New Features in Cisco IOS XE 3.18SP Releases

This chapter provides information about the new features introduced in the Cisco IOS XE Release 3.18SP.

This chapter includes the following sections:

New Hardware Features in Cisco IOS XE Release 3.18.9SP

There are no new features introduced for Cisco IOS XE Release 3.18.9SP.

New Software Features in Cisco IOS XE Release 3.18.9SP

There are no new features introduced for Cisco IOS XE Release 3.18.9SP.

New Hardware Features in Cisco IOS XE Release 3.18.8aSP

There are no new features introduced for Cisco IOS XE Release 3.18.8aSP.

New Software Features in Cisco IOS XE Release 3.18.8aSP

There are no new features introduced for Cisco IOS XE Release 3.18.8aSP.

New Hardware Features in Cisco IOS XE Release 3.18.7SP

There are no new features introduced for Cisco IOS XE Release 3.18.7SP.

New Software Features in Cisco IOS XE Release 3.18.7SP

There are no new features introduced for Cisco IOS XE Release 3.18.7SP.

New Hardware Features in Cisco IOS XE Release 3.18.6SP

There are no new features introduced for Cisco IOS XE Release 3.18.6SP.

New Software Features in Cisco IOS XE Release 3.18.6SP

There are no new features introduced for Cisco IOS XE Release 3.18.6SP.

New Hardware Features in Cisco IOS XE Release 3.18.5SP

There are no new features introduced for Cisco IOS XE Release 3.18.5SP.

New Software Features in Cisco IOS XE Release 3.18.5SP

There are no new features introduced for Cisco IOS XE Release 3.18.5SP.

New Hardware Features in Cisco IOS XE Release 3.18.4SP

There are no new features introduced for Cisco IOS XE Release 3.18.4SP.

New Software Features in Cisco IOS XE Release 3.18.4SP

Multi EFPs for Single BDI Support on Cisco RSP3 Module

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

New Hardware Features in Cisco IOS XE Release 3.18.3SP

There are no new features introduced for Cisco IOS XE Release 3.18.3SP.

New Software Features in Cisco IOS XE Release 3.18.3SP

The following feature is introduced for Cisco IOS XE Release 3.18.3SP.

- MPLS-TE over PoCH

MPLS-TE over PoCH

MPLS-TE over port channel (PoCH) is now supported. For more information see MPLS Traffic Engineering Path Link and Node Protection Configuration Guide, Cisco ASR 900 Series.

New Hardware Features in Cisco IOS XE Release 3.18.2SP

There are no new features introduced for Cisco IOS XE Release 3.18.2SP.

New Software Features in Cisco IOS XE Release 3.18.2SP

The following features are introduced for Cisco IOS XE Release 3.18.2SP.

- VPLS over Port-channel and BDI
- PTP over MPLS Support

VPLS over Port-channel and BDI

Effective with Cisco IOS XE Release 3.18.2SP, Cisco ASR 900 RSP3 Module supports VPLS over Port-channel (PoCH) and bridge domain interfaces (BDI), VPLS over Fast Reroute (VPLSoFRR), VPLS with BGP PIC-Edge, and VPLS with RFC3107.

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

PTP over MPLS Support

In the Cisco IOS XE Release 3.18.2SP, PTP packets carrying MPLS labels are supported in the ingress or egress direction on the Cisco RSP3 module.

New Hardware Features in Cisco IOS XE Release 3.18.1SP

The following features are introduced in Cisco IOS Release 3.18.1SP:

- 4-Port C37.94 Interface Module
- 48-Port T1/E1 CEM Interface Module
- 48-Port T3/E3 CEM Interface Module
- 1-Port OC-192 or 8-Port Low Rate CEM Interface Module Support
- Serial Interface Module

4-Port C37.94 Interface Module

The Cisco (A900-IMA4C3794) is a 4-port interface module that provides IEEE C37.94-2002 compliant Nx64 kbps optical interface ports to the router.

This interface module is supported on the RSP2 module on the ASR 903 and ASR 902 routers.

For information more information, see Cisco ASR 903 Series Aggregation Services Router Hardware Installation Guide.

For information more information, see Cisco ASR 902 Aggregation Services Router Hardware Installation Guide.

48-Port T1/E1 CEM Interface Module

The 48 x T1/E1 interface module provides connectivity for up to 48 x T1/E1 ports through 3 high-density connectors on the front panel. Each port supports 16 TX and RX ports.

This is supported on the RSP3 module on the ASR 903 router.

For information more information, see Cisco ASR 907 Router Hardware Installation Guide.

For information more information, see Cisco ASR 903 Series Aggregation Services Router Hardware Installation Guide

48-Port T3/E3 CEM Interface Module

The 48 X T3/E3 interface module provides connectivity for up to 48 x T3/E3 ports through 3 high-density connectors on the front panel. Each port supports 16 TX and RX ports.

This is supported on the RSP3 module on the ASR 903 router.

For information more information, see Cisco ASR 907 Router Hardware Installation Guide.

For information more information, see Cisco ASR 903 Series Aggregation Services Router Hardware Installation Guide.

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

The 1-Port OC-192 interface module with 8-port low rate CEM interface module is a high density combination interface module. This module supports 1-Port OC-192 and 8 low rate CEM or 1 Gigabit Ethernet port.

This is supported on the RSP3 module on the ASR 903 router.

For information more information, see Cisco ASR 907 Router Hardware Installation Guide.

For information more information, see Cisco ASR 903 Series Aggregation Services Router Hardware Installation Guide.

Serial Interface Module

The serial interface module, which is designed to provide a low-latency communication platform for legacy interfaces. Designed for utilities, the module is hardened to accommodate the wide operating temperature swings, EMI and surge spikes, and dust found in substation environments.

This is supported on the RSP2 module on the ASR 902 router.

For more information, see Cisco ASR 902 Aggregation Services Router Hardware Installation Guide.

New Hardware Features in Cisco IOS XE Release 3.18.1bSP

There are no new features introduced for Cisco IOS XE Release 3.18.1bSP.

Note The Cisco IOS XE 3.18.1bSP release is applicable only on the Cisco ASR900 RSP3 module.

New Software Features in Cisco IOS XE Release 3.18.1SP

The following features are introduced in Cisco IOS Release 3.18.1SP

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

The 1-Port OC-192 or 8-Port Low Rate CEM Interface Module (10G HO / 10G LO) is supported.

The following features are supported on the interface module:

- ACR and DCR Support

Adaptive Clock Recovery (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.

Differential Clock Recovery (DCR) is a technique used for Circuit Emulation (CES) to recover clocks based on the difference between PE clocks. TDM clock frequency is tuned to receive differential timing messages from sending end to the receiving end.

- Alarm History Support

Alarm history or alarm persistence feature enables the maintenance of the history of the port and the path alarms. History of the port-level and path-level alarms are saved into a file and is retained for monitoring network events.

- APS Support

Automatic protection switching (APS) is a protection mechanism for SONET networks that enables SONET connections to switch to another SONET circuit when a circuit failure occurs. A protection interface serves as the backup interface for the working interface. When the working interface fails, the protection interface quickly assumes its traffic load.

1-Port OC-192 and 8-Port OC-48 Interface Modules supports the following SONET protection switching schemes:

  - Linear Bidirectional 1+1 APS
  - Linear Unidirectional 1+1 APS

- Circuit Emulation Support

Circuit Emulation (CEM) is a technology that provides a protocol-independent transport over a packet-based backhaul technology such as MPLS or IP Networks. CEM provides a bridge between a time-division multiplexing (TDM) network and MPLS network. L2VPN over IP/MPLS is also supported on the interface modules.

- ONS Pluggable Optics Support

A comprehensive range of pluggable optical modules is supported.

- OTN Wrapper Support

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. Cisco NCS 4200 acts as an aggregator for ethernet, TDM, and SONET traffic to connect to an OTN network and vice versa. The ports on the interface modules are capable of OTN functionality.

- 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
- Performance Monitoring Support

Performance monitoring (PM) parameters are used by service providers to gather, store, and set thresholds, and to report performance data for early detection of problems.

- QoS Support on CEMoMPLS

The QoS EXP Matching feature allows you to classify and mark network traffic by modifying the Multiprotocol Label Switching (MPLS) experimental bits (EXP) field in IP packets. This feature allows you to organize network traffic by setting values for the MPLS EXP field in MPLS packets. By choosing different values for the MPLS EXP field, you can mark packets so that packets have the priority that they require during periods of congestion.

- SONET Support

Synchronous Optical NETwork (SONET) defines optical signals and a synchronous frame structure for multiplexed digital traffic. SONET is supported on 1-Port OC-192 and 8-Port Low Rate CEM Interface Modules. The transport network using SONET provides much more powerful networking capabilities than existing asynchronous systems. SONET is a set of standards that define the rates and formats for optical networks specified in GR-253-CORE.

For more information, see 1-Port OC-192 or 8-Port Low Rate CEM Interface Module Configuration Guide (Cisco ASR 900 Series).

4-Port C37.94 Interface Module

Starting with Cisco IOS XE 3.18.1SP, 4-port C37.94 interface module is supported on the RSP2 module on the ASR 903 and ASR 902 routers. C37.94 is an IEEE Standard for Nx64 kbps optical fiber interfaces between tele-protection and multiplexer equipment.

For more information, see Configuring IOT Serial Controller Configuration Guide, (Cisco ASR 900 Series).

48-Port T1 CEM Interface Module Support

The 48-port T1 Interface Module is supported on the RSP3 module on the ASR 903 and ASR 907 routers. The 48-port T1/E1 with circuit emulation line card supports generic single or dual-port T1 trunk interfaces for voice, data, and integrated voice or data applications.

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 ASR 900 Series).

48-Port T3 CEM Interface Module Support

The 48-port T3 Interface Module is supported on the RSP3 module on the ASR 903 and ASR 907 routers. The 48-port T3/E3 with circuit emulation line card supports 48 ports. The channels on the T3 interfaces 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
- DS3 Channelization
- MDL Support
- Performance Monitoring

For more information, see 48-Port T3/E3 CEM Interface Module Configuration Guide (Cisco ASR 900 Series).

FlexLSP Inter-area Support on Non-corouted Mode

Flex LSP supports inter-area tunnels with non co-routed mode. For more information on the restrictions for this feature and its configuration details, see MPLS Basic Configuration Guide, Cisco IOS XE Release 3S (ASR 900).

WAN-PHY Support

Effective Cisco IOS XE 3.18.1SP, A900-IMA8Z Interface Modules support LAN/WAN-PHY mode on the ASR 900 RSP3 Module.

For more information, see Cisco ASR 900 Router Series Configuration Guide.

Leap Second

Starting with Cisco IOS-XE Release 3.18.1SP, you can configure the leap second event date and Offset value (+1 or -1) on master ordinary clock, hybrid boundary clock, dynamic ports, and virtual ports.

The following two new keywords are added to the utc-offset command:

- **leap-second**
- **offset**

You can also configure time properties holdover time on boundary clock, hybrid boundary clock, and dynamic ports. The following new command is introduced:

- **time-properties persist**

For more information, see Cisco ASR 900 Router Series Configuration Guide.

For more information, see G.8275.1 Telecom Profile.

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

Port Licensing

Port Licensing is supported on the 1-Port OC-192 or 8-Port Low Rate CEM Interface Module. For more information, see Software Activation Configuration Guide, Cisco IOS XE Release 3S (ASR 903).

Pseudowire Redundancy with Uni-directional Active-Active

Pseudowire redundancy with uni-directional active-active feature configuration allows, pseudowires (PW) on both the working and protect circuits to remain in UP state to allow traffic to flow from the upstream. The **aps l2vpn-state detach** command and **redundancy all-active replicate** command is introduced to configure uni-directional active-active pseudo wire redundancy.

This feature is introduced on the ASR 900 RSP1 module.

For more information, see Time Division Multiplexing Configuration Guide, Cisco IOS XE Release 3S (Cisco ASR 900 Series).

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

For more information, see Cisco IOS Wide-Area Networking Command Reference.

New Software Features in Cisco IOS XE Release 3.18.1bSP

There are no new features introduced for Cisco IOS XE Release 3.18.1bSP.

Note The Cisco IOS XE 3.18.1bSP release is applicable only on the Cisco ASR900 RSP3 module.

New Hardware Features in Cisco IOS XE Release 3.18SP

There are no new features introduced for Cisco IOS XE Release 3.18SP.

New Software Features in Cisco IOS XE Release 3.18SP

The following features are introduced in Cisco IOS Release 3.18SP

- 802.1ad
- DHCPv4 Snooping and DHCPv6
- EPL and EVPL using Local Connect
- Legacy Ethertypes
- Flex LSP
- Flexible Netflow Support

- G8275.1 Support
- IPsec
- IPV6 Multicast PIM
- IPV6 Access Control Lists
- IPv6 VPN4 & VPNv6
- MPLS TE FRR
- OTN Wrapper
- PTP Interoperability Improvements
- QoS Support on Ether Channel LACP Active Standby (1:1)
- VRRPv3 Support
- QoS Support on Ether Channel LACP Active Standby (1:1)
- SSM Support on Cisco ASR 900 Series 4-Port OC3/STM1 or 1-Port OC12/STM4 Module
- SSM Support on Cisco ASR 900 Series 4-Port OC3/STM1 or 1-Port OC12/STM4 Module
- Support for G.8273.2 Telecom Recommendation
- X21 Circuit Emulation Service
- VRRPv3 Support

802.1ad

Configuring IEEE 802.1ad is supported on ASR900 RSP3 Module. IEEE 802.1ad enables the service providers to use the architecture and protocols of IEEE 802.1Q to offer separate LANs, bridged local area networks, or virtual bridged local area networks to a number of customers, with minimal cooperation or no cooperation between each customer and the service provider.

For more information, see Carrier Ethernet Configuration Guide (Cisco ASR 900 Series)

DHCPv4 Snooping and DHCPv6

DHCP v4 Snooping and DHCP are supported on ASR900 RSP3 Module. DHCP is widely used in LAN environments to dynamically assign host IP addresses from a centralized server, which significantly reduces the overhead of administration of IP addresses. DHCP also helps conserve the limited IP address space because IP addresses no longer need to be permanently assigned to hosts; only those hosts that are connected to the network consume IP addresses.

For more information, see Configuring DHCP Features on the Cisco ASR 903 Router

EPL and EVPL using Local Connect

EPL and EVPL using Local connect are supported on ASR900 RSP3 Module. Local connect (Layer 2 point to point service) is a point to point connection. It transparently transmits packet between two service instances which are configured on the same box. Local connect only connects two end points (service instances). This is different from the traditional L2 bridging.

For more information, see Carrier Ethernet Configuration Guide (Cisco ASR 900 Series)

Legacy Ethertypes

Legacy Ethertype is supported on ASR900 RSP3 Module. With the custom dot1q ethertype, you can select a non-standard (0x9100 and 0x9200) 2-byte ethertype in order to identify 802.1Q tagged frames. The router is allowed to interoperate with third party vendors' switches that do not use the standard 0x8100 ethertype to identify 802.1Q-tagged frames. For instance, if 0x9100 ethertype is used as the custom dot1q ethertype on a particular port, incoming frames containing the ethertype are assigned to the VLAN contained in the tag, immediately following the ethertype. Frames that arrive on that same port containing ethertypes other than 0x9100 are forwarded to service instance with default encapsulation, if present.

The interface can be configured with the following ethertypes:

- 0x9100
- 0x9200

For more information, see Configuring Ethernet Virtual Connections on the Cisco ASR 903 Router

Flex LSP

Effective IOS-XE 3.18SP, Cisco ASR 900 Series Routers (RSP3 Module) support Flex Label Switched Paths (Flex LSPs).

Flex LSPs are LSP instances where the forward and the reverse direction paths are setup, monitored and protected independently and associated together during signaling. You use a RSVP Association object to bind the two forward and reverse LSPs together to form either a co-routed or non co-routed associated bidirectional TE tunnel.

For more information, see MPLS Basic Configuration Guide, Cisco IOS XE Release 3S (ASR 900)

Flexible Netflow Support

Netflow Monitoring is supported on RSP2 module. NetFlow provides data to enable network and security monitoring, network planning, traffic analysis, and IP accounting.

The following features are supported for Netflow:

- Netflow—IPv4 and IPv6 unicast flows
- Netflow Export over IPv4 and IPv6 addresses
- ISSU and SSO

For more information, see Flexible Netflow Configuration Guide (Cisco ASR 900 Series).

G8275.1 Support

G8275.1 feature is supported on ASR 900 RSP3 module.

For more information, see Compatibility Matrix Cisco ASR 900 Series.

IPsec

Starting with Cisco IOS-XE Release 3.18SP, IPsec tunnel is supported only on the Cisco ASR903 and ASR907 routers with payload encryption (PE) images.

Note IPsec license must be acquired and installed on the router for IPsec to work.

Note NPE images shipped for Cisco ASR 900 routers do not support data plane encryptions. However, control plane encryption is supported with NPE images, with processing done in software, without the crypto engine.

The following features are supported for IPSec:

- Internet Key Exchange (IKE) for IPsec
- IKEv1 and IKEv2 Transform sets
- IPSec Virtual Tunnel Interfaces
- Encrypted Preshared Key
- IPSec Dead Peer Detection
- IPsec Anti-replay Window
- Public Key Infrastructure (PKI) support for IPSec

For more information, see IPsec Configuration Guide, (Cisco ASR 900 Series).

Starting with Cisco IOS-XE Release 3.18SP, Public Key Infrastructure (PKI) is supported on Cisco ASR 903 and Cisco ASR 907 routers.

The following features are supported for PKI:

- Deploying RSA Keys for PKI
- Authorization and Enrollment of Certificates
- CRL Support for PKI
- Certificate Enrollment for PKI
- OCSP

For more information on understanding and configuring PKI, see Public Key Infrastructure Configuration Guide.

IPV6 Multicast PIM

IPV6 Multicast PIM is supported on ASR 900 RSP3 module. Protocol Independent Multicast (PIM) is used between devices so that they can track which multicast packets to forward to each other and to their directly connected LANs. PIM works independently of the unicast routing protocol to perform send or receive multicast route updates like other protocols. Regardless of which unicast routing protocols are being used in the LAN to populate the unicast routing table, Cisco IOS PIM uses the existing unicast table content to perform the Reverse Path Forwarding (RPF) check instead of building and maintaining its own separate routing table.

For more information, see IP Multicast: Multicast Configuration Guide, Cisco IOS XE Release 3S (Cisco ASR 900 Series)

IPV6 Access Control Lists

IPV6 Access Control Lists is supported on ASR 900 RSP3 Module. Access lists determine what traffic is blocked and what traffic is forwarded at device interfaces and allow filtering of traffic based on source and destination addresses, and inbound and outbound traffic to a specific interface. Standard IPv6 ACL functionality was extended to support traffic filtering based on IPv6 option headers and optional, upper-layer protocol type information for finer granularity of control. Standard IPv6 ACL functionality was extended to support traffic filtering based on IPv6 option headers and optional, upper-layer protocol type information for finer granularity of control.

For more information, see Security Configuration Guide: Access Control Lists, Cisco IOS XE Release 3S (ASR 900 Series)

IPv6 VPN4 & VPNv6

Starting with release 3.18SP, this feature is supported on the ASR 900 RSP3 module.

For more information, see Layer 3 VPNs Configuration Guide, Cisco IOS XE Release 3S (Cisco ASR 900 Series).

MPLS TE FRR

Effective XE 3.18SP, this feature is supported on the ASR 900 RSP3 module.

For more information, see MPLS Traffic Engineering Path Link and Node Protection Configuration Guide, Cisco IOS XE Release 3S (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. Cisco ASR 900 Series Routers acts as an aggregator for ethernet, TDM, and SONET traffic to connect to an OTN network and vice versa. The ports on the interface modules are capable of OTN functionality.

OTN Wrapper feature is supported on the following interface modules:

- 8x10GE (A900-IMA8Z) - The encapsulation type is OTU1e and OTU2e.
- 2x40GE (A900-IMA2F) - The encapsulation type is OTU3

For more information, see Cisco ASR 900 Router Series Configuration Guide.

PTP Interoperability Improvements

- Threshold Clock-Class
- Threshold QL for NetSync Algorithm
- UTC Offset

Threshold Clock-Class

This release introduces support to set the threshold clock-class value. This allows the PTP algorithm to use the time stamps from an upstream master clock, only if the clock-class sent by the master clock is less than or equal to the configured threshold clock-class.

The following command is supported: **min-clock-class**

For more information, see Configuring a Hybrid Boundary Clock

Threshold QL for NetSync Algorithm

This release introduces support to set the threshold QL value for the input frequency source. The input frequency source, which is better than or equal to the configured threshold QL value, is selected to recover the frequency. Otherwise, the internal clock is selected.

The following command is supported: **network-clock synchronization input-threshold**

For more information, see Configuring a Hybrid Boundary Clock

UTC Offset

This release introduces support to set the UTC Offset value.

The following command is supported: **utc-offset**

For more information, see Configuring a Master Ordinary Clock

QoS Support on Ether Channel LACP Active Standby (1:1)

Link Aggregation Control Protocol (LACP) supports the automatic creation of ether channels by exchanging LACP packets between LAN ports. LACP packets are exchanged only between ports in passive and active modes. The support of Aggregate QoS method with single member link is introduced with the introduction of LACP 1:1 Active/Standby Etherchannel QOS support.

To use the hot standby or active standby or 1:1 feature in the event an ether channel fails, both ends of the LACP bundle must support the **lacp max-bundle** command.

For more information, see *QoS Support on Ether Channel LACP Active Standby (1:1)*.

8K EFP with 4 Queue Model

In Cisco IOS XE Release 3.18SP, the 8K EFP (4 Queue Model) support allows up to 8000 EFPs at the system level. This feature is enabled with a specific sdm template, **enable_8k_efp.**

For more information, see Quality of Service Configuration Guidelines for Cisco ASR 900 Router Series

SSM Support on Cisco ASR 900 Series 4-Port OC3/STM1 or 1-Port OC12/STM4 Module

SSM is carried over OC-3 and OC-12 optical links. The SSM is transported in the S1 byte when it is carried over an optical line for SONET and SDH. The SSM messages enable SONET and SDH devices to select the highest quality timing reference automatically and avoid the timing loops.

SSM is supported on Cisco ASR 900 Series 4-Port OC3/STM1 or 1-Port OC12/STM4 Module. It has four ports and the default rate is OC-3. OC-3 rate is supported on all the four ports and OC-12 rate is supported on first port only.

For more information, see *Configuring Synchronous Ethernet ESMC and SSM.*

Storm Control

Storm Control is supported on ASR 900 RSP3 Module. A traffic storm occurs when packets flood the LAN, creating excessive traffic and degrading network performance. The traffic broadcast and multicast suppression (or storm control) feature prevents LAN ports from being disrupted by a broadcast, multicast and unicast traffic storm on physical interfaces.

For more information, see Security Configuration Guide: Broadcast and Multicast Suppression, Cisco IOS XE Release 3S (ASR 900 Series)

Support for G.8273.2 Telecom Recommendation

Effective with Cisco IOS-XE Release 3.18SP, Cisco ASR 900 routers with RSP2 and RSP3 module support the G.8273.2 telecom recommendation.

For more information, see G.8275.1 Telecom Profile

X21 Circuit Emulation Service

The X21 Circuit Emulation feature enables transporting x21 traffic over MPLS core.

For more information, see *X21 CESoPSN Configuration Guide for Cisco ASR 900 Router Series*

VRRPv3 Support

VRRPv3 feature is supported on ASR 900 RSP3 Module.

Increase in VRRP Group Scale on the RSP3 module

The supported VRRP group scale is increased to 256 VRRPv3 groups (both IPv4 and IPv6) based on VRRP virtual MAC address.

- The group numbers for either IPv4 or IPv6 can be configured only from 1 to 255. VRRPv3 groups can be scaled up to 255, only if either IPv4 or IPv6 configured individually. If both IPv4 and IPv6 groups are scaled together, up to 256 groups can be scaled in any combination (for example, 128 IPv4 + 128 IPv6 groups)
- VRRPv3 group numbers can be reused multiple times. If VRRPv3 groups are repeated, the virtual MAC address scale should not exceed 256. If the assigned virtual MAC address crosses 256, then unpredictable behavior may be expected.

For more information, see *VRRPv3 Protocol Support*

For more information, see Compatibility Matrix Cisco ASR 900 Series.