



## Release Notes for Cisco 8000 Series Routers, IOS XR Release 7.5.2

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# Cisco 8100, 8200, and 8800 Series Routers

## What's New in Cisco IOS XR Release 7.5.2

### Software Features Introduced and Enhanced

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

Feature	Description
<b>Application Hosting</b>	
<a href="#">Virtual IP address in the Linux networking stack</a>	<p>Virtual IP addresses allow a single IP address to connect to the current active RP after an RP switchover event. In addition, this functionality enables your network stack to support virtual IP addresses for third-party applications and IOS XR applications that use the Linux networking stack.</p> <p>The following commands are modified:</p> <ul style="list-style-type: none"><li>• <a href="#">ipv4 virtual address</a></li><li>• <a href="#">ipv6 virtual address</a></li><li>• <a href="#">show linux networking interfaces address-only</a></li></ul>
<b>BGP</b>	
<a href="#">BGP AS Path Replacement with Custom Values</a>	<p>You can now configure to replace the AS Path in BGP with custom values, based on route policy. While selecting the BGP best path, a shorter AS Path makes the selection process simple and flexible.</p> <p>This feature introduces the following command:</p> <p><b><a href="#">replace as-path all</a></b></p>
<a href="#">Scaling BGP Flowspec to 6000 Rules</a>	<p>You can now assign 6000 BGP Flowspec rules for Cisco 8800 series routers and 3000 for Cisco 8100 and 8200 series routers thus providing enhanced mitigation against Distributed Denial-of-Service (DDoS) attacks</p> <p>In earlier releases, you could assign 2000 BGP Flowspec rules. These are one dimensional scale numbers. The numbers vary based on other intersecting features like AccessList (ACL), Quality of Service (QoS), and Local Path Transport Switching (LPTS).</p>
<b>Programmability</b>	
<a href="#">OpenConfig YANG Model:dscp-set</a>	<p>This model allows you to configure a minimum and maximum Differentiated Services Code Point (DSCP) value in the dscp-set leaf-list. When you send these values in your request to the NETCONF agent, it filters the traffic by matching the values in the list with the incoming packet header. This ensures that your network is not vulnerable to unwanted traffic.</p> <p>You can access the OC data model from the <a href="#">Github</a> repository.</p>

Feature	Description
<a href="#">OpenConfig YANG Model:procmon</a>	<p>This model provides data definitions to monitor the health of one or more processes running on a system, delivering insights into the performance of critical processes and helping remediate performance bottlenecks.</p> <p>For example, the stress tool that is part of the Linux distribution may be consuming high CPU. The openconfig-procmon model pulls this information and sends it to you when you query the node. As a remediation measure, you can then restart the process.</p> <p>You can access the OC data model from the <a href="#">Github</a> repository.</p>
<a href="#">OpenConfig YANG Model:MACsec</a>	<p>You can now use the OpenConfig YANG data model to define the MACsec key chain and policy, and apply MACsec encryption on a router interface.</p> <p>You can access the OC data model from the <a href="#">Github</a> repository.</p>
<b>Interface and Hardware Component</b>	
<a href="#">ERSPAN Traffic to a Destination in a Non-Default VRF</a>	<p>Previously, Encapsulated Remote Switched Port Analyzer (ERSPAN) transported mirrored traffic through GRE tunnels that belonged to only default VRF. This feature enables ERSPAN to transport mirrored traffic through GRE tunnels that belong to any VRF. This feature allows mirrored traffic to be transported within a network design that contains multiple Layer 3 partitions.</p>
<a href="#">Introduction of IP MTU on Q200-based Systems</a>	<p>With the introduction of this feature, the system allows you to configure IP MTU for IPv4 and IPv6 MTU on an L3 interface. Thus, allowing for a smooth traffic flow on Layer 3 interfaces.</p> <p>Use the <code>show ipv4/ipv6 interfaces</code> command to view the IP MTU configurations.</p>
<a href="#">IP-in-IP tunnels with IPv6 over IPv4 Decapsulation</a>	<p>Routers can now transport IPv6 packets across routers supporting only IPv4 by encapsulating the IPv6 packets within IPv4 packets. Such an encapsulation helps the efficient passing of packets across different network protocols. These packets are eventually decapsulated at the destination IPv6 network.</p>
ECMP and Bundle Hashing for NVGRE Flows	<p>This feature supports Equal-cost multipath (ECMP) and bundle hashing on the outer header of Network Virtualization using Generic Routing Encapsulation (NVGRE) flows. NVGRE Hashing happens based on Ethernet packet header which is carried through GRE.</p>
Support for MPLS over GRE	<p>The MPLS over generic routing encapsulation (MPLSoGRE) feature provides a mechanism for utilizing PBR to redirect incoming traffic into statically configured MPLS LSPs, that are in turn encapsulated into GRE tunnels.</p>
Inner Layer 4 Header Fields for ECMP and UCMP Tunnels	<p>Load balancing for equal-cost multi-path (ECMP) and unequal-cost multi-path (UCMP) tunnels now includes fields for inner Layer 4 headers. This enhances the granularity of flow assignment to tunnel links and distributes the traffic better while maintaining the order of packets within traffic flows.</p>
<b>IP Addresses and Services</b>	
<a href="#">HSRP over BVI</a>	<p>Hot Standby Router Protocol (HSRP) runs on top of interfaces of multiple routers in the same home network that has only Cisco routers. It allows a group of routers to behave as a single virtual default gateway router, thereby providing default gateway redundancy and minimizing traffic loss. HSRP now supports Bridge-Group Virtual Interface (BVI), which means that HSRP sessions can run between BVI interfaces of multiple routers.</p>

Feature	Description
User Managed Control Plane and Management Plane ACL	<p>You can create a virtual LPTS interface and apply hybrid ACLs to it for inspecting traffic. This functionality lets you use the hybrid ACLs to filter and customize the control plane and management plane traffic.</p> <p>This feature modifies the following commands:</p> <ul style="list-style-type: none"> <li>• <b>hw-module profile cef</b></li> </ul>
VRRP over BVI	<p>Virtual Router Redundancy Protocol (VRRP) runs on top of interfaces of multiple routers in the same home network that has both Cisco and other vendor routers. It allows a group of routers to behave as a single virtual default gateway router, thereby providing default gateway redundancy and minimizing traffic loss. VRRP now supports Bridge-Group Virtual Interface (BVI), which means that VRRP sessions can run between BVI interfaces of multiple routers.</p>
<b>L2VPN</b>	
VPLS over Preferred TE and MPLS OAM	<p>Based on your network traffic pattern, you can configure the preferred Traffic Engineering (TE) tunnel path between Provider Edge (PE) routers participating in the same Virtual Private LAN Services (VPLS). You optimize network resource utilization and performance when you set an explicit path on the PE router to direct traffic flow to a specific destination PE router.</p> <p>With VPLS, you now have MPLS-OAM capabilities for troubleshooting MPLS networks:</p> <ul style="list-style-type: none"> <li>• <b>MPLS LSP Ping</b></li> <li>• <b>MPLS LSP Traceroute</b></li> <li>• <b>Flow-Aware Transport (FAT) Pseudowires (PW)</b></li> </ul> <p>This functionality adds the following command:</p> <p><b>control-word</b></p>
<b>MPLS</b>	
Controlling State Advertisements in an mLDP-Only Setup	<p>In conformance with RFC 7473, you can control state advertisements of non-negotiated Label Distribution Protocol (LDP) applications in a Multipoint LDP (mLDP)-only environment. In such an environment, participating routers don't need to exchange any unicast binding information. As a result, the flow of LDP state information in an mLDP-only setup is faster. Also, when routers come up after a network event, the network convergence time is shorter.</p>
Load Balancing based on the Position of Entropy Label	<p>The router achieves multi-pathing or traffic load balancing based on the Entropy Label (EL) and Entropy Label Indicator (ELI) position.</p> <p>The load balancing is based on the router ID and label stack if the ELI is in any of the three bottom labels. If not, the load balancing is based on all labels in the label stack plus the MPLS payload.</p>
<b>Modular QoS</b>	
Equitable Traffic Flow Using Fair VOQ on Cisco 8201-32FH Routers	<p>You can now ensure that the bandwidth available at the destination port for a given traffic class is distributed equally to all source ports requesting bandwidth on Cisco 8201-32FH routers.</p>

Feature	Description
QoS Policy Propagation via BGP	<p>You now have the ability to install a BGP route in the routing table with a QoS Group so that IP packets that match the route receive the QoS policies associated with the QoS group.</p> <p>This functionality enables convenient classification and marking when BGP is deployed, overcoming the administrative challenges of classifying based on ACLs.</p>
<b>Segment Routing</b>	
BGP Best Path Computation using SR Policy Paths	<p>BGP best-path selection is modified for a prefix when at least one of its paths resolves over the next hop using SR policies (SR policy in “up” state). Under this condition, paths not steered over an SR policy (those using native next-hop resolution) are considered ineligible during best-path selection.</p> <p>You can thus control the best path selection in order to steer traffic, preferably or exclusively, over SR policies with the desired SLA.</p> <p>This feature introduces the <b>bgp bestpath sr-policy {force   prefer}</b> command.</p>
Flexible Algorithm Prefix-SID Redistribution for External Route Propagation	<p>You can now propagate flexible algorithm prefix-SIDs and their algorithm-specific metric between different IGP domains, such as OSPF to IS-IS RIP to OSPF. With this functionality enabling interdomain traffic engineering, you can export flexible algorithm labels from the OSPF domain to other domains and import the labels from other domains into OSPF.</p> <p>The <b>show ospf route flex-algo</b> command has been modified to include additional attributes to indicate the external routes.</p>
Flexible Algorithm to Exclude SRLGs for OSPF	<p>You can now configure the flexible algorithm to exclude any link belonging to the Shared Risk Link Groups (SRLGs) from the path computation for OSPF. The ability to exclude the at-risk links ensures that the rest of the links in the network remain unaffected.</p>
SR Policy Liveness Monitoring Enhancement	<p>This monitoring enhancement allows both liveness monitoring and delay measurement using a single-set of performance monitoring packets as opposed to running separate monitoring sessions for each purpose. This improves the overall scale by reducing the number of performance monitoring sessions required.</p>
SRv6 with Full-Length SIDs	<p>This feature extends Segment Routing support with IPv6 data plane.</p> <p>In a Segment Routing over IPv6 (SRv6) network, an IPv6 address serves as the Segment Identifier (SID). The source router encodes the path to destination as an ordered list of segments (list of IPv6 addresses) in the IPv6 packet using a new header for SRv6 called a Segment Routing Header (SRH). In an SRv6 enabled network, the active segment is indicated by the destination address of the packet, and the next segment is indicated by a pointer in the SRH.</p>
SRv6 with Micro-Segment (uSID)	<p>This release introduces support for Segment Routing over IPv6 data plane using Micro SIDs (uSIDs).</p> <p>This feature allows the source router to encode multiple SRv6 uSID instructions within a single 128-bit SID address. Such functionality allows for efficient and compact SRv6 SID representation with a low MTU overhead.</p> <p>In a Segment Routing over IPv6 (SRv6) network, an IPv6 address serves as the segment identifier (SID). The source router can encode multiple SRv6 uSID instructions within a single 128-bit SID address. Such a SID address is called a uSID Carrier.</p> <p>SRv6 uSIDs provides low MTU overhead; for example, 6 uSIDs per uSID carrier results in 18 source-routing waypoints in only 40 bytes of overhead (in SRH).</p>

Feature	Description
<a href="#">Segment Routing Path Computation Element</a>	<p>You can use a recommended platform to act as the Segment Routing Path Computation Element (SR-PCE) to calculate a suitable network path for transmitting data between a source and destination by applying metrics such as IGP, TE, and latency and restrictions such as the affinity of flexible algorithms for delay or IGP, and disjointness for LSPs.</p> <p>SR-PCE supports up to:</p> <ul style="list-style-type: none"> <li>• 50000 nodes</li> <li>• 100000 LSPs</li> <li>• 500000 links</li> <li>• 2000 PCEP sessions</li> </ul> <p>You can use SR-PCE for:</p> <ul style="list-style-type: none"> <li>• <a href="#">Disjoint Policy</a></li> <li>• <a href="#">PCE-initiated SR Policies for Traffic Management</a></li> <li>• <a href="#">PCC-initiated Policies Delegated to PCE</a></li> <li>• <a href="#">SR-PCE IPv4 Unnumbered Interface Support</a></li> </ul>
<a href="#">Segment Routing Traffic Engineering (SR-TE)</a>	<p>You create a policy to steer traffic between a source-and-destination pair using the concept of source routing, where the source calculates the path and encodes it in the packet header as a segment. This functionality uses a single intelligent source and does not rely on the remaining nodes to compute a path through the network. This feature utilizes network bandwidth more effectively than traditional MPLS-TE networks by using ECMP at every segment level.</p>
<b>System Management</b>	
<a href="#">Dynamic Power Management</a>	<p>The Cisco 8202-32FH-M router will now consider dynamic factors, such as optical modules to enable improved power allocation and utilization.</p>
<a href="#">Precision Time Protocol (PTP) Support on 88-LC0-36FH-M Line card and 8202-32FH-M Router</a>	<p>With this release, support for Precision Time Protocol (PTP) telecom profiles 8273.2 and 8275.1 is extended to the following:</p> <ul style="list-style-type: none"> <li>• 88-LC0-36FH-M line card</li> <li>• 8202-32FH-M router</li> </ul> <p>Support of PTP profile 8273.2 allows distribution of time and phase synchronization for packet-based network. Support of PTP profile 8275.1 enables network element interoperability for the delivery of accurate phase and time synchronization.</p>

Feature	Description
<a href="#">Synchronous Ethernet (SyncE) Support on 88-LC0-36FH-M Line card and 8202-32FH-M Router</a>	<p>With this release, support for Synchronous Ethernet (SyncE) ITU-T profiles G.8262 and G.8264 is extended to the following:</p> <ul style="list-style-type: none"> <li>• 88-LC0-36FH-M line card</li> <li>• 8202-32FH-M router</li> </ul> <p>The SyncE profile G.8262 enables synchronous ethernet clock support and the SyncE profile G.8264 enables ethernet synchronization messaging channel (ESMC).</p>
<b>System Monitoring</b>	
<a href="#">Online Diagnostics for NPU</a>	<p>You can now run an online diagnostic tool to verify the router NPUs are operational. The tool logs NPU failures in the system log output.</p> <p>This feature introduces the following commands:</p> <ul style="list-style-type: none"> <li>• <b>diagnostic monitor interval</b></li> <li>• <b>diagnostic monitor location</b></li> <li>• <b>diagnostic monitor syslog</b></li> <li>• <b>diagnostic monitor threshold</b></li> <li>• <b>show diagnostic trace location</b></li> </ul> <p>You can also generate <b>tech-support</b> information that is useful for Cisco Technical Support representatives when troubleshooting a router.</p>
<a href="#">Platform Automated Monitoring for Blocked Processes</a>	<p>You can enable the Platform Automated Monitoring tool integrated into the Cisco IOS XR software image and receive alerts if any process is blocked. Several system failures can cause a blocked process, such as memory leak, network connection loss, and so on.</p> <p>The tool collects the required data to troubleshoot the issue and generates a system log message with the name of the process that is currently blocked.</p> <p>This feature introduces the following commands:</p> <ul style="list-style-type: none"> <li>• <b>enable-pam process-monitoring</b></li> <li>• <b>disable-pam process-monitoring</b></li> <li>• <b>show pam process-monitoring-status</b></li> </ul>
<b>System Security</b>	
<a href="#">MACSec Encryption on 8202-32FH-M</a>	<p>This release introduces the 8202-32FH-M fixed chassis with MACsec support. The chassis has 32 ports of 400GE in a compact 2RU form factor. MACsec, the Layer 2 encryption protocol, secures the data on physical media and provides data integrity and confidentiality even at higher network layers.</p>



Feature	Description
<a href="#">MAC Authentication Bypass</a>	<p>Based on the MAC address of the end device or the client connected to the router port, this feature enables port control functionality for your router. This functionality provides controlled access to network services for end devices that do not support other authentication methods such as IEEE 802.1X port-based authentication.</p> <p>This feature introduces these commands and options:</p> <ul style="list-style-type: none"> <li>• <b>mab</b> option in the <b>dot1x profile</b> command</li> <li>• <b>mab-retry-time</b> option in the <b>authenticator</b> command</li> <li>• <b>clear mab</b></li> <li>• <b>show mab</b></li> </ul>
<b>Software Installation</b>	
<a href="#">ZTP on Breakout Interfaces</a>	<p>ZTP detects if breakout optics are connected to data ports and determines the breakout capability, thus enabling it to connect to the DHCP server automatically.</p> <p>In earlier releases, ZTP worked with only with connected data port interfaces without breakout optics or with data ports that applied breakout configurations.</p>
<b>Telemetry</b>	
<a href="#">Enhanced Syslog Notifications for Unresolved Line Card Forwarding Paths</a>	<p>This feature notifies you of Line Card and Route Processor paths not resolving in the Forwarding Information Base. Both Model-Driven Telemetry (MDT) and Event Driven Telemetry (EDT) notifications are supported. In earlier releases, notifications for route processors were supported. This feature provides for improved diagnostics.</p>
<b>Setup and Upgrade</b>	
<a href="#">Automatic FPD upgrade for PSU</a>	<p>Automatic FPD upgrade for PSUs is now enabled. In earlier releases, automatic upgrades did not apply to FPDs associated with the PSUs.</p>

## Deprecated features

This section lists the features deprecated in the release:

- [BaseboardManagement Controller \(BMC\)](#)

## Hardware Introduced

Cisco IOS XR Release 7.5.2 introduces the following hardware support:

Hardware Feature	Description
8202-32FH-M and 8202-32FH-MO	<p>These are fixed-port, high-density, 2RU form-factor routers with MACsec that support 32-ports of 400 GbE. These routers consume low power for efficient cooling and can scale to the increasing bandwidth and scale requirements. The 8202-32FH-MO variant supports Cisco-qualified open-source network operating systems, such as SONiC (Software for Open Networking in the Cloud).</p>



For a complete list of supported hardware and ordering information, see the [Cisco 8000 Series Data Sheet](#).

## Release 7.5.2 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
- An optional package that is included in the ISO
- An optional package that is not included in the ISO

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
Package
-----
Version
-----
xr-8000-af-ea                7.5.2v1.0.0-1
xr-8000-aib                  7.5.2v1.0.0-1
xr-8000-bfd                  7.5.2v1.0.0-1
xr-8000-buffhdr-ea          7.5.2v1.0.0-1
xr-8000-bundles              7.5.2v1.0.0-1
xr-8000-card-support         7.5.2v1.0.0-1
xr-8000-cdp-ea               7.5.2v1.0.0-1
xr-8000-cfm                  7.5.2v1.0.0-1
xr-8000-core                 7.5.2v1.0.0-1
xr-8000-cpa                  7.5.2v1.0.0-1
xr-8000-cpa-npu              7.5.2v1.0.0-1
xr-8000-cpa-sb-data          7.5.2v1.0.0-1
xr-8000-dot1x                7.5.2v1.0.0-1
xr-8000-dsm                  7.5.2v1.0.0-1
xr-8000-encap-id             7.5.2v1.0.0-1
xr-8000-ether-ea             7.5.2v1.0.0-1
xr-8000-fabric               7.5.2v1.0.0-1
xr-8000-feat-mgr             7.5.2v1.0.0-1
xr-8000-fib-ea               7.5.2v1.0.0-1
xr-8000-forwarder           7.5.2v1.0.0-1
xr-8000-fpd                  7.5.2v1.0.0-1
xr-8000-fwd-tools            7.5.2v1.0.0-1
xr-8000-fwplib               7.5.2v1.0.0-1
xr-8000-host-core            7.5.2v1.0.0-1
xr-8000-l2fib                7.5.2v1.0.0-1
xr-8000-leabaofa             7.5.2v1.0.0-1
xr-8000-libofaasync          7.5.2v1.0.0-1
xr-8000-lpts-ea              7.5.2v1.0.0-1
xr-8000-mcast                 7.5.2v1.0.0-1
xr-8000-netflow              7.5.2v1.0.0-1
xr-8000-npu                  7.5.2v1.0.0-1
xr-8000-oam                  7.5.2v1.0.0-1
xr-8000-optics               7.5.2v1.0.0-1
xr-8000-os                   7.5.2v1.0.0-1
xr-8000-os-extra             7.5.2v1.0.0-1
xr-8000-pbr                   7.5.2v1.0.0-1
xr-8000-pfilter              7.5.2v1.0.0-1
xr-8000-pidb                 7.5.2v1.0.0-1
xr-8000-pktio                7.5.2v1.0.0-1
xr-8000-port-mapper          7.5.2v1.0.0-1
```

xr-8000-port-mode	7.5.2v1.0.0-1
xr-8000-ppinfo	7.5.2v1.0.0-1
xr-8000-qos-ea	7.5.2v1.0.0-1
xr-8000-secy-driver	7.5.2v1.0.0-1
xr-8000-span	7.5.2v1.0.0-1
xr-8000-spio	7.5.2v1.0.0-1
xr-8000-spp-ea	7.5.2v1.0.0-1
xr-8000-timing	7.5.2v1.0.0-1
xr-8000-tunnel-ip	7.5.2v1.0.0-1
xr-8000-utapp-blaze	7.5.2v1.0.0-1
xr-8000-vether	7.5.2v1.0.0-1
xr-8000-ztp-ea	7.5.2v1.0.0-1
xr-aaa	7.5.2v1.0.0-1
xr-acl	7.5.2v1.0.0-1
xr-apphosting	7.5.2v1.0.0-1
xr-appmgr	7.5.2v1.0.0-1
xr-bcdl	7.5.2v1.0.0-1
xr-bfd	7.5.2v1.0.0-1
xr-bgp	7.5.2v1.0.0-1
xr-bgputil	7.5.2v1.0.0-1
xr-bng-stubs	7.5.2v1.0.0-1
xr-bundles	7.5.2v1.0.0-1
xr-cal-pi	7.5.2v1.0.0-1
xr-cdp	7.5.2v1.0.0-1
xr-cds	7.5.2v1.0.0-1
xr-cfgmgr	7.5.2v1.0.0-1
xr-cfm	7.5.2v1.0.0-1
xr-cofo	7.5.2v1.0.0-1
xr-core	7.5.2v1.0.0-1
xr-core-calv	7.5.2v1.0.0-1
xr-cpa-common	7.5.2v1.0.0-1
xr-cpa-common-optics	7.5.2v1.0.0-1
xr-cpa-common-psu	7.5.2v1.0.0-1
xr-cpa-driver-devobj-gnss	7.5.2v1.0.0-1
xr-cpa-driver-devobj-misc	7.5.2v1.0.0-1
xr-cpa-driver-devobj-npu	7.5.2v1.0.0-1
xr-cpa-driver-devobj-phy	7.5.2v1.0.0-1
xr-cpa-driver-devobj-sensors	7.5.2v1.0.0-1
xr-cpa-driver-devobj-storage	7.5.2v1.0.0-1
xr-cpa-driver-devobj-test	7.5.2v1.0.0-1
xr-cpa-driver-devobj-timing	7.5.2v1.0.0-1
xr-cpa-driver-fpgalib-access	7.5.2v1.0.0-1
xr-cpa-driver-fpgalib-common	7.5.2v1.0.0-1
xr-cpa-driver-fpgalib-infra	7.5.2v1.0.0-1
xr-cpa-driver-fpgalib-kmod	7.5.2v1.0.0-1
xr-cpa-driver-fpgalib-misc	7.5.2v1.0.0-1
xr-cpa-driver-fpgalib-optics	7.5.2v1.0.0-1
xr-cpa-driver-optics	7.5.2v1.0.0-1
xr-cpa-ethsw	7.5.2v1.0.0-1
xr-cpa-idprom	7.5.2v1.0.0-1
xr-cpa-tamlib	7.5.2v1.0.0-1
xr-ctc	7.5.2v1.0.0-1
xr-debug	7.5.2v1.0.0-1
xr-dhcp	7.5.2v1.0.0-1
xr-diags	7.5.2v1.0.0-1
xr-diskboot	7.5.2v1.0.0-1
xr-drivers	7.5.2v1.0.0-1
xr-eem	7.5.2v1.0.0-1
xr-elmi-stubs	7.5.2v1.0.0-1
xr-ema	7.5.2v1.0.0-1
xr-enhancedmanageability	7.5.2v1.0.0-1
xr-featurecapability	7.5.2v1.0.0-1
xr-fib	7.5.2v1.0.0-1
xr-filesysinv	7.5.2v1.0.0-1

xr-foundation-8000	7.5.2v1.0.0-1
xr-fpd	7.5.2v1.0.0-1
xr-ha-infra	7.5.2v1.0.0-1
xr-healthcheck	7.5.2v1.0.0-1
xr-host-core	7.5.2v1.0.0-1
xr-httpclient	7.5.2v1.0.0-1
xr-icpe-eth	7.5.2v1.0.0-1
xr-icpe-opt	7.5.2v1.0.0-1
xr-identifier	7.5.2v1.0.0-1
xr-infra-sla	7.5.2v1.0.0-1
xr-install	7.5.2v1.0.0-1
xr-ip-apps	7.5.2v1.0.0-1
xr-ip-core	7.5.2v1.0.0-1
xr-ip-infra-vrf	7.5.2v1.0.0-1
xr-ip-mibs	7.5.2v1.0.0-1
xr-ip-static	7.5.2v1.0.0-1
xr-ipc	7.5.2v1.0.0-1
xr-ipsla	7.5.2v1.0.0-1
xr-is-is	7.5.2v1.0.0-1
xr-k9sec	7.5.2v1.0.0-1
xr-l2snooptransport	7.5.2v1.0.0-1
xr-l2vpn	7.5.2v1.0.0-1
xr-ldp	7.5.2v1.0.0-1
xr-licensing	7.5.2v1.0.0-1
xr-link-oam	7.5.2v1.0.0-1
xr-linuxnetworking	7.5.2v1.0.0-1
xr-linuxsecurity	7.5.2v1.0.0-1
xr-lldp	7.5.2v1.0.0-1
xr-lpts	7.5.2v1.0.0-1
xr-manageabilityxml	7.5.2v1.0.0-1
xr-mandatory	7.5.2v1.0.0-1
xr-mcast	7.5.2v1.0.0-1
xr-mda	7.5.2v1.0.0-1
xr-mps	7.5.2v1.0.0-1
xr-mps-oam	7.5.2v1.0.0-1
xr-mps-oam-client	7.5.2v1.0.0-1
xr-mps-static	7.5.2v1.0.0-1
xr-netflow	7.5.2v1.0.0-1
xr-networkboot	7.5.2v1.0.0-1
xr-nosi	7.5.2v1.0.0-1
xr-ntp	7.5.2v1.0.0-1
xr-ofa	7.5.2v1.0.0-1
xr-optics	7.5.2v1.0.0-1
xr-orrsfp	7.5.2v1.0.0-1
xr-os-apps	7.5.2v1.0.0-1
xr-os-core	7.5.2v1.0.0-1
xr-os-hardware	7.5.2v1.0.0-1
xr-ospf	7.5.2v1.0.0-1
xr-perf-meas	7.5.2v1.0.0-1
xr-perfmgmt	7.5.2v1.0.0-1
xr-pfi	7.5.2v1.0.0-1
xr-pird-stubs	7.5.2v1.0.0-1
xr-pkt-trace	7.5.2v1.0.0-1
xr-platforms-ras	7.5.2v1.0.0-1
xr-pm-alarm	7.5.2v1.0.0-1
xr-procmgr	7.5.2v1.0.0-1
xr-python	7.5.2v1.0.0-1
xr-qos	7.5.2v1.0.0-1
xr-rid-mgr	7.5.2v1.0.0-1
xr-routing	7.5.2v1.0.0-1
xr-rpl	7.5.2v1.0.0-1
xr-rsvp-te	7.5.2v1.0.0-1
xr-security	7.5.2v1.0.0-1
xr-security-tams	7.5.2v1.0.0-1

```

xr-servicelayer 7.5.2v1.0.0-1
xr-snmp 7.5.2v1.0.0-1
xr-snmp-hw 7.5.2v1.0.0-1
xr-span 7.5.2v1.0.0-1
xr-spi-core 7.5.2v1.0.0-1
xr-spi-hw 7.5.2v1.0.0-1
xr-spp 7.5.2v1.0.0-1
xr-sr 7.5.2v1.0.0-1
xr-stats 7.5.2v1.0.0-1
xr-stp 7.5.2v1.0.0-1
xr-stubs 7.5.2v1.0.0-1
xr-sysdb 7.5.2v1.0.0-1
xr-syslog 7.5.2v1.0.0-1
xr-telemetry 7.5.2v1.0.0-1
xr-telnet 7.5.2v1.0.0-1
xr-timing 7.5.2v1.0.0-1
xr-tmpdir-cleanup 7.5.2v1.0.0-1
xr-track 7.5.2v1.0.0-1
xr-transport 7.5.2v1.0.0-1
xr-tty 7.5.2v1.0.0-1
xr-tunnel-ip 7.5.2v1.0.0-1
xr-tunnel-nve 7.5.2v1.0.0-1
xr-upgradematrix 7.5.2v1.0.0-1
xr-utils 7.5.2v1.0.0-1
xr-vether 7.5.2v1.0.0-1
xr-vpnmib 7.5.2v1.0.0-1
xr-xmlinfra 7.5.2v1.0.0-1
xr-xrlicurl 7.5.2v1.0.0-1
xr-ztp 7.5.2v1.0.0-1

```

To know about all the RPMs installed including XR, OS and other components 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

These caveats are applicable for Cisco IOS XR Software:

**Table 1: Cisco 8000 Series Router Specific Bugs**

Bug ID	Headline
<a href="#">CSCwb24923</a>	shelfmgr crash seen while upgrading node from 7014 to 752.

## 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 7.5.2 LNT
Copyright (c) 2013-2022 by Cisco Systems, Inc.
```

Build Information:

```
Built By      : username
Built On     : Tue Apr 26 23:38:37 UTC 2022
Build Host  : iox-ucs-030
Workspace   : /auto/srcarchive14/prod/7.5.2/8000/ws
Version     : 7.5.2
Label      : 7.5.2-752GISO
```

```
cisco 8000 (Intel(R) Xeon(R) CPU D-1530 @ 2.40GHz)
cisco 8201-32FH (Intel(R) Xeon(R) CPU D-1530 @ 2.40GHz) processor with 32GB of memory
R1-XAR-Churchil uptime is 42 minutes
Cisco 8000 Series 32x400G QSFPDD 1RU Fixed System w/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
                                =====
```

Card Type	FPD Description	Req Reload	SW Ver	Min Req SW Ver	Min Req Board Ver
8101-32FH	Bios	YES	0.17	0.17	0.0
	BiosGolden	YES	0.17	0.13	0.0
	IoFpga	YES	1.04	1.04	0.35
	IoFpgaGolden	YES	1.04	1.02	0.35
	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	1.21	1.21	0.35
	x86FpgaGolden	YES	1.21	1.06	0.35
	x86TamFw	YES	6.05	6.05	0.0
	x86TamFwGolden	YES	6.05	6.05	0.0
	8101-32FH-O	Bios	YES	0.218	0.218
BiosGolden		YES	0.218	0.218	0.0
IoFpga		YES	1.04	1.04	0.35
IoFpgaGolden		YES	1.04	1.02	0.35
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	1.21	1.21	0.35
x86FpgaGolden		YES	1.21	1.06	0.35
x86TamFw		YES	6.05	6.05	0.0
x86TamFwGolden		YES	6.05	6.05	0.0
8201-24H8FH		Bios	YES	0.17	0.17
	BiosGolden	YES	0.17	0.13	0.0
	IoFpga	YES	1.04	1.04	0.35
	IoFpgaGolden	YES	1.04	1.02	0.35

	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	1.21	1.21	0.35
	x86FpgaGolden	YES	1.21	1.06	0.35
	x86TamFw	YES	6.05	6.05	0.0
	x86TamFwGolden	YES	6.05	6.05	0.0
-----					
8201-24H8FH-O	Bios	YES	0.218	0.218	0.0
	BiosGolden	YES	0.218	0.218	0.0
	IoFpga	YES	1.04	1.04	0.35
	IoFpgaGolden	YES	1.04	1.02	0.35
	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	1.21	1.21	0.35
	x86FpgaGolden	YES	1.21	1.06	0.35
	x86TamFw	YES	6.05	6.05	0.0
	x86TamFwGolden	YES	6.05	6.05	0.0
-----					
8201-32FH	Bios	YES	0.17	0.17	0.0
	BiosGolden	YES	0.17	0.13	0.0
	IoFpga	YES	1.04	1.04	0.35
	IoFpgaGolden	YES	1.04	1.02	0.35
	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	1.21	1.21	0.35
	x86FpgaGolden	YES	1.21	1.06	0.35
	x86TamFw	YES	6.05	6.05	0.0
	x86TamFwGolden	YES	6.05	6.05	0.0
-----					
8201-32FH-O	Bios	YES	0.218	0.218	0.0
	BiosGolden	YES	0.218	0.218	0.0
	IoFpga	YES	1.04	1.04	0.35
	IoFpgaGolden	YES	1.04	1.02	0.35
	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	1.21	1.21	0.35
	x86FpgaGolden	YES	1.21	1.06	0.35
	x86TamFw	YES	6.05	6.05	0.0
	x86TamFwGolden	YES	6.05	6.05	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	17.54	17.54	0.0
-----					
PSU2KW-ACPI	PO-PrimMCU	NO	17.56	17.56	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	17.136	17.136	0.0

## Cisco 8200 Series Router

RP/0/RP0/CPU0# show fpd package

```

=====
                        Field Programmable Device Package
=====

```

Card Type	FPD Description	Req Reload	SW Ver	Min Req SW Ver	Min Req Board Ver
8101-32FH	Bios	YES	1.03	1.03	0.0
	BiosGolden	YES	1.03	0.13	0.0
	IoFpga	YES	1.04	1.04	0.35
	IoFpgaGolden	YES	1.04	1.02	0.35
	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	1.21	1.21	0.35
	x86FpgaGolden	YES	1.21	1.06	0.35
	x86TamFw	YES	6.05	6.05	0.0
	x86TamFwGolden	YES	6.05	6.05	0.0
8101-32FH-O	Bios	YES	0.218	0.218	0.0
	BiosGolden	YES	0.218	0.218	0.0
	IoFpga	YES	1.04	1.04	0.35
	IoFpgaGolden	YES	1.04	1.02	0.35
	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	1.21	1.21	0.35
	x86FpgaGolden	YES	1.21	1.06	0.35
	x86TamFw	YES	6.05	6.05	0.0
	x86TamFwGolden	YES	6.05	6.05	0.0
8201-24H8FH	Bios	YES	1.03	1.03	0.0
	BiosGolden	YES	1.03	0.13	0.0
	IoFpga	YES	1.04	1.04	0.35
	IoFpgaGolden	YES	1.04	1.02	0.35
	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	1.21	1.21	0.35
	x86FpgaGolden	YES	1.21	1.06	0.35
	x86TamFw	YES	6.05	6.05	0.0
	x86TamFwGolden	YES	6.05	6.05	0.0
8201-24H8FH-O	Bios	YES	0.218	0.218	0.0
	BiosGolden	YES	0.218	0.218	0.0
	IoFpga	YES	1.04	1.04	0.35
	IoFpgaGolden	YES	1.04	1.02	0.35
	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	1.21	1.21	0.35
	x86FpgaGolden	YES	1.21	1.06	0.35
	x86TamFw	YES	6.05	6.05	0.0
	x86TamFwGolden	YES	6.05	6.05	0.0
8201-32FH	Bios	YES	1.03	1.03	0.0
	BiosGolden	YES	1.03	0.13	0.0



	IoFpga	YES	1.04	1.04	0.35
	IoFpgaGolden	YES	1.04	1.02	0.35
	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	1.21	1.21	0.35
	x86FpgaGolden	YES	1.21	1.06	0.35
	x86TamFw	YES	6.05	6.05	0.0
	x86TamFwGolden	YES	6.05	6.05	0.0
-----					
8201-32FH-O	Bios	YES	0.218	0.218	0.0
	BiosGolden	YES	0.218	0.218	0.0
	IoFpga	YES	1.04	1.04	0.35
	IoFpgaGolden	YES	1.04	1.02	0.35
	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	1.21	1.21	0.35
	x86FpgaGolden	YES	1.21	1.06	0.35
	x86TamFw	YES	6.05	6.05	0.0
	x86TamFwGolden	YES	6.05	6.05	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	17.54	17.54	0.0
-----					
PSU2KW-ACPI	PO-PrimMCU	NO	17.56	17.56	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	17.136	17.136	0.0

## Cisco 8800 Series Router

RP/0/RP0/CPU0# show fpd package

```

=====
Field Programmable Device Package
=====

```

Card Type	FPD Description	Req Reload	SW Ver	Min Req SW Ver	Min Req Board Ver
88-LC0-34H14FH	Bios	YES	1.03	1.03	0.0
	BiosGolden	YES	1.03	0.13	0.0
	EthSwitch	YES	1.04	1.04	0.0
	EthSwitchGolden	YES	1.04	0.07	0.0
	IoFpga	YES	1.01	1.01	0.1
	IoFpgaGolden	YES	1.01	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	0.78	0.78	0.1
	x86FpgaGolden	YES	0.78	0.78	0.1
	x86TamFw	YES	6.10	6.10	0.1
	x86TamFwGolden	YES	6.10	6.10	0.1

-----					
88-LC0-34H14FH-O	Bios	YES	0.218	0.218	0.0
	BiosGolden	YES	0.218	0.218	0.0
	EthSwitch	YES	1.04	1.04	0.0
	EthSwitchGolden	YES	1.04	0.07	0.0
	IoFpga	YES	1.01	1.01	0.1
	IoFpgaGolden	YES	1.01	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	0.78	0.78	0.1
	x86FpgaGolden	YES	0.78	0.78	0.1
	x86TamFw	YES	6.10	6.10	0.1
	x86TamFwGolden	YES	6.10	6.10	0.1
-----					
88-LC0-36FH	Bios	YES	1.03	1.03	0.0
	BiosGolden	YES	1.03	0.13	0.0
	EthSwitch	YES	1.04	1.04	0.0
	EthSwitchGolden	YES	1.04	0.07	0.0
	IoFpga	YES	1.00	1.00	0.1
	IoFpgaGolden	YES	1.00	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	1.15	1.15	0.1
	x86FpgaGolden	YES	1.15	1.04	0.1
	x86TamFw	YES	6.05	6.05	0.1
	x86TamFwGolden	YES	6.05	6.05	0.1
-----					
88-LC0-36FH-M	Bios	YES	1.03	1.03	0.0
	BiosGolden	YES	1.03	0.13	0.0
	EthSwitch	YES	1.04	1.04	0.0
	EthSwitchGolden	YES	1.04	0.07	0.0
	IoFpga	YES	1.00	1.00	0.1
	IoFpgaGolden	YES	1.00	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	1.15	1.15	0.1
	x86FpgaGolden	YES	1.15	1.04	0.1
	x86TamFw	YES	6.05	6.05	0.1
	x86TamFwGolden	YES	6.05	6.05	0.1
-----					
88-LC0-36FH-MO	Bios	YES	0.218	0.218	0.0
	BiosGolden	YES	0.218	0.218	0.0
	EthSwitch	YES	1.04	1.04	0.0
	EthSwitchGolden	YES	1.04	0.07	0.0
	IoFpga	YES	1.00	1.00	0.1
	IoFpgaGolden	YES	1.00	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	1.15	1.15	0.1
	x86FpgaGolden	YES	1.15	1.04	0.1
	x86TamFw	YES	6.05	6.05	0.1
	x86TamFwGolden	YES	6.05	6.05	0.1
-----					
88-LC0-36FH-O	Bios	YES	0.218	0.218	0.0
	BiosGolden	YES	0.218	0.218	0.0
	EthSwitch	YES	1.04	1.04	0.0

	EthSwitchGolden	YES	1.04	0.07	0.0
	IoFpga	YES	1.00	1.00	0.1
	IoFpgaGolden	YES	1.00	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	1.15	1.15	0.1
	x86FpgaGolden	YES	1.15	1.04	0.1
	x86TamFw	YES	6.05	6.05	0.1
	x86TamFwGolden	YES	6.05	6.05	0.1
-----					
8800-LC-36FH	Bios	YES	1.23	1.23	0.0
	BiosGolden	YES	1.23	1.15	0.0
	EthSwitch	YES	1.04	1.04	0.0
	EthSwitchGolden	YES	1.04	0.07	0.0
	IoFpga	YES	1.12	1.12	0.0
	IoFpgaGolden	YES	1.12	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	1.13	1.13	0.0
	x86FpgaGolden	YES	1.13	0.33	0.0
	x86TamFw	YES	5.06	5.06	0.0
	x86TamFwGolden	YES	5.06	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	1.12	1.12	0.0
	IoFpgaGolden	YES	1.12	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	1.13	1.13	0.0
	x86FpgaGolden	YES	1.13	0.33	0.0
	x86TamFw	YES	5.06	5.06	0.0
	x86TamFwGolden	YES	5.06	5.05	0.0
-----					
8800-LC-48H	Bios	YES	1.23	1.23	0.0
	BiosGolden	YES	1.23	1.15	0.0
	EthSwitch	YES	1.04	1.04	0.0
	EthSwitchGolden	YES	1.04	0.07	0.0
	IoFpga	YES	1.12	1.12	0.0
	IoFpgaGolden	YES	1.12	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	1.13	1.13	0.0
	x86FpgaGolden	YES	1.13	0.33	0.0
	x86TamFw	YES	5.06	5.06	0.0
	x86TamFwGolden	YES	5.06	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	1.12	1.12	0.0
	IoFpgaGolden	YES	1.12	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	1.13	1.13	0.0
	x86FpgaGolden	YES	1.13	0.33	0.0
	x86TamFw	YES	5.06	5.06	0.0
	x86TamFwGolden	YES	5.06	5.05	0.0
-----					
8800-RP	Bios	YES	1.23	1.23	0.0
	BiosGolden	YES	1.23	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	1.31	1.31	0.0
	x86FpgaGolden	YES	1.23	0.24	0.0
	x86TamFw	YES	5.06	5.06	0.0
	x86TamFwGolden	YES	5.06	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	1.31	1.31	0.0
	x86FpgaGolden	YES	1.23	0.24	0.0
	x86TamFw	YES	5.06	5.06	0.0
	x86TamFwGolden	YES	5.06	5.05	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-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
-----					
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-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	51.85	51.85	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-loc-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.

## Supported Transceiver Modules

To determine the transceivers that Cisco hardware device supports, refer to the [Transceiver Module Group \(TMG\) Compatibility Matrix](#) 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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