Release Notes for Cisco 8000 Series Routers, IOS XR Release 7.9.1

Revised: June 11, 2025

Cisco 8100, 8200, and 8800 Series Routers

What's New in Cisco IOS XR Release 7.9.1

For more details on the Cisco IOS XR release model and associated support, see Guidelines for Cisco IOS XR Software.

New in Documentation

This release introduces rich and intuitive ways for you to access YANG data models supported in the Cisco IOS XR software.

Product	Description
Cisco IOS XR Error Messages	Search by release number, error strings, or compare release numbers to view a detailed repository of error messages and descriptions.
Cisco IOS XR MIBs	Select the MIB of your choice from a drop-down to explore an extensive repository of MIB information.
YANG Data Models Navigator	We have launched the tool as an easy reference to view the Data Models (Native, Unified, OpenConfig) supported in IOS XR platforms and releases. You can explore the data model definitions, locate a specific model, and view the containers and their respective lists, leaves, leaf lists, Xpaths, and much more. As we continue to enhance the tool, we would love to hear your feedback. You are welcome to drop us a note here.
Use Case-based Documentation at Learning Labs	You can now quickly explore and experiment on use-cases without setting up any hardware resources with the new Interactive documentation for Cisco 8000 routers on DevNet Learning Labs. Powered by Jupyter, the automated code blocks within the documentation enable you to configure the desired functionality on the routers and retrieve real-time output swiftly. Check out the new interactive documentation here: • End to end 3-stage CLOS Networks for SONiC • Use cases for QoS and Model-driven Telemetry

Software Features Enhanced and Introduced

To learn about features introduced in other Cisco IOS XR releases, select the release from the Documentation Landing Page.

Feature	Description
Interface and Hardware Component	

Feature	Description
Link Loss Forwarding	We have now enabled high availability between two bridged interfaces by disabling both interfaces if any one of them fails. Such high availability is enabled because the functionality allows a fault detected on one side of a CFM-protected network to propagate to the other, allowing the device to re-route around the failure. In earlier releases, a failure on one bridged interface did not disable the other interface, and connected devices remained unaware of the link loss. The feature introduces these changes: • **CLI**: New **propagate remote-status** command • **YANG Data Model**: New XPaths for **Cisco-IOS-XR-um-ethernet-cfm-cfg.yang** (see GitHub, YANG Data Models Navigator)
oFEC Traffic Configuration for QDD-400G-ZRP-S	QDD-400G-ZRP-S optical module can now support the following oFEC traffic configurations: • 400G-TXP-1x1-16 QAM • 4x100G-MXP-1x1-16 QAM • 3x100G-MXP-1x1-8 QAM • 2x100G-MXP-1x1-QPSK • 2x100G-MXP-1x1-8 QAM • 2x100G-MXP-1x1-16 QAM This increases the interoperability of the QDD-400G-ZRP-S optical module across network components supporting these formats.
IP Addresses and Services	
Limit Address Resolution Protocol (ARP) Cache Entries per Interface	In this feature, you can configure the maximum limit for the number of entries of dynamic mapping between IP addresses and media addresses by ARP per interface. Limiting the number of entries provides overflow protections in ARP cache and protects the routers from DOS attacks by preventing memory overuse by cache entries. This feature introduces the **arp cache-limit** command.

Feature	Description
Local Station MAC Address for Router	Local Station MAC Address is the MAC address for the router that applies to all interfaces, including VRFs. You can configure Local Station MAC Address for a router using the **hw-module local-station-mac** command. This feature allows the router and its interaces to have one network-wide identity and helps in identifying the neighboring devices in the network while using static ARP. This feature introduces these changes: • **CLI**: • **hw-module local-station-mac** • **show hw-module local-station-mac** • **YANG Data Model**: `Cisco-IOS-XR-um-8000-local-mac-cfg.yang` Cisco native model (see GitHub).
Route Scale Improvements	This feature enables you to increase the number of Forwarding Information Base (FIB) entries supported for IPv4 traffic from 2 million to 3 million and IPv6 traffic from 0.5 million to 1 million. The increased FIB entries allow the router to route more traffic streams. It also helps the router to achieve a faster switch or process-switch forwarding scenario by eliminating the frequent need for route cache maintenance due to fewer route entries in the FIB database. This feature introduces the **hw-module profile route scale** command.
View VRRP statistics in Router	With this feature, you can view or clear statistics of one or all Virtual Router Redundancy Protocol (VRRP) groups or Virtual Router IDs (VRIDs). This information helps you monitor VRRP health in the routers. It's also helpful in debugging VRRP issues like packet exchange failures when all virtual routers in the VRRP topology function as backup virtual routers and there's no IP address owner. This feature introduces the following commands: • **CLI:** • **show vrrp statistics** • **clear vrrp statistics** • **YANG Data Model**: `Cisco-IOS-XR-ipv4-vrrp-oper.yang` Cisco native model (see GitHub)
L2VPN	
CFM Hardware Offload	CFM Hardware offloading allows to implement connectivity and fault monitoring for physical and bundle interfaces, using continuity check messages (CCM). This feature helps to detect network failure with short CCM intervals, which enables the router to recover from the failure without dropping the packets.
Call Admission Control for L2VPN P2P Services over Circuit-Style SR-TE Policies	This feature allows you to configure guaranteed bandwidth for Layer 2 P2P services steered over Circuit-Style SR-TE policies. This ensures that a Circuit-Style SR-TE policy has sufficient bandwidth to accommodate a Layer 2 P2P service, while also preventing a L2 P2P service from being steered over a Circuit-Style SR-TE policy when there is insufficient available bandwidth.

Feature	Description
Enhanced L3VPN VRF Scale	You can now configure up to a maximum of 2000 VRFs on Layer 3 VPN. With this enhancement, the router can create network segments without using additional routers, thus improving your network's efficiency. This enhancement is supported only on Cisco Silicon One Q200 processors and not on Cisco Silicon One Q100 processors. In earlier releases, you could configure only 512 VRFs.
L3VPN	
Inter-AS Option B for L3VPN	You can now provide inter-autonomous system (AS) support for L3VPN networks with two or more autonomous systems (ASes) that are using Border Gateway Protocol Multicast Virtual Private Network (BGP-MVPN). This functionality provides the flexibility for administrators to control their ASes independently. ASes facilitate efficient scalability by allowing ASes that are equipped with Autonomous System Boundary Routers (ASBRs) administered by different entities to communicate through a singular BGP session, exchanging VPN-IP addresses, IP routes, and MPLS labels.
Routing	
Limiting LSA numbers in a OSPF Link-State Database	The nonself-generated link-state advertisements (LSAs) for a given Open Shortest Path First (OSPF) process is limited to 500000. This protection mechanism prevents routers from receiving many LSAs, preventing CPU failure and memory shortages, and is enabled by default from this release onwards. If you have over 500000 LSAs in your network, configure the **max-lsa** command with the expected LSA scale before upgrading to this release or later. This feature modifies the following commands: • **show ospf** to display the maximum number of redistributed prefixes. • **show ospf database database-summary detail** to display the number of LSA counts per router. • **show ospf database database-summary adv-router** router ID to display the router information and the LSAs received from a particular router.
Limiting the Maximum Redistributed Type-3 LSA Prefixes in OSPF	By default, the maximum redistributed Type-3 LSA prefixes for a given OSPF process is now limited to 100000. This mechanism prevents OSPF from redistributing a large number of prefixes as Type-3 LSAs and therefore preventing high CPU utilization and memory shortages. Once the number of redistributed prefixes is reached or exceeds the threshold value, the system log message is generated, and no more prefixes are redistributed. Support was added to count only the number of redistributed prefixes instead of the number of LSAs. Individual prefixes are counted when multiple prefixes are aggregated in an LSA using the **summary-prefix** command.
BFD Hardware Offload for Resource Reservation Protocol Tail-End (RSVP TE)	You can use Bidirectional Forwarding Detection (BFD) to detect Multiprotocol Label Switching (MPLS) Label Switched Path (LSP) data plane failures. BFD process interacts with the Tail-End (TE) and LSPV processes to support BFD over TE LSP feature. MPLS TE automatically establishes and maintains the LSPs across the MPLS network by using the Resource Reservation Protocol (RSVP). This feature improves the scale and reduces the overall network convergence time by sending rapid failure detection packets to the routing protocols for recalculating the routing table.
Segment Routing	

Feature	Description
SR-TE Automated Steering Without Service Label	This feature allows traffic to a BGP service route to be steered over an SR-TE policy using the AS principles, and without imposing the service route's prefix label. This feature enables use-cases such as centralized BGP EPE for 6PE in an SR-MPLS network.
SR-TE Explicit Segment Lists with Mix of IPv4 and IPv6 Segments	Explicit segment list can be configured to include IPv6 segments, for example IPv6 adjacency SIDs or IPv6 EPE SIDs. This feature enables use-cases such as Centralized BGP EPE for 6PE in an SR-MPLS Network.
SRv6 Services: Services with Remote SIDs from W-LIB	This feature enables an SRv6 headend node to receive and install remote SIDs with Wide (32-bit) functions (Remote W-LIB). There is no new CLI to enable this capability at the ingress PE.
Support for SR-ODN: Layer-3 Services	Segment Routing On-Demand Next Hop (SR-ODN) allows a service head-end router to automatically instantiate an SR policy to a BGP next-hop when required (on-demand). This feature introduces support for Layer 3 IPv4 and IPv6 BGP services (VPNv4/VPNv6) over SR-ODN.
Support for up to 8 labels on the TI-LFA backup path	This feature increases the maximum number of labels that can be pushed on the backup path (including the label of the protected prefix) from 3 to 8.
System Management	

Feature	Description
Auto-Save with Secure File-Transfer and Additional Configurable Parameters	Apart from automatically backing up the running configuration after every commit, you can also do the following with Auto-Save: • Save running configurations to remote systems using Secure Copy Protocol (SCP) and Secure File Transfer Protocol (SFTP). • Configure wait-time between two subsequent auto-saves. • Append time-stamp to the file name of the saved configuration. • Save the encrypted password. • Specify the maximum number of files that you can auto-save. The feature introduces these changes: CLI: Modified the **configuration commit auto-save command** by adding the following keywords: • **filename scp** • **filename sftp** • **wait-time** • **time-stamp** • **password** • **maximum** Yang Data Model: • Cisco-IOS-XR-config-autosave-cfg • Cisco-IOS-XR-um-config-commit-cfg
FQDN for NTP Server on Non-default VRF	You can now specify a Fully Qualified Domain Name (FQDN) as the hostname for NTP server configuration over non-default VRFs. FQDNs are easy to remember compared to numeric IP addresses. Service migration from one host to another can cause a change in IP address leading to outages. Prior releases allowed FQDN handling in only default VRFs.

Feature	Description
New Cisco-NTP-MIB Traps to Monitor NTP server and Improve Timing Accuracy	Cisco-NTP-MIB allows you to monitor NTP on the server and client using SNMP MIB. This release supports new traps, which will help monitor the NTP server and improve timing accuracy . These traps also display the NTP server's current status, the local clock's stratum, the maximum error in seconds, and the delay in round-trip in seconds.Use MIB Navigator to know more about the newly added traps: • cntpSysPeer • cntpSysSrvStatus • cntpSysStratum • cntpSysRootDelay • cntpSysRootDispersion • cntpPeers
Support for SFTP (Secure File Transfer Protocol) and SCP (Secure Copy Protocol) options in the Copy command	With this feature, the router can transfer data to a remote server on SFTP and SCP by using the underlying SSH protocol implementation. You can use the SFTP and SCP option to facilitate secure transfer of configuration files from the router to an achieve server. This feature modifies the **copy** command.
ITU-T G.8275.2 Profile	This feature supports the architecture defined in ITU-T G.8275.2 for systems requiring accurate phase or time-of-day synchronization, and where each network device participates in the PTP protocol. Support of this capability is extended to the following Cisco 8000 Series routers and line cards in this release: • 8202-32FH-M • 8201-24H8FH • 8201-32FH • 88-LC0-36FH-M • 88-LC0-36FH • 88-LC0-48TH-MO • 88-LC0-34H14FH
System Security	

Feature	Description
Secure Key Integration Protocol (SKIP) for Routers	The Cisco 8000 Series Routers are now capable of handling the SKIP protocol. With this ability, it can communicate with external quantum devices. This helps in using Quantum Key Distribution (QKD) devices for exchanging MACsec encryption keys between routers to eliminate the key distribution problem in a post quantum world where the current cryptographic systems are no longer secure due to the advent of quantum computers. This feature introduces the following: • **CLI:** • **crypto-sks-kme** • **show crypto sks profile** • **show crypto sks profile stats** • **Yang Data Model**: Cisco-IOS-XR-um-sks-server-cfg.yang For more information on Quantum Key Distribution, see Post Quantum Security Brief.
Validating X.509v3 Certificate Extensions over Mutual Transport Layer Security (mTLS)	With this feature, the router can handle the X.509v3 Certificates Extensions defined in RFC 5280 while validating the client certificate over mTLS. Here, the router acknowledges all extensions in X.509v3 Certificates of the user while validating it. Previously, the router failed to process certification extensions when the severity was critical and resulting in authentication failure. This feature permits users to configure any certificate extensions with different severity in their X.509v3 Certificates.
uRPF in Strict Mode	You can protect the router against DoS attacks with spoofed source IP addresses by enabling the Strict mode in uRPF. When this feature is enabled, the router accepts the incoming packet only if the source IP address of the packet is present in its routing table and if the source IP address of the input packet is reachable via the interface on which the packet has been received. If not, the router drops the packet.In earlier releases IOS XR supports only loose mode uRPF. This feature introduces the **hw-module profile cef unipath-surpf** command. This feature modifies the **ipv4/ipv6 verify unicast source reachable-via** command.
Programmability	
Manage routes in the RIB using gRIBI RPCs	gRPC Routing Information Base Interface (gRIBI) is a gRPC service that allows an external client to programatically manage the routes in the Routing Information Base (RIB) of the router. With gRIBI RPCs, you can customize traffic engineering decisions based on individual requirement irrespective of the interdependency with the routes configured using other routing protocols. This feature introduces the show gribi aft command.
gNOI OS Proto	The RPCs defined in the proto file can be used to install the software, activate the software version and verify that the installation is successful.
gNOI Cert Proto	The RPCs defined in the proto file supports loading a Certificate Authority (CA) bundle to validate a peer's certificate.
Disable TLS Version 1.0	Although Transport Layer Security (TLS) provides secure communication between servers and clients, TLS version 1.0 may pose a security threat. You can now disable TLS version 1.0 using the tlsv1-disable command.

Feature	Description
System Setup	
Saving ZTP Configuration Hashes in Router	This feature allows you to customize**ztp.ini** file to save the ZTP configuration hashes in the **/disk0:/ztp/** location on the router. The router computes the ZTP configuration hash for all the secure ZTP configurations. The ZTP configurations hashes are useful in detecting and preventing tampering between any secure ZTP configuration and the subsequent reboot.

YANG Data Models Introduced and Enhanced

This release introduces or enhances the following data models. For detailed information about the supported and unsupported sensor paths of all the data models, see the Github repository. To get a comprehensive list of the data models supported in a release, navigate to the Available-Content.md file for the release in the Github repository. The unsupported sensor paths are documented as deviations. For example, openconfig-acl.yang provides details about the supported sensor paths, whereas cisco-xr-openconfig-acl-deviations.yang provides the unsupported sensor paths for openconfig-acl.yang on Cisco IOS XR routers.

You can also view the data model definitions using the YANG Data Models Navigator tool. This GUI-based and easy-to-use tool helps you explore the nuances of the data model and view the dependencies between various containers in the model. You can view the list of models supported across Cisco IOS XR releases and platforms, locate a specific model, view the containers and their respective lists, leaves, and leaf lists presentedvisually in a tree structure.

To get started with using data models, see the *Programmability Configuration Guide for Cisco 8000 Series Routers*.

Feature	Description
Programmability	
Cisco-IOS-XR-config-autosave-cfg	This Cisco native YANG data model enables you to automatically backup the running configuration files after every commit is made.
Cisco-IOS-XR-um-config-commit-cfg	This unified data model enables you to automatically backup the running configuration of the router after every commit is made.

Feature	Description
openconfig-bgp Revision 6.0.0	The OpenConfig data model is revised from version 3.0.1 to 6.0.0. This version supports the following configurations: • Route reflectors to remove full mesh of Interior Border Gateway Protocol (IBGP) peers in your network. • Neighbor TCP MTU size to support IP packet size. • Graceful restart helper mode. • Removal of private AS numbers for global internet access. The following guideline apply for the revised BGP data model: When a new Address-Family-Identifier (AFI) is added through OCNI model, the following BGPconfigurations which are configured either through OCNI model or CLI are replicated to the newly added AFI: • Route Reflector Client • Remote Private AS
Cisco-IOS-XR-um-mpls-static-cfg.yang	This Unified data model enables you to assign static local labels to an IPv4 or IPv6 prefix per VRF. You can use the Label Switched Paths (LSPs) and specify the next hop information to forward the packets that contain these static labels. With this release, this model is enhanced to disable the default route to resolve issues with the next hop information.
openconfig-system-grpc.yang Version 1.0.0	The OpenConfig data model defines the configuration and operational state related to gRPC services running on a router. This data model augments the openconfig-system.yang model. Only a single gRPC server instance is supported with the default value of DEFAULT. The first name that you provide when configuring the gRPC server is the only supported server instance. All the updates to the gRPC server are programmed for this specific instance of the server. If you reconfigure the name, the same name gets overwritten. If you do not configure a name for the server instance, the system uses the name DEFAULT.
openconfig-isis.yang Version 1.0.0	This OpenConfig data model is revised from version 0.6.0 to 1.0.0 to simplify the authentication keychain nodes. With this feature, you can configure the authentication type to limit the establishment of adjacencies and the exchange of LSPs. You can also retrieve the operational state of the authentication nodes.

Feature	Description
openconfig-network-instance.yang	With this release, the OpenConfig data model is enhanced to view the number of routes that are routed through a specific neighbor for each peer and Subsequent Address Family Identifiers (SAFI) installed counter. The counter reflects the current state of the Border Gateway Protocol (BGP) and Routing Information Base (RIB), and can be monitored to check the presence of stale routes, missing routes, and the current installed state of the BGP routes in RIB. The model supports a single instance of BGP with default VRF and address family (IPv4 or IPv6).
openconfig-policy-forwarding.yang Version 0.4.0	This OpenConfig data model is part of the openconfig-network-instance.yang model that configures the actions to be performed on an inbound traffic when a packet matches the conditions defined in the policy-map. With this release, the match criteria is enhanced to include IPv4 source address and protocol 41 for IPv4 packets. The following limitations apply when configuring the routing policy using the data model: • The redirect VRF must be a non-default VRF. • One policy type of policy-based routing (PBR) is supported per interface. VRF, global policy and PBR interface policy are not supported on the same interface. • A policy-map configured through the data model cannot be modified using CLI command. Although the modification is accepted, it may lead to unpredictable outcome. • Configuration changes made using the OpenConfig model can be retrieved only through the NETCONF get-config operation. Retrieving the configuration using specific show command is not supported. • OpenConfig statistics for policy-forwarding is not supported. • Configuring PBR ACL is supported only on Cisco Silicon One Q200-based cards. To enable this feature, configure the **hw-module profile pbr vrfredirect** command, followed by a router reload operation.
Cisco-IOS-XR-um-ethernet-cfm-cfg.yang	Use this data model to configure the **propagate remote-status** command. This command is used to enable Link Loss Forwarding (LLF) on an interface.
Cisco-IOS-XR-um-8000-local-mac-cfg.yang	This Cisco native YANG data model enables you to configure the local station MAC address for the router that applies to all interfaces, including VRFs.

Feature	Description
Cisco-IOS-XR-ipv4-vrrp-oper.yang	This Cisco native YANG data model enables you to get router running configuration that you can utilize to view the VRRP statistics.

Hardware Introduced

Hardware Feature	Description
Optics	This release launches the following new optics on selective hardware within the product portfolio. For details refer to the Transceiver Module Group (TMG) Compatibility Matrix. • Cisco 100GBASE Quad Small Form-Factor Pluggable Double Density (QSFP-DD) • QSFP-100G-ZR4-S • QSFP-100G-ERL-S • QSFP-40/100-SRBD • Cisco 400G QSFP-DD High-Power (Bright) Optical Module • DP04QSDD-HE0 • Cisco 400G Digital Coherent Optics QSFP-DD Optical Module • QDD-400G-ZRP-S

For a complete list of supported hardware and ordering information, see the Cisco 8000 Series Data Sheet.

Behavior Changes

- In Cisco IOS XR Release 7.5.2, SR-ODN configurations with Flexible Algorithm constraints can be configured using either of the followingcommands:
  - **segment-routing traffic-eng on-demand color** *color* **dynamic sid-algorithm** *algorithm-number*
  - **segment-routing traffic-eng on-demand color** *color* **constraints segments sid-algorithm***algorithm-number*

  Starting with Cisco IOS XR Release 7.9.1, the **dynamic sid-algorithm** *algorithm-number* command has been deprecated. Only the **constraints segments sid-algorithm** *algorithm-number* command is supported. Configurations stored in NVRAM usingthe **dynamic sid-algorithm** *algorithm-number* command will be rejected at boot-up.

  As a result, SR-ODN configurations with Flexible Algorithm constraints using the **dynamic sid-algorithm** *algorithm-number* command must be re-configured using the **constraints segments sid-algorithm** *algorithm-number* command.

- Prior to Cisco IOS XR release 7.2.1, a segment of an explicit segment list can be configured as an IPv4 address (representing a Node or a Link) using the **index** *index***address ipv4** *address* command.

  Starting with Cisco IOS XR release 7.2.1, an IPv4-based segment (representing a Node or a Link) can also be configured with the new **index** *index* **mpls adjacency***address* command. The configuration is stored in NVRAM in the same CLI format used to create it. There is no conversion from the old CLI to the new CLI.

Starting with Cisco IOS XR release 7.9.1, the old CLI has been deprecated. Old configurations stored in NVRAM will be rejected at boot-up.

As a result, explicit segment lists with IPv4-based segments using the old CLI must be re-configured using the new CLI.

There are no CLI changes for segments configured as MPLS labels using the **index** *index* **mpls label** *label* command.

Release 7.9.1 Packages

The Cisco IOS XR software is composed of a base image (ISO) that provides the XR infrastructure. The ISO image is made up of a set of packages (also called RPMs). These packages are of three types:

- A mandatory package that is included in the ISO, which can be upgraded/downgraded.
- An optional package that is included in the ISO, which can be removed/added OR upgraded/downgraded.
- An optional package that is not included in the ISO, which can be added/removed OR upgraded/downgraded after adding to base image.

Visit the Cisco Software Download page to download the Cisco IOS XR software images.

To determine the Cisco IOS XR Software packages installed on your router, log in to the router and enter the **show install active** command:

```
RP/0/RP0/CPU0#show install active
Software Hash: 9d2e225086704bc5fece9b983a017dfc98e9d3b7e36442e1db7931b3819349fd
Package                                                          Version
---------------------------------------------------- ----------------------------
xr-8000-af-ea                                                  7.9.1v1.0.0-1
xr-8000-aib                                                    7.9.1v1.0.0-1
xr-8000-bfd                                                    7.9.1v1.0.0-1
xr-8000-buffhdr-ea                                             7.9.1v1.0.0-1
xr-8000-bundles                                                7.9.1v1.0.0-1
xr-8000-card-support                                           7.9.1v1.0.0-1
xr-8000-cdp-ea                                                 7.9.1v1.0.0-1
xr-8000-cem-driver                                             7.9.1v1.0.0-1
xr-8000-cfm                                                    7.9.1v1.0.0-1
xr-8000-common-otn                                             7.9.1v1.0.0-1
xr-8000-core                                                   7.9.1v1.0.0-1
xr-8000-cpa                                                    7.9.1v1.0.0-1
xr-8000-cpa-devobj-misc                                        7.9.1v1.0.0-1
xr-8000-cpa-npu                                                7.9.1v1.0.0-1
xr-8000-cpa-sb-data                                            7.9.1v1.0.0-1
xr-8000-dot1x                                                  7.9.1v1.0.0-1
xr-8000-dsm                                                    7.9.1v1.0.0-1
xr-8000-encap-id                                               7.9.1v1.0.0-1
xr-8000-ether-ea                                               7.9.1v1.0.0-1
xr-8000-fabric                                                 7.9.1v1.0.0-1
xr-8000-feat-mgr                                               7.9.1v1.0.0-1
xr-8000-fib-ea                                                 7.9.1v1.0.0-1
xr-8000-forwarder                                              7.9.1v1.0.0-1
xr-8000-fpd                                                    7.9.1v1.0.0-1
xr-8000-fwd-tools                                              7.9.1v1.0.0-1
xr-8000-fwdlib                                                 7.9.1v1.0.0-1
xr-8000-gil-ea                                                 7.9.1v1.0.0-1
xr-8000-host-core                                              7.9.1v1.0.0-1
xr-8000-l2fib                                                  7.9.1v1.0.0-1
xr-8000-l2mcast                                                7.9.1v1.0.0-1
xr-8000-leabaofa                                               7.9.1v1.0.0-1
xr-8000-libofaasync                                            7.9.1v1.0.0-1
```

xr-8000-lpts-ea	7.9.1v1.0.0-1
xr-8000-mcast	7.9.1v1.0.0-1
xr-8000-netflow	7.9.1v1.0.0-1
xr-8000-npu	7.9.1v1.0.0-1
xr-8000-oam	7.9.1v1.0.0-1
xr-8000-optics	7.9.1v1.0.0-1
xr-8000-os-wr9	7.9.1v1.0.0-1
xr-8000-os-wr9-extra	7.9.1v1.0.0-1
xr-8000-pbr	7.9.1v1.0.0-1
xr-8000-pd-port-mode	7.9.1v1.0.0-1
xr-8000-pfilter	7.9.1v1.0.0-1
xr-8000-pidb	7.9.1v1.0.0-1
xr-8000-pktio	7.9.1v1.0.0-1
xr-8000-ple-sdk	7.9.1v1.0.0-1
xr-8000-port-mapper	7.9.1v1.0.0-1
xr-8000-port-mode	7.9.1v1.0.0-1
xr-8000-ppinfo	7.9.1v1.0.0-1
xr-8000-pwhe-ea	7.9.1v1.0.0-1
xr-8000-qos-ea	7.9.1v1.0.0-1
xr-8000-span	7.9.1v1.0.0-1
xr-8000-spio	7.9.1v1.0.0-1
xr-8000-spp-ea	7.9.1v1.0.0-1
xr-8000-timing	7.9.1v1.0.0-1
xr-8000-tunnel-ip	7.9.1v1.0.0-1
xr-8000-utapp-blaze	7.9.1v1.0.0-1
xr-8000-vether	7.9.1v1.0.0-1
xr-8000-ztp-ea	7.9.1v1.0.0-1
xr-aaa	7.9.1v1.0.0-1
xr-acl	7.9.1v1.0.0-1
xr-apphosting	7.9.1v1.0.0-1
xr-appmgr	7.9.1v1.0.0-1
xr-bcdl	7.9.1v1.0.0-1
xr-bfd	7.9.1v1.0.0-1
xr-bgp	7.9.1v1.0.0-1
xr-bgputil	7.9.1v1.0.0-1
xr-bng-stubs	7.9.1v1.0.0-1
xr-bundles	7.9.1v1.0.0-1
xr-cal-pi	7.9.1v1.0.0-1
xr-cdp	7.9.1v1.0.0-1
xr-cds	7.9.1v1.0.0-1
xr-cfgmgr	7.9.1v1.0.0-1
xr-cfm	7.9.1v1.0.0-1
xr-cofo	7.9.1v1.0.0-1
xr-core	7.9.1v1.0.0-1
xr-core-calv	7.9.1v1.0.0-1
xr-cpa-common	7.9.1v1.0.0-1
xr-cpa-common-optics	7.9.1v1.0.0-1
xr-cpa-common-psu	7.9.1v1.0.0-1
xr-cpa-driver-devobj-gnss	7.9.1v1.0.0-1
xr-cpa-driver-devobj-misc	7.9.1v1.0.0-1
xr-cpa-driver-devobj-npu	7.9.1v1.0.0-1
xr-cpa-driver-devobj-phy	7.9.1v1.0.0-1
xr-cpa-driver-devobj-sensors	7.9.1v1.0.0-1
xr-cpa-driver-devobj-storage	7.9.1v1.0.0-1
xr-cpa-driver-devobj-test	7.9.1v1.0.0-1
xr-cpa-driver-devobj-timing	7.9.1v1.0.0-1
xr-cpa-driver-fpgalib-access	7.9.1v1.0.0-1
xr-cpa-driver-fpgalib-common	7.9.1v1.0.0-1
xr-cpa-driver-fpgalib-infra	7.9.1v1.0.0-1
xr-cpa-driver-fpgalib-kmod	7.9.1v1.0.0-1
xr-cpa-driver-fpgalib-misc	7.9.1v1.0.0-1
xr-cpa-driver-fpgalib-optics	7.9.1v1.0.0-1
xr-cpa-driver-optics	7.9.1v1.0.0-1
xr-cpa-ethsw	7.9.1v1.0.0-1

xr-cpa-idprom	7.9.1v1.0.0-1
xr-cpa-tamlib	7.9.1v1.0.0-1
xr-ctc	7.9.1v1.0.0-1
xr-debug	7.9.1v1.0.0-1
xr-dhcp	7.9.1v1.0.0-1
xr-diags	7.9.1v1.0.0-1
xr-diskboot	7.9.1v1.0.0-1
xr-drivers	7.9.1v1.0.0-1
xr-eem	7.9.1v1.0.0-1
xr-elmi-stubs	7.9.1v1.0.0-1
xr-ema	7.9.1v1.0.0-1
xr-enhancedmanageability	7.9.1v1.0.0-1
xr-erp	7.9.1v1.0.0-1
xr-featurecapability	7.9.1v1.0.0-1
xr-fib	7.9.1v1.0.0-1
xr-filesysinv	7.9.1v1.0.0-1
xr-foundation-8000	7.9.1v1.0.0-1
xr-fpd	7.9.1v1.0.0-1
xr-gil	7.9.1v1.0.0-1
xr-ha-infra	7.9.1v1.0.0-1
xr-healthcheck	7.9.1v1.0.0-1
xr-host-core	7.9.1v1.0.0-1
xr-httpclient	7.9.1v1.0.0-1
xr-icpe-eth	7.9.1v1.0.0-1
xr-icpe-opt	7.9.1v1.0.0-1
xr-identifier	7.9.1v1.0.0-1
xr-infra-sla	7.9.1v1.0.0-1
xr-install	7.9.1v1.0.0-1
xr-ip-apps	7.9.1v1.0.0-1
xr-ip-core	7.9.1v1.0.0-1
xr-ip-infra-vrf	7.9.1v1.0.0-1
xr-ip-mibs	7.9.1v1.0.0-1
xr-ip-static	7.9.1v1.0.0-1
xr-ipc	7.9.1v1.0.0-1
xr-ipsla	7.9.1v1.0.0-1
xr-is-is	7.9.1v1.0.0-1
xr-k9sec	7.9.1v1.0.0-1
xr-l2snooptransport	7.9.1v1.0.0-1
xr-l2vpn	7.9.1v1.0.0-1
xr-ldp	7.9.1v1.0.0-1
xr-licensing	7.9.1v1.0.0-1
xr-link-oam	7.9.1v1.0.0-1
xr-linuxnetworking	7.9.1v1.0.0-1
xr-linuxsecurity	7.9.1v1.0.0-1
xr-lldp	7.9.1v1.0.0-1
xr-lpts	7.9.1v1.0.0-1
xr-manageabilityxml	7.9.1v1.0.0-1
xr-mandatory	7.9.1v1.0.0-1
xr-mcast	7.9.1v1.0.0-1
xr-mcastl2snoop	7.9.1v1.0.0-1
xr-mda	7.9.1v1.0.0-1
xr-mpls	7.9.1v1.0.0-1
xr-mpls-oam	7.9.1v1.0.0-1
xr-mpls-oam-client	7.9.1v1.0.0-1
xr-mpls-static	7.9.1v1.0.0-1
xr-netflow	7.9.1v1.0.0-1
xr-networkboot	7.9.1v1.0.0-1
xr-nosi	7.9.1v1.0.0-1
xr-ntp	7.9.1v1.0.0-1
xr-ofa	7.9.1v1.0.0-1
xr-optics	7.9.1v1.0.0-1
xr-orrspf	7.9.1v1.0.0-1
xr-os-wr9-apps	7.9.1v1.0.0-1
xr-os-wr9-core	7.9.1v1.0.0-1

```
xr-os-wr9-hardware                                      7.9.1v1.0.0-1
xr-ospf                                                 7.9.1v1.0.0-1
xr-p4rt                                                 7.9.1v1.0.0-1
xr-perf-meas                                            7.9.1v1.0.0-1
xr-perfmgmt                                             7.9.1v1.0.0-1
xr-pfi                                                  7.9.1v1.0.0-1
xr-pird-stubs                                           7.9.1v1.0.0-1
xr-pkt-trace                                            7.9.1v1.0.0-1
xr-platforms-ras                                        7.9.1v1.0.0-1
xr-pm-alarm                                             7.9.1v1.0.0-1
xr-procmgr                                              7.9.1v1.0.0-1
xr-python                                               7.9.1v1.0.0-1
xr-qos                                                  7.9.1v1.0.0-1
xr-rid-mgr                                              7.9.1v1.0.0-1
xr-routing                                              7.9.1v1.0.0-1
xr-rpl                                                  7.9.1v1.0.0-1
xr-rsvp-te                                              7.9.1v1.0.0-1
xr-security                                             7.9.1v1.0.0-1
xr-security-tams                                        7.9.1v1.0.0-1
xr-secy-driver                                          7.9.1v1.0.0-1
xr-servicelayer                                         7.9.1v1.0.0-1
xr-snmp                                                 7.9.1v1.0.0-1
xr-snmp-hw                                              7.9.1v1.0.0-1
xr-span                                                 7.9.1v1.0.0-1
xr-spi-core                                             7.9.1v1.0.0-1
xr-spi-hw                                               7.9.1v1.0.0-1
xr-spp                                                  7.9.1v1.0.0-1
xr-sr                                                   7.9.1v1.0.0-1
xr-stats                                                7.9.1v1.0.0-1
xr-stp                                                  7.9.1v1.0.0-1
xr-stubs                                                7.9.1v1.0.0-1
xr-sysdb                                                7.9.1v1.0.0-1
xr-syslog                                               7.9.1v1.0.0-1
xr-telemetry                                            7.9.1v1.0.0-1
xr-telnet                                               7.9.1v1.0.0-1
xr-timing                                               7.9.1v1.0.0-1
xr-tmpdir-cleanup                                       7.9.1v1.0.0-1
xr-track                                                7.9.1v1.0.0-1
xr-transports                                           7.9.1v1.0.0-1
xr-tty                                                  7.9.1v1.0.0-1
xr-tunnel-ip                                            7.9.1v1.0.0-1
xr-tunnel-nve                                           7.9.1v1.0.0-1
xr-upgradematrix                                        7.9.1v1.0.0-1
xr-utils                                                7.9.1v1.0.0-1
xr-vether                                               7.9.1v1.0.0-1
xr-vpnmib                                               7.9.1v1.0.0-1
xr-xmlinfra                                             7.9.1v1.0.0-1
xr-xrlibcurl                                            7.9.1v1.0.0-1
xr-ztp                                                  7.9.1v1.0.0-1
```

To know about all the RPMs installed including XR, OS and other componen2s use the **show install active all** command.

The software modularity approach provides a flexible model that allows you to install a subset of IOS XR packages on devices based on your individual requirements. All critical components are modularized as packages so that you can select the features that you want to run on your router.

Note The above show command output displays mandatory packages that are installed on the router. To view the optional and bug fix RPM packages, first install the package and use the **show install active summary** command.

Caveats

There are no caveats in this release.

Determine Software Version

Log in to the router and enter the **show version** command:

```
RP/0/RP0/CPU0# show version
Cisco IOS XR Software, Version 7.9.1 LNT
Copyright (c) 2013-2023 by Cisco Systems, Inc.

Build Information:
 Built By     : sajshah
 Built On     : Sun Apr 02 15:10:49 UTC 2023
 Build Host   : iox-ucs-075
 Workspace    : /auto/ioxdepot6/GISO/giso_build_lindt/giso_release_create/chearora_2023-04-02_22-08-55_UTC
 Version      : 7.9.1
 Label        : 7.9.1-Renumber_3

cisco 8000 (Intel(R) Xeon(R) CPU D-1530 @ 2.40GHz)
cisco 8101-32H (Intel(R) Xeon(R) CPU D-1530 @ 2.40GHz) processor with 16GB of memory
R2 uptime is 17 hours, 3 minutes
Cisco 8100 32x100G QSFP28 1RU Fixed System w/o HBM
```

Determine Firmware Support

Log in to the router and enter **show fpd package** command:

Cisco 8100 Series Router

```
RP/0/RP0/CPU0# show fpd package
                      Field Programmable Device Package
                 ================================================
                                               Req     SW      Min Req   Min Req
Card Type            FPD Description           Reload  Ver     SW Ver   Board Ver
=================== ========================== ====== ======= ======== =========
--------------------------------------------------------------------------------
8101-32H             Bios                        YES     1.07      1.07       0.0
                     BiosGolden                  YES     1.07      0.13       0.0
                     IoFpga                      YES     1.04      1.04       0.0
                     IoFpgaGolden                YES     1.04      1.04       0.0
                     SsdIntelS3520               YES     1.21      1.21       0.0
                     SsdIntelS4510               YES    11.32     11.32       0.0
                     SsdMicron5100               YES     7.01      7.01       0.0
                     SsdMicron5300               YES     0.01      0.01       0.0
                     x86Fpga                     YES     1.81      1.81       0.0
                     x86FpgaGolden               YES     1.81      1.06       0.0
                     x86TamFw                    YES     6.13      6.13       0.0
                     x86TamFwGolden              YES     6.13      6.05       0.0
--------------------------------------------------------------------------------
8101-32H-O           Bios                        YES     0.219     0.219      0.0
                     BiosGolden                  YES     0.219     0.219      0.0
                     IoFpga                      YES     1.04      1.04       0.0
                     IoFpgaGolden                YES     1.04      1.04       0.0
                     SsdIntelS3520               YES     1.21      1.21       0.0
                     SsdIntelS4510               YES    11.32     11.32       0.0
```

```
                    SsdMicron5100              YES     7.01      7.01      0.0
                    SsdMicron5300              YES     0.01      0.01      0.0
                    x86Fpga                    YES     1.81      1.81      0.0
                    x86FpgaGolden              YES     1.81      1.06      0.0
                    x86TamFw                   YES     6.13      6.13      0.0
                    x86TamFwGolden             YES     6.13      6.05      0.0
-------------------------------------------------------------------------------
PSU2KW-HVPI         PO-PrimMCU                 NO      1.09      1.09      0.0
                    PO-SecMCU                  NO      1.10      1.10      0.0
-------------------------------------------------------------------------------
PSU650W-ACPE        EM-PrimMCU                 NO      1.25      1.25      0.0
                    EM-SecMCU                  NO      1.49      1.49      0.0
                    LI-SecMCU                  NO      2.55      2.55      0.0
-------------------------------------------------------------------------------
PSU650W-ACPI        EM-PrimMCU                 NO      1.25      1.25      0.0
                    EM-SecMCU                  NO      1.49      1.49      0.0
                    LI-SecMCU                  NO      2.54      2.54      0.0
-------------------------------------------------------------------------------
PSU930W-DCPE        LI-SecMCU                  NO      2.03      2.03      0.0
-------------------------------------------------------------------------------
PSU930W-DCPI        LI-SecMCU                  NO      3.03      3.03      0.0
```

Cisco 8200 Series Router

```
RP/0/RP0/CPU0# show fpd package
                Field Programmable Device Package
            ================================================
                                          Req     SW      Min Req   Min Req
Card Type           FPD Description       Reload  Ver     SW Ver  Board Ver
=================== ========================= ====== ======= ======== =========
-------------------------------------------------------------------------------
8201                Bios                       YES     1.24      1.24      0.0
                    BiosGolden                 YES     1.24      1.15      0.0
                    IoFpga                     YES     1.11      1.11      0.1
                    IoFpgaGolden               YES     1.11      0.48      0.1
                    SsdIntelS3520              YES     1.21      1.21      0.0
                    SsdIntelS4510              YES    11.32     11.32      0.0
                    SsdMicron5100              YES     7.01      7.01      0.0
                    SsdMicron5300              YES     0.01      0.01      0.0
                    x86Fpga                    YES     1.06      1.06      0.0
                    x86FpgaGolden              YES     1.06      0.48      0.0
                    x86TamFw                   YES     5.13      5.13      0.0
                    x86TamFwGolden             YES     5.13      5.05      0.0
-------------------------------------------------------------------------------
8201-ON             Bios                       YES     1.208     1.208     0.0
                    BiosGolden                 YES     1.208     1.207     0.0
                    IoFpga                     YES     1.11      1.11      0.1
                    IoFpgaGolden               YES     1.11      0.48      0.1
                    SsdIntelS3520              YES     1.21      1.21      0.0
                    SsdIntelS4510              YES    11.32     11.32      0.0
                    SsdMicron5100              YES     7.01      7.01      0.0
                    SsdMicron5300              YES     0.01      0.01      0.0
                    x86Fpga                    YES     1.06      1.06      0.0
                    x86FpgaGolden              YES     1.06      0.48      0.0
                    x86TamFw                   YES     5.13      5.13      0.0
                    x86TamFwGolden             YES     5.13      5.05      0.0
-------------------------------------------------------------------------------
8201-SYS            Bios                       YES     1.24      1.24      0.0
                    BiosGolden                 YES     1.24      1.15      0.0
                    IoFpga                     YES     1.11      1.11      0.1
                    IoFpgaGolden               YES     1.11      0.48      0.1
                    SsdIntelS3520              YES     1.21      1.21      0.0
                    SsdIntelS4510              YES    11.32     11.32      0.0
                    SsdMicron5100              YES     7.01      7.01      0.0
```

```
                    SsdMicron5300             YES     0.01      0.01      0.0
                    x86Fpga                   YES     1.06      1.06      0.0
                    x86FpgaGolden             YES     1.06      0.48      0.0
                    x86TamFw                  YES     5.13      5.13      0.0
                    x86TamFwGolden            YES     5.13      5.05      0.0
--------------------------------------------------------------------------------
8201-SYS-ON         Bios                      YES     1.208     1.208     0.0
                    BiosGolden                YES     1.208     1.207     0.0
                    IoFpga                    YES     1.11      1.11      0.1
                    IoFpgaGolden              YES     1.11      0.48      0.1
                    SsdIntelS3520             YES     1.21      1.21      0.0
                    SsdIntelS4510             YES    11.32     11.32      0.0
                    SsdMicron5100             YES     7.01      7.01      0.0
                    SsdMicron5300             YES     0.01      0.01      0.0
                    x86Fpga                   YES     1.06      1.06      0.0
                    x86FpgaGolden             YES     1.06      0.48      0.0
                    x86TamFw                  YES     5.13      5.13      0.0
                    x86TamFwGolden            YES     5.13      5.05      0.0
--------------------------------------------------------------------------------
PSU1.4KW-ACPE       DT-PrimMCU                NO      3.01      3.01      0.0
                    DT-SecMCU                 NO      2.02      2.02      0.0
--------------------------------------------------------------------------------
PSU1.4KW-ACPI       DT-PrimMCU                NO      3.01      3.01      0.0
                    DT-SecMCU                 NO      2.02      2.02      0.0
--------------------------------------------------------------------------------
PSU2KW-ACPE         PO-PrimMCU                NO      1.03      1.03      0.0
                    PO-SecMCU                 NO      1.06      1.06      0.0
--------------------------------------------------------------------------------
PSU2KW-ACPI         PO-PrimMCU                NO      1.03      1.03      0.0
                    PO-SecMCU                 NO      1.08      1.08      0.0
--------------------------------------------------------------------------------
PSU2KW-DCPE         PO-PrimMCU                NO      1.07      1.07      0.0
--------------------------------------------------------------------------------
PSU2KW-DCPI         PO-PrimMCU                NO      1.07      1.07      0.0
--------------------------------------------------------------------------------
PSU2KW-HVPI         PO-PrimMCU                NO      1.09      1.09      0.0
                    PO-SecMCU                 NO      1.10      1.10      0.0

RP/0/RP0/CPU0# show fpd package
================================ ================================================
                                        Field Programmable Device Package
                                 ================================================
                                           Req     SW      Min Req   Min Req
Card Type           FPD Description        Reload  Ver     SW Ver  Board Ver
================== ========================== ====== ======= ======== =========
--------------------------------------------------------------------------------
8202                Bios                      YES     1.24      1.24      0.0
                    BiosGolden                YES     1.24      1.15      0.0
                    IoFpga                    YES     1.03      1.03      0.0
                    IoFpgaGolden              YES     1.03      0.33      0.0
                    MiFpga                    YES     1.00      1.00      0.0
                    MiFpgaGolden              YES     1.00      0.02      0.0
                    SsdIntelS3520             YES     1.21      1.21      0.0
                    SsdIntelS4510             YES    11.32     11.32      0.0
                    SsdMicron5100             YES     7.01      7.01      0.0
                    SsdMicron5300             YES     0.01      0.01      0.0
                    x86Fpga                   YES     1.06      1.06      0.0
                    x86FpgaGolden             YES     1.06      0.48      0.0
                    x86TamFw                  YES     5.13      5.13      0.0
                    x86TamFwGolden            YES     5.13      5.05      0.0
--------------------------------------------------------------------------------
8202-O              Bios                      YES     1.208     1.208     0.0
                    BiosGolden                YES     1.208     1.207     0.0
                    IoFpga                    YES     1.03      1.03      0.0
                    IoFpgaGolden              YES     1.03      0.33      0.0
```

```
                    MiFpga                     YES     1.00      1.00       0.0
                    MiFpgaGolden               YES     1.00      0.02       0.0
                    SsdIntelS3520              YES     1.21      1.21       0.0
                    SsdIntelS4510              YES    11.32     11.32       0.0
                    SsdMicron5100              YES     7.01      7.01       0.0
                    SsdMicron5300              YES     0.01      0.01       0.0
                    x86Fpga                    YES     1.06      1.06       0.0
                    x86FpgaGolden              YES     1.06      0.48       0.0
                    x86TamFw                   YES     5.13      5.13       0.0
                    x86TamFwGolden             YES     5.13      5.05       0.0
--------------------------------------------------------------------------------
PSU2KW-ACPE         PO-PrimMCU                 NO      1.03      1.03       0.0
                    PO-SecMCU                  NO      1.06      1.06       0.0
--------------------------------------------------------------------------------
PSU2KW-ACPI         PO-PrimMCU                 NO      1.03      1.03       0.0
                    PO-SecMCU                  NO      1.08      1.08       0.0
--------------------------------------------------------------------------------
PSU2KW-DCPE         PO-PrimMCU                 NO      1.07      1.07       0.0
--------------------------------------------------------------------------------
PSU2KW-DCPI         PO-PrimMCU                 NO      1.07      1.07       0.0
--------------------------------------------------------------------------------
PSU2KW-HVPI         PO-PrimMCU                 NO      1.09      1.09       0.0
                    PO-SecMCU                  NO      1.10      1.10       0.0
```

Cisco 8800 Series Router

```
RP/0/RP0/CPU0#show fpd package
               Field Programmable Device Package
           ================================================
                                          Req     SW      Min Req   Min Req
Card Type           FPD Description       Reload  Ver     SW Ver   Board Ver
=================== ========================== ====== ======= ======== =========
--------------------------------------------------------------------------------
88-LC0-34H14FH      Bios                       YES     1.07      1.07       0.0
                    BiosGolden                 YES     1.07      0.13       0.0
                    EthSwitch                  YES     1.04      1.04       0.0
                    EthSwitchGolden            YES     1.04      0.07       0.0
                    IoFpga                     YES     1.09      1.09       0.1
                    IoFpgaGolden               YES     1.09      1.01       0.1
                    SsdIntelS3520              YES     1.21      1.21       0.0
                    SsdIntelS4510              YES    11.32     11.32       0.0
                    SsdMicron5100              YES     7.01      7.01       0.0
                    SsdMicron5300              YES     0.01      0.01       0.0
                    x86Fpga                    YES     0.91      0.91       0.1
                    x86FpgaGolden              YES     0.91      0.78       0.1
                    x86TamFw                   YES     6.13      6.13       0.1
                    x86TamFwGolden             YES     6.13      6.10       0.1
--------------------------------------------------------------------------------
88-LC0-34H14FH-O    Bios                       YES     0.219     0.219      0.0
                    BiosGolden                 YES     0.219     0.219      0.0
                    EthSwitch                  YES     1.04      1.04       0.0
                    EthSwitchGolden            YES     1.04      0.07       0.0
                    IoFpga                     YES     1.09      1.09       0.1
                    IoFpgaGolden               YES     1.09      1.01       0.1
                    SsdIntelS3520              YES     1.21      1.21       0.0
                    SsdIntelS4510              YES    11.32     11.32       0.0
                    SsdMicron5100              YES     7.01      7.01       0.0
                    SsdMicron5300              YES     0.01      0.01       0.0
                    x86Fpga                    YES     0.91      0.91       0.1
                    x86FpgaGolden              YES     0.91      0.78       0.1
                    x86TamFw                   YES     6.13      6.13       0.1
                    x86TamFwGolden             YES     6.13      6.10       0.1
--------------------------------------------------------------------------------
```

88-LC0-36FH	Bios	YES	1.07	1.07	0.0
	BiosGolden	YES	1.07	0.13	0.0
	EthSwitch	YES	1.04	1.04	0.0
	EthSwitchGolden	YES	1.04	0.07	0.0
	IoFpga	YES	1.13	1.13	0.1
	IoFpgaGolden	YES	1.13	1.00	0.1
	SsdIntelS3520	YES	1.21	1.21	0.0
	SsdIntelS4510	YES	11.32	11.32	0.0
	SsdMicron5100	YES	7.01	7.01	0.0
	SsdMicron5300	YES	0.01	0.01	0.0
	x86Fpga	YES	1.36	1.36	0.1
	x86FpgaGolden	YES	1.36	1.04	0.1
	x86TamFw	YES	6.13	6.13	0.1
	x86TamFwGolden	YES	6.13	6.05	0.1
88-LC0-36FH-M	Bios	YES	1.07	1.07	0.0
	BiosGolden	YES	1.07	0.13	0.0
	EthSwitch	YES	1.04	1.04	0.0
	EthSwitchGolden	YES	1.04	0.07	0.0
	IoFpga	YES	1.13	1.13	0.1
	IoFpgaGolden	YES	1.13	1.00	0.1
	SsdIntelS3520	YES	1.21	1.21	0.0
	SsdIntelS4510	YES	11.32	11.32	0.0
	SsdMicron5100	YES	7.01	7.01	0.0
	SsdMicron5300	YES	0.01	0.01	0.0
	x86Fpga	YES	1.36	1.36	0.1
	x86FpgaGolden	YES	1.36	1.04	0.1
	x86TamFw	YES	6.13	6.13	0.1
	x86TamFwGolden	YES	6.13	6.05	0.1
88-LC0-36FH-MO	Bios	YES	0.219	0.219	0.0
	BiosGolden	YES	0.219	0.219	0.0
	EthSwitch	YES	1.04	1.04	0.0
	EthSwitchGolden	YES	1.04	0.07	0.0
	IoFpga	YES	1.13	1.13	0.1
	IoFpgaGolden	YES	1.13	1.00	0.1
	SsdIntelS3520	YES	1.21	1.21	0.0
	SsdIntelS4510	YES	11.32	11.32	0.0
	SsdMicron5100	YES	7.01	7.01	0.0
	SsdMicron5300	YES	0.01	0.01	0.0
	x86Fpga	YES	1.36	1.36	0.1
	x86FpgaGolden	YES	1.36	1.04	0.1
	x86TamFw	YES	6.13	6.13	0.1
	x86TamFwGolden	YES	6.13	6.05	0.1
88-LC0-36FH-O	Bios	YES	0.219	0.219	0.0
	BiosGolden	YES	0.219	0.219	0.0
	EthSwitch	YES	1.04	1.04	0.0
	EthSwitchGolden	YES	1.04	0.07	0.0
	IoFpga	YES	1.13	1.13	0.1
	IoFpgaGolden	YES	1.13	1.00	0.1
	SsdIntelS3520	YES	1.21	1.21	0.0
	SsdIntelS4510	YES	11.32	11.32	0.0
	SsdMicron5100	YES	7.01	7.01	0.0
	SsdMicron5300	YES	0.01	0.01	0.0
	x86Fpga	YES	1.36	1.36	0.1
	x86FpgaGolden	YES	1.36	1.04	0.1
	x86TamFw	YES	6.13	6.13	0.1
	x86TamFwGolden	YES	6.13	6.05	0.1
8800-LC-36FH	Bios	YES	1.24	1.24	0.0
	BiosGolden	YES	1.24	1.15	0.0
	EthSwitch	YES	1.04	1.04	0.0
	EthSwitchGolden	YES	1.04	0.07	0.0

```
                    IoFpga                    YES     1.38      1.38      0.0
                    IoFpgaGolden              YES     1.38      0.08      0.0
                    SsdIntelS3520             YES     1.21      1.21      0.0
                    SsdIntelS4510             YES    11.32     11.32      0.0
                    SsdMicron5100             YES     7.01      7.01      0.0
                    SsdMicron5300             YES     0.01      0.01      0.0
                    x86Fpga                   YES     1.52      1.52      0.0
                    x86FpgaGolden             YES     1.52      0.33      0.0
                    x86TamFw                  YES     5.13      5.13      0.0
                    x86TamFwGolden            YES     5.13      5.05      0.0
--------------------------------------------------------------------------------
8800-LC-36FH-O      Bios                      YES     1.208     1.208     0.0
                    BiosGolden                YES     1.208     1.207     0.0
                    EthSwitch                 YES     1.04      1.04      0.0
                    EthSwitchGolden           YES     1.04      0.07      0.0
                    IoFpga                    YES     1.38      1.38      0.0
                    IoFpgaGolden              YES     1.38      0.08      0.0
                    SsdIntelS3520             YES     1.21      1.21      0.0
                    SsdIntelS4510             YES    11.32     11.32      0.0
                    SsdMicron5100             YES     7.01      7.01      0.0
                    SsdMicron5300             YES     0.01      0.01      0.0
                    x86Fpga                   YES     1.52      1.52      0.0
                    x86FpgaGolden             YES     1.52      0.33      0.0
                    x86TamFw                  YES     5.13      5.13      0.0
                    x86TamFwGolden            YES     5.13      5.05      0.0
--------------------------------------------------------------------------------
8800-LC-48H         Bios                      YES     1.24      1.24      0.0
                    BiosGolden                YES     1.24      1.15      0.0
                    EthSwitch                 YES     1.04      1.04      0.0
                    EthSwitchGolden           YES     1.04      0.07      0.0
                    IoFpga                    YES     1.38      1.38      0.0
                    IoFpgaGolden              YES     1.38      0.08      0.0
                    SsdIntelS3520             YES     1.21      1.21      0.0
                    SsdIntelS4510             YES    11.32     11.32      0.0
                    SsdMicron5100             YES     7.01      7.01      0.0
                    SsdMicron5300             YES     0.01      0.01      0.0
                    x86Fpga                   YES     1.52      1.52      0.0
                    x86FpgaGolden             YES     1.52      0.33      0.0
                    x86TamFw                  YES     5.13      5.13      0.0
                    x86TamFwGolden            YES     5.13      5.05      0.0
--------------------------------------------------------------------------------
8800-LC-48H-O       Bios                      YES     1.208     1.208     0.0
                    BiosGolden                YES     1.208     1.207     0.0
                    EthSwitch                 YES     1.04      1.04      0.0
                    EthSwitchGolden           YES     1.04      0.07      0.0
                    IoFpga                    YES     1.38      1.38      0.0
                    IoFpgaGolden              YES     1.38      0.08      0.0
                    SsdIntelS3520             YES     1.21      1.21      0.0
                    SsdIntelS4510             YES    11.32     11.32      0.0
                    SsdMicron5100             YES     7.01      7.01      0.0
                    SsdMicron5300             YES     0.01      0.01      0.0
                    x86Fpga                   YES     1.52      1.52      0.0
                    x86FpgaGolden             YES     1.52      0.33      0.0
                    x86TamFw                  YES     5.13      5.13      0.0
                    x86TamFwGolden            YES     5.13      5.05      0.0
--------------------------------------------------------------------------------
8800-RP             Bios                      YES     1.24      1.24      0.0
                    BiosGolden                YES     1.24      1.15      0.0
                    EthSwitch                 YES     1.02      1.02      0.0
                    EthSwitchGolden           YES     1.02      0.07      0.0
                    SsdIntelS3520             YES     1.21      1.21      0.0
                    SsdIntelS4510             YES    11.32     11.32      0.0
                    SsdMicron5100             YES     7.01      7.01      0.0
                    SsdMicron5300             YES     0.01      0.01      0.0
```

	TimingFpga	YES	1.02	1.02	0.0
	TimingFpgaGolden	YES	1.02	0.11	0.0
	x86Fpga	YES	1.32	1.32	0.0
	x86FpgaGolden	YES	1.32	0.24	0.0
	x86TamFw	YES	5.13	5.13	0.0
	x86TamFwGolden	YES	5.13	5.05	0.0
8800-RP-E	Bios	YES	1.24	1.24	0.0
	BiosGolden	YES	1.24	1.15	0.0
	EthSwitch	YES	1.02	1.02	0.0
	EthSwitchGolden	YES	1.02	0.07	0.0
	SsdIntelS3520	YES	1.21	1.21	0.0
	SsdIntelS4510	YES	11.32	11.32	0.0
	SsdMicron5100	YES	7.01	7.01	0.0
	SsdMicron5300	YES	0.01	0.01	0.0
	TimingFpga	YES	1.02	1.02	0.0
	TimingFpgaGolden	YES	1.02	0.11	0.0
	x86Fpga	YES	1.32	1.32	0.0
	x86FpgaGolden	YES	1.32	0.24	0.0
	x86TamFw	YES	5.13	5.13	0.0
	x86TamFwGolden	YES	5.13	5.05	0.0
8800-RP-O	Bios	YES	1.208	1.208	0.0
	BiosGolden	YES	1.208	1.207	0.0
	EthSwitch	YES	1.02	1.02	0.0
	EthSwitchGolden	YES	1.02	0.07	0.0
	SsdIntelS3520	YES	1.21	1.21	0.0
	SsdIntelS4510	YES	11.32	11.32	0.0
	SsdMicron5100	YES	7.01	7.01	0.0
	SsdMicron5300	YES	0.01	0.01	0.0
	TimingFpga	YES	1.02	1.02	0.0
	TimingFpgaGolden	YES	1.02	0.11	0.0
	x86Fpga	YES	1.32	1.32	0.0
	x86FpgaGolden	YES	1.32	0.24	0.0
	x86TamFw	YES	5.13	5.13	0.0
	x86TamFwGolden	YES	5.13	5.05	0.0
8800-RP2	Bios	YES	1.06	1.06	0.3
	BiosGolden	YES	1.06	1.06	0.3
	EthSwitch	YES	1.02	1.02	0.0
	EthSwitchGolden	YES	1.02	0.07	0.0
	SsdIntelS3520	YES	1.21	1.21	0.0
	SsdIntelS4510	YES	11.32	11.32	0.0
	SsdMicron5100	YES	7.01	7.01	0.0
	SsdMicron5300	YES	0.01	0.01	0.0
	TimingFpga	YES	1.00	1.00	0.0
	TimingFpgaGolden	YES	1.00	1.00	0.0
	x86Fpga	YES	1.00	1.00	0.3
	x86FpgaGolden	YES	1.00	1.00	0.3
	x86TamFw	YES	7.13	7.13	0.3
	x86TamFwGolden	YES	7.13	7.13	0.3
8800-RP2-O	Bios	YES	0.02	0.02	0.0
	BiosGolden	YES	0.02	0.02	0.0
	EthSwitch	YES	1.02	1.02	0.0
	EthSwitchGolden	YES	1.02	0.07	0.0
	SsdIntelS3520	YES	1.21	1.21	0.0
	SsdIntelS4510	YES	11.32	11.32	0.0
	SsdMicron5100	YES	7.01	7.01	0.0
	SsdMicron5300	YES	0.01	0.01	0.0
	TimingFpga	YES	1.00	1.00	0.0
	TimingFpgaGolden	YES	1.00	1.00	0.0
	x86Fpga	YES	0.73	0.73	0.0
	x86FpgaGolden	YES	0.73	0.73	0.0

	x86TamFw	YES	7.09	7.09	0.0
	x86TamFwGolden	YES	7.09	7.09	0.0
8804-FAN	FtFpga	NO	1.00	1.00	0.0
	FtFpgaGolden	NO	1.00	0.16	0.0
8804-FC0	IoFpga	YES	1.00	1.00	0.0
	IoFpgaGolden	YES	1.00	0.16	0.0
8808-FAN	FtFpga	NO	1.00	1.00	0.0
	FtFpgaGolden	NO	1.00	0.16	0.0
8808-FAN-V1	FtFpga	NO	1.00	1.00	0.0
	FtFpgaGolden	NO	1.00	0.16	0.0
8808-FC	IoFpga	YES	1.02	1.02	0.0
	IoFpgaGolden	YES	1.02	0.05	0.0
8808-FC0	IoFpga	YES	1.00	1.00	0.0
	IoFpgaGolden	YES	1.00	0.16	0.0
8808-FC1	IoFpga	YES	0.14	0.14	0.0
	IoFpgaGolden	YES	0.14	0.14	0.0
8812-FAN	FtFpga	NO	1.00	1.00	0.0
	FtFpgaGolden	NO	1.00	0.16	0.0
8812-FC	IoFpga	YES	1.02	1.02	0.0
	IoFpgaGolden	YES	1.02	0.05	0.0
	Retimer	YES	3.00	3.00	0.0
8818-FAN	FtFpga	NO	1.00	1.00	0.0
	FtFpgaGolden	NO	1.00	0.16	0.0
8818-FAN-V1	FtFpga	NO	1.00	1.00	0.0
	FtFpgaGolden	NO	1.00	0.16	0.0
8818-FC	IoFpga	YES	1.02	1.02	0.0
	IoFpgaGolden	YES	1.02	0.05	0.0
	Retimer	YES	3.00	3.00	0.0
8818-FC0	IoFpga	YES	1.00	1.00	0.0
	IoFpgaGolden	YES	1.00	0.16	0.0
	Retimer	YES	3.00	3.00	0.0
PSU-4.8KW-DC100	PO-PrimMCU	NO	3.05	3.05	0.0
	PO-SecMCU	NO	3.05	3.05	0.0
PSU6.3KW-20A-HV	DT-LogicMCU	NO	1.00	1.00	0.0
	DT-PrimMCU	NO	1.00	1.00	0.0
	DT-SecMCU	NO	1.00	1.00	0.0
PSU6.3KW-HV	AB-LogicMCU	NO	3.08	3.08	0.0
	AB-PrimMCU	NO	3.08	3.08	0.0
	AB-SecMCU	NO	3.06	3.06	0.0
	DT-LogicMCU	NO	4.11	4.11	0.0
	DT-PrimMCU	NO	4.01	4.01	0.0
	DT-SecMCU	NO	4.00	4.00	0.0
PWR-4.4KW-DC-V3	DT-LogicMCU	NO	3.02	3.02	0.0
	DT-Prim1MCU	NO	3.01	3.01	0.0
	DT-Prim2MCU	NO	3.01	3.01	0.0
	DT-Sec1MCU	NO	3.01	3.01	0.0
	DT-Sec2MCU	NO	3.01	3.01	0.0

Important Notes

- The warning message that the smart licensing evaluation period has expired is displayed in the console every hour. There is, however, no functionality impact on the device. The issue is seen on routers that don't have the Flexible Consumption licensing model enabled. To stop the repetitive messaging, register the device with the smart licensing server and enable the Flexible Consumption model. Later load a new registration token.

  To register the device with the smart licensing server, see the Registering and Activating Your Router.

- When you execute the **show tech-support** command, a temporary directory is created and the related data is stored in this directory. This directory is deleted after the command is completed. For example,

  ```
  Router#run ls -ltr
  drwxrwxrwx. 3 root root show-tech-fabric-link-incl-loca-010cpu0_2.tgz
  ```

  In case, you terminate the **show tech-support** command manually, we recommend you to delete the corresponding show tech directory if not needed.

- You must disable auto FPD upgrade for PSUs before upgrading the router to Cisco IOS XR Software Release 7.9.1 or later if your router uses any of the following PSUs:

  - PSU2KW-ACPI
  - PSU2KW-ACPE
  - PSU2KW-HVPI
  - PSU4.8KW-DC100

Production Software Maintenance Updates (SMUs)

A production SMU is a SMU that is formally requested, developed, tested, and released. Production SMUs are intended for use in a live network environment and are formally supported by the Cisco TAC and the relevant development teams. Software bugs identified through software recommendations or Bug Search Tools are not a basis for production SMU requests.

For information on production SMU types, refer the Production SMU Types section of the *IOS XR Software Maintenance Updates (SMUs)* guide.

Supported Transceiver Modules

To determine the transceivers that Cisco hardware device supports, refer to the Transceiver Module Group (TMG) Compatibility Matrix tool.

Cisco IOS XR Error messages

To view, search, compare, and download Cisco IOS XR Error Messages, refer to the Cisco IOS XR Error messages tool.

Cisco IOS XR MIBs

To determine the MIBs supported by platform and release, refer to the Cisco IOS XR MIBs tool.

Related Documentation

The most current Cisco 8000 router documentation is located at the following URL:

https://www.cisco.com/c/en/us/td/docs/iosxr/8000-series-routers.html

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA 95134-1706
USA

Asia Pacific Headquarters
CiscoSystems(USA)Pte.Ltd.
Singapore

Europe Headquarters
CiscoSystemsInternationalBV
Amsterdam,TheNetherlands

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