New Features

This chapter describes the new features supported on the Cisco IOS XE Fuji 16.7.1.

New Hardware Features in Cisco IOS XE Fuji 16.7.2

There are no new hardware features in Cisco IOS XE Fuji 16.7.2.

New Software Features in Cisco IOS XE Fuji 16.7.2

There are no new software features in Cisco IOS XE Fuji 16.7.2.

New Hardware Features in Cisco IOS XE Fuji 16.7.1

- **8/16-port 1 Gigabit Ethernet (SFP / SFP) + 1-port 10 Gigabit Ethernet (SFP+) / 2-port 1 Gigabit Ethernet (CSFP) Interface Module**

  The A900-IMA8CS1Z-M interface module has the flexibility to support SFP+/SFP/CSFP on the modules as mentioned below:

  - 1-port 10 Gigabit Ethernet Small Form-Factor Pluggable (SFP+) interface supports one of three modules as 1xSFP+, 1xSFP or 1xCSFP
  - 8-port Gigabit Ethernet Small Form-Factor Pluggable (SFP) interface supports as either 8xSFP or 8xCSFP

  For more information on supported ports, see Cisco ASR 903 and ASR 903U Aggregation Services Router Hardware Installation Guide, Cisco ASR 907 Router Hardware Installation Guide or Cisco ASR 914 Aggregation Services Router Hardware Installation Guide.

- **1-port OC48/ 4-port OC12/OC3 + 12-port T1/E1 + 4-port T3/E3 CEM Interface Module**

  The A900-IMA3G-IMSG interface module supports:

- 12xDS1/E1 + 4xDS3/E3 + 4xOC3/12 or 1xOC48 interface over the high-density port

For more information on supported ports, see Cisco ASR 903 and ASR 903U Aggregation Services Router Hardware Installation Guide, or Cisco ASR 920 Series Aggregation Services Router Hardware Installation Guide.

New Software Features in Cisco IOS XE Fuji 16.7.1

- **3G Synchronous Digital Hierarchy Support**

  Synchronous Digital Hierarchy (SDH) is supported on the 3G mode on 1-port OC48/ 4-port OC12/OC3 + 12-port T1/E1 + 4-port T3/E3 CEM Interface Module.

  Note You can configure STM-1 or STM-4 on all four ports. If you configure rate STM-16 on any of the four ports, others ports are not available.

  For more information on 3G, see Configuring SDH.

- **5G Synchronous Digital Hierarchy Support**

  Synchronous Digital Hierarchy (SDH) is supported on the 5G mode on 1-port OC192/STM-64 or 8-Port OC3/12/48/STM-1/-4/-16 Interface Module.

  Note The OC-192/STM-64 port is disabled in 5G mode.

  Ports 0-7 are available as STM-16, STM-4, and STM-1 ports. To achieve 5G traffic on the card, four ports are grouped. For example, 0-3 and 4-7 can provide a maximum traffic of 2.5G.

  Note If one of the port is configured as STM-16, the other ports in the group cannot be configured. If STM-4 or STM-1 rate is configured in any of the port groups, STM-16 cannot be configured.

  For more information on 5G, see Configuring 5G Mode on 1-Port OC192/STM-64 or 8-Port OC3/12/48/STM-1/-4/-16 Interface Module.

- **AIS Coreflap**

  New alarms are generated for AIS support during core failure for 8-port T1/E1 interface module and 16-port T1/E1 interface module on the Cisco ASR 903 platform. AIS alarms are generated to replace the normal traffic signal when it contains a defect. AIS alarms are generated and detected either when the TDM circuits go down on the access layer of the network topology or a failure occurs in the MPLS domain due to which SAToP connectivity goes down. For more information, see Cisco ASR 900 Router Series Configuration Guide, Cisco IOS XE Fuji 16.7.1.

- **Card Protection for 48-port T1/E1 CEM Interface Module and 48-port T3/E3 CEM Interface Module**

The card protection feature protects traffic when the interface module is out of service, a software failure occurs, or hardware issues are observed. Card protection is supported on primary and backup cards. Traffic is switched to the backup interface module when the primary interface module does not respond and vice versa. A new Y-cable is introduced to support the feature.

The following features are added in this release (Maintenance commands):

- Lockout
- Force
- Manual

Note This feature does not require any change in the patch panel of the interface modules.

For more information on DS1/DS3, see Card Protection for 48-port T1/E1 CEM Interface Module and 48-port T3/E3 CEM Interface Module.

- **CESoPSN**

  Effective Cisco IOS XE Fuji 16.7.1, the Cisco RSP3 module supports Circuit Emulation Service over Packet Switched Network (CESoPSN) features on the 48-Port T1/E1 CEM Interface Module, 48-Port T3/E3 CEM Interface Module, and 1-Port OC-192 or 8-Port Low Rate CEM Interface Module. The CESoPSN features include CEM group configuration, Bit-Error Rate Testing (BERT), Adaptive Clock Recovery (ACR), and Differential Clock Recovery (DCR).

  For more information, see 48-Port T1/E1 CEM Interface Module Configuration Guide, 48-Port T3/E3 CEM Interface Module Configuration Guide, and 1-Port OC-192 or 8-Port Low Rate CEM Interface Module Configuration Guide, Cisco IOS XE Fuji 16.7.1.

- **Configuring 8/16-port 1-Gigabit Ethernet (SFP / SFP) + 1-port 10-Gigabit Ethernet (SFP+) / 2-port 1-Gigabit Ethernet (CSFP)**

  This interface module operates on multiple port densities and operating modes to provide extended bandwidth. Each physical port can be extended to have 2 ports of 1 Gigabit Ethernet with the use of Compact-SFP (CSFP). Each port on CSFP acts as Transmitter or Receiver and connects to GLC-BX-U using a single strand fiber.

  The interface module has 8 physical ports of 1 Gigabit Ethernet and 1 physical port of 10 Gigabit Ethernet, but with the support of CSFP, it can support a maximum of 18 ports of 1 Gigabit Ethernet. For more information, see Configuring 8 / 16-port 1 Gigabit Ethernet (SFP / SFP) + 1-port 10 Gigabit Ethernet (SFP+) / 2-port 1 Gigabit Ethernet (CSFP) Interface Module.

- **EVC Egress Filtering for the Cisco RSP3 Module**

  EVC Filtering is used to filter out unmatched packets that go out as an attachment or access circuit, when the packets do not match a for a given tag format. The packets are filtered based on the matching tag format at the ingress point of the AC. At the egress point of the AC, the packets are matched based on VLAN parameters. If the packets do not match the expected VLAN tag format, then the packets are dropped.

  For more information, see Carrier Ethernet Configuration Guide, Cisco IOS XE Fuji 16.7.1.

- **FPGA based SAT Support on the RSP3 Module**

In FPGA based SAT, the FPGA generates and terminates the packets based on the IP SLA configurations. All measurements are performed in FPGA. For more information, see IP SLAs Configuration Guide, Cisco IOS XE Fuji 16.7.1.

- **Latching Loopback**

  The Cisco ASR 900 routers supports latching loopback on the RSP2 module.

  For more information, see Carrier Ethernet Configuration Guide Cisco IOS XE Fuji 16.7.1.

- **Layer 2 Control Protocol**

  Effective Cisco IOS XE Fuji 16.7.1, you can forward, tunnel, or discard Multiple Registration Protocol (MRP), Multiple VLAN Registration Protocol (MMRP) or Multiple MAC Registration Protocol (MVRP) for a service instance on an ethernet interface.

  For more information, see Carrier Ethernet Configuration Guide, Cisco IOS XE Fuji 16.7.1.

- **MAC Limiting Support for the Cisco RSP3 Module**

  MAC address limiting on the bridge domain feature is now supported for the Cisco RSP3 module.

  For more information, see Layer 2 Configuration Guide, Cisco IOS XE Fuji 16.7.1.

- **Port Licensing Support**

  The Cisco Software License Activation feature is a set of processes and components to activate Cisco IOS XE software feature sets by obtaining and validating fee-based Cisco software licenses. You should enable the license only for OCx ports on 1-port OC48/ 4-port OC12/OC3 + 12-port T1/E1 + 4-port T3/E3 CEM Interface Module. Use the platform **enable controller Mediatype** command to enable a particular license type on the controller port.

  Note License is not required for the ports 0-15 (DSx ports).

  For more information, see Configuring Support of 1 port OC48/ 4 port OC12/OC3 + 12 port T1/E1 + 4 port T3/E3 CEM Interface Module.

- **Programmability**

  Yet Another Next Generation (YANG) data-modelling language – A Data Modelling Language for the Network Configuration Protocol (NETCONF), which replaces the process of manual configuration with a programmatic and standards-based way of writing configurations to any network device. It supports the automation of configuration for multiple switches across the network using data models.

  RESTCONF - provides a programmatic interface based on standard mechanisms for accessing configuration data, state data, data-model-specific Remote Procedure Call (RPC) operations and event notifications defined in the YANG model.

  YANG Data Models—For the list of Cisco IOS XE YANG models available with this release, navigate to https://github.com/YangModels/yang/tree/master/vendor/cisco/xe/1671. Revision statements embedded in the YANG files indicate if there has been a model revision. The README.md file in the same github location highlights changes that have been made in the release.

  For more information, see Programmability Configuration Guide, Cisco IOS XE Fuji 16.7.1.

- **Support for BFD over IPv6 on Cisco RSP3**

BFD over IPv6 is now supported on the Cisco RSP3 module. For more information, see IP Routing: BFD Configuration Guide, Cisco IOS XE Fuji 16.7.1.

- **TCAM Scale Support for Ingress QoS**

  Effective Cisco IOS XE Fuji 16.7.1 release, the Cisco RSP3 module supports the Ternary Content Addressable Memory (TCAM) scale for ingress QoS. The TCAM scale increases to 2048 TCAM entries per Network Processor Unit for the ingress QoS policy maps.

  For more information, see Quality of Service Configuration Guidelines, Cisco IOS XE Everest 16.7.1 (Cisco ASR 900 Series).