



New Features

This chapter describes the new features supported on the Cisco IOS XE Everest 16.5.1.

- [New Software Features in Cisco IOS XE Everest 16.5.1, on page 1](#)

New Software Features in Cisco IOS XE Everest 16.5.1

Following are the new software features:

- **10G SAT**

Service activation testing (SAT) is designed to measure the ability of a Device Under Test (DUT) or a network under test to properly forward traffic in different states. 10 Gigabit (10G) SAT session is now supported on Cisco ASR 900 RSP2 and RSP3 modules. Any SAT session with a rate-step greater than or equal to 1 Gbps is considered as 10G SAT session. For more information, see [IP SLAs Configuration Guide, Cisco IOS XE Everest 16.5.1 \(Cisco ASR 900\)](#).

- **Additional Flex LSP feature support**

Effective Cisco IOS XE Everest 16.5.1, the Cisco ASR 900 routers have enhanced the support for Flex LSP. Flex LSP also known as Associated Bidirectional Label Switched Paths (LSPs) are LSP instances where the forward and the reverse direction paths are set up, monitored, protected independently, and associated together during signaling. The RSVP Association aims to bind the forward and reverse LSPs together to form either a co-routed or a non co-routed associated bidirectional traffic engineering (TE) tunnel.

In this release, Flex LSP supports the following features:

- SRLG Protection
- Non-revertive
- Sticky
- Hop count and cost max-limit
- ECMP min-fill and max-fill
- Restore path option

For more information, see [Flex LSP Overview](#).

- **Auto In-Service States**

The Cisco ASR 900 series routers with RSP3 module now support configuration of interface modules in administrative configuration mode according to the Telecordia GR-1093. For more information, see [Auto In-Service States](#).

- **BCP Support on MLPPP**

This feature is only applicable for Cisco ASR 900 RSP2 module. Bridge Control Protocol (BCP) is responsible for configuring, enabling and disabling the bridge protocol modules on both ends of the point-to-point link. The BCP feature enables forwarding of Ethernet frames over serial networks, and provides a high-speed extension of enterprise LAN backbone traffic through a metropolitan area. When BCP is supported on Multilink PPP (MLPPP), it enables transport of Ethernet Layer 2 frames through MLPPP. For more information, see [BCP Support on MLPPP](#).

- **BFD on IP Unnumbered Interfaces**

Cisco ASR routers support BFD to run on IP unnumbered interfaces, which take the IP address from the loopback address. You can use the same loopback address on multiple interfaces. For more information, see [BFD on IP Unnumbered Interfaces](#).

- **Configuring 1G Mode on 8-port 10 Gigabit Ethernet Interface Module**

The 8-port 10 Gigabit Ethernet Interface Module (8X10GE) has eight ports and is supported on the Cisco ASR 900 RSP3 module. 1G mode is now supported with the devices in the distribution layer and that support both 1G and 10G traffic. Thus, all the eight ports can now work in 1G mode as well as 10G mode. For more information, see [Cisco ASR 900 Router Series Configuration Guide, Cisco IOS XE Everest 16.5.1](#).

- **Configuring 5G Traffic on 1-Port OC192/STM-64 or 8-Port OC3/12/48/STM-1/-4/-16 Interface Module**

Effective Cisco IOS XE Everest 16.5.1, 5G traffic is supported on 1-Port OC192/STM-64 or 8-Port OC3/12/48/STM-1/-4/-16 Interface Module. Prior to this release, only 10G traffic was supported. 5G traffic mode is supported on those interface module slots that do not support 10G traffic mode. For more information, see [Configuring 5G Traffic on 1-Port OC192/STM-64 or 8-Port OC3/12/48/STM-1/-4/-16 Interface Module](#).

- **Configuring Unidirectional Path Switching Ring (UPSR)**

The Cisco ASR 900 RSP3 module now supports Unidirectional Path Switching Ring (UPSR), a unidirectional network with two rings, one ring used as the working ring and the other as the protection ring. The same signal flows through both rings, one clockwise and the other counterclockwise. It is called UPSR because monitoring is done at the path layer. For more information, see [Cisco ASR 900 Router Series Configuration Guide, Cisco IOS XE Everest 16.5.1](#).

- **E1 Support on 48-Port T1/E1 CEM Interface Module**

The Cisco ASR 900 RSP3 module now support E1 mode for voice, data, and integrated voice or data applications on the 48-Port T1/E1 Interface Module.

The following features are supported on this interface module:

- ACR and DCR Support
- Alarm History Support
- Loopback and BERT Support
- Performance Monitoring

For more information, see [48-Port T1/E1 CEM Interface Module Configuration Guide, Cisco IOS XE Everest 16.5.1 \(Cisco ASR 900 Series\)](#).

- **E3 Support on 48-Port T3/E3 CEM Interface Module**

The Cisco ASR 900 RSP3 module now support the channels on the E3 interfaces on the 48-Port T3/E3 Interface Module. The channels on E3 interface can be configured as either clear channel mode or channelized mode.

The following features are supported on this interface module:

- ACR and DCR Support
- Alarm History Support
- Loopback and BERT Support
- Performance Monitoring
- DS3 Channelization

For more information, see [48-Port T1/E1 CEM Interface Module Configuration Guide, Cisco IOS XE Everest 16.5.1 \(Cisco ASR 900 Series\)](#).

- **Egress QoS Support on MLPPP Bundle**

Effective with Cisco IOS XE Release Everest 16.5.1, egress QoS support on MLPPP bundle is introduced on the Cisco ASR 900 RSP2 module. For more information, see [Quality of Service Configuration Guidelines, Cisco IOS XE Everest 16.5.1 \(Cisco ASR 900 Series\)](#).

- **Egress Shaping Support on MLPPP Bundle**

Effective with Cisco IOS XE Release Everest 16.5.1, egress shaping support on MLPPP bundle is introduced on the Cisco ASR 900 RSP2 module. For more information, see [Quality of Service Configuration Guidelines, Cisco IOS XE Everest 16.5.1 \(Cisco ASR 900 Series\)](#).

- **Ethernet Dataplane Loopback**

Ethernet dataplane loopback is now supported on the Cisco ASR 900 RSP3 module. For more information, see [Configuring Ethernet Dataplane Loopback](#).

- **Flow-Aware Transport (FAT)**

Flow-Aware Transport Pseudowire (FAT-PW) is now supported on the Cisco ASR 900 RSP3 module, to load-balance traffic in the core, when Equal Cost Multiple Paths (ECMP) exist. FAT is applicable only on Cisco ASR 900 RSP3 module. For more information, see [Flow-Aware Transport \(FAT\) Load Balancing](#).

- **G.8275.2 Telecom Profile**

The Cisco ASR 900 RSP2 and Cisco ASR 900 RSP3 modules now support the ITU- T G.8275.2 telecom profile (PTP telecom profile for Phase and Time-of-day synchronization with partial timing support from the network).

The G.8275.2 is a PTP profile for use in telecom networks where phase or time-of-day synchronization is required. It differs from G.8275.1 in that it is not required that each device in the network participates in the PTP protocol. Also, G.8275.2 uses PTP over IPv4 and IPv6 in unicast mode. For more information, see [G.8275.2 Telecom Profile](#).

- **IPv6 QoS**

Ingress QoS features (classification, marking, and policing) is now supported for IPv6 traffic on Cisco ASR 900 RSP3 module. For more information, see [Quality of Service Configuration Guidelines](#).

- **MAC Security**

The MAC Security is now supported on the Cisco ASR 900 RSP3 module. The MAC Security addresses ports security with service instances by providing the capability to control and filter MAC address learning behavior. For more information, see [MAC Security](#).

- **MC-LAG**

Multichassis link aggregation group (MC-LAG) is supported on Cisco ASR 900 RSP3 module. For more information, see [Multichassis LACP](#).

- **MLDPv4 and MLDPv6 Support**

MLDP is supported on the Cisco ASR 900 RSP3 module. For more information, see [IP Multicast: Multicast Configuration Guide](#).

- **OAM (Link OAM, CFM and Y.1731) Support on Port Channel**

The Cisco ASR 900 RSP3 module now supports Operations, Administration and Maintenance (OAM) on port channel. For more information, see [Carrier Ethernet Configuration Guide, Cisco IOS XE Everest 16.5.1 \(Cisco ASR 900 Series\)](#).

- **OTN Wrapper**

Optical Transport Network (OTN) Wrapper feature provides robust transport services that leverage many of the benefits such as resiliency and performance monitoring, while adding enhanced multi-rate capabilities in support of packet traffic, plus the transparency required by Dense Wavelength Division Multiplexing (DWDM) networks. OTN is the ideal technology to bridge the gap between next generation IP and legacy Time Division Multiplexing (TDM) networks by acting as a converged transport layer for newer packet-based and existing TDM services. OTN is defined in ITU G.709 and allows network operators to converge networks through seamless transport of the numerous types of legacy protocols, while providing the flexibility required to support future client protocols.

OTN Wrapper feature is supported on the following interface modules:

- 8-port 10 Gigabit Ethernet Interface Module (8x10GE) (A900-IMA8Z) - The encapsulation type is OTU1e and OTU2e.
- 2-port 40 Gigabit Ethernet QSFP Interface Module (2x40GE) (A900-IMA2F) - The encapsulation type is OTU3.
- 1-port 100 Gigabit Ethernet Interface Module (1X100GE) (A900-IMA1C) - The encapsulation type is OTU4.

For more information, see [Cisco ASR 900 Router Series Configuration Guide, Cisco IOS XE Everest 16.5.1](#).

- **Service Activation**

ITU-T Y.1564 Ethernet service performance test methodology measures the ability of a network device to enable movement of traffic at the configured data rate. For more information, see [IP SLAs Configuration Guide, Cisco IOS XE Everest 16.5.1 \(Cisco ASR 900\)](#).

- **SSM Support on Cisco 48 X T3/E3 CEM Interface Module**

SSM is transported over T3 links using proprietary method. SSM is supported on the Cisco ASR 900 RSP3 module. SSM enables T3 to select the highest quality timing reference automatically and avoid the timing loops. SSM is supported on Cisco 48-Port T3/E3 CEM Interface Module. Effective Cisco IOS XE Everest 16.5.1, E3 mode is not supported. For more information, see [Cisco ASR 900 Router Series Configuration Guide, Cisco IOS XE Everest 16.5.1](#).

- **Support for Optic ONS-SI-2G-S1**

The ONS-SI-2G-S1 is supported on the 1-Port OC-192 or 8-Port Low Rate CEM IM. For more information, see [Cisco ASR 900 Series Aggregation Services Routers Optics Matrix](#).

- **Support of Adaptive Clock Recovery (ACR) on 8-port T1/E1 Interface Module**

Adaptive Clock Recovery (ACR) is most commonly used for Circuit Emulation (CEM). ACR is an averaging process that negates the effect of random packet delay variation and captures the average rate of transmission of the original bit stream. ACR recovers the original clock for a synchronous data stream from the actual payload of the data stream. In other words, a synchronous clock is derived from an asynchronous packet stream. ACR is a technique where the clock from the TDM domain is mapped through the packet domain.

Effective Cisco IOS XE Everest 16.5.1, ACR is supported on 8-port T1/E1 interface module. For more information, see [Configuring Pseudowire](#).

- **Table Map MDT Index Optimization**

Effective with Cisco IOS XE Everest Release 16.5.1, if the same table-mapping is applied on multiple interfaces, the MDT index is shared across these interfaces. Thus increased scaling of table-map is possible if table-mapping is reused. For more information see [QoS: Classification Configuration Guide](#) and [Quality of Service Configuration Guidelines](#).

- **TWAMP Responder with VRF support**

The Cisco ASR 900 RSP2 and Cisco ASR 900 RSP3 modules now support IETF Two-Way Active Measurement Protocol (TWAMP) responder on a Cisco device measures IP performance between the Cisco device and a non-Cisco TWAMP control device on the network. For more information, see [IP SLAs TWAMP Responder](#).

- **VPLS over Port-channel and BDI**

Effective with Cisco IOS XE Everest 16.5.1, Cisco ASR 900 RSP3 module supports VPLS over Port-channel (PoCH) and bridge domain interfaces (BDI).

For information more information, see [MPLS Layer 2 VPNs Configuration Guide, Cisco IOS XE Release 3S \(Cisco ASR 900 Series\)](#).

