

Release Notes for Cisco NCS 4206 and Cisco NCS 4216 Series, Cisco IOS XE Cupertino 17.9.x

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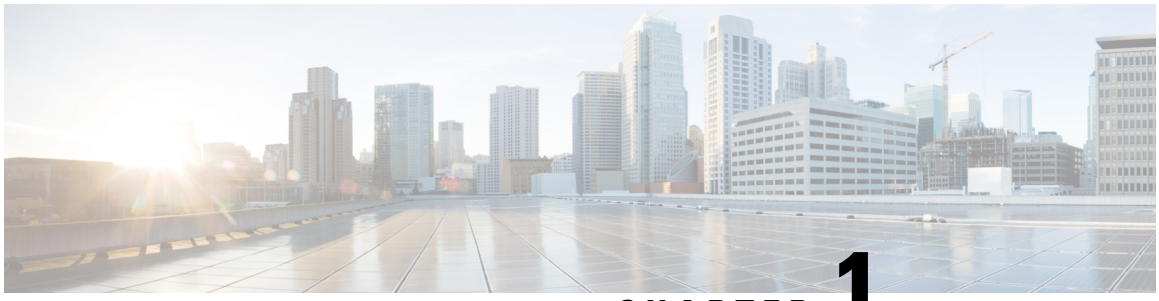
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CHAPTER 1

Introduction

This document provides information about the IOS XE software release for the Cisco NCS 4206 and Cisco NCS 4216 beginning with Cisco IOS XE Release 3.18SP.

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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.

NCS 4216 14RU

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 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 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.

Cisco NCS 4216 F2B Supported Interface Modules

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

Restrictions and Limitations

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

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

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

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

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

- Embedded Packet Capture (EPC) is not supported on NCS 4200 routers.
- From the Cisco IOS XE 16.6.1 releases, In-Service Software Upgrade (ISSU) is not supported on the router to the latest releases. For more information on the compatible release versions, see ISSU Support Matrix.
- ISSU is not supported between a Cisco IOS XE 3S release and the Cisco IOS XE Bengaluru 17.6.x release.

- The port restriction on 1-port OC-192 or 8-port low rate CEM interface module is on port pair groups. If you have OC48 configured on a port, the possible port pair groups are 0–1, 2–3, 4–5, 6–7. If one of the ports within this port group is configured with OC48 rate, the other port cannot be used.
- RS422 pinout works only on ports 0–7.
- The **ip cef accounting** command is *not* supported on the router.
- Configuration sync does *not* happen on the Standby RSP when the active RSP has Cisco Software Licensing configured, and the standby RSP has Smart Licensing configured on the router. If the active RSP has Smart Licensing configured, the state of the standby RSP is undetermined. The state could be pending or authorized as the sync between the RSP modules is not performed.
- Evaluation mode feature licenses may not be available to use after disabling, and enabling the smart licensing on the RSP2 module. A reload of the router is required.
- Ingress counters are not incremented for packets of the below format on the RSP3 module for the 10-Gigabit Ethernet interfaces, 100-Gigabit Ethernet interfaces, and 40-Gigabit Ethernet interfaces:

  Packet Format

  MAC header---->VLAN header---->Length/Type

  When these packets are received on the RSP3 module, the packets are not dropped, but the counters are not incremented.
- T1 SAToP, T3 SAToP, and CT3 are supported on an UPSR ring only with local connect mode. Cross-connect configuration of T1, T3, and CT3 circuits to UPSR are not supported.
- PTP is not supported when 8-port 10-Gigabit Ethernet interface module is in oversubscribed mode.
- Port channel 61–64 is not supported in the 16.11.1a release. The range of configurable port channel interfaces has been limited to 60.
- Effective with Cisco IOS XE Everest 16.6.1, the VPLS over Port-channel (PoCH) scale is reduced from 48 to 24 for Cisco ASR 903 RSP3 module.



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

- The frame drops may occur for packets with packet size of less than 100 bytes, when there is a line rate of traffic over all 1G or 10G interfaces available in the system. This restriction is applicable only on RSP2 module, and is not applicable for RSP3 module.
- One Ternary Content-Addressable Memory (TCAM) entry is utilized for Segment Routing Performance Measurement. This is required for the hardware timestamping to function.
- While performing an auto upgrade of ROMMON, only primary partition is upgraded. Use the **upgrade rom-mon filename** command to upgrade the secondary partition of the ROMMON during the auto upgrade. However, the router can be reloaded during the next planned reload to complete the secondary ROMMON upgrade. This is applicable to ASR 903 and ASR 907 routers.
- In the Cisco IOS XE 17.1.1 release, the EVPN EVI type is VLAN-based by default, and while configuring for the EVPN EVI type, it is recommended to configure the EVPN EVI type as VLAN-based, VLAN bundle and VLAN aware model.

- For Cisco IOS XE Gibraltar Release 16.9.5, Cisco IOS XE Gibraltar Release 16.12.3, and Cisco IOS XE Amsterdam 17.1.x, a minimum disk space of 2 MB is required in the boot flash memory file system for a successful ROMMON auto upgrade process. For a disk space lesser than 2 MB, ROMMON auto upgrade fails and the router reboots. This is applicable to Cisco ASR 903 and Cisco ASR 907 routers.
- In the Cisco IOS XE 16.12.1, 17.1.1, and 17.2.1 releases, IPsec is not supported on the Cisco RSP3 module.
- CEM circuit provisioning issues may occur during downgrade from Cisco IOS XE Amsterdam 17.3.1 to any lower versions or during upgrade to Cisco IOS XE Amsterdam 17.3.1 from any lower versions, if the CEM scale values are greater than 10500 APS/UPSR in protected CEM circuits. So, ensure that the CEM scale values are not greater than 10500, during ISSU to or from 17.3.1.
- Some router models are not fully compliant with all IETF guidelines as exemplified by running the pyang tool with the **lint** flag. The errors and warnings that are exhibited by running the pyang tool with the **lint** flag are currently noncritical as they do not impact the semantic of the models or prevent the models from being used as part of the toolchains. A script has been provided, "check-models.sh", that runs pyang with **lint** validation enabled, but ignoring certain errors. This allows the developer to determine what issues may be present.

  As part of model validation for the Cisco IOS XE Amsterdam 17.3.1 release, "LEAFREF_IDENTIFIER_NOT_FOUND" and "STRICT_XPATH_FUNCTIONS" error types are ignored.
- Test Access Port (TAP) is not supported when the iMSG VLAN handoff feature is enabled on the same node.
- Data Communication Channel (DCC) is not supported in the NCS4200-1T8S-20CS interface module for the Cisco IOS XE Cupertino 17.8.1 release.
- SF and SD alarms are NOT supported on T1 and T3 ports for the following interface modules:
  - NCS4200-3GMS
  - NCS4200-48T3E3-CE
  - NCS4200-48T1E1-CE
- In RSP2 and RSP3 modules, during In-Service Software Upgrade (ISSU), interface modules undergo FPGA upgrade.

  The following table details the IM Cisco IOS XE versions during ISSU with respect to FPGA upgrade and the impact of traffic flow for these IMs:

Table 3: Impact on IM during ISSU and FPGA Upgrade

IM	IM Version During ISSU	Pre-ISSU FPGA Upgrade	Post-ISSU Impact on IM	FPGA Version post ISSU
Phase 1	Cisco IOS XE 17.3.x or earlier version to Cisco IOS XE 17.4.x	FPGA upgrade completes and IM starts after the reload process. FPGA version (phase -1) - 0.47	Traffic is impacted during upgrade.	0.75

IM	IM Version During ISSU	Pre-ISSU FPGA Upgrade	Post-ISSU Impact on IM	FPGA Version post ISSU
Phases 1 and 2	Version earlier to Cisco IOS XE 17.8.x	FPGA upgrade completes and IM starts after the reload process. • FPGA version (Phase 1)—0.47 • FPGA version (Phase 2) • NCS4200-1T8LR-PS—62 • Combo IM: 69.24	Traffic is impacted during upgrade.	• FPGA version (Phase 1)—0.75 • FPGA version (Phase 2) • NCS4200-1T8LR-PS—64 • Combo IM: 69.32
Phase 1	Cisco IOS XE 17.4.1 or later versions to Cisco IOS XE 17.8.1	IM FPGA already upgraded with the latest version and reload is not required.	Traffic is not impacted.	0.75

For more information on the FPGA versions, see Supported FPGA Versions.

Refer the following table for supported IMs:

Table 4: NCS 4200 Supported Ethernet Interface Module

Phase 1 IM	Phase 2 IM	Phase 3 IM
NCS4200-1T8LR	NCS4200-1T8LR-PS	NCS4200-8T-PS
		NCS4200-2Q-P
		NCS4200-2H-PQ

Determining the Software Version

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

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

Upgrading to a New Software Release

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

For information about upgrading to a new software release, see the Upgrading the Software on the Cisco NCS 4200 Series Routers .

Upgrading the FPD Firmware

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

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

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 TDM IM and CEM FPGAs 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
IM FPGA	17.9.8	1.22	1.22	1.15	0.93	2.0
CEM FPGA		6.0	5.2	5G mode: 6.5 10G mode: 7.9	10G mode: 7.2 20G mode: 7.2	9.3

	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
IM FPGA	17.9.7	1.22	1.22	1.15	0.93	2.0
CEM FPGA		6.0	5.2	5G mode: 6.5 10G mode: 7.9	10G mode: 7.2 20G mode: 7.2	9.3
IM FPGA	17.9.6	1.22	1.22	1.15	0.93	2.0
CEM FPGA		6.0	5.2	5G mode: 6.5 10G mode: 7.9	10G mode: 7.2 20G mode: 7.2	9.3
IM FPGA	17.9.5a	1.22	1.22	1.15	0.93	2.0
CEM FPGA		6.0	5.2	5G mode: 6.5 10G mode: 7.9	10G mode: 7.2 20G mode: 7.2	9.3
IM FPGA	17.9.4a	1.22	1.22	1.15	0.93	2.0
CEM FPGA		6.0	5.2	5G mode: 6.5 10G mode: 7.9	10G mode: 7.2 20G mode: 7.2	9.1
IM FPGA	17.9.4	1.22	1.22	1.15	0.93	2.0
CEM FPGA		6.0	5.2	5G mode: 6.5 10G mode: 7.9	10G mode: 7.2 20G mode: 7.2	9.1

	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
IM FPGA	17.9.3	1.22	1.22	1.15	0.93	2.0
CEM FPGA		6.0	5.2	5G mode: 6.5 10G mode: 7.9	10G mode: 7.2 20G mode: 7.2	9.1
IM FPGA	17.9.2a	1.22	1.22	1.15	0.93	2.0
CEM FPGA		6.0	5.2	5G mode: 6.5 10G mode: 7.9	10G mode: 7.2 20G mode: 7.2	9.1
IM FPGA	17.9.1	1.22	1.22	1.15	0.93	2.0
CEM FPGA		6.0	5.2	5G mode: 6.5 10G mode: 7.9	10G mode: 7.2 20G mode: 7.2	9.1
IM FPGA	17.8.1	1.22	1.22	1.15	0.93	2.0
CEM FPGA		6	5.2	5G mode: 6.5 10G mode: 7.9	10G mode: 7.0 20G mode: 6.0	9.0
IM FPGA	17.7.1	1.22	1.22	1.15	0.93	2.0
CEM FPGA		0x52110052	0x52520052	5G mode: 0x10090065 10G mode: 0x10070079	10G mode: 0x10290051 20G mode: 0x10290051	0x10030076

	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
IM FPGA	17.6.2	1.22	1.22	1.15	0.93	2.0
CEM FPGA		0x52110052	0x52520052	5G mode: 0x10090065 10G mode: 0x10070079	10G mode: 0x10290051 20G mode: 0x10290051	0x10030076
IM FPGA	17.6.1	1.22	1.22	1.15	0.93	2.0
CEM FPGA		0x52110052	0x52520052	5G mode: 0x10090065 10G mode: 0x10070079	10G mode: 0x10290051 20G mode: 0x10290051	0x10030076
IM FPGA	17.5.1	1.22	1.22	1.15	0.93	2.0
CEM FPGA		0x52050052	0x52420052	5G mode: 0x10210063 10G mode: 0x10530078	10G mode: 0x10090051 20G mode: 0x10090051	0x10020076

Table 6: Supported Ethernet IM FPGA/FPD versions for NCS 4206-RSP3 and NCS 4216

Cisco IOS XE Release	NCS4200-1T16G -PS	NCS4200-1T8LR -PS	NCS4200-8T -PS	NCS4200-2Q -P	NCS4200-1H -PK	NCS4200-2H -PQ	NCS4200 -1T16LR
17.9.8	1.129	69.32	0.21	0.21	0.22	0.20	69.24
17.9.7	1.129	69.32	0.21	0.21	0.22	0.20	69.24
17.9.6	1.129	69.32	0.21	0.21	0.22	0.20	69.24
17.9.5a	1.129	69.32	0.21	0.21	0.22	0.20	69.24
17.9.4a	1.129	69.32	0.21	0.21	0.22	0.20	69.24
17.9.4	1.129	69.32	0.21	0.21	0.22	0.20	69.24
17.9.2a	1.129	69.32	0.21	0.21	0.22	0.20	69.24
17.9.1	1.129	69.32	0.21	0.21	0.22	0.20	69.24
17.8.1	1.129	69.32	0.21	0.21	0.22	0.20	69.24
17.7.1	1.129	1.129	0.21	0.21	0.22	0.20	69.24

Cisco IOS XE Release	NCS4200-1T16G-PS	NCS4200-1T8LR-PS	NCS4200-8T-PS	NCS4200-2Q-P	NCS4200-1H-PK	NCS4200-2H-PQ	NCS4200-1T16LR
17.6.1	1.129	1.129	0.21	0.21	0.22	0.20	69.24
17.5.1	1.22	1.22	1.15	0.93	2.0	0.23	0.20
17.4.1	1.129	69.24	0.21	0.22	0.20	3.4	1.129

Table 7: FPGA, HoFPGA, and ROMMON Versions for Cisco IOS XE 17.9.2, 17.9.4, 17.9.4a,17.9.5a, 17.9.6, 17.9.7, and Cisco IOS XE 17.9.8 Releases

Platform	Interface Module	FPGA Current Version	FPGA Minimum Required Version	RSP HoFPGA Active	RSP HoFPGA Standby	ROMMON
NCS420X-RSP-128	NCS4200-1T8LR-PS	0.75	0.75	0X00030011	0X00030011	15.6(54r)S
NCS4206-RSP	NCS4200-1H-PK	0.20	0.20	40035	40035	15.6(54r)S
	NCS4200-8T-PS	0.22	0.21			
	NCS4200-1T8LR-PS	69.32	69.32			
NCS4216-RSP	NCS4200-1H-PK	0.20	0.20	20040034	20040034	15.6(54r)S

Table 8: FPGA, HoFPGA, and ROMMON Versions for Cisco IOS XE 17.9.1 Release

Platform	Interface Module	FPGA Current Version	FPGA Minimum Required Version	RSP HoFPGA Active	RSP HoFPGA Standby	ROMMON
NCS420X-RSP-128	NCS4200-1T8LR-PS	0.75	0.75	0X00030011	0X00030011	15.6(54r)S
NCS4206-RSP	NCS4200-1H-PK	0.20	0.20	40035	40035	15.6(54r)S
	NCS4200-8T-PS	0.22	0.21			
	NCS4200-1T8LR-PS	69.32	69.32			
NCS4216-RSP	NCS4200-1H-PK	0.20	0.20	20040034	20040034	15.6(54r)S

Additional References

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)
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

Supported MIBs		
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)	

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:

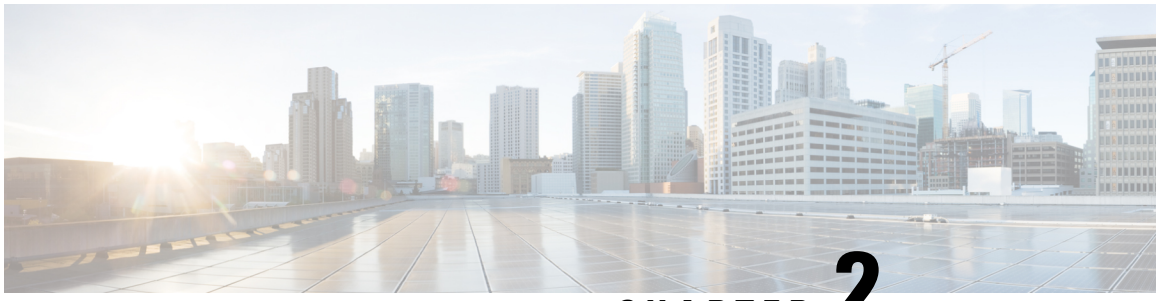
http://www.cisco.com/en/US/products/ps11174/products_licensing_information_listing.html

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- 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

What's New for Cisco IOS XE Cupertino 17.9.x

- What's New in Hardware for Cisco IOS XE Cupertino 17.9.8, on page 15
- What's New in Software for Cisco IOS XE Cupertino 17.9.8, on page 15
- What's New in Hardware for Cisco IOS XE Cupertino 17.9.7, on page 15
- What's New in Software for Cisco IOS XE Cupertino 17.9.7, on page 16
- What's New in Hardware for Cisco IOS XE Cupertino 17.9.6, on page 16
- What's New in Software for Cisco IOS XE Cupertino 17.9.6, on page 16
- What's New in Hardware for Cisco IOS XE Cupertino 17.9.5a, on page 16
- What's New in Software for Cisco IOS XE Cupertino 17.9.5a, on page 16
- What's New in Hardware for Cisco IOS XE Cupertino 17.9.4a, on page 16
- What's New in Software for Cisco IOS XE Cupertino 17.9.4a, on page 16
- What's New in Hardware for Cisco IOS XE Cupertino 17.9.4, on page 16
- What's New in Software for Cisco IOS XE Cupertino 17.9.4, on page 16
- What's New in Hardware for Cisco IOS XE Cupertino 17.9.3, on page 17
- What's New in Software for Cisco IOS XE Cupertino 17.9.3, on page 17
- What's New in Hardware for Cisco IOS XE Cupertino 17.9.2a, on page 17
- What's New in Software for Cisco IOS XE Cupertino 17.9.2a, on page 17
- What's New in Hardware for Cisco IOS XE Cupertino 17.9.1, on page 17
- What's New in Software for Cisco IOS XE Cupertino 17.9.1, on page 17

What's New in Hardware for Cisco IOS XE Cupertino 17.9.8

There are no new hardware features introduced for this release.

What's New in Software for Cisco IOS XE Cupertino 17.9.8

There are no new software features introduced for this release.

What's New in Hardware for Cisco IOS XE Cupertino 17.9.7

There are no new hardware features introduced for this release.

What's New in Software for Cisco IOS XE Cupertino 17.9.7

There are no new software features introduced for this release.

What's New in Hardware for Cisco IOS XE Cupertino 17.9.6

There are no new hardware features introduced for this release.

What's New in Software for Cisco IOS XE Cupertino 17.9.6

There are no new software features introduced for this release.

What's New in Hardware for Cisco IOS XE Cupertino 17.9.5a

There are no new hardware features introduced for this release.

What's New in Software for Cisco IOS XE Cupertino 17.9.5a

There are no new software features introduced for this release.

What's New in Hardware for Cisco IOS XE Cupertino 17.9.4a

There are no new hardware features introduced for this release.

What's New in Software for Cisco IOS XE Cupertino 17.9.4a

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

What's New in Hardware for Cisco IOS XE Cupertino 17.9.4

There are no new hardware features introduced for this release.

What's New in Software for Cisco IOS XE Cupertino 17.9.4

There are no new software features introduced for this release.

What's New in Hardware for Cisco IOS XE Cupertino 17.9.3

There are no new hardware features introduced for this release.

What's New in Software for Cisco IOS XE Cupertino 17.9.3

There are no new software features introduced for this release.

What's New in Hardware for Cisco IOS XE Cupertino 17.9.2a

There are no new hardware features introduced for this release.

What's New in Software for Cisco IOS XE Cupertino 17.9.2a

There are no new software features introduced for this release.

What's New in Hardware for Cisco IOS XE Cupertino 17.9.1

There are no new hardware features introduced for this release.

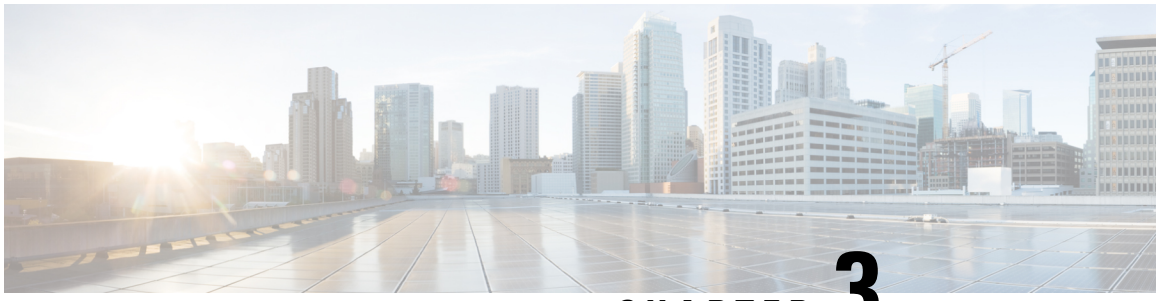
What's New in Software for Cisco IOS XE Cupertino 17.9.1

Feature	Description
Carrier Ethernet	
Application of QoS Policies on ITU-T Y.1731 Egress Packets	You can now apply QoS policies on Y.1731 egress packets. Operations, Administration, and Maintenance (OAM) functions and mechanisms for Ethernet-based networks are defined in ITU-T Y.1731. With this implementation, you can prioritize OAM traffic; for example, prioritizing operational information used to detect faults and determining network performance.

Feature	Description
Custom Idle Pattern	You can configure idle pattern manually on CEM circuits and verify if it's stable and transmitted to the other end in alarm conditions. You can configure on all CEM PWs in a T1/E1 circuit. Supported on the following IMs on CESoPSN circuits with both partial and full time slots. • ASR 900 48 port T1/E1 Interface Module • ASR 900 48 port DS3/E3 Interface Module • 1-port OC481/ STM-16 or 4-port OC-12/OC-3 / STM-1/STM-4 + 12-Port T1/E1 + 4-Port T3/E3 CEM Interface Module • ASR 900 Combo 8-Port SFP GE and 1-Port 10 GE 20G Interface Module These idle pattern numbers are used for tracking purposes.
Layer 2 Control Protocol Enhancements	Layer 2 Control Protocols (L2CP) propagate the MAC address control information to determine which parts of a network the router should forward, tunnel, peer, or discard information. For the RSP2 and RSP3 modules, this release supports **forward** and **discard** options for the following protocols: • MRP Block • Cisco BPDU • Cisco STP UplinkFast • Cisco CFM For the RSP3 module, this release supports **forward** , **discard** , and **tunnel** options for the following protocols: • DOT1X • MMRP • MVRP
Cisco ASR 900 Router Series	
Persistent Bandwidth for 8-port 10 Gigabit Ethernet Interface module (A900-IMA8Z)	This feature persistently retains the configured bandwidth value of the interface for 8-port 10 Gigabit Ethernet Interface module (A900-IMA8Z) across triggers such as interface shut or no-shut, IM reload, Stateful Switchover (SSO), and so on.
IOT Interface Modules	
Hitless Switching on C37.94 Interface Module	Hitless switching protection describes the ability to switch between the active and backup paths without losing packets when an active path fails. This feature ensures uninterrupted continuous service and maintains an extremely high-reliability rating.

Feature	Description
IP Multicast: Multicast	
Support for MVPN Bidirectional PIM	This release extends the support of bidirectional PIM over MVPN. This feature is only supported on profile 1 MVPN or default MDT - MLDP MP2MP - PIM C-mcast signaling. This feature is only supported on Cisco RSP3 module.
OCx CEM Interface Module	
MLPPP ACR support for IPv4 or IPv6 Interworking Multiservice Gateway (iMSG)	MLPPP ACR is supported for IPv4 or IPv6 iMSG on: • ASR 900 1-Port OC-192 or 8-Port Low Rate CEM 20G Bandwidth Interface Module (A900-IMA1Z8S-CXMS) Now, you can increase the bandwidth of a specific OCx port using MLPPP. The restrictions for MLPPP interworking are applicable to iMSG ACR.
QoS Support on Serial Interfaces	QoS is supported on serial interfaces. You can apply service policies on egress of L3 terminated serial interfaces with both HDLC and PPP encapsulation. By implementing QoS policies on serial interfaces you can shape, classify, or prioritize the data.
MPLS Basic	
Support for Co-routed Inter-area Flex-LSP Tunnels	Flex LSPs (also called Associated Bidirectional LSPs) now support inter-area co-routed tunnels. With this implementation, we meet the specific requirements of network operators to create on-demand tunnels by defining an explicit path across different areas.
Segment Routing	
LSR Support for Autoroute Announce SR Policies	This feature enables Label Switch Routing (LSR) and thus helps to forward labeled (EOS0, EOS1) traffic over three or four labeled segment routing autoroute static tunnels.
Support of BGP PIC for Short LCM Policies	This feature introduces the support of BGP Prefix Independent Convergence (PIC) and helps you to enable BGP PIC core and BGP PIC edge for short local congestion mitigation (LCM) policies. This feature helps to minimise the convergence time after a network failure. You should only configure LCM policies or the SR policies with 0, 1, and 2 SR labels.
YANG Model Support for QoS Service Group	Cisco YANG now supports QoS Service Groups. Service-Groups allow you to add service instances to groups and apply service policies. You can configure the definition of the service-group and apply the service-group to an interface. With this implementation, you can quickly deploy QoS mechanisms, such as creating a class for email traffic.
IPv6: RFC 8200 Compliance	Improvements have been made to the Cisco IOS XE platforms to maintain compliance with IETF standards as specified for the Internet Protocol, Version 6 (IPv6) in RFC 8200. The enhancements bring in improved security and better handling of IP packets with fragments.

Feature	Description
Show tech-support Enhancements	
Show tech-support Enhancements	The **show tech-support** now supports generic commands to provide better debuggability. The **show tech-support platform cef** command now displays IPv4 address information. For more information, see Cisco IOS Configuration Fundamentals Command Reference.



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.

- Resolved Caveats – Cisco IOS XE Cupertino 17.9.8, on page 22
- Open Caveats – Cisco IOS XE Cupertino 17.9.8, on page 22
- Resolved Caveats – Cisco IOS XE Cupertino 17.9.7, on page 22
- Open Caveats – Cisco IOS XE Cupertino 17.9.7, on page 22
- Resolved Caveats – Cisco IOS XE Cupertino 17.9.6, on page 22
- Open Caveats – Cisco IOS XE Cupertino 17.9.6, on page 22
- Resolved Caveats – Cisco IOS XE Cupertino 17.9.5a, on page 23
- Open Caveats – Cisco IOS XE Cupertino 17.9.5a, on page 23
- Resolved Caveats – Cisco IOS XE Cupertino 17.9.4a, on page 23
- Open Caveats – Cisco IOS XE Cupertino 17.9.4a, on page 24
- Resolved Caveats – Cisco IOS XE Cupertino 17.9.4, on page 24
- Open Caveats – Cisco IOS XE Cupertino 17.9.4, on page 24
- Resolved Caveats – Cisco IOS XE Cupertino 17.9.3, on page 24
- Open Caveats – Cisco IOS XE Cupertino 17.9.3, on page 25
- Resolved Caveats – Cisco IOS XE Cupertino 17.9.2a, on page 25
- Open Caveats – Cisco IOS XE Cupertino 17.9.2a, on page 26
- Resolved Caveats – Cisco IOS XE Cupertino 17.9.1, on page 26
- Open Caveats – Cisco IOS XE Cupertino 17.9.1, on page 27
- Cisco Bug Search Tool, on page 27

Resolved Caveats – Cisco IOS XE Cupertino 17.9.8

There are no resolved caveats for the Cisco IOS XE Cupertino 17.9.8 release.

Open Caveats – Cisco IOS XE Cupertino 17.9.8

There are no open caveats for the Cisco IOS XE Cupertino 17.9.8 release.

Resolved Caveats – Cisco IOS XE Cupertino 17.9.7

Identifier	Headline
CSCwm86214	LDP session flap causes memory leak for EMPLS3LD which leads to RSP crash.
CSCwm91197	Silent reload of 3GMS IM due to PCI transaction failure.
CSCwj72178	RSP3 - OSPF not coming on G8032 vlan post reload.
CSCwk87121	Ports on router remain down after ISSU operation with RSP3.

Open Caveats – Cisco IOS XE Cupertino 17.9.7

Identifier	Headline
CSCwi76112	Message to be displayed for M13 framing when configured with clear-channel.

Resolved Caveats – Cisco IOS XE Cupertino 17.9.6

Identifier	Headline
CSCwj05647	3GMS serial interface protocol down with specific modem
CSCwj06370	Serial cease traffic when configuring module other port

Open Caveats – Cisco IOS XE Cupertino 17.9.6

Identifier	Headline
CSCwj38216	BDI ARP is not learning but peer side BDI MAC is learning through VC
CSCwj72178	RSP3 - OSPF not coming on G8032 vlan post reload

Identifier	Headline
CSCwi74892	VLAN tagged pause frames were flooded towards router (RSP3) and caused port-channel flap

Resolved Caveats – Cisco IOS XE Cupertino 17.9.5a

Identifier	Headline
CSCwh28391	The **show running config** and **write memory** commands trigger **ERR:Interfacenotfound** error messages
CSCwf77316	ASR900/RSP3: MPLS incorrect label programmed with scenarios of double implicit-null
CSCwf86864	CEM traffic flow is dropped in one direction due to DEI bit set from 4202
CSCwf07736	The cem interface counters momentarily report error when x21 xconnect is cleared and reestablished
CSCwh06287	When policy is attached to serial interface, the device is going for a reload
CSCwf53995	17.13 system BERT interval is reset with clear counters
CSCwh64181	After losing primary master, T-BC stuck in the HOLDOVER state though secondary master is reachable.
CSCwh84309	With telcordia profile, Ethernet interfaces sec admin state is not going to the AINS state.

Open Caveats – Cisco IOS XE Cupertino 17.9.5a

Identifier	Headline
CSCwd87661	NCS4206 Fan running at high speed and creating noise SW version 17.03.04
CSCwe22859	Ping is not working on EFP based MACSec interfaces after SSO is complete
CSCwc03299	RSP3: Pending ack on active RSP pointing to efp-bridge-domain-bind

Resolved Caveats – Cisco IOS XE Cupertino 17.9.4a

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

Open Caveats – Cisco IOS XE Cupertino 17.9.4a

There are no open caveats in this release.

Resolved Caveats – Cisco IOS XE Cupertino 17.9.4

Identifier	Headline
CSCwd88680	High Convergence after Port channel member Failure
CSCwd90840	The multicast data traffic is getting dropped over VPLS
CSCwd67723	In the IMA32D/IMA8D card, sometimes change in E1 controller config (after ctrlr flap) results in IM reboot
CSCwe38959	In rs232 ASYNC PW service with full scale, the packet and byte drop intermittently
CSCwf14167	RSP3: uea_mgr memory leak on ARP probes
CSCwe33508	SRTE policy is down when removing and configuring ISIS

Open Caveats – Cisco IOS XE Cupertino 17.9.4

Identifier	Headline
CSCwd88680	High Convergence after Port channel member Failure
CSCwd05362	Performance issue on ASR900 platform
CSCwd87661	Fan is running at high speed and creating noise (Fan PID A903-FAN-H) - SW version 17.03.04
CSCwe13024	ASR900-RSP2: All readings for Power supply unit reflect as zero though the unit is functional
CSCwe27155	Traffic drop with BDI shut (IP_FRR configs)

Resolved Caveats – Cisco IOS XE Cupertino 17.9.3

Identifier	Headline
CSCwb77093	next hop self does changes automatically on VRF lite and ipv4
CSCwc55520	Traceback and IDB leak noticed when a RSP3 setup performs a switchover
CSCwc65971	RSP3: MPLS pseudowire - Incorrect label stack pushed to packet

Identifier	Headline
CSCwc76772	In RSP2 Serial intf protocol goes down after bulk sync and SSO
CSCwd06972	IOS-XE 17.x - user password not saved if user attribute list is configured
CSCwd15539	RSP2/RSP3 : IM's shouldn't reload during sipspa install stage 3 in single step install ISSU
CSCwd26357	rs485 with half-duplex configuration when reloaded, it gets into default full-duplex mode
CSCwd40870	RSP2 will crash when entering "ip prefix" list
CSCwd44817	After router reload E1 framing gets changed to unframed in SDH VC12 mode with channe-group config
CSCwd57471	Change in BGP ORF prefix-filter not being advertised from XE to XR node
CSCwd58396	NETCONF: Failed sync between Running configs and Candidate database
CSCwd66936	RSP2 UDP pseudowire stuck in Activating

Open Caveats – Cisco IOS XE Cupertino 17.9.3

Identifier	Headline
CSCwc03907	ISIS SRLG to BGPLS export problems
CSCwd76589	BGP On Change Notification not sent for BGP Dynamic Peers
CSCwd90908	NTP packets are sent from global VRF with a source IP configured on service VRF interface

Resolved Caveats – Cisco IOS XE Cupertino 17.9.2a

Identifier	Headline
CSCwb78907	DS3_RX_RAI is shown in both **facility-alarm** and **facility-condition status** cli
CSCwb77396	G.8032: Ring brief output doesnt display the Block port flag in Idle state
CSCwc21402	Invalid BGP update when add-paths negotiated only for label (SAFI 4) and not unicast (SAFI1)
CSCwc67367	Seeing traffic issues after clearing isis with SRTE_ODN_ISIS_Flex_Algo configs

Open Caveats – Cisco IOS XE Cupertino 17.9.2a

Identifier	Headline
CSCwc65971	RSP3: MPLS pseudowire - Incorrect label stack pushed to packet
CSCwc54860	EIGRP down authentication issues after ugprading from 17.3 to 17.6
CSCwc03907	ISIS SRLG to BGPLS export problems
CSCwc23316	Command **show snmp mib ifmib ifindex detail [IntName]** truncated when it is more than 32 characters

Resolved Caveats – Cisco IOS XE Cupertino 17.9.1

Identifier	Headline
CSCwa94444	F2B chassis: show env does not display the fan speed.
CSCwb06353	Router crashed with ip sla configuration which is not supported
CSCwa33548	Observed traffic issue with latest labels &bi-directional traffic is not working and drop is seen
CSCwa41638	ASR920 MAC Table and L2VPN EVPN Table out of sync
CSCwa54842	RSP3: QOSMGR-4-QUEUE_ExCEEDING_HW: VOQs exceeded hardware limit
CSCwb76150	STS1e -> vt-15 -> t1 -> Difference in ifName string format for controller up/down syslog messages
CSCwb09946	Bilbo/Eomer - T3 loopback doesn't generate syslogs
CSCvz65726	Post SSO with Qos OHA counters stop works
CSCvv16943	Uea-iomd phase2 IM FPD ugprade commit to polaris_dev
CSCwa78999	While rebooting the IM: A900-IMA4C3794, RSP2 device is going for Crash
CSCvz34941	RSP3-4000S: Punt Keepalive Failure issue 17.x
CSCwb20542	DCC not working if 10GMS and 3GMS is connected.
CSCwb69025	Change in SD-BER threshold value to 10e-9 causes SD alarm assertion
CSCwb60002	ASR900 may experience an unexpected reset when configuring or using interface BDI >= 4097
CSCvz02262	TCAM corruption happening at bank boundary when one of the bank is full.
CSCwb33605	Problem with CISCO-ENTITY-SENSOR-MIB SNMP on ASR903 router

Open Caveats – Cisco IOS XE Cupertino 17.9.1

Identifier	Headline
CSCwc28528	Netconf returns wrong IM Slot when supervisor R1 is active in Cisco-IOS-XE-platform-oper
CSCwc34663	FPD: Failure to downgrade the firmware of card 0/0
CSCwb78907	DS3_RX_RAI is shown in both facility-alarm and facility-condition status cli
CSCwb79003	PPLM is asserted when Tx C2=01 in case of mode unframed.

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