Release Notes for Cisco 8000 Series Routers, IOS XR Release 7.5.1

Cisco 8100, 8200, and 8800 Series Routers

What's New in Cisco IOS XR Release 7.5.1

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
Setup and Upgrade	
Automatic Bridging of Bug Fix RPMs	In earlier releases, any mandatory bridging bug fixes had to be installed separately *before* a GISO upgrade. In this release, this feature allows mandatory bridging bug fixes to be included within the GISO for installation during the GISO upgrade process. This eliminates the older two-step workflow.
Build Golden ISO (GISO) Using gisobuild.py Tool	This feature allows you to build your GISO image without support from Cisco. You can now select the install files, add your RPMs, repackage them as a custom image, and install the image. In previous releases, you had to contact Cisco to get your GISO built.
Check Integrity of Golden ISO (GISO) Files	This feature enables an automated check during **install package replace** operations to ensure that the files in GISO have not been corrupted. It does so by calculating the md5sum of the files and comparing it against md5sum value that is contained within the GISO that was calculated when the image was built.
IOS XR Configuration File in Golden ISO (GISO)	GISO is a customized image with the standard functional components and additional configuration files. This feature extracts the IOS XR configuration file in GISO and automates the updating of configuration files when the router is reloaded with the new GISO. This feature introduces **iso-config [ignore | replace]** keywords to the **install replace** and **install package replace** commands.
Telemetry	
Target-Defined Mode for Cached Generic Counters Data	This feature streams telemetry data for cached generic counters using a TARGET_DEFINED subscription. This subscription ensures that any change to the cache streams the latest data to the collector as an event-driven telemetry notification. This feature introduces support for the following sensor path: `Cisco-IOS-XR-infra-statsd-oper:infra-statistics/interfaces/interface/cache/generic-counters`
gNMI Dial-Out via Tunnel Service	This feature uses the tunnel service to allow the router (tunnel client) to dial out to a collector (tunnel server). After the session is established, the server-client switch directions where a server can act as a client to request gNMI services without altering the gNMI semantics.
Programmability	

Feature	Description
Add Multiple Events In a Policy Map With a Single EEM Script	With this feature, you can add multiple events to a policy map with boolean (AND or OR) correlation. EEM triggers the script when the correlation defined in the policy map for the events is true. Using EEM scripts, you can create a logical correlation of events in the policy map and configure multiple actions for detectors such as timer, object-tracking, and telemetry events via sensor path.
Control Line Card Power Using YANG Data Model	The `oc-platform.yang` YANG data model enables or disables power to the line card and identifies its slot or chassis. You can access this data model from the Github repository.
Debug Automation Scripts	Use this feature to collect logs that contain debug information for ltraces and tech-support data. These logs aid in troubleshooting whenever the scripts are not working as expected. This feature introduces the **show tech-support script** command.
Github Repository for Automation Scripts	You now have access to sample scripts and templates published on the Github repository. You can leverage these samples to use the python packages and libraries developed by Cisco to build your custom automation scripts for your network
Manage Common Script Actions Using YANG RPCs	This feature enables you to use YANG remote procedure calls (RPCs) on `Cisco-IOS-XR-infra-script-mgmt-act.yang` data model to perform actions on the automation scripts such as add or remove script from the script repository, run, or stop script from running.
Update Automation Scripts from Remote Server	This feature lets you update automation scripts across routers by accessing the master script from a remote site. This eases script management, where you make changes to the master script and then copy it to routers where it is deployed. This feature introduces the **auto-update** keyword in the **script exec** command.
Upgraded IOS XR Python from Version 3.5 to Version 3.9	This upgrade adds new modules and capabilities to create Python scripts and execute the scripts on routers running Cisco IOS XR software. Some of the modules added as part of the upgraded IOS XR Python 3.9 are: hashlib, idna, packaging, pyparsing, six, yaml.
Validate Pre-configuration Using Config Scripts	This feature allows you to use config scripts to validate pre-configuration during a commit or validate operation. Any active config scripts can read and validate (accept, reject or modify) pre-configuration. The pre-configuration is only applied to the system later on, when the relevant hardware is inserted, and does not require further script validation at that point. Previously, config scripts did not allow validating configuration until the corresponding hardware was present.
gRPC Connections over UNIX domain sockets for Enhanced Security and Control	This feature allows local containers and scripts on the router to establish gRPC connections over UNIX domain sockets. These sockets provide better inter-process communication eliminating the need to manage passwords for local communications. Configuring communication over UNIX domain sockets also gives you better control of permissions and security because UNIX file permissions come into force. This feature introduces the **grpc local-connection** command.
System Monitoring	

Feature	Description
Supporting Custom Profile show tech command	This feature lets you run a customized list of **show** commands and **System Admin show** commands from all core protocols such as BGP, MPLS, Segment Routing etc. You can also generate **tech-support** information that is useful for Cisco Technical Support representatives when troubleshooting a router.
	This feature introduces the **show tech support custom profile-name** command.
System Security	
Command Authorization Using Local User Account	This feature allows locally authenticated users—authenticated by the AAA server internal to the router—to run all XR VM commands even if a remote TACACS+ AAA server is not reachable for authorization. It prevents a complete router lockdown. The feature also prevents remotely authenticated users—authenticated using a remote AAA server (say, TACACS+ server)—from running any non-permitted commands on the router, and thus prevents misuse of user privileges.
	This feature modifies the aaa authorization commands default command to include the **local** option for XR VM command authorization.

Hardware Introduced

Cisco IOS XR Release 7.5.1 introduces the following hardware support:

Hardware Feature	Description
88-LC0-34H14FH based on Q200 Silicon Chip	This release introduces a 48-port combo line card that provides 9 Tbps of throughput. The 88-LC0-34H14FH line card is Q200 silicon chip-based and comprises 34 ports of 100 GbE (QSFP28) and 14 ports of 400 GbE (QSFP-DD). Sixteen 100 GbE ports are MACSec capable. 100 GbE ports support 4x10/25 GbE breakout, and 400 GbE ports support 4x100 GbE, 2x100 GbE, and 4x10/25 GbE breakout.
	The 88-LC0-34H14FH line card is supported on Cisco 8800 series modular chassis.
	For more information on this line card, see the Cisco 8000 Series Routers Data Sheet.

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

Release 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                                          7.5.1v1.0.0-1
xr-8000-aib                                            7.5.1v1.0.0-1
xr-8000-bfd                                            7.5.1v1.0.0-1
xr-8000-bmc                                            7.5.1v1.0.0-1
xr-8000-buffhdr-ea                                     7.5.1v1.0.0-1
xr-8000-bundles                                        7.5.1v1.0.0-1
xr-8000-card-support                                   7.5.1v1.0.0-1
xr-8000-cdp-ea                                         7.5.1v1.0.0-1
xr-8000-cfm                                            7.5.1v1.0.0-1
xr-8000-core                                           7.5.1v1.0.0-1
xr-8000-cpa                                            7.5.1v1.0.0-1
xr-8000-cpa-npu                                        7.5.1v1.0.0-1
xr-8000-cpa-sb-data                                    7.5.1v1.0.0-1
xr-8000-dsm                                            7.5.1v1.0.0-1
xr-8000-encap-id                                       7.5.1v1.0.0-1
xr-8000-ether-ea                                       7.5.1v1.0.0-1
xr-8000-fabric                                         7.5.1v1.0.0-1
xr-8000-feat-mgr                                       7.5.1v1.0.0-1
xr-8000-fib-ea                                         7.5.1v1.0.0-1
xr-8000-forwarder                                      7.5.1v1.0.0-1
xr-8000-fpd                                            7.5.1v1.0.0-1
xr-8000-fwdlib                                         7.5.1v1.0.0-1
xr-8000-host-core                                      7.5.1v1.0.0-1
xr-8000-l2fib                                          7.5.1v1.0.0-1
xr-8000-leabaofa                                       7.5.1v1.0.0-1
xr-8000-libofaasync                                    7.5.1v1.0.0-1
xr-8000-lpts-ea                                        7.5.1v1.0.0-1
xr-8000-mcast                                          7.5.1v1.0.0-1
xr-8000-netflow                                        7.5.1v1.0.0-1
xr-8000-npu                                            7.5.1v1.0.0-1
xr-8000-oam                                            7.5.1v1.0.0-1
xr-8000-optics                                         7.5.1v1.0.0-1
xr-8000-os                                             7.5.1v1.0.0-1
xr-8000-pbr                                            7.5.1v1.0.0-1
xr-8000-pfilter                                        7.5.1v1.0.0-1
xr-8000-pidb                                           7.5.1v1.0.0-1
xr-8000-pktio                                          7.5.1v1.0.0-1
xr-8000-port-mapper                                    7.5.1v1.0.0-1
xr-8000-port-mode                                      7.5.1v1.0.0-1
xr-8000-ppinfo                                         7.5.1v1.0.0-1
xr-8000-qos-ea                                         7.5.1v1.0.0-1
xr-8000-secy-driver                                    7.5.1v1.0.0-1
xr-8000-span                                           7.5.1v1.0.0-1
xr-8000-spio                                           7.5.1v1.0.0-1
xr-8000-spp-ea                                         7.5.1v1.0.0-1
xr-8000-timing                                         7.5.1v1.0.0-1
xr-8000-tunnel-ip                                      7.5.1v1.0.0-1
xr-8000-utapp-blaze                                    7.5.1v1.0.0-1
xr-8000-vether                                         7.5.1v1.0.0-1
xr-8000-ztp-ea                                         7.5.1v1.0.0-1
xr-aaa                                                 7.5.1v1.0.0-1
xr-acl                                                 7.5.1v1.0.0-1
xr-apphosting                                          7.5.1v1.0.0-1
xr-appmgr                                              7.5.1v1.0.0-1
xr-bcdl                                                7.5.1v1.0.0-1
xr-bfd                                                 7.5.1v1.0.0-1
```

```
xr-bgp                             7.5.1v1.0.0-1
xr-bgputil                         7.5.1v1.0.0-1
xr-bng-stubs                       7.5.1v1.0.0-1
xr-bundles                         7.5.1v1.0.0-1
xr-cal-pi                          7.5.1v1.0.0-1
xr-cdp                             7.5.1v1.0.0-1
xr-cds                             7.5.1v1.0.0-1
xr-cfgmgr                          7.5.1v1.0.0-1
xr-cfm                             7.5.1v1.0.0-1
xr-cofo                            7.5.1v1.0.0-1
xr-core                            7.5.1v1.0.0-1
xr-core-calv                       7.5.1v1.0.0-1
xr-cpa-common                      7.5.1v1.0.0-1
xr-cpa-common-optics               7.5.1v1.0.0-1
xr-cpa-common-psu                  7.5.1v1.0.0-1
xr-cpa-driver-devobj-misc          7.5.1v1.0.0-1
xr-cpa-driver-devobj-npu           7.5.1v1.0.0-1
xr-cpa-driver-devobj-phy           7.5.1v1.0.0-1
xr-cpa-driver-devobj-sensors       7.5.1v1.0.0-1
xr-cpa-driver-devobj-storage       7.5.1v1.0.0-1
xr-cpa-driver-devobj-test          7.5.1v1.0.0-1
xr-cpa-driver-devobj-timing        7.5.1v1.0.0-1
xr-cpa-driver-fpgalib-access       7.5.1v1.0.0-1
xr-cpa-driver-fpgalib-common       7.5.1v1.0.0-1
xr-cpa-driver-fpgalib-infra        7.5.1v1.0.0-1
xr-cpa-driver-fpgalib-kmod         7.5.1v1.0.0-1
xr-cpa-driver-fpgalib-misc         7.5.1v1.0.0-1
xr-cpa-driver-fpgalib-optics       7.5.1v1.0.0-1
xr-cpa-driver-optics               7.5.1v1.0.0-1
xr-cpa-ethsw                       7.5.1v1.0.0-1
xr-cpa-idprom                      7.5.1v1.0.0-1
xr-cpa-tamlib                      7.5.1v1.0.0-1
xr-ctc                             7.5.1v1.0.0-1
xr-debug                           7.5.1v1.0.0-1
xr-dhcp                            7.5.1v1.0.0-1
xr-diags                           7.5.1v1.0.0-1
xr-diskboot                        7.5.1v1.0.0-1
xr-drivers                         7.5.1v1.0.0-1
xr-eem                             7.5.1v1.0.0-1
xr-elmi-stubs                      7.5.1v1.0.0-1
xr-ema                             7.5.1v1.0.0-1
xr-enhancedmanageability           7.5.1v1.0.0-1
xr-featurecapability               7.5.1v1.0.0-1
xr-fib                             7.5.1v1.0.0-1
xr-filesysinv                      7.5.1v1.0.0-1
xr-foundation-8000                 7.5.1v1.0.0-1
xr-fpd                             7.5.1v1.0.0-1
xr-ha-infra                        7.5.1v1.0.0-1
xr-healthcheck                     7.5.1v1.0.0-1
xr-host-core                       7.5.1v1.0.0-1
xr-httpclient                      7.5.1v1.0.0-1
xr-icpe-eth                        7.5.1v1.0.0-1
xr-icpe-opt                        7.5.1v1.0.0-1
xr-identifier                      7.5.1v1.0.0-1
xr-infra-sla                       7.5.1v1.0.0-1
xr-install                         7.5.1v1.0.0-1
xr-ip-apps                         7.5.1v1.0.0-1
xr-ip-core                         7.5.1v1.0.0-1
xr-ip-infra-vrf                    7.5.1v1.0.0-1
xr-ip-mibs                         7.5.1v1.0.0-1
xr-ip-static                       7.5.1v1.0.0-1
xr-ipc                             7.5.1v1.0.0-1
xr-ipsla                           7.5.1v1.0.0-1
xr-is-is                           7.5.1v1.0.0-1
```

```
xr-k9sec                      7.5.1v1.0.0-1
xr-l2snooptransport           7.5.1v1.0.0-1
xr-l2vpn                      7.5.1v1.0.0-1
xr-ldp                        7.5.1v1.0.0-1
xr-licensing                  7.5.1v1.0.0-1
xr-link-oam                   7.5.1v1.0.0-1
xr-linuxnetworking            7.5.1v1.0.0-1
xr-linuxsecurity              7.5.1v1.0.0-1
xr-lldp                       7.5.1v1.0.0-1
xr-lpts                       7.5.1v1.0.0-1
xr-manageabilityxml           7.5.1v1.0.0-1
xr-mandatory                  7.5.1v1.0.0-1
xr-mcast                      7.5.1v1.0.0-1
xr-mda                        7.5.1v1.0.0-1
xr-mpls                       7.5.1v1.0.0-1
xr-mpls-oam                   7.5.1v1.0.0-1
xr-mpls-oam-client            7.5.1v1.0.0-1
xr-mpls-static                7.5.1v1.0.0-1
xr-netflow                    7.5.1v1.0.0-1
xr-networkboot                7.5.1v1.0.0-1
xr-nosi                       7.5.1v1.0.0-1
xr-ntp                        7.5.1v1.0.0-1
xr-ofa                        7.5.1v1.0.0-1
xr-optics                     7.5.1v1.0.0-1
xr-orrspf                     7.5.1v1.0.0-1
xr-os-apps                    7.5.1v1.0.0-1
xr-os-core                    7.5.1v1.0.0-1
xr-os-hardware                7.5.1v1.0.0-1
xr-ospf                       7.5.1v1.0.0-1
xr-perf-meas                  7.5.1v1.0.0-1
xr-perfmgmt                   7.5.1v1.0.0-1
xr-pfi                        7.5.1v1.0.0-1
xr-pird-stubs                 7.5.1v1.0.0-1
xr-pkt-trace                  7.5.1v1.0.0-1
xr-platforms-ras              7.5.1v1.0.0-1
xr-pm-alarm                   7.5.1v1.0.0-1
xr-procmgr                    7.5.1v1.0.0-1
xr-python                     7.5.1v1.0.0-1
xr-qos                        7.5.1v1.0.0-1
xr-rid-mgr                    7.5.1v1.0.0-1
xr-routing                    7.5.1v1.0.0-1
xr-rpl                        7.5.1v1.0.0-1
xr-rsvp-te                    7.5.1v1.0.0-1
xr-security                   7.5.1v1.0.0-1
xr-security-tams              7.5.1v1.0.0-1
xr-servicelayer               7.5.1v1.0.0-1
xr-snmp                       7.5.1v1.0.0-1
xr-snmp-hw                    7.5.1v1.0.0-1
xr-span                       7.5.1v1.0.0-1
xr-spi-core                   7.5.1v1.0.0-1
xr-spi-hw                     7.5.1v1.0.0-1
xr-spp                        7.5.1v1.0.0-1
xr-sr                         7.5.1v1.0.0-1
xr-stats                      7.5.1v1.0.0-1
xr-stp                        7.5.1v1.0.0-1
xr-stubs                      7.5.1v1.0.0-1
xr-sysdb                      7.5.1v1.0.0-1
xr-syslog                     7.5.1v1.0.0-1
xr-telemetry                  7.5.1v1.0.0-1
xr-telnet                     7.5.1v1.0.0-1
xr-timing                     7.5.1v1.0.0-1
xr-tmpdir-cleanup             7.5.1v1.0.0-1
xr-track                      7.5.1v1.0.0-1
xr-transports                 7.5.1v1.0.0-1
```

```
xr-tty                                                   7.5.1v1.0.0-1
xr-tunnel-ip                                             7.5.1v1.0.0-1
xr-utils                                                 7.5.1v1.0.0-1
xr-vether                                                7.5.1v1.0.0-1
xr-vpnmib                                                7.5.1v1.0.0-1
xr-xmlinfra                                              7.5.1v1.0.0-1
xr-xrlibcurl                                             7.5.1v1.0.0-1
xr-ztp                                                   7.5.1v1.0.0-1
```

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

Table 1: Cisco 8000 Series Router Specific Bugs

Bug ID	Headline
CSCvz53722	Commit replace failed with message " 'OSPFV3' detected the 'resource not available' condition".
CSCwa19042	Login banner text leaf (line) is missed on Cisco-IOS-XR-um-banner-cfg when the total characters in text exceeds 1015.

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 7.5.1 LNT
Copyright (c) 2013-2021 by Cisco Systems, Inc.

Build Information:
Built By     : username
Built On     : Sun Nov 28 17:24:00 UTC 2021
Build Host   : iox-ucs-030
Workspace    : /auto/srcarchive15/prod/7.5.1/8000/ws
Version      : 7.5.1
Label        : 7.5.1

cisco 8000 (Intel(R) Xeon(R) CPU D-1530 @ 2.40GHz)
cisco 8201-SYS (Intel(R) Xeon(R) CPU D-1530 @ 2.40GHz) processor with 32GB of memory
R1-Sherman uptime is 11 minutes
Cisco 8201 1RU System with 24x400GE QSFP56-DD & 12x100GE QSFP28
```

Determine Firmware Support

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

Cisco 8200 Series Router

Cisco 8800 Series Router

```
RP/0/RP0/CPU0# show fpd package
```

Card Type	FPD Description	Req Reload	SW Ver	Min Req SW Ver	Min Req Board Ver
88-LC0-34H14FH	Bios	YES	0.17	0.17	0.0
	BiosGolden	YES	0.17	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	0.17	0.17	0.0
	BiosGolden	YES	0.17	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	1.06	1.06	0.1
	x86FpgaGolden	YES	1.06	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    0.17     0.17     0.0
                   BiosGolden          YES    0.17     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    1.06     1.06     0.1
                   x86FpgaGolden       YES    1.06     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    1.06     1.06     0.1
                   x86FpgaGolden       YES    1.06     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    1.06     1.06     0.1
                   x86FpgaGolden       YES    1.06     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    1.22     1.22     0.0
                   BiosGolden          YES    1.22     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     1.22     1.22      0.0
                        BiosGolden            YES     1.22     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     1.22     1.22      0.0
                        BiosGolden            YES     1.22     1.15      0.0
                        BmcFitGolden          YES     5.00     0.240     0.0
                        BmcFitPrimary         YES     5.00     5.00      0.0
                        BmcFpga               YES     1.03     1.03      0.0
                        BmcFpgaGolden         YES     1.03     0.19      0.0
                        BmcTamFw              YES     5.08     5.08      0.0
                        BmcTamFwGolden        YES     5.08     5.05      0.0
                        BmcUbootGolden        YES     1.02     0.15      0.0
                        BmcUbootPrimary       YES     1.02     1.02      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     1.02     1.02      0.0
                        TimingFpgaGolden      YES     1.02     0.11      0.0
                        x86Fpga               YES     1.23     1.23      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
                  BmcFitGolden        YES   5.00    0.240   0.0
                  BmcFitPrimary       YES   5.00    5.00    0.0
                  BmcFpga             YES   1.03    1.03    0.0
                  BmcFpgaGolden       YES   1.03    0.19    0.0
                  BmcTamFw            YES   5.08    5.08    0.0
                  BmcTamFwGolden      YES   5.08    5.05    0.0
                  BmcUbootGolden      YES   1.02    0.15    0.0
                  BmcUbootPrimary     YES   1.02    1.02    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   1.02    1.02    0.0
                  TimingFpgaGolden    YES   1.02    0.11    0.0
                  x86Fpga             YES   1.23    1.23    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-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.

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