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New Features in Cisco IOS XE 3.6S Releases

This chapter provides information about the new features introduced in the Cisco IOS XE Release 3.6S.

Note Cisco IOS XE 3.6S inherits all supported features from Cisco IOS Release 3.5, which is not described in this document. For more information about Cisco IOS Release 3.5, see the Release Notes for Cisco IOS XE Release 3S.

This chapter includes the following sections:

New Hardware Features in Cisco IOS XE Release 3.6(2)S

The IOS XE 3.6(2)S Release for the Cisco ASR 903 Router does not introduce any new hardware features.

New Hardware Features in Cisco IOS XE Release 3.6(1)S

The IOS XE 3.6(1)S Release for the Cisco ASR 903 Router does not introduce any new hardware features.

New Hardware Features in Cisco IOS XE Release 3.6S

The IOS XE 3.6(0)S Release for the Cisco ASR 903 Router introduces support for the following hardware features:

- New SFP modules—This release introduces support for the following SFP modules:
  - 1000M SFP-DWDM-SFP
  - 1000M SFP-CWDM
  - 1000M SFP - GLC-ZX-SMD
  - 1000M SFP - GLC-SX-MMD
  - 1000M SFP - GLC-LH-SMD
  - ONS-SI-155-SR-MM
  - ONS-SI-155-I1
  - ONS-SI-155-L1
  - ONS-SI-155-L2
- 4-Port OC3/STM-1 or 1-Port OC12/STM-4 Interface Module—This release introduces support for the A900-IMA4OS interface module. This combo module supports one of four modes: 4xOC3, 4xSTM-1, 1xOC12, and 1xSTM-4. The module supports SDH framing and HDLC encapsulation.

Note The A900-IMA4OS Interface Module requires a license for use. For more information about supported licenses, see Software Licensing Overview, page 2.

Note IOS XE Release 3.6 for the offers a limited set of software features for the A900-IMA4OS Interface Module. For more information, see http://www.cisco.com/en/US/docs/wireless/asr_900/software/guide/chassis/Release3.6.0S/ASR903-Chassis-SW-36.html

New Software Features in Cisco IOS XE Release 3.6(2)S

The IOS XE 3.6(2)S Release for the Cisco ASR 903 Router does not introduce any new software features.

New Software Features in Cisco IOS XE Release 3.6(1)S

The following are the new software features introduced in Cisco IOS XE Release 3.6(1)S:

- OC-3 Interface Module Software Features—Release 3.6(1) introduces support for PPP and MLPPP the OC-3 interface module. For details about this feature, see:
  - http://www.cisco.com/en/US/docs/wireless/asr_900/software/guide/chassis/Release3.6.0S/OC_Ifc_Module.html
  - http://www.cisco.com/en/US/docs/wireless/asr_900/software/guide/chassis/Release3.6.0S/pseudowire.html

  - http://www.cisco.com/en/US/docs/ios/ios_xe/atm/configuration/guide/xe_3s/atm_xe_3s_book.html
  - http://www.cisco.com/en/US/docs/ios/dial/configuration/guide/dia_media-ind_multi_ppp.html
  - http://www.cisco.com/en/US/docs/ios/dial/configuration/guide/dia_async_slip_ppp.html

- PPP MRRU Negotiation Configuration—Introduces support for the **ppp multilink mrru** command, which allows you to specify a Maximum-Receive-Reconstructed-Unit (MRRU) value on MLP interfaces and member links after a change in the MTU value on the interface. For details about this feature, see http://www.cisco.com/en/US/docs/ios/dial/configuration/guide/dia_pppmlp_mrru_neg.html.
- ACFC and PFC Support on Multilink Interfaces—Using the Address and Control Field Compression (ACFC) and PPP Protocol Field Compression (PFC) Support on Multilink Interfaces feature, you can control the negotiation and application of the Link Control Protocol (LCP) configuration options for ACFC and PFC.

  This release introduces support for ACFC and PFC support on serial interfaces on the T1/E1 and optical interface modules. This feature includes support for the following commands:

  - **ppp acfc local** {**request** | **forbid**}
  - **ppp acfc remote** {**apply** | **reject** | **ignore**}
  - **ppp pfc local** {**request** | **forbid**}
  - **ppp pfc remote** {**apply** | **reject** | **ignore**}

  For more information about configuring ACFC and PFC, see the following documents

  - http://www.cisco.com/en/US/partner/docs/interfaces_modules/shared_port_adapters/configuration/7600series/76cfgsip.html#wp1372108
  - http://www.cisco.com/en/US/partner/docs/routers/7600/install_config/flexwan_config/features.html#wp256581
- Egress QoS policies on main physical interface for port shaping + H-policies on EFP—Previous releases did not support QoS policies on interfaces configured with an Ethernet Flow Point (EFP) or port-channel member links with EFPs. This release introduces support for hierarchical QoS policies on EFP interfaces. For more information about how to configure QoS on EFP interfaces, see

  http://www.cisco.com/en/US/docs/wireless/asr_900/software/guide/chassis/Release3.6.0S/ASR903-Chassis-SW-36.html
- Switch Port Analyzer—Release 3.6.1 introduces support for Switch Port Analyzer (SPAN) on physical interfaces. The following commands are supported:

  - **monitor session** {*session_number*} {**source** {**interface** *slot/port*}} [, | - | **rx** | **tx** | **both**]
  - **monitor session** {*session_number*} {**destination** {**interface** *type/num*} [, | -]}

  For more information about SPAN, see http://www.cisco.com/en/US/docs/wireless/asr_900/feature/guides/SPAN.html
- Support for MPLS Labels with PTP traffic- This release introduces support for MPLS labels with PTP Delay-Request packets. The following encapsulation types are supported:

  - VPN
  - BGP IPv4
  - LDP
  - FRR

  The router adds time stamps to MPLS-encapsulated PTP packets by default.

- Reverse Path Forwarding failure handling—This release introduces support for the **platform multicast rpf_fail_handling enable** command. The Cisco ASR 903 Router hardware does not handle RPF fail packets default; you can use this command to enable RPF fail packets handling.

New Software Features in Cisco IOS XE Release 3.6S

The following are the new software features introduced in Cisco IOS XE Release 3.6S:

Note Many of the features supported on the Cisco ASR 903 Router require a license for use. For more information about supported licenses, see Software Licensing Overview, page 2.

- Any Transport over MPLS (AToM)—ATM AAL5 over MPLS (AAL5oMPLS)—The AAL5 Transport over MPLS feature provides an ATM permanent virtual circuit (PVC) transport service for transporting AAL5 PDUs across an IP/MPLS backbone with rate-limit policing and configurable PVC priority value. A dynamic MPLS tunnel is configured to enable label imposition and disposition of encapsulated ATM PDUs transported between two edge routers having a Label Distribution Protocol (LDP) neighbor relationship. For details about this feature, see:
  - http://www.cisco.com/en/US/docs/ios-xml/ios/mp_l2_vpns/configuration/15-2s/mp-any-transport.html
  - http://www.cisco.com/en/US/docs/ios/ios_xe/mpls/configuration/guide/mp_any_transport_xe.html
  - http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_any_transport.html
  - http://www.cisco.com/en/US/docs/wireless/asr_900/software/guide/chassis/Release3.6.0S/ASR903-Chassis-SW-36.html
- BFD IPv6 Encapsulation—This feature introduces support for IPv6 addresses with the BFD protocol. For details about this feature, see http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-bfd.html
- BGP PIC Edge for IP/MPLS—This feature introduces support for BGP PIC Edge for IP/MPLS for sub-second convergence for IP and MPLS-VPN. For details about this feature, see:
  - http://www.cisco.com/en/US/partner/docs/ios-xml/ios/iproute_bgp/configuration/xe-3s/asr903/irg-xe-3s-asr903-book.html
  - http://www.cisco.com/en/US/docs/ios/iproute_bgp/configuration/guide/irg_bgp_mp_pic.html
  - http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_bgp/configuration/15-2mt/irg-bgp-mp-pic.html
- CFM over EFP interface with xconnect—This feature provides support for IEEE 802.1ag draft 8.1-compliant CFM functionality on pseudowire & VFI interfaces. For details about this feature, see:
  - http://www.cisco.com/en/US/docs/wireless/asr_900/feature/guides/CFM_EFP_xconnect.html
  - http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap4.html
- CFM on Port-Channel Interfaces—This feature provides support for IEEE 802.1ag (CFM) on port-channel interfaces for end-to-end connectivity fault management on Ethernet networks. For details about this feature, see:
  - http://www.cisco.com/en/US/docs/ios/cether/configuration/guide/ce_cfm.html

  - http://www.cisco.com/en/US/docs/ios/ipsla/configuration/guide/sla_metro_ethernet.html
  - http://www.cisco.com/en/US/partner/docs/ios-xml/ios/cether/configuration/xe-3s/ce-cfm.html
- Class-based QoS MIB—This feature introduces support for the class-based QoS MIB. For details about this feature, see http://www.cisco.com/en/US/docs/wireless/asr_900/mib/guide/asr903mib.html
- Egress QoS Marking—This feature introduces support for QoS marking on egress interfaces. For details about this feature, see http://www.cisco.com/en/US/docs/wireless/asr_900/software/guide/chassis/Release3.6.0S/ASR903-Chassis-SW-36.html
- Egress QoS Policing—This feature introduces support for QoS policing on egress interfaces. For details about this feature, see http://www.cisco.com/en/US/docs/wireless/asr_900/software/guide/chassis/Release3.6.0S/ASR903-Chassis-SW-36.html
- E-OAM-CFM CCM Hardware Offload—The router automatically offloads processing of Continuity Check (CC) messages if the CC interval is less than 1 second.
- H-VPLS N-PE Redundancy for MPLS Access—This feature allows user provider (U-PE) devices to be dual-homed to network provider edge (N-PE) devices in a loop-free topology with MPLS as the access/aggregation domain. For details about this feature, see:
  - http://www.cisco.com/en/US/docs/ios-xml/ios/mp_l2_vpns/configuration/12-2sy/mp-hvpls-npe-red.html
  - http://www.cisco.com/en/US/docs/ios-xml/ios/mp_l2_vpns/configuration/xe-3s/mp-hvpls-npe-red.html
- IPv6 Quality of Service Classification—This feature allows you to define traffic classes, create and configure traffic policies (policy maps), and attach those traffic policies to interfaces. The Cisco ASR 903 Router supports classification of IPv6 traffic based on DSCP or Precedence values on ingress and egress interfaces. For details about this feature, see
  - http://www.cisco.com/en/US/docs/ios-xml/ios/ipv6/configuration/xe-3s/ip6-qos.html
  - http://www.cisco.com/en/US/docs/wireless/asr_900/software/guide/chassis/Release3.6.0S/ASR903-Chassis-SW-36.html
- IPv6 Quality of Service Marking—This feature introduces support for marking IPv6 traffic with DSCP or Precedence values. IPv6 QoS is supported on ingress and egress interfaces. For details about this feature, see
  - http://www.cisco.com/en/US/docs/ios/ios_xe/ipv6/configuration/guide/ip6-qos_xe.html
  - http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-qos.html
  - http://www.cisco.com/en/US/docs/wireless/asr_900/software/guide/chassis/Release3.6.0S/ASR903-Chassis-SW-36.html
- ISIS IPv4 Loop Free Alternate Fast ReRoute (LFA FRR) for VPLS Core—IPFRR (IP Fast ReRoute) is a set of technologies used in order to rapidly converge traffic flows around link and/or node failures. For details about this feature, see http://www.cisco.com/en/US/docs/ios/iproute_isis/configuration/guide/irs_ipv4_lfafrr.html
- ITU-T G.8032 Ethernet Ring Protection Switching—This feature implements protection switching mechanisms for Ethernet layer ring topologies. This feature uses the G.8032 Ethernet Ring Protection (ERP) protocol, defined in ITU-T G.8032, to provide protection for Ethernet traffic in a ring topology, while ensuring that there are no loops within the ring at the Ethernet layer. The loops

are prevented by blocking either a pre-determined link or a failed link. For details about this feature, see http://www.cisco.com/en/US/docs/ios-xml/ios/cether/configuration/xe-3s/ce-g8032-ering-pro.html

- L2 ACL on Service Instance—This is a security feature which customers can apply to an EVC interface to filter packets based on their MAC address. For details about this feature, see http://www.cisco.com/en/US/docs/ios-xml/ios/cether/configuration/xe-3s/ce-l2acl-evc.html
- L2PT - Layer 2 Protocol Tunneling on Trunk Ports—Layer 2 protocol tunneling makes control protocol PDUs such as STP, CDP, and VTP, transparent to the service provider cloud when passing traffic through trunk ports. For details about this feature, see http://www.cisco.com/en/US/docs/ios-xml/ios/wan_lserv/configuration/xe-3s/wan-lserv-xe-3s-book.html
- MLPPP - Multilink PPP—Multilink PPP (also referred to as MP, MPPP, MLP, or Multilink) provides a method for spreading traffic across multiple physical WAN links and is described in RFC1990. For details about this feature, see:
  - http://www.cisco.com/en/US/docs/ios/dial/configuration/guide/dia_media-ind_multi_ppp.html

Note Limitations apply when configuring MLPPP. For more information, see Chapter 6, "Restrictions and Caveats in Cisco IOS XE 3.6S Releases."

- MPLS Traffic Engineering (TE) - Fast Reroute (FRR) Link and Node Protection—This feature introduces support for MPLS Traffic Engineering (TE) - Fast Reroute (FRR) Link and Node Protection. For details about this feature, see http://www.cisco.com/en/US/docs/ios-xml/ios/mp_te_path_protect/configuration/xe-3s/mp-te-frr-node-prot.html
- Multiple Matching Commands—This feature introduces support for multiple **match** or **match-any** commands in a given QoS class-map. For details about this feature, see http://www.cisco.com/en/US/docs/wireless/asr_900/software/guide/chassis/Release3.6.0S/ASR903-Chassis-SW-36.html
- Port-Shaper and LLQ in the presence of EFPs—This feature allows you to create a QoS policy to shape traffic across all EFPs on a given physical port. —For details about this feature, see http://www.cisco.com/en/US/docs/ios-xml/ios/qos_plcshp/configuration/xe-3s/qos-plcshp-ehqos-pshape.html
- PPP—This feature introduces support for PPP, which provides a method for transmitting datagrams over serial point-to-point links. For details about this feature, see http://www.cisco.com/en/US/docs/ios/dial/configuration/guide/dia_async_slip_ppp.html
- Static Route Support for BFD over IPv6—This feature introduces support for static routes for BFD using IPv6 addressing. For details about this feature, see:
  - http://www.cisco.com/en/US/docs/ios-xml/ios/ipv6/configuration/xe-3s/ip6-bfd-static-xe.html
  - http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-bfd.html
- Static VPLS over MPLS-TP—This feature introduces support for static VPLS over MPLS-TP. For details about this feature, see http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-bfd.html
- STM-1 support—This feature adds support for STM1 mode on Cisco ASR 903 Router in concatenated and channelized mode to the DS1 level. For details about this feature, see http://www.cisco.com/en/US/docs/wireless/asr_900/software/guide/chassis/Release3.6.0S/ASR903-Chassis-SW-36.html

- Support for Low Latency Queuing on Multiple EFPs—This feature allows you to apply a QoS policy for Low Latency Queuing to multiple EFP interfaces. For details about this feature, see http://www.cisco.com/en/US/docs/ios-xml/ios/qos_plcshp/configuration/xe-3s/qos-plcshp-ehqos-pshape.html.
- Support for Weighted Random Early Detection—This feature introduces support for Weighted Random Early Detection (WRED) for congestion avoidance on egress interfaces. For details about this feature, see:
  - http://www.cisco.com/en/US/docs/ios-xml/ios/qos_conavd/configuration/xe-3s/qos-conavd-diffserv-wred.html
  - http://www.cisco.com/en/US/docs/ios/qos/configuration/guide/config_wred.html
  - http://www.cisco.com/en/US/products/hw/routers/ps133/products_configuration_guide_book09186a00805b9497.html
  - http://www.cisco.com/en/US/docs/wireless/asr_900/software/guide/chassis/Release3.6.0S/ASR903-Chassis-SW-36.html
- Y.1731 Performance Monitoring—Y.1731-PM provides a standards-based Ethernet performance monitoring function, which encompasses measurement of Ethernet frame delay, frame delay variation, frame loss, and frame throughput as outlined in the ITU-T Y-1731 specification and interpreted by the Metro Ethernet Forum (MEF) standards group. For details about this feature, see:
  - http://www.cisco.com/en/US/docs/ios-xml/ios/cether/configuration/xe-3s/ce-y1731-perfmon.html
  - http://www.cisco.com/en/US/docs/ios/cether/configuration/guide/ce_y1731-perfmon.html