ECMP loadbalancing failing for ip traffic
CSCvg43975	RSP3: Leak in G8032 IOS TDL Messaging on Flapping the Ring
CSCvg44405	WRT : storm-control unable to fetch correct level in percentage value, hence failing to take action
CSCvg48485	RSP3 - Ingress LDP label incorrectly programmed to FEC 0x0
CSCvg53410	RSP3: IMA1X handle PHY HiBER events
CSCvg53877	Egress QOS Fails when speed is changed at interface via nego auto, speed cli command
CSCvg63915	2 Xconnect TDL Messages Leaked in Cylon_Mgr on "show running-config"
CSCvg70409	IOT: For Serial IM, flowcontrol is not applicable
CSCvg74427	ASR903 fan tray external alarm input should not cause RSP to crash
CSCvg79798	"ZTP reset" as last reload reason in IOS when ZTP button pressed > 8sec
CSCvg83081	Fixed Ports moving to admin down state after IMA8S insertion
CSCvg84699	BFD session not coming up on RSP3 due to wrong platform offload limit
CSCvg85163	ZTP not triggered with Gratuitous ARP
CSCvg88049	Remove IOS syslog message for link status IDLE
CSCvg91082	1681: Crash@uea_brcm_vfi_notify_bdi_state_change seen during stressed soak run
CSCvg93982	IOS XE entSensorThresholdNotification trap is not generated for Card Temperature
CSCvh03346	Fan speed display in IOS not matching the actual written value and read value
CSCvh06736	Device crashes on dynamically attaching a class to a policy.
CSCvh08220	RSP3: Crash in IOSD chasfs task on Defaulting and Removing IMA-1X
CSCvh10730	BFD stuck at init state for Sessin ID 1023 alone on ASR903 RSP3C after link flap
CSCvh20282	Crete: Traffic is not flooding on all the interface for same TEFP BD
CSCvh68935	RSP3/RSP2: BFD Flap on the link between RSP3 (8x10G) and RSP2 (Combo 10G) with switchover

Caveat ID Number	Description
CSCvh83722	All BFD Sessions Down as FPGA Stuck due to invalid Packet Length and Offset Error in DDR3
CSCvi06424	Traffic fails after moving/relearning mac-address from EFP to Xconnect interface
CSCvf45581	QoS: Configuration failed. Can not configure more than one access-group per class



CHAPTER 4

Restrictions and Limitations

- RS422 works only on ports from 0 to 7.
- The **ip cef accounting** command is *not* supported on the router.
- Crash may be observed on the router when:
  - EoMPLS, CEM, ATM and IMA Pseudowire Redundancy (PW-redundancy) configurations exist while switchover and fail-back of the pseudowires are being triggered, and the **show platform hardware pp active pw eompls** command is executed.
- 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 ASR 903 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 of T1, T3, and CT3 circuits to UPSR are not supported.
- ISSU is not supported between a Cisco IOS XE 3S Release and the Cisco IOS XE Fuji 16.8.1.
- This is applicable only to Cisco ASR903 RSP2 module.
  - Traffic is dropped when packets of size 64 to 100 bytes are sent on 1G and 10G ports.
    - For 64-byte packets, traffic drop is seen at 70% and beyond of the line rate.
    - For 90-byte packets, traffic drop is seen at 90% and beyond of the line rate.
    - For 95-byte packets, traffic drop is seen at 95% and beyond of the line rate.

- Traffic is dropped when:
  - Traffic is sent on a VRF interface.
  - Traffic is sent across layer 2 and layer 3.

  However, traffic is not dropped when the packet size is greater than 100 bytes, even if the packets are sent bidirectionally at the line rate.
- Effective with Cisco IOS XE Everest 16.6.1, the Port-channel (PoCH) scale is reduced to 24 from 48 for Cisco ASR 900 RSP3 module.

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