Release Notes for Cisco NCS 4206 and Cisco NCS 4216 Series, Cisco IOS XE Gibraltar 16.12.x

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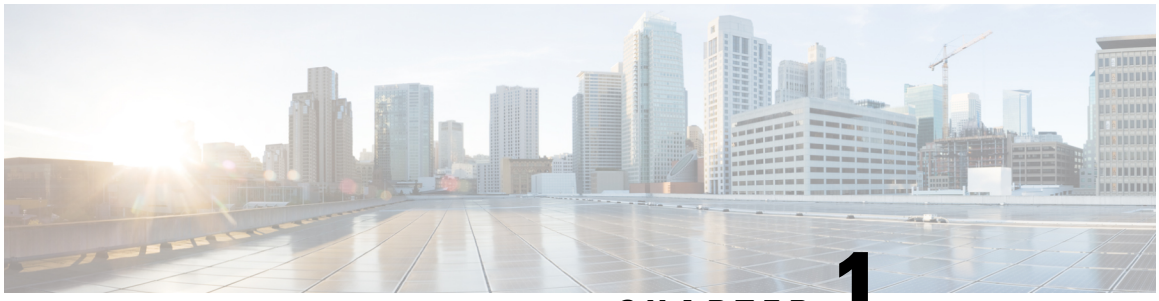

CHAPTER 1

Introduction

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This document provides information about the IOS XE software release for the Cisco NCS 4201 and Cisco NCS 4202 beginning with Cisco IOS XE Release 3.18SP.

Overview of Cisco NCS 4206 and NCS 4216

Cisco NCS 4206

The Cisco NCS 4206 is a fully-featured aggregation platform designed for the cost-effective delivery of converged mobile and business services. With shallow depth, low power consumption, and an extended

temperature range, this compact 3-rack-unit (RU) chassis provides high service scale, full redundancy, and flexible hardware configuration.

The Cisco NCS 4206 expands the Cisco service provider product portfolio by providing a rich and scalable feature set of Layer 2 VPN (L2VPN) and Layer 3 VPN (L3VPN) services in a compact package. It also supports a variety of software features, including Carrier Ethernet features, Timing over Packet, and pseudowire.

For more information on the Cisco NCS 4206 Chassis, see the Cisco NCS 4206 Hardware Installation Guide.

Cisco NCS 4216

The Cisco NCS 4216 is a seven-rack (7RU) unit chassis that belongs to the Cisco NCS 4200 family of chassis. This chassis complements Cisco's offerings for IP RAN solutions for the GSM, UMTS, LTE and CDMA. Given it's form-factor, interface types and Gigabit Ethernet density the Cisco NCS 4216 can also be positioned as a Carrier Ethernet aggregation platform.

The Cisco NCS 4216 is a cost optimized, fully redundant, centralized forwarding, extended temperature, and flexible pre-aggregation chassis.

For more information about the Cisco NCS 4216 Chassis, see the Cisco NCS 4216 Hardware Installation Guide.

Cisco NCS 4216 F2B

The Cisco NCS 4216 F2B is a 14-rack unit router that belongs to the Cisco NCS 4200 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 NCS 4216 F2B can also be positioned as a Carrier Ethernet aggregation platform.

The Cisco NCS 4216 F2B is a cost optimized, fully redundant, centralized forwarding, extended temperature, and flexible pre-aggregation router.

For more information about the Cisco NCS 4216 F2B Chassis, see the Cisco NCS 4216 F2B Hardware Installation Guide.

NCS 4216 14RU

The Cisco NCS 4216 14RU is a 14-rack unit router that belongs to the Cisco NCS 4200 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 NCS 4216 14RU can also be positioned as a Carrier Ethernet aggregation platform.

The Cisco NCS 4216 14RU is a cost optimized, fully redundant, centralized forwarding, extended temperature, and flexible pre-aggregation router.

For more information about the Cisco NCS 4216 14RU chassis, see the Cisco NCS 4216 14RU Hardware Installation Guide.

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 Supported

The following sections list the hardware supported for Cisco NCS 4206 and Cisco NCS 4216 chassis.

Cisco NCS 4206 Supported Interface Modules

Supported Interface Modules

Note If the **license feature service-offload enable** command is configured, then the NCS4200-1T8LR-PS IM is not supported in the router for RSP3.

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

Note FAN OIR is applicable every time the IM based fan speed profile is switched to NCS4200-1H-PK= and NCS4200-2Q-P interface modules. Even though the IMs remain in the Out-of-Service state, they are still considered as present in the chassis.

Table 1: NCS420X-RSP Supported Interface Modules and Part Numbers

RSP Module	Supported Interface Modules	Part Numbers	Slot
NCS420X-RSP	8-port 10 Gigabit Ethernet Interface Module (8X10GE)	NCS4200-8T-PS	All
	1-port 100 Gigabit Ethernet Interface Module (1X100GE)	NCS4200-1H-PK=	4 and 5
	2-port 40 Gigabit Ethernet QSFP Interface Module (2X40GE)	NCS4200-2Q-P	4 and 5
	8/16-port 1 Gigabit Ethernet (SFP/SFP) + 1-port 10 Gigabit Ethernet (SFP+) / 2-port 1 Gigabit Ethernet (CSFP) Interface Module	NCS4200-1T16G-PS	0,3,4, and 5
	1-port OC-192 Interface module or 8-port Low Rate Interface Module	NCS4200-1T8S-10CS	2,3,4, and 5
	NCS 4200 1-Port OC-192 or 8-Port Low Rate CEM 20G Bandwidth Interface Module	NCS4200-1T8S-20CS	2,3,4, and 5[1]
	48-port T1/E1 CEM Interface Module	NCS4200-48T1E1-CE	All
	48-port T3/E3 CEM Interface Module	NCS4200-48T3E3-CE	All
	2-port 100 Gigabit Ethernet (QSFP) Interface Module (2X100GE)[2]	NCS4200-2H-PQ	4,5
	1-port OC48[3]/ STM-16 or 4-port OC-12/OC-3 / STM-1/STM-4 + 12-port T1/E1 + 4-Port T3/E3 CEM Interface Module	NCS4200-3GMS	2,3,4, and 5

[1] These slots are supported on 10G or 20G mode.
[2] IM supports only one port of 100G with RSP3 as QSFP28 on Port 0 in both slots 4 and 5.
[3] If OC48 is enabled, then the remaining 3 ports are disabled.

Table 2: NCS420X-RSP-128 Supported Interface Modules and Part Numbers

RSP Module	Supported Interface Modules	Part Numbers	Slot
NCS420X-RSP	SFP Combo IM—8-port Gigabit Ethernet (8X1GE) + 1-port 10 Gigabit Ethernet Interface Module (1X10GE)	NCS4200-1T8LR-PS	All
	8-port T1/E1 CEM Interface Module	NCS4200-8E1T1-CE	All
	1-port OC48[4]/ STM-16 or 4-port OC-12/OC-3 / STM-1/STM-4 + 12-port T1/E1 + 4-Port T3/E3 CEM Interface Module	NCS4200-3GMS	2,3,4, and 5

[4] If OC48 is enabled, then the remaining 3 ports are disabled.

Cisco NCS 4216 Supported Interface Modules

For information on supported interface modules, see Supported Interface Modules.

Swapping of Interface Modules

The following Ethernet interface modules support swapping on the Cisco NCS4216-RSP 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)
- 8/16-port 1 Gigabit Ethernet (SFP/SFP) + 1-port 10 Gigabit Ethernet (SFP+) / 2-port 1 Gigabit Ethernet (CSFP) Interface Module
- 8-port 10 Gigabit Ethernet Interface Module (8X10GE)
- 1-port 100 Gigabit Ethernet Interface Module (1X100GE)
- 2-port 100 Gigabit Ethernet (QSFP) Interface Module (2X100GE)

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

- 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 1-Port OC-192 or 8-Port Low Rate CEM 20G Bandwidth Interface Module

Note If the **license feature service-offload enable** command is configured, then the NCS4200-1T8LR-PS IM is not supported in the router for RSP3.

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 3: NCS4216-RSP Supported Interface Modules and Part Numbers

RSP Module	Interface Modules	Part Number	Slot
NCS4216-RSP	SFP Combo IM—8-port Gigabit Ethernet (8X1GE) + 1-port 10 Gigabit Ethernet (1X10GE)	NCS4200-1T8LR-PS	2,5,6,9,10,13,14,15
	1-port 100 Gigabit Ethernet Interface Module (1X100GE)	NCS4200-1H-PK	7,8
	2-port 100 Gigabit Ethernet (QSFP) Interface Module (2X100GE)[5]	NCS4200-2H-PQ	7,8
	2-port 40 Gigabit Ethernet QSFP Interface Module (2X40GE)	NCS4200-2Q-P	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	NCS4200-1T16G-PS	All slots
	1-port OC48[6]/ STM-16 or 4-port OC-12/OC-3 / STM-1/STM-4 + 12-port T1/E1 + 4-Port T3/E3 CEM Interface Module	NCS4200-3GMS	All slots
	8-port 10 Gigabit Ethernet Interface Module (8X10GE)	NCS4200-8T-PS	3,4,7,8,11,12

	1-port OC-192 Interface Module with 8-port Low Rate CEM Interface Module (5G/ 10G HO / 10G LO)	NCS4200-1T8S-10CS	3,4,7,8,11,12 (10G mode)
			0,1,2,5,6,9,10,13,14,15 (5G mode)
			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`

	NCS 4200 1-Port OC-192 or 8-Port Low Rate CEM 20G Bandwidth Interface Module	NCS4200-1T8S-20CS	3,4,7,8,11,12 (20G mode)
			0,1,2,5,6,9,10,13,14,15 (10G mode)
			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`

	48-port T1/E1 Interface module	NCS4200-48T1E1-CE	2,3,4,5,6,7,8,9,10,13,14,15
	48-port T3/E3 Interface module	NCS4200-48T3E3-CE	2,3,4,5,6,7,8,9,10,13,14,15

[5] IM supports only one port of 100G with RSP3 as QSFP28 on Port 0 in both slots 7 and 8.
[6] If OC48 is enabled, then the remaining 3 ports are disabled.

Cisco NCS 4216 F2B Supported Interface Modules

For information on supported interface modules, see Supported Interface Modules.

Swapping of Interface Modules

The following interface modules support swapping on the Cisco NCS4216-RSP 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)
- 2-port 100 Gigabit Ethernet Interface Module (2X100GE)
- 8/16-port 1 Gigabit Ethernet (SFP/SFP) + 1-port 10 Gigabit Ethernet (SFP+) / 2-port 1 Gigabit Ethernet (CSFP) Interface Module
- 1-port OC-192 Interface Module with 8-port Low Rate CEM Interface Module (10G HO / 10G LO)
- 48-port T1/E1 TDM Interface Module (48XT1/E1)
- 48-port T3/E3 TDM Interface Module (48XT3/E3)
- 1-port OC 482/ STM-16 or 4-port OC-12/OC-3 / STM-1/STM-4 + 12-port T1/E1 + 4-Port T3/E3 CEM Interface Module (NCS4200-3GMS)
- 1-Port 10 Gigabit MR and 8-Port LR 20 Gigabit CEM and iMSG Interface Module (NCS 4200-1T8S-20CS)

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

See the *Cisco NCS 4216 Router Hardware Installation Guide* for information on Supported Interface Modules on the RSP.

Note If the **license feature service-offload enable** command is configured, then the NCS4200-1T8LR-PS IM is not supported in the router for RSP3.

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 4: Cisco NCS4216-RSP Supported Interface Modules and Part Numbers

RSP Module	Interface Modules	Part Number	Slot
NCS4216-RSP	SFP Combo IM—8-port Gigabit Ethernet (8X1GE) + 1-port 10 Gigabit Ethernet (1X10GE)	NCS4200-1T8LR-PS	2,5,6,9,10,13,14,15
	1-port 100 Gigabit Ethernet Interface Module (1X100GE)	NCS4200-1H-PK	7,8
	2-port 100 Gigabit Ethernet (QSFP) Interface Module (2X100GE)[7]	NCS4200-2H-PQ	7,8
	2-port 40 Gigabit Ethernet QSFP Interface Module (2X40GE)	NCS4200-2Q-P	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	NCS4200-1T16G-PS	All slots
	8-port 10 Gigabit Ethernet Interface Module (8X10GE)	NCS4200-8T-PS	3,4,7,8,11,12
	1-port OC-192 Interface Module with 8-port Low Rate CEM Interface Module (5G/ 10G HO / 10G LO)	NCS4200-1T8S-10CS	3,4,7,8,11,12 (10G mode) 0,1,2,5,6,9,10,13,14,15 (5G mode)
	NCS 4200 1-Port OC-192 or 8-Port Low Rate CEM 20G Bandwidth Interface Module	NCS4200-1T8S-20CS	3,4,7,8,11,12 (20G mode) 0,1,2,5,6,9,10,13,14,15 (10G mode)
	48XT1/E1 Interface module	NCS4200-48T1E1-CE	2,3,4,5,6,7,8,9,10,13,14,15
	48XT3/E3 Interface module	NCS4200-48T3E3-CE	2,3,4,5,6,7,8,9,10,13,14,15
	1-port OC48[8]/ STM-16 or 4-port OC-12/OC-3 / STM-1/STM-4 + 12-port T1/E1 + 4-Port T3/E3 CEM Interface Module	NCS4200-3GMS	All slots

[7] IM supports only one port of 100G with RSP3 as QSFP28 on Port 0 in both slots 7 and 8.
[8] If OC48 is enabled, then the remaining 3 ports are disabled.

Restrictions and Limitations for Cisco NCS 4206 and Cisco NCS 4216

- In the Cisco IOS XE 16.12.1 release, IPSec is not supported on the Cisco RSP3 module.
- Default and untagged encapsulation types are not supported in an Ethernet service instance where a QoS policy is applied. See CSCuu19619 for more information.
- VT PMON is not supported.
- APS is supported across interface modules. But it is not supported on the same interface module.

- VT loopback is not supported if T1 is configured for the VT mode.
- DS1/DS3 SF/SD is not supported.
- Alternate 0's and 1's BERT pattern is not supported for DS1.
- All zeros BERT pattern on system side does not get in sync on DS3.
- DS3/OCx MDL does not interoperate with legacy Q.921 standards.
- APM is not supported with EPAR on CEP.
- FDL is not supported.
- STS24-c is not supported on 1-port OC-192 or 8-port low rate CEM interface module.
- Port restriction on 1-port OC-192 or 8-port low rate CEM interface module. If you have OC-48 configured on a port, you cannot use the neighboring port.
- Bellcore remote loopbacks are not supported for DS1/DS3. Only T1.403 remote loopbacks are supported.
- CEP MIB is not supported.
- HSPW is not supported on DS3/DS1/OCX card.
- The **ip cef accounting** command is not supported on the chassis.
- A system crash may be observed on the chassis 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 chassis. 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 Cisco NCS 4206. A reload of the chassis is required.
- Ingress counters are not incremented for packets as shown in the format below 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.
- DCC is supported only on PPP encapsulation. It is not supported on CLNS encapsulation.
- If oversubscription is enabled on 8-port 10 Gigabit Ethernet interface module, PTP is not supported.
- 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 NCS 4216 routers is 48.

- Remote loopback under STS1E controllers is not supported in Cisco IOS XE Release 16.12.5.

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 3S consolidated packages can be downloaded from Cisco.com; users who want to run the chassis using individual subpackages must first download the image from Cisco.com and extract the individual subpackages from the consolidated package.

ROMMON Version

For software upgrade later than the Cisco IOS XE 16.9.x release, it is mandatory that you upgrade the ROMMON version to 15.6(49r)S.

Supported FPGA Versions for NCS 4206 and NCS 4216

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

Use the **show platform software agent iomd** [*slot/subslot*] **firmware cem-fpga** command to display the CEM FPGA version on the chassis.

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

Note During ISSU, TDM interface modules are reset for FPGA upgrade.

Table 5: Supported FPGA Versions for NCS 4206-RSP3 and NCS 4216

	Cisco IOS XE Release	48 X T1/E1 CEM Interface Module FPGA	48 X T3/E3 CEM Interface Module FPGA	OC-192 Interface Module + 8-port Low Rate Interface Module FPGA	NCS 4200-1T8S-20CS	NCS4200-3GMS	8x10G FPGA	2x40G FPGA	1x100G FPGA
IM FPGA	3.18SP	1.22	1.22	1.12	—	—	0.17 (0x1100 H)	0.22 (0x1600 H)	0.19 (0x1300 H)
CEM FPGA		4.6	4.6	6.6	—	—	—	—	—
IM FPGA	3.18.1SP	1.22	1.22	1.12	—	—	0.17 (0x1100 H)	0.22 (0x1600 H)	0.19 (0x1300 H)
CEM FPGA		4.6	4.6	7.0	—	—	—	—	—
IM FPGA	16.5.1	1.22	1.22	1.15	—	—	0.21 (0x1500 H)	0.22 (0x1600 H)	0.20 (0x1400 H)
CEM FPGA		0x46310046	0x46310046	5G mode: 0x10070059 10G mode: 0x10050073	—	—	—	—	—
IM FPGA	16.6.1	1.22	1.22	1.15	—	—	0.21 (0x1500 H)	0.22 (0x1600 H)	0.20 (0x1400 H)
CEM FPGA		0x46310046	0x46310046	5G mode: 0x10070059 10G mode: 0x10050073	—	—	—	—	—
IM FPGA	16.7.1	1.22	1.22	1.15	—	2.0	0.21 (0x1500 H)	0.22 (0x1600 H)	0.20 (0x1400 H)
CEM FPGA		0x46410046	0x46410046	5G mode: 0x10780059 10G mode: 0x10120076	—	0x10230039	—	—	—

	Cisco IOS XE Release	48 X T1/E1 CEM Interface Module FPGA	48 X T3/E3 CEM Interface Module FPGA	OC-192 Interface Module + 8-port Low Rate Interface Module FPGA	NCS 4200-1T8S-20CS	NCS4200-3GMS	8x10G FPGA	2x40G FPGA	1x100G FPGA
IM FPGA	16.8.1	1.22	1.22	1.15	—	2.0	0.22	0.22	0.20
CEM FPGA		0x46470046	0x46470046	5G mode: 0x10780059 10G mode: 0x10670075	—	0x10380039	—	—	—
IM FPGA	16.9.1	1.22	1.22	1.15	—	2.0	0.22	0.22	0.20
CEM FPGA		0x50090050	0x50060050	5G mode: 0x10070062 10G mode: 0x10480078	—	0x10520063	—	—	—
IM FPGA	16.10.1	1.22	1.22	1.15	—	2.0	0.22	0.22	0.20
CEM FPGA		0x50090050	0x50060050	5G mode: 0x10070062 10G mode: 0x10480078	—	0x10520063	—	—	—
IM FPGA	16.11.1	1.22	1.22	1.15	—	2.0	0.22	0.22	0.20
CEM FPGA		0x00000051	0x00000051	5G mode: 0x10180062 10G mode: 0x10510078	—	0x10820063	—	—	—
IM FPGA	16.12.1	1.22	1.22	1.15	0.80	2.0	0.22	0.22	0.20
CEM FPGA		0x00000051	0x00000051	5G mode: 0x10180062 10G mode: 0x10510078	10G mode: 0x10260046 20G mode: 0x10710047	0x10050071	—	—	—

	Cisco IOS XE Release	48 X T1/E1 CEM Interface Module FPGA	48 X T3/E3 CEM Interface Module FPGA	OC-192 Interface Module + 8-port Low Rate Interface Module FPGA	NCS 4200-1T8S-20CS	NCS4200-3GMS	8x10G FPGA	2x40G FPGA	1x100G FPGA
IM FPGA	16.12.2	1.22	1.22	1.15	0.80	2.0	0.22	0.22	0.20
CEM FPGA		0x00000051	0x00000051	5G mode: 0x10180062 10G mode: 0x10510078	10G mode: 0x10260046 20G mode: 0x10710047	0x10050071	—	—	—
IM FPGA	16.12.3	0x00000051	0x00000051	1.15	0.80	2.0	0.22	0.22	0.20
CEM FPGA		1.22	1.22	5G mode: 0x10180062 10G mode: 0x10510078	10G mode: 0x10260046 20G mode: 0x10710047	0x10050071	—	—	—
IM FPGA	16.12.4	1.22	1.22	1.15	0.86	2.0	—	—	—
CEM FPGA		0x00000051	0x00000051	0x10510078	0x10260046	0x10050071	—	—	—
IM FPGA	16.12.5	1.22	1.22	1.15	0.86	2.0	—	—	—
CEM FPGA		0x00000051	0x00000051	0x10510078	0x10260046	0x10050071	—	—	—
IM FPGA	16.12.6	1.22	1.22	1.15	0.93	2.0	—	—	—
CEM FPGA		0x00000051	0x00000051	0x10510078	0x10260046	0x10050071	—	—	—
IM FPGA	16.12.7	1.22	1.22	1.15	0.93	2.0	—	—	—
CEM FPGA		0x00000051	0x00000051	0x10510078	0x10260046	0x10050071	—	—	—

	Cisco IOS XE Release	48 X T1/E1 CEM Interface Module FPGA	48 X T3/E3 CEM Interface Module FPGA	OC-192 Interface Module + 8-port Low Rate Interface Module FPGA	NCS 4200-1T8S-20CS	NCS4200-3GMS	8x10G FPGA	2x40G FPGA	1x100G FPGA
IM FPGA	16.12.8	1.22	1.22	1.15	0.93	2.0	—	—	—
CEM FPGA		0x00000051	0x00000051	0x10510078	0x10260046	0x10050071	—	—	—

Deferrals

Cisco IOS software images are subject to deferral. We recommend that you view the deferral notices at the following location to determine whether your software release is affected: http://www.cisco.com/en/US/products/products_security_advisories_listing.html.

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.

MIB Support

The below table summarizes the supported MIBs on the Cisco NCS 4206 and Cisco NCS 4216.

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 (draft-ietf-ospf-mib-update-05)	OSPF-TRAP-MIB (RFC 1850)

Supported MIBs		
CISCO-CLASS-BASED-QOS-MIB	CISCO-OSPF-TRAP-MIB (draft-ietf-ospf-mib-update-05)	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-MGR-MIB	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-CONTROL- MIB	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)	

The below table summarizes the unverified and supported MIBs on the Cisco NCS 4206 and Cisco NCS 4216.

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

Unverified MIBs		
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-MIB-EXTN	CISCO-TCP-MIB	VRRP-MIB
CISCO-IETF-BFD-MIB	CISCO-VRF-MIB	
CISCO-IETF-DHCP-SERVER-MIB	ETHER-WIS (RFC 3637)	

MIB Documentation

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

To access Cisco MIB Locator, you must have an account on Cisco.com. If you have forgotten or lost your account information, send a blank e-mail to cco-locksmith@cisco.com. An automatic check will verify that your e-mail address is registered with Cisco.com. If the check is successful, account details with a new random password will be e-mailed to you. Qualified users can establish an account on Cisco.com by following the directions found at the following location:

http://tools.cisco.com/RPF/register/register.do

Open Source License Notices

For a listing of the license notices for open source software used in Cisco IOS XE 3S Releases, see the documents accessible from the License Information page at the following location:

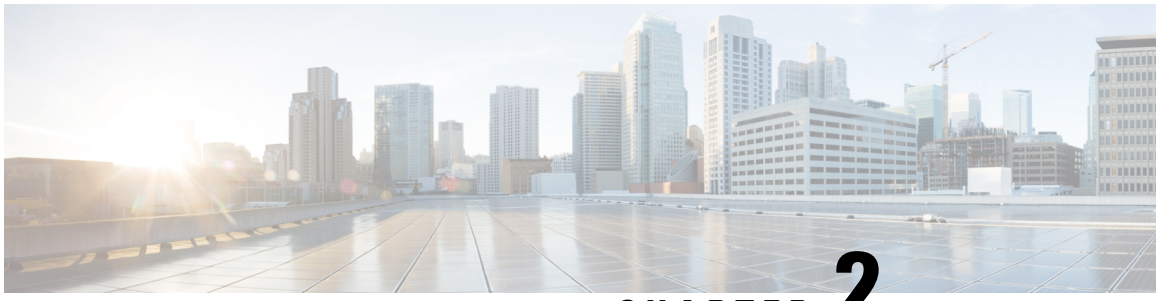
http://www.cisco.com/en/US/products/ps11174/products_licensing_information_listing.html

Communications, Services, and Additional Information

- To receive timely, relevant information from Cisco, sign up at Cisco Profile Manager.
- To get the business impact you're looking for with the technologies that matter, visit Cisco Services.
- To submit a service request, visit Cisco Support.
- To discover and browse secure, validated enterprise-class apps, products, solutions and services, visit Cisco Marketplace.
- To obtain general networking, training, and certification titles, visit Cisco Press.
- To find warranty information for a specific product or product family, access Cisco Warranty Finder.

Cisco Bug Search Tool

Cisco Bug Search Tool (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.



CHAPTER 2

New Features

This chapter describes the new hardware and software features supported on the Cisco NCS 4200 Series in this release.

New Software Features in Cisco IOS XE Gibraltar 16.12.8

There are no new software features introduced for Cisco IOS XE Release 16.12.8.

New Hardware Features in Cisco IOS XE Gibraltar 16.12.8

There are no new hardware features introduced for Cisco IOS XE Release 16.12.8.

New Software Features in Cisco IOS XE Gibraltar 16.12.7

There are no new software features introduced for Cisco IOS XE Release 16.12.7.

New Hardware Features in Cisco IOS XE Gibraltar 16.12.7

There are no new hardware features introduced for Cisco IOS XE Release 16.12.7.

New Software Features in Cisco IOS XE Gibraltar 16.12.6

There are no new software features introduced for Cisco IOS XE Release 16.12.6.

New Hardware Features in Cisco IOS XE Gibraltar 16.12.6

There are no new hardware features introduced for Cisco IOS XE Release 16.12.6.

New Software Features in Cisco IOS XE Gibraltar 16.12.5

There are no new software features introduced for Cisco IOS XE Release 16.12.5.

New Hardware Features in Cisco IOS XE Gibraltar 16.12.5

There are no new hardware features introduced for Cisco IOS XE Release 16.12.5.

New Hardware Features for NCS 4206 and NCS 4216 in Cisco IOS XE Gibraltar 16.12.4

There are no new features introduced for this release.

New Software Features for NCS 4206 and NCS 4216 in Cisco IOS XE Gibraltar 16.12.4

- **Configurable Y.1564 Service Activation Frame Sizes and EMIX Support**

  Enterprise traffic (EMIX) packet size (default abceg pattern) is supported. For EMIX traffic, ITU-T Rec. Y.1564 packet sizes of 64, 128, 256, 1024, and 1518 bytes are supported.

  For more information, see the IP SLAs Configuration Guide, Cisco IOS XE 17 (Cisco ASR 4200 Series).

- **OPTICS: ONS-SI-GE-EX and ONS-SI-GE-LX Support**

  The optics, ONS-SI-GE-EX and ONS-SI-GE-LX are supported on the Cisco NCS4200-1T16G-PS interface module.

  For more information, see the Optics Matrix for ASR 900.

New Hardware Features for NCS 4206 and NCS 4216 in Cisco IOS XE Gibraltar 16.12.3

There are no new features introduced for this release.

New Software Features for NCS 4206 and NCS 4216 in Cisco IOS XE Gibraltar 16.12.3

There are no new features introduced for this release.

New Hardware Features for NCS 4206 and NCS 4216 in Cisco IOS XE Gibraltar 16.12.2

There are no new features introduced for this release.

New Software Features for NCS 4206 and NCS 4216 in Cisco IOS XE Gibraltar 16.12.2

There are no new features introduced for this release.

New Hardware Features for NCS 4206 and NCS 4216 in Cisco IOS XE Gibraltar 16.12.1

- **NCS 4200 1x10 Gigabit MR + 8-Port Low Rate 20 Gigabit CEM, iMSG Interface Module (NCS4200-1T8S-20CS)**

  The 1-Port 10 Gigabit MR and 8-Port LR 20 Gigabit CEM and iMSG Interface Module is a cost-effective interface module (IM) that supports CEM features on the OCn interfaces. This interface module is supported on the Cisco NCS 4206 Router, Cisco NCS 4216 Router, and Cisco NCS 4216 F2B Router.

  For more information about this IM for any of the supported routers, see the NCS 4200 Series Aggregation Services Routers Hardware Installation Guides.

  For more information on Feature Optics Matrix, see the Cisco NCS 4206-16 Series Aggregation Services Routers Feature Optics Matrix.

New Software Features for NCS 4206 and NCS 4216 in Cisco IOS XE Gibraltar 16.12.1

- **1-Port 10 Gigabit MR and 8-Port LR 20 Gigabit CEM and iMSG Interface Module Support**

  The 1-Port 10 Gigabit MR and 8-Port LR 20 Gigabit CEM and iMSG interface module (NCS4200-1T8S-20CS) is supported on the Cisco RSP3 module and has the capability for SONET or SDH termination, SAToP, CESoP, and CEP.

  For more information on configuring theNCS4200-1T8S-20CS interface module, see the 1-Port OC-192 or 8-Port Low Rate CEM Interface Module Configuration Guide, Cisco IOS XE Gibraltar 16.12.x (Cisco NCS 4200 Series).

Note The Multiservice Gateway features are not supported on this IM for Cisco IOS XE Release 16.12.1.

- **Five-Tupple Hash Load Balancing Support**

  The router supports different load balancing hash algorithms with combinations of MAC (Layer 2) or IP (Layer 3) headers on the RSP3 platform to find the hash key. The five-Tupple hash algorithm on RSP3 includes protocol field and Layer 4 port numbers while calculating the hash key.

  For more information, see the Ethernet Channel Configuration Guide Cisco IOS XE Gibraltar 16.12.x (Cisco NCS 4200 Series).

- **Generic Routing Encapsulation (GRE) Feature Updates**

  Generic Routing Encapsulation (GRE) tunneling protocol provides a simple generic approach to transport packets of one protocol over another protocol by means of encapsulation.

  GRE supports the following features:

  - IPv4 or IPv6 Global over GRE (IPv4 Core)
  - VRF Lite over GRE

  For more information on GRE, see the MPLS: Layer 3 VPNs Configuration Guide, Cisco IOS XE Gibraltar 16.12.x (Cisco NCS 4200 Series)

- **Maximum Transmission Unit Support on Bridge Domain Interface**

  On the Cisco RSP3 module, filtering of IP packets and MPLS-IP packets that egress out Bridge Domain Interface (BDI) is performed based on the Maximum Transmission Unit (MTU) value of the physical interface. The constraint where the BDI inherits the physical interface's MTU causes a limitation, for example, fragmentation or dropping of packets, during network deployments. To avoid such limitation, ensure that you configure BDI MTU.

  For more information on BDI MTU support, see the Carrier Ethernet Configuration Guide, Cisco IOS XE Gibraltar 16.12.x (Cisco NCS 4200 Series).

- **MPLS Layer 3 VPN Conditional Marking**

The MPLS Layer 3 conditional marking feature marks the traffic with appropriate QoS group and sets policer to mark the color (discard class) based on Committed Information Rate (CIR) and Peak Information Rate (PIR) values. You can use the QoS group to create ingress policy map.

For more information to configure MPLS Layer 3 VPN conditional marking, see the Quality of Service Configuration Guidelines, Cisco IOS XE Gibraltar 16.12.x (Cisco NCS4200 Series).

- **Psuedowire Scale Support**

  Effective from the Cisco IOS XE 16.12.x release, CEM scale of 21504 psuedowires is supported on the Cisco routers.

  For more information on the pseudowire scale support, see the 1-Port OC-192 or 8-Port Low Rate CEM Interface Module Configuration Guide, Cisco IOS XE Gibraltar 16.12.x (Cisco NCS 4200 Series).

- **QoS Short-pipe Mode**

  QoS short-pipe mode is supported on the RSP3 module. You can enable this feature using the SDM template.

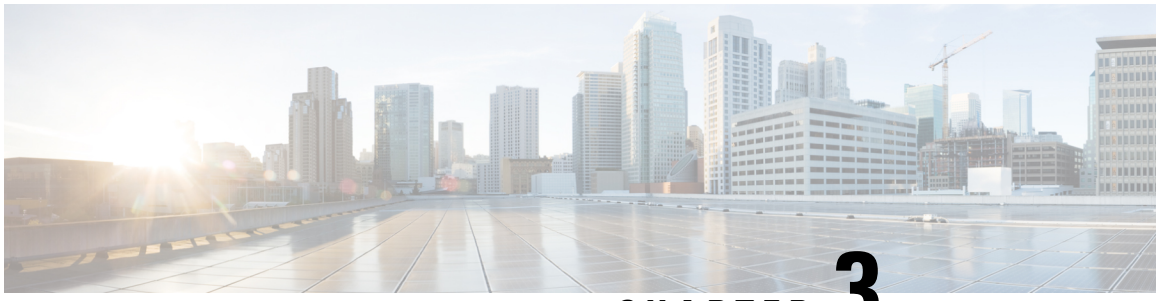
  You can identify the egress traffic on an interface or on EVC and classify based on DSCP, mark qos-group, and color using the **platform table-map** command.

  For more information on how to enable short-pipe mode, see the Quality of Service Configuration Guidelines, Cisco IOS XE Gibraltar 16.12.x (Cisco NCS 4200 Series).

- **Segment Routing uLoop Avoidance**

  The Segment Routing uLoop Avoidance feature prevents the occurrences of microloops during network convergence after a link-down event or link-up event.

  For more information, see the Segment Routing Configuration Guide, Cisco IOS XE Gibraltar 16.12.x (Cisco NCS 4200 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.

• Open Caveats – Cisco IOS XE Gibraltar 16.12.1, on page 39
• Resolved Caveats – Cisco IOS XE Gibraltar 16.12.1a, on page 40

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 Gibraltar 16.12.8

There are no open caveats for this release.

Resolved Caveats - Cisco IOS XE Gibraltar 16.12.8

Identifier	Headline
CSCwb26335	RSP3:Error reading data from the table dmi-general: Could not get boolean value for feature.side_effect_sync.
CSCwa79398	rs232 service on port-8 gives SLIP errors when databits is set on other ports.

Open Caveats – Cisco IOS XE Gibraltar 16.12.7

Identifier	Headline
CSCvx34215	APS 1+1 Uni - Traffic hit due to sonet controllers down after inactive IMOIR then SSO.

Resolved Caveats – Cisco IOS XE Gibraltar 16.12.7

Caveat ID Number	Description
CSCwa35351	Memory leak observed in tcp raw-socket when L1 is down

Open Caveats – Cisco IOS XE Gibraltar 16.12.6

Caveat ID Number	Description
CSCvo36974	Traffic drop is observed over IPSEC with dynamic modication in IPSEC tunnel and route
CSCvq68615	SRTE: Complete traffic drops for prefixes with 2 Transport + 2 service Labels.
CSCvq93254	After ipv6 nd cache expired, transit traffic fails when ECMP enabled
CSCvr25131	VZ-WRT -V171-dcc1 -After reload the SDC interface is down
CSCvs04458	RS485 - Show running-config output does not display the duplex mode config details
CSCvs21550	The **snmpwalk** command is not retrieving vt description in mode vt-15.
CSCvs35755	CEM ACR: shut/no shut on physical sonet controller is causing path to go down
CSCvs82744	Shutting one BDI is affecting traffic on other tunnels
CSCvu31005	Enable L-bit propogation in framed SATOP for LOF alarm
CSCvu38228	High convergence time seen over port-channel switchover for CEM-TDM traffic
CSCvv58669	ROMMON region 0 and 1 verification CLI
CSCvv92835	APS full scale OC192 - Traffic outage after IMOIR as IM goes to out of service and CPUHOG
CSCvw85788	BFD flaps due to ARP packet loss when other non priority classes congested
CSCvx32380	RSP3: SFP GLC-FE-100LX-RGD show incorrect description
CSCvx84476	RSP3: FATAL crash happening with Mcast MVPN profile 0 scenario when hardware resources exhausted.
CSCvy75452	SYNCLOSS on client port of 100G-CK-C after interface flap
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
CSCvz02262	TCAM corruption happening at bank boundary when one of the bank is full.
CSCvz07477	DWDM SFPs threshold Value set to 0.0 dbm for RX/TX and -0.0 C for temperature. Version 16.12.4
CSCvz18784	Ingress QoS policer not freed upon interface going down causing POLICERD leak
CSCvz19022	RSP3C 16.9.3 and 16.12.3 ping issue with MTU greater than 1508
CSCvy34396	MAC table inconsistency due to parity error

Open Caveats – Cisco IOS XE Gibraltar 16.12.6 - Platform Independent

Caveat ID Number	Description
CSCvy78284	The router crashes when zeroised RSA key is regenerated

Resolved Caveats – Cisco IOS XE Gibraltar 16.12.6

Caveat ID Number	Description
CSCvv72192	IMA2Z IM, xfp and sfp+ are present then XFP is removed LED still shows as green
CSCvv99456	ACL entries with FRAGMENT keywords are not working on the ASR920 platform
CSCvw46012	Traffic not passing via BDI after physical interface flaps
CSCvx07262	[RSP3-DHCP-Relay]: dhcp relay unicast is dropped in transparent case with HSRP/VRRP/GLBP on EVC-BD
CSCvx08446	show recovered-clock output shows Type as T1/E1 in RSP2
CSCvx55831	Ingress Policy with set qos-group action is creating extra TCAM entry with match on Egress Policy
CSCvx63370	With channelized T3 mode after IM OIR alarm clear/assert not happening for first T1.
CSCvx69665	ASR903-RSP3: Continuous Ipv6 Neighbor addition retries exhausting the platform resources.
CSCvy23345	ASR90X-RSP3: MAC address is getting learned for L2CP control frames over the G.8032 Blocked port
CSCvy25392	Cannot delete recovered clock configuration from STS-3c
CSCvy26121	Object down failures observed on ASR903 devices post upgrade to 16.12.3
CSCvy29290	ASR90x-RSP3 : Pending objects for BDI Tx Channel on creation of Port channel with member link
CSCvy51848	Active RP HW gone bad during an IO FPGA Upgrade and Standby started booting in Loop
CSCvy50955	CEM traffic not resuming after IM shut/unshut with service inst on Gig created when TDM IM is shut
CSCvv40968	The cman_fp process crashed while booting up
CSCvx92879	IMA8T1Z is going for continuous reload with IM authentication error message

Caveat ID Number	Description
CSCvv73547	Router crashed fib_loadinfo_max_oce_idx
CSCvx64624	Default buffer length needs to be adjusted in latest releases

Resolved Caveats – Cisco IOS XE Gibraltar 16.12.6 – Platform Independent

Caveat ID Number	Description
CSCvx19209	ISIS crash in isis_sr_tilfa_compute_protection
CSCvx37945	Crash happened when uea_mgr was trying to write an error log
CSCvy20783	The **show run all** command does not list default value for debugging

Open Caveats – Cisco IOS XE Gibraltar 16.12.5

Caveat ID Number	Description
CSCvm84355	LinkDown trap should not be sent when the port is in AINS mode
CSCvp12250	caam_jr and asfctrl error logs are observed with IPsec configuration on certain conditions
CSCvs21550	**snmpwalk** command does not retrieve VT description in mode vt-15
CSCvs44915	PATH TRACE BUFFER : UNSTABLE attriibute is shown under show controller
CSCvs47204	IPSEC - Kernel crash is observed on reload with traffic
CSCvs52712	REDUNDANCY-3-STANDBY_LOST: Standby processor fault (KEEPALIVE_FAILURE)
CSCvs74016	Kernel Crash XFRM State lookup
CSCvs74471	Crypto Session is down post SSO event
CSCvs82744	Shutting 1 BDI affects traffic on other tunnels
CSCvw86859	Router may not load-balance traffic on MPLS links even having ECMP in RIB/CEF
CSCvt42842	Flood of SKB is received from Kernel and cannot find SA kernel logs
CSCvu51238	Kernel log messages are seen on the console while doing config replace & interface flap

Caveat ID Number	Description
CSCvv72192	When IMA2Z IM, XFP and SFP+ are present and then XFP is removed, LED still shows as green

Open Caveats – Cisco IOS XE Gibraltar 16.12.5 - Platform Independent

Caveat ID Number	Description
CSCvp98693	MLPPP IPV4 IW: Range for the MLPPP group numbers does not match in the configuring CLIs
CSCvr39157	Cisco RSP3 Module: Y1731 1DM receive is inactive after delete or add of SLA configuration
CSCvu77385	Full throughput is not working priority shaper percent is > ~40" 4206/4216 over 100g NNI
CSCvv74332	VPLSo BKPW: MAC not is flushed or withdrawn in remote peer on VC swichover from active to standby
CSCvw06702	IP SLA Egress classification is not working

Resolved Caveats – Cisco IOS XE Gibraltar 16.12.5

Caveat ID Number	Description
CSCvn47496	RSP3C Request for overriding restriction: 'MVPN-GRE VRF-SM: RP must be at Encap PE'
CSCvp16947	Router shows CRITICAL alarm when one of the power supplies is missing
CSCvs86113	MAC learning issue results in P2P ping fail or protocols are down
CSCvt35963	Uea_mgr and keepalive crashes are observed in a sequence after attempting to enable service-offload
CSCvt42183	Traffic outage is observed due to l2-flood-list failure over multi-active PC QoS
CSCvt58155	Kernel crash is observed bcmINTR rcu_check_callback
CSCvt82525	Router crashes while IPV6 updates prefixes
CSCvt98075	Memory leak is seen on SNMP DG when IGP flaps
CSCvu18276	Standby Cisco RSP3 module crashes during IOS upgrade
CSCvu30972	All readings for Power supply unit reflect as zero though the unit is functional

Caveat ID Number	Description
CSCvu36636	ROMMON region 0 and 1 verification CLI
CSCvu57879	OIR of 48-port T3/E3 CEM Interface Module in bay 12 affects RX traffic of 1-port OC-192 Interface module or 8-port Low Rate Interface Module (ASR 900 Combo 8 port SFP GE and 1 port 10GE IM with CEM, 10G) in bay 0
CSCvu73172	Suppress alarm if one of the power feeds to 900W dual feed PSU is missing
CSCvu95940	Egress QoS policy config missing on PoCh member link flap
CSCvu97978	Cisco RSP2 node crashed with core generation in 16.12 throttle
CSCvv13495	Loopback local is not working on T3 card protection physically connected ports
CSCvv16454	Traffic failure is observed due to MPLS ECMP load-balancing in one of the labelled paths
CSCvv24059	Cylon mgr crash is noticed on RSP when EMPLSINTD is exhausted.
CSCvv51145	Crash is seen on **show plat hard pp active feature multicast database ipv4 table label <>eos <>**
CSCvv59312	OC-48 SONET controller status shows UP without receiving signal
CSCvv74342	MAC is not flushed or withdrawn in remote peer on VC swichover from active to standby
CSCvv76949	Op state and Ad state show NA for all slot with Bandwidth command
CSCvv83093	OBFL updation with valid time after NTP Sync in RTC failure case
CSCvv91704	Mac flap is observed when shut or no-shut is executed over ME3400
CSCvv95745	Crash of standby supervisor is observed because of QoS Overhead Accounting
CSCvw04366	Display GNSS Chassis SN instead of PCB SN in show CLIs
CSCvw34109	PTP failure due to LSMPI buffer exhaustion
CSCvw56612	**show lic** CLI does not show port details
CSCvw57114	IGMP queries are dropped entering a Poch
CSCvw64784	Not able to reuse same clock ID on another controller after deleted clock ID
CSCvw71735	Async Line raw-socket packet-length Configure to 0 on Switchover
CSCvw72143	CPUHOG and Dying GASP related traceback seen on router reload
CSCvw81102	Copy recent standby logs and corefiles to Active

Resolved Caveats – Cisco IOS XE Gibraltar 16.12.5 - Platform Independent

Caveat ID Number	Description
CSCvu23567	RSP3: BGP crash seen on Stand by router when 100 BGP sessions are established.
CSCvu44467	VRRP packets are generated with CS0 marking instead of CS6
CSCvu06475	Segment routing CLI cleanup under OSPF not happening after deleting segment routing from Global
CSCvv07825	SR uloop should only be calculated for best path
CSCvv42663	**no snmp trap link-status** under serial interface disappear after router reload
CSCvv79677	ASR902-RSP2 crashes after BGP flaps

Open Caveats – Cisco IOS XE Gibraltar 16.12.4

Caveat ID Number	Description
CSCvn47496	RSP3C Request for overriding restriction "MVPN-GRE VRF-SM: RP must be at Encapsulation PE"
CSCvs08297	Hidden CLI service **enable-optics-threshold-clear-notification** should be made as normal CLI
CSCvs86109	AG1 - BFD is down over single BDI
CSCvt01049	Description cannot add on ACR STS1/AU4 entities in the SONET/SDH-ACR
CSCvt82525	Router crashes while IPV6 updating prefixes
CSCvu30972	All readings for Power supply unit reflect as zero though the unit is functional
CSCvu36636	ASR900 ROMMON region 0 and 1 verification CLI
CSCvu66126	OC192 APS Group is stuck with Signal Fail condition
CSCvw34109	PTP failure due to LSMPI buffer exhaustion

Open Caveats – Cisco IOS XE Gibraltar 16.12.4 - Platform Independent

Caveat ID Number	Description
CSCvu37848	Traceback: Processes show 0% usage in show processes CPU platform sorted location

Resolved Caveats – Cisco IOS XE Gibraltar 16.12.4

Caveat ID Number	Description
CSCvs34482	ISSU is not working on Cisco RSP2 nodes
CSCvs71834	Router stops forwarding over VC after dot1.q tag is removed and is added back to service instance
CSCvt61512	DS3 Admin Down Alarm persists in card protected setup
CSCvt64706	CPU HOG occurs due to constant soft-parity errors
CSCvu38550	For VCOP configured with type DS3, Applique type should be Subrate T3 instead of Channelized T3/T1

Resolved Caveats – Cisco IOS XE Gibraltar 16.12.4 - Platform Independent

Caveat ID Number	Description
CSCvs30865	rLFA for LDP causes loss of MPLS traffic after RSP switchover
CSCvt14323	IGMP reports received on mLACP Port-Channel drop incorrectly
CSCvt25458	MPLS TE does not come up when bandwidth is configured on Juniper head end
CSCvs95815	C1111 telnet refused for link-local addresses when using ipv6 access class

Open Caveats – Cisco IOS XE Gibraltar 16.12.3

Caveat ID Number	Description
CSCvm84355	[SVSP-299]-linkDown trap should not be sent when the port is in AINS mode-[SVSPE-570]

Caveat ID Number	Description
CSCvs54101	OC192 APS: OCx T1 scale setup : alarm gets cleared after SSO
CSCvs71834	Stops forwarding over VC after dot1.q tag is removed and added back to service instance
CSCvs63874	Reworked: Invalid ifindex during notification causing lldp localport table mib walk failure
CSCvs21550	snmpwalk command is not retrieving vt description in mode vt-15
CSCvs43077	R0/0: kernel: pci 0001:0e:00.0: BAR 0: error updating (high 0x00000f != 0x000000)
CSCvw34109	PTP failure due to LSMPI buffer exhaustion

Open Caveats – Platform Independent

Caveat ID Number	Description
CSCvq76305	AutoRP listener functionality issue
CSCvs30865	rLFA for LDP causes loss of MPLS traffic after RSP switchover
CSCvs58498	High CPU on SNMP engine due to CISCO-CEF-MIB

Resolved Caveats – Cisco IOS XE Gibraltar 16.12.3

Caveat ID Number	Description
CSCvm31596	ASR903 RSP3C-400-S going in hang state
CSCvm38889	New fan tray speed algorithm based upon type of IMs present in the chassis
CSCvq61092	IM keeps reloading or router reloads once silently, beyond 400 CEM circuits on Port 8-OC192
CSCvq64605	RLFA resource leak on FRR create/delete with link flaps
CSCvr28956	Show debug memory leak should not be the part of "show tech" as this is intriusive command
CSCvr50508	Router_RP_0_fman_rp crash on applying conditional crypto debug
CSCvs52494	CRASH: Equipment reboot after "No shut" command is applied on T3 interface having VCOP (smart SFP).
CSCvs74558	IPV6 Traffic causing Broadcast Storm on port with hwidx 3
CSCvs39740	User defined dummy pattern implementation and handle AIS alarm during xconnect down.

Caveat ID Number	Description
CSCvr40788	BERT is allowed to run without timeslot option in CESOP mode
CSCvs03541	With framed satop configured, T1 goes into loop on receiving inband loopcode
CSCvs58434	DS1 card prot : Change the fix of CSCvq85371 from AIS to LOS

Resolved Caveats – Platform Independent

Caveat ID Number	Description
CSCvm79556	MSPW VC down after Switchover (Error Local access circuit is not ready for label advertise)

Open Caveats – Cisco IOS XE Gibraltar 16.12.2a

Caveat ID Number	Description
CSCvm31596	The router is not responding.
CSCvq08730	With license service offload enable rsp3-200 fails to boot with Crash in PE image
CSCvq11964	SDH : Change mode from TUG-3 to VC4 causes PW provisioning failure
CSCvq64605	RLFA resource leak on FRR create/delete with link flaps
CSCvr61371	BFD remains down when using PBR on BDI/interface
CSCvw34109	PTP failure due to LSMPI buffer exhaustion

Open Caveats – Platform Independent

Caveat ID Number	Description
CSCux43298	The show interface pseudowire displays invalid peer info
CSCvm79556	RSP3: MSPW VC down after Switchover (Error Local access circuit is not ready for label advertise)
CSCvn86673	Dialer watch not disconnecting the backup link even after the watched route exists in routing table.
CSCvp60827	Delay of 30 sec while creating a new config file for phone using tftp.
CSCvq50202	Class-attributes duplicated after EAP reauthen. in ISG radius proxy scenario
CSCvq65438	Copying config file containing SmartPort macros to run fails

Caveat ID Number	Description
CSCvq69866	HSRPv2 crash whilst retrieving group from received packet
CSCvq76305	ASR900 autoRP listener functionality issue
CSCvq78692	mGRE L3VPN broken after reload
CSCvq93089	Active switch crashed after standby reloaded
CSCvq95479	Parser returning invalid PRC to certain commands
CSCvq96794	VPLS label misprogramming after RSP switchover
CSCvr05504	Dialer interface counter does not correlate to the counter of interfaces bounded to
CSCvr08740	Router crash after receiving EVPN route-type 2 without any ext-community
CSCvr08961	Switch stop responding to CoA
CSCvr18919	9400 SVL - Upon redundancy failover, route being purged on downstream device
CSCvr21440	3850 loops get-response value of object cafSessionClientMacAddress
CSCvr23104	BGP looped update among 3 peers
CSCvr27393	Crash on "BGP Router" process
CSCvr34118	remove login and fix broken command
CSCvr34677	DHCP packets are not encrypted in redundant ip helper setup
CSCvr39868	Unexpected reload when issueing show ip mroute vrf <vrf> verbose
CSCvr40112	Removing pseudowire-class for 1 peer makes all the peers fail.
CSCvr45669	cEdge - Template is not push because of bad-command "no ip domain-name"
CSCvr49439	Multiple encapsulations of packet with L2TP headers crash ASR1K
CSCvr51079	PPPoE session stuck in LCP state due to the wrong invoke of AAA method list.
CSCvr54031	TBs seen with scaled IP SLA configs with "ip sla reset"
CSCvr57022	Routes not removed from routing table when Dialer interface is shut
CSCvr57138	Wrong pointer to next buffer - Catalyst 9300
CSCvr57340	MAB is getting removed from template and causing Authorization failure.
CSCvr61879	static ip addresses not configured for the list message
CSCvr70470	sessmgrd crash with "clear dot1x mac" command
CSCvr73095	After aes encryption is enabled, entering plain aaa dynamic-author keys corrups key
CSCvr74333	smd memory leak sending radius packets

Caveat ID Number	Description
CSCvr74619	Cat 9000 switch crashes during Authentication Failure of Wired Client
CSCvr75640	LNS crash with Segmentation fault(11) in L2TP mgmt daemon
CSCvr76555	In two redundant RPs, VPDN tunnel did not come up
CSCvr79052	In the cEdge console, 0 does not honor the privilege set in the username.

Resolved Caveats – Cisco IOS XE Gibraltar 16.12.2a

Caveat ID Number	Description
CSCvp78600	V1612:IPSEC_THS Traffic is not happening "hash algorithm ESP-MD5-HMAC" tunnels
CSCvp91087	PRBS/BERT line is not working on pdh de1 of 3GMS IM
CSCvq00404	Bcast packets are punted to CPU on the disposition node
CSCvq67129	The router forwards directed broadcast out same interface if uRPF is enabled on BDI

Resolved Caveats – Platform Independent

Caveat ID Number	Description
CSCts28315	DHCP-pd reflect the Advertised prefix in Request message
CSCvi22263	Crash when IOS is adapting shaping with Adaptive QoS over DMVPN configured
CSCvj76866	Partial Power Failure in Stack Causes Interfaces to Become "shutdown"
CSCvm40566	IP prefix list replacement gets error from IOS side
CSCvo55194	After RSP switchover label imposition was not programmed in Software on APS standby router
CSCvo55783	Pending objects wrt to uRPF on reload or soak script run
CSCvp38407	The "Radius-server attribute 31" command broken on LNS when LAC sends Remote-Id string
CSCvp66281	default ip forward-protocol udp xx changed to no ip forward-protocol udp xx after rollback
CSCvp74674	QoS fails to apply to tunnel2 when underlying tunnel1 reachability change
CSCvp96887	Failed to attach template to Cisco XE SDWAN Rtr if qos-map name changed after policy-map is attached

Caveat ID Number	Description
CSCvq00263	Device crashed @ radius_io_stats_timer_handler due to dynamic-author
CSCvq04828	VRF aware reverse DNS lookup not working
CSCvq04989	Ping between 2 Interfaces is not working , dialer interface is interferring in the ARP Processs
CSCvq09061	The .py file check is not done while registering the policy and the error is seen
CSCvq18328	SSH: host_key->name is not null after reload which prevents SSH from starting up
CSCvq29953	IP SLA react for packetloss and successivepacketloss do not set $_ipsla_react_type in EEM
CSCvq33004	Account logon failing for both direct and indirect lite-session in 16.9.3
CSCvq34893	Template push to CEdge fails when we change the access VLAN on a switchport from VLAN 1
CSCvq35631	Crash due to HTTP Core
CSCvq49721	Telnet access fails when VRF-aware extended VTY ACL is configured
CSCvq54265	Ip bootp server should be disabled by default as a device hardening best practice
CSCvq56114	Crash in IGMP code due to invalid source count in DNS lookup
CSCvq56208	MDT: xpath union operator only outputs data from the left hand expression
CSCvq58265	BGP PIC Repair path broke after link flap
CSCvq58722	Python script register failure when using custom directory instead of Flash
CSCvq59908	Stack crashed after upgrade
CSCvq60252	PBR works although an interface is down.
CSCvq70148	BGP is improperly formatting the BGP ASSET attribute if ASSET attribute length is beyond 255
CSCvq72298	Router crashed on running show policy-map interface <> output command
CSCvq73364	mVPN - Multicast packets dropped and "%MFIB-SW2-3-MFIB_CTXT_DEPTH_EXCEEDED" printed continuously
CSCvq89252	IP SLA for Path-Jitter returning a value which isn't defined by the MIB
CSCvq94679	[SDA] Crash due to Segmentation fault(11), Process = ARP Input
CSCvq95645	WLC crashed due to Memory Corruption
CSCvq97365	2 interfaces of client in different vrf connected to same vlan of server not able to get ip via dhcp

Caveat ID Number	Description
CSCvr00183	AAA accounting issue after router reload when mGRE and L3VPN configured
CSCvr00344	"ip access-list logging hash-generation" removes ACL statements upon reload
CSCvr02957	Re-add app-hosting move support - removed in v16.12.1
CSCvr05406	LISP Map-cache not updated correctly after wired Host-mobility
CSCvr09014	IGP metric not detected MPLS TE topology
CSCvr13213	Session unauthorized as Redirect ACL Failure. Failed attribute name POSTURE_REDIRECT.
CSCvr36887	WLC crashes by wncd process when modifying AAA configs from WebUI

Open Caveats – Cisco IOS XE Gibraltar 16.12.1

Caveat ID Number	Description
CSCvm31596	ASR903 RSP3C-400-S stops responding
CSCvp78600	V1612:IPSEC_THS Traffic is not happening "hash algorithm ESP-MD5-HMAC" tunnels
CSCvp91087	PRBS/BERT line is not working on pdh de1 of 3GMS IM
CSCvn27921	LPPS TE Absolute Avg Time is failing for N560-IMA2C
CSCvo18347	RSP2:Service impact seen while enabling the netconf-yang model
CSCvp35154	RSP3: arp not getting resolved resulting in back to back BDI ping fail post IM OIR trigger
CSCvp59580	Striker-O DR_10G_PORT_MAP is not correct during SFP OIR
CSCvq00342	Duplicated packets on MVPN deployment on ASR920
CSCvq00404	RSP3: Bcast packets are punted to CPU on the disposition node
CSCvq01602	After IPv6 and cache expired, transit traffic fails when ECMP
CSCvq08730	RSP3 :With license service offload enable rsp3-200 fails to boot with Crash in PE image
CSCvq11964	SDH : Change mode from TUG-3 to VC4 causes PW provisioning failure
CSCvq40026	SSFPD memory leak with ONS-SI-PDH-VCOP
CSCvp11822	RSP3 Crash during recursive routing for GRE Tunnel
CSCvp52636	RSP3-903: After doing IM-OIR of A900-IMA8S device, the device stops responding.

Caveat ID Number	Description
CSCvo13032	ROMMON: Invalid USB device handle error while doing dir USB0.
CSCvo36974	Data traffic drop is observed over VRF_AWARE_IPSEC with IPSEC profile removal and addition
CSCvp12219	IKEV1 tunnel goes down even after core port un-shut and comes up again
CSCvp28897	Kernel crash observed with 1500 frame size on core port shut or un-shut on peer
CSCvp61200	VRF AWARE IPSEC - One-way traffic hits tunnel during clear crypto process
CSCvp12250	The error logs such as caam_jr and asfctrl are observed
CSCvw34109	PTP failure due to LSMPI buffer exhaustion

Resolved Caveats – Cisco IOS XE Gibraltar 16.12.1a

Caveat ID Number	Description
CSCvi93315	RSP2: Cylon_Mgr Crash in Multicast on RP SSO Soak
CSCvj75078	RSP3: IOMD crash @ iomd_bsess_open_callback_retry on new active after RP SSO
CSCvj87085	PTPD crashed after removing the ptp configs, default profile <169>
CSCvk13764	The **uea_mgr fault on fp_0_0** issue leads to 907 crash on boot-up .
CSCvk32423	IMA8Z 6-port mode, hwidx not created leading to complete traffic drop
CSCvk54023	Convergence delay in active RSP removal
CSCvn19901	After upgrade (318SP2-1671) the router stayed down
CSCvn49741	ASR903/920 cylon_mgr crash.
CSCvn55871	T1 serial interface went down with encapsulation mode as PPP with remote loopback config as iboc.
CSCvn64973	A900-IMA4OS module reload with controller mode change
CSCvn82547	ASR903 : OSPF packets over VPLS are punted to CPU queue 15
CSCvn97073	Serdes release does not happen for OCx IM when moved from slot 14 to slot 12
CSCvo07619	ASR920-BDI IPv6 ping failure_FMFP_OBJ_Download_Failure
CSCvo10847	RSP3:POCH TE-FRR with Min Link less than No of Members Triggers FRR Via FLCD
CSCvo19770	Router crashes at hashtable_get_nth_entry

Caveat ID Number	Description
CSCvo35275	ASR-920:MVPN: Unable to pass high MTU multicast packets-MDT-MTU
CSCvo40953	SDH : Serial interface stay in up/down status for SDH Modes
CSCvo44727	OC-3 port will not clear PUNEQ alarm
CSCvo44745	OCn IM shows as insertable-hw-module in slots where it is not supported in 10G_CEM mode
CSCvo65688	16.9.3-QIP-crete-TOD flaps in Crete (master) when setup is left overnight
CSCvp16487	High CPU utilisation observed for iomd process
CSCvp19127	Card-protection : Channelized T1 circuits fails to pass traffic , after RSP switchover
CSCvp25241	APS group OC48 does not send signal fail indication in K1 byte
CSCvp27918	ASR900 Router should throw out warning when wrong FAN TRAY installed (Module overheat and shut down)
CSCvq08464	ELBORON: Restrict max. supported CESoP PWs to 672 only in 16.12.1 release
CSCvq10257	About incorrect I/F notation when enable qos-overhead-accounting Tengig interface
CSCvo25659	ASR903-RSP3C-400:IMA8s Link set to down as serdes peer is not ready