New Features in Cisco IOS XE 3.10S Releases

This chapter provides information about the new features introduced in the Cisco IOS XE Release 3.10S.

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- New Hardware Features in Cisco IOS XE Release 3.10.2S, page 6-1
- New Hardware Features in Cisco IOS XE Release 3.10.1S, page 6-1
- New Hardware Features in Cisco IOS XE Release 3.10S, page 2
- New Software Features in Cisco IOS XE Release 3.10.2S, page 6-3
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New Hardware Features in Cisco IOS XE Release 3.10.2S

There are no new hardware features introduced for Cisco IOS XE Release 3.10.2.S.

New Hardware Features in Cisco IOS XE Release 3.10.1S

The IOS XE 3.10S Release for the Cisco ASR 903 Router introduces the following hardware features:

DC PEM Module (A900-PWR550-D-E)

The power supply provides 550 W output power for system 12 V power. The power supply is field replaceable, hot-swappable, and operates separately from the fan tray. The power supply contains a front panel with mounting screws, a handle for insertion and removal, and two status LEDs. No ON/OFF switch is provided

The A900-PWR550-D-E DC PEM module has a T-shaped power input terminal connector. For information on DC PEM module specifications, see Cisco ASR 903 router Overview. For information on installing the connector, see Installing the Cisco ASR 903 Series Aggregation Services Router.

Fan Tray (A903-FAN-E)

The A903-FAN-E is a fan tray containing twelve (40 x 40 x 20 mm) fans and provides sufficient capacity to maintain operation indefinitely in the event of an individual fan failure. For information on installing the fan tray, see Installing the Cisco ASR 903 Series Aggregation Services Router.

Dust Filter (A903-FAN-F)

The dust filter on the fan tray is a quadrafoam 45PPI filter which is 85 percent dust resistant. For information on installing the dust filter, see Installing the Cisco ASR 903 Series Aggregation Services Router.

Dummy Cover (A903-FAN-F-B)

A dummy cover (A903-FAN-F-B) secures the dust filter in the chassis. For installing the fan filter, see For information on installing the dummy cover on the fan tray, see Installing the Cisco ASR 903 Series Aggregation Services Router.

Cable Bracket (A903-CAB-BRACKET)

The cable management bracket helps in routing the cables from the interface modules; therefore enabling a proper cable bending radius. For installing the bracket, see Installing the Cisco ASR 903 Series Aggregation Services Router.

Air Plenum

Air Plenum or air baffle assembly is used change the air flow pattern of the unit. When the router is installed with the plenum, the air flow pattern is changed from side-side to front-back. For information on ordering the air plenum, see Installing the Cisco ASR 903 Series Aggregation Services Router.

New Hardware Features in Cisco IOS XE Release 3.10S

The IOS XE 3.10S Release for the Cisco ASR 903 Router introduces the following hardware features:

Serial Interface Module

IOS XE Release 3.10(0)S introduces support for 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.

The combination of the Cisco ASR 903 Router and the serial interface module enables migration from TDM and serial networks to an IP-based network that can control latency and jitter across the network and enable multiple Smart Grid applications.

The Cisco ASR 903 Serial Interface Module supports the following standards:

- EEE 1613 2009—IEEE Standard for Environmental and Testing Requirements for Communications Networking Devices in Electric Power Substations
- EC 61850-3—IEC standard specifying general requirements for substation automation systems (SAS) communications and related system requirements.
- EC 60870-2-1:1995—IEC standard for substation environmental conditions
- EC 60870-2-2:1996—IEC standard for substation environmental conditions
- EC 61000-6-5:2001—IEC standard defining immunity for power station and substation environments

For information on how to install the serial interface module, see the *Cisco ASR 903 Hardware Installation Guide*.

For information on how to configure the serial interface module, see *Configuring Raw Socket Transport on the Cisco ASR 903 Router.*

Note We recommend the installation of the Metro IP Services and Metro Aggregation Services licenses with serial interface module. For more information about obtaining and installing licenses, see Software Licensing Overview.

CWDM SFP

Cisco IOS XE Release 3.10S introduces support for the following SFPs on the 10 Gigabit Ethernet XFP Interface Module:

- ONS-XC-10G-EP
- ONS-XC-10G-1470
- ONS-XC-10G-1490
- ONS-XC-10G-1510
- ONS-XC-10G-1530
- ONS-XC-10G-1550
- ONS-XC-10G-1570
- ONS-XC-10G-1590
- ONS-XC-10G-1610

For more information about how to configure these SFPs, see:
http://www.cisco.com/en/US/partner/docs/interfaces_modules/transceiver_modules/installation/note/OL_24246.html

http://www.cisco.com/en/US/partner/products/hw/modules/ps5455/tsd_products_support_series_home.html

New Software Features in Cisco IOS XE Release 3.10.2S

There are no new software features introduced for Cisco IOS XE Release 3.10.2.S.

New Software Features in Cisco IOS XE Release 3.10.1S

There are no new software features introduced for Cisco IOS XE Release 3.10.1.S.

New Software Features in Cisco IOS XE Release 3.10S

The following features are introduced in Cisco IOS Release 3.10S.

- Access Circuit Redundancy, page 6-4
- Access Switch Device Manager Template, page 6-4
- Auto-IP, page 6-5
- BFD Debug Enhancement, page 6-5
- Bidirectional Forwarding Detection Deterministic Hardware Offload, page 6-5
- Broadcast and Multicast Suppression, page 6-5
- IGMP Snooping, page 6-5
- Licensing the OC-3 and OC-12 Interface Modules, page 6-6
- Multichassis LACP, page 6-6
- Pseudowire Group Switchover, page 6-6
- Remote LFA FRR Protection for TDM and ATM Pseudowires, page 6-7
- Remote LFA FRR and Labeled BGP PIC FRR Integration, page 6-8
- VPLS over Remote LFA, page 6-9

Access Circuit Redundancy

Access Circuit Redundancy (ACR) enables local switching for circuit emulation (CEM) interfaces by creating a virtual CEM-ACR interface. All configuration changes made on the virtual CEM-ACR interface are applied automatically on both the Working and Protect interfaces.

For more information see, *Configuring Access Circuit Redundancy on the Cisco ASR 903 Router*.

Access Switch Device Manager Template

The Switch Device Manager (SDM) templates are used to optimize system resources in the router to support specific features, depending on how the router is used in the network. The SDM templates allocate Ternary Content Addressable Memory (TCAM) resources to support different features.

Note SDM templates are supported only by the Metro Aggregation Services license.

For more information see, *Configuring Access Switch Device Manager Template on the Cisco ASR 903 Router.*

Auto-IP

The Auto-IP feature addresses the problem of manually reconfiguring nodes during insertion, deletion, and movement of nodes within an auto-IP ring. The auto-IP feature automatically provides IP addresses to the node interfaces inserted into an auto-IP ring.

For more information, see *Auto-IP*.

BFD Debug Enhancement

The Bidirectional Forwarding Detection (BFD) Debug Enhancement feature enhances the BFD debug messages and the show command output and enables logs and history for critical BFD events. This feature helps network engineers and operators to easily identify any issues with BFD sessions or events.

The following commands were introduced for this feature: monitor event-trace bfd, monitor event-trace bfd event, monitor event-trace bfd packet, and show monitor event-trace bfd.

For more information, refer to the *IP Routing: BFD Configuration Guide, Cisco IOS XE Release 3S (Cisco ASR 903)*, *IP Routing Protocol-Independent Commands A through R*, and *IP Routing Protocol-Independent Commands S through T*.

Bidirectional Forwarding Detection Deterministic Hardware Offload

The Bidirectional Forwarding Detection (BFD) deterministic hardware offload feature allows you to define the BFD transmission timer value. Any BFD sessions below or equal to the set value are sent to hardware.

For more information see, *Bidirectional Forwarding Detection Deterministic Hardware Offload.*

Broadcast and Multicast Suppression

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.

Storm control prevents traffic on a LAN from being disrupted by a broadcast, multicast, or unicast storm on a port. Storm control is applicable for physical interfaces and is used to restrict the unicast, broadcast and multicast ingress traffic on the Layer2 interfaces. The feature is disabled by default on the Cisco ASR 903 router.

For more information see, *Configuring Broadcast and Multicast Suppression on the Cisco ASR Router.*

IGMP Snooping

IP Multicast Internet Group Management Protocol (IGMP), which runs at Layer 3 on a multicast device, generates Layer 3 IGMP queries in subnets where the multicast traffic must be routed. IGMP (on a device) sends out periodic general IGMP queries.

IGMP Snooping is an Ethernet Virtual Circuit (EVC)-based feature set. When IGMP snooping is enabled on a bridge domain, the bridge domain interface responds at Layer 2 to the IGMP queries with only one IGMP join request per Layer 2 multicast group. Each bridge domain represents a Layer 2 broadcast domain.

For more information see, *Configuring IGMP Snooping on Cisco ASR 903 Router*.

Licensing the OC-3 and OC-12 Interface Modules

The optical modules 4-Port OC3/STM-1 or 1-Port OC12/STM-4 delivers four active ports of OC-3 interface module (IM) or Synchronous Transport Module level 1 (STM-1) connectivity, or one active port of OC-12 IM or STM-4 connectivity, on the Cisco ASR 903 Router. Licensing is applicable to these ports on the interface modules.

The benefits of licensing these ports are:

- Facilitate the pay-as-you-grow model to enhance the ports by purchasing licenses as required.
- Provide the ability to shift license from one port to another.
- Provide the ability to release a license when the interface module is removed from a slot and reinstall the license when inserted again.
- Support for high availability and OIR of interface modules.

Table 6-1 lists the license supported on the OC-3 and OC-12 interface modules.

Table 6-1 OC-3 and OC-12 Port Licenses

License Type	Description	Usability
1 OC3 port license	Single OC3/STM-1 port	STM-1 on OC-3 port
1 OC12 port license	Single OC12/STM-4 port	STM-1 on OC-3 port

For more information see, *Licensing the OC-3 and OC-12 Interface Modules on the Cisco ASR 903 Router*.

Multichassis LACP

Cisco's Multichassis EtherChannel (MCEC) solution addresses the need for interchassis redundancy mechanisms, where a carrier wants to "dual home" a device to two upstream points of attachment (PoAs) for redundancy. Some carriers either cannot or will not run loop prevention control protocols in their access networks, making an alternative redundancy scheme necessary. MCEC addresses this issue with enhancements to the 802.3ad Link Aggregation Control Protocol (LACP) implementation. These enhancements are provided in the Multichassis LACP (mLACP) feature.

For more information, see *Multichassis LACP*.

Pseudowire Group Switchover

Currently, pseudowire switchovers to the backup pseudowires occur one by one from IOS to platform dataplane and can take up to four seconds for 1000 pseudowires. The group switchover feature reduces this switchover time by efficiently grouping status messages in both Label Distribution Protocol (LDP) and internal Inter-Process Communications (IPCs).

Note The Pseudowire Group Switchover feature is enabled by default and cannot be disabled.

For more information, see *Cisco ASR 903 Router Chassis Software Configuration Guide, IOS XE Release 3.10S*.

Raw Socket

Raw Socket Transport is a method for transporting serial data through an IP network. Raw Socket transports Supervisory Control and Data Acquisition (SCADA) data from Remote Terminal Units (RTUs). This method is an alternative to the Block Serial Tunnel (BSTUN) protocol. Raw Socket supports point-to-point and point-to-multipoint connections. For instructions on how to configure Raw Socket, see Configuring Raw Socket Transport on the Cisco ASR 903 Router.

Raw Socket is supported on the serial interface module. For instructions on how to install the serial interface module, see the Cisco ASR 903 Hardware Installation Guide.

For information on how to configure the serial interface module, see *Configuring Raw Socket Transport on the Cisco ASR 903 Router.*

Note We recommend the installation of the Metro IP Services and Metro Aggregation Services licenses with serial interface module. For more information about obtaining and installing licenses, see *Software Licensing Overview*.

Hardware Limitations

Serial Interface Module Limitations—The following limitations apply to the serial interface module:

- A maximum of 2 serial interface modules are supported on the Cisco ASR 903 Router.
- The serial interface module hardware supports a 230.4 Kbps traffic rate in asynchronous mode. The actual speed is dependent on cable quality and length. The serial interface module hardware supports an 8 Mbps traffic rate in synchronous mode. The actual speed is dependent on cable quality and length.

Software Limitations

Raw Socket limitations—The following software limitations apply to the serial interface module:

- Raw Socket encapsulation is supported on up to 28 serial ports.
- Asynchronous EIA/TIA-232 serial traffic is supported with DB-25, DB-9, and RJ-45 connectors.
- The X.21, V.35, RS-485, EIA-449, EIA-530, and IRIG-B standards are not currently supported by software.
- Synchronous traffic is not currently supported.

Remote LFA FRR Protection for TDM and ATM Pseudowires

Starting with Cisco IOS XE Release 3.10S, the Loop-Free Alternate (LFA) Fast Reroute (FRR) feature is supported for Time-division multiplexing (TDM) pseudowires.

- Circuit Emulation Service over Packet Switched Network (CESoPSN) over MPLS, and Structure-Agnostic Time Division Multiplexing over Packet (SAToP) over MPLS networks for T1, E1, SDH and SONET framing is supported.
- Inverse Multiplexing over ATM (IMA) over MPLS; PVC and PVC sessions are supported for the ATM (IMA).

For more information see, *Configuring Loop-Free Alternate Fast Reroute on the Cisco ASR 903 Router*.

Remote LFA FRR and Labeled BGP PIC FRR Integration

Starting with Cisco IOS XE Release 3.10S, Both the Labeled Border Gateway Protocol (BGP) Prefix-Independent Convergence (PIC) feature and the Loop-Free Alternate (LFA) Fast Reroute (FRR) feature can be configured together on the Cisco ASR 903 router.

For more information see, *Configuring Loop-Free Alternate Fast Reroute on the Cisco ASR 903 Router*.

VPLS over Remote LFA

Starting with Cisco IOS XE Release 3.10, Virtual Private LAN Services (VPLS) is supported on the Cisco ASR 903 router.

For more information see, *Configuring Loop-Free Alternate Fast Reroute on the Cisco ASR 903 Router*.