Release Notes for Cisco 8000 Series Routers, Release 7.0.12

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Cisco 8000 Series Routers

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The Cisco 8000 Series combines Cisco's revolutionary IOS XR software, and a set of clean-sheet chassis to deliver a breakthrough in high-performance routers. The 8000 Series comprises a full range of feature-rich, highly scalable, deep-buffered, and 400G-optimized. These routers range from 10.8 Tbps in a 1-RU to 2-RU footprint to an industry-leading, rack-mountable modular system capable of ~260 Tbps of full duplex, line rate forwarding.

The Cisco 8000 Series includes two distinct router architectures- 8800 Series and 8200 Series.

The 8000 series routers deliver significant hardware improvements that includes:

- State-of-the-art redundant fans
- Network Equipment Building System (NEBS)-compliant air filters with doors for simplified line card access
- Future-proof power capacity with power-saving internal distribution
- New power supplies for power feed redundancy with reduced provisioning
- Cable management for up to 864 fibers

The Cisco IOS XR7 network operating system running on Cisco 8000 Series is the enhanced version of Cisco IOS XR software. The enhancements are designed to make Cisco IOS XR7 trusted, simple, and automatable.

Trusted Network

Building a secure and trustworthy network infrastructure is the one of Cisco's major objective.

The ability to verify that a Cisco device is genuine and running authentic code depends on Cisco Secure Boot. Cisco Secure Boot ensures that the device boot image is genuine and untampered. With advanced signing technology, IOS XR7 establishes software integrity enforcement and measurement.

Even if booted securely, a router may have vulnerabilities at runtime, which may remain undetected for a long time. IOS XR7 leverages Integrated Measurement Architecture (IMA) to significantly enhance security by verifying the integrity of the software at runtime.

Simple Network

The IOS XR7 operating system runs across diverse network devices that include proprietary hardware, third party hardware and virtual network functions (VNF). Also, with IOS XR7, all critical components are modularized as packages so that customers load only what they need. Cisco software packages, customized packages, third-party software packages, as well as the router configuration,

are pulled together into a single Cisco software image that is known as a Golden ISO. Customized images can now be installed consistently and with confidence across devices in the network.

Automatable Network

IOS XR 7 embraces model-driven telemetry and APIs to automate your network tasks and functions. IOS XR7 supports a comprehensive list of both native and industry-driven OpenConfig models to exchange configuration and operational data between a client and a server. To keep a check on internal system parameters, IOS XR7 supports a service processor called Board Management Controller (BMC). BMC provides specialized controllers that monitor the state of a network device. It enables monitoring and management of various aspects of the system, such as device health, log events for failure analysis, environmental control, and firmware upgrades. BMC also helps in recovering the router in case of failures.

What's New in Cisco IOS XR Release 7.0.12

Cisco is continuously enhancing the product with every release and this section covers a brief description of key features and enhancements. It also includes links to detailed documentation, where available.

Software

- Routing Protocols—BGP, OSPF, and IS-IS
- IPv4 and IPv6 Routing
- Segment Routing
- MPLS
- Multicast
- Quality of Service (Qos)
- Access List (ACL)
- NetFlow
- Traffic Mirroring using ERSPAN
- IPinIP
- CDP
- LLDP
- Priority Flow Control
- System Management
- System Security
- Interfaces:
    - Physical Interface and Physical sub-interface—100G, 400G, 40G, and 10G
    - Bundle

Hardware

- Cisco 8201, Cisco 8808 and Cisco 8812 chassis
- 36-port QSFP56-DD 400 GbE line card
- 48-port QSFP28 100 GbE line card
- Cisco 8812 and Cisco 8808 fabric card

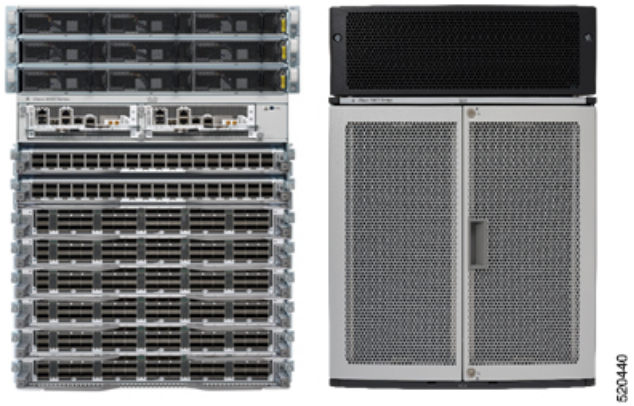
Cisco 8201 Chassis

Figure 1: Cisco 8201

The Cisco 8201 (8201-SYS) is a fixed chassis router. This chassis delivers up to 10.8 Tbps of network bandwidth with dramatically lower power consumption than contemporary 10 Tbps systems.

Cisco 8808 Chassis

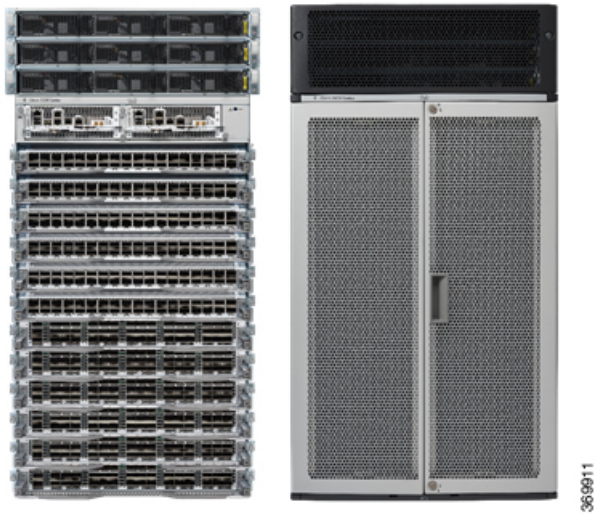
Figure 2: Cisco 8808



The Cisco 8808 (8808-SYS) is a modular chassis router that supports upto 8 line cards, 8 fabric cards and 2 route processor cards. This chassis delivers up to 115.2 Tbps bandwidth.

Cisco 8812 Chassis

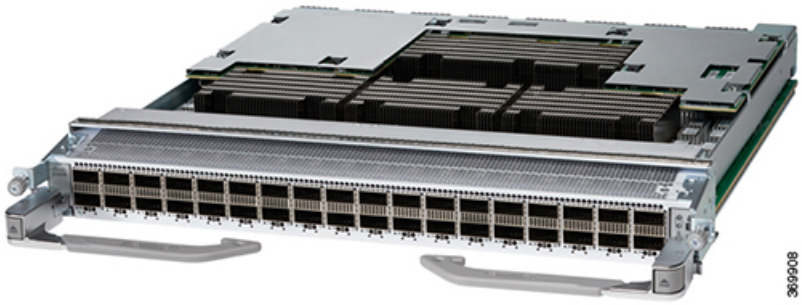
Figure 3: Cisco 8812



The Cisco 8812 (8812-SYS) is a modular chassis router that supports upto 12 line cards, 8 fabric cards and 2 route processor cards. This chassis delivers up to 14.4 Tbps per line card through 100 and 400 Gigabit Ethernet (GbE) ports.

36-port QSFP56-DD 400 GbE Line Card

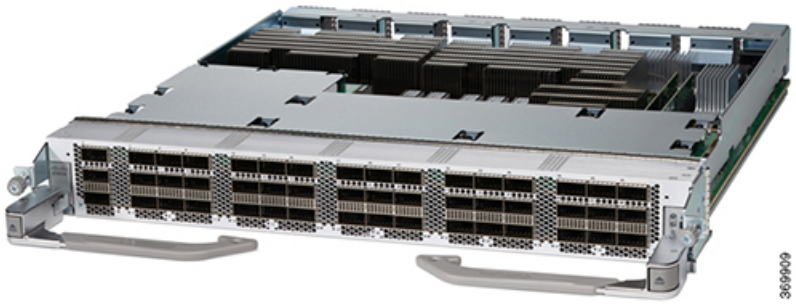
Figure 4: 36-port 400 GbE Line Card



The 36-port QSFP56-DD 400 GbE line card (8800-LC-36FH) provides 14.4 Tbps via 36 QSFP56-DD ports. It provides up to 144 ports of 100 GbE via breakout and supports QSFP+, QSFP28, and QSFP56-DD modules.

48-port QSFP28 100 GbE Line Card

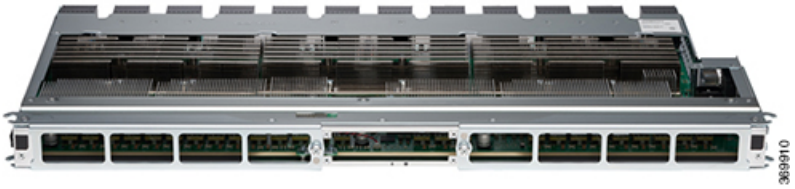
Figure 5: 48-port 100 GbE Line Card



The 48-port QSFP28 100 GbE line card (8800-LC-48H) provides 4.8 Tbps with MACsec support on all ports. It also supports QSFP+ optics 40G (4x10G breakout only).

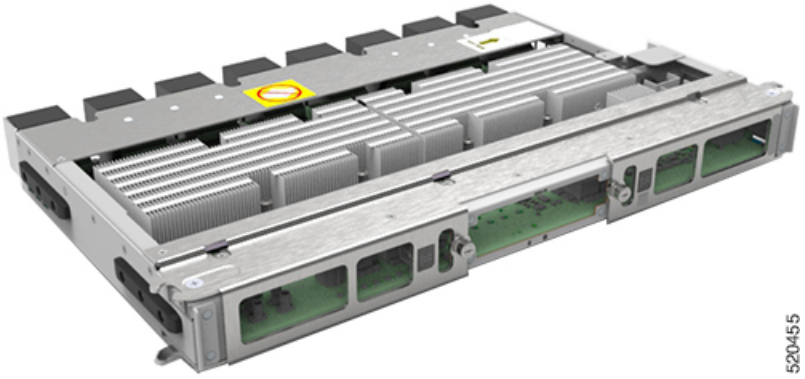
Cisco 8812 Fabric Card

Figure 6: Cisco 8812 FC



Cisco 8808 Fabric Card

Figure 7: Cisco 8808 FC



The Cisco 8812 and Cisco 8808 chassis is powered by 8 fabric cards (8812-FC and 8808-FC) that provide 7+1-line rate redundancy. In addition, the fabric card supports a separate operational mode with 4+1 fabric card redundancy to provide an entry-level option for systems with only the 48-port 100 GbE line card.

Caveats

This section lists the open bugs for Cisco 8000 Series Routers.

Bug ID	Headline
CSCvt27030	On booting a Cisco 8201 router with XR 7012 image, show fpd may display BMC fpds in NOT READY state.
CSCvt43772	Performing a commit replace of entire router configuration followed by loading of configuration or rollback of configuration may cause router to be in inconsistent state.

Supported Packages and System Requirements

Supported Hardware

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

Release 7.0.12 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

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

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.

Determine Software Version

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

```
RP/0/RP0/CPU0# show version
Mon Oct 12 14:43:39.609 EDT
Cisco IOS XR Software, Version 7.2.12 LNT
Copyright (c) 2013-2020 by Cisco Systems, Inc.
```

```
Build Information:
Built By     : <username>
Built On     : Mon Oct 12 08:25:38 UTC 2020
Build Host   : iox-lnx-060
Workspace    : /auto/srcarchive17/prod/7.2.12/8000/ws
Version      : 7.2.12
Label        : 7.2.12-7212_brusilva_1012_renumber

cisco 8000 (D-1530 @ 2.40GHz)
System uptime is 15 minutes
```

```
RP/0/RP0/CPU0:router# show version
Wed Jan 15 21:45:57.239 UTC
Cisco IOS XR Software, Version 7.0.12 LNT
Copyright (c) 2013-2020 by Cisco Systems, Inc.

Build Information:
Built By     : <username>
Built On     : Sat Mar 14 14:18:11 UTC 2020
Build Host   : iox-ucs-033
Workspace    : /auto/srcarchive17/prod/7.0.12/8000/ws
Version      : 7.0.12
Label        : 7.0.12

cisco 8000
System uptime is 2 days, 18 hours, 44 minutes
```

Determine Firmware Support

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

Cisco 8201

```
RP/0/RP0/CPU0:router# 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      1.15     1.15     0.0
                     BiosGolden               YES      1.15     1.15     0.0
                     BmcFitPrimary            YES      0.550    0.550    0.0
                     BmcFpga                  YES      1.00     1.00     0.0
                     BmcFpgaGolden            YES      1.00     0.86     0.0
                     BmcTamFw                 YES      5.06     5.06     0.0
                     BmcTamFwGolden           YES      5.06     5.05     0.0
                     BmcUbootPrimary          YES      1.00     1.00     0.0
                     IoFpga                   YES      1.00     1.00     0.1
                     IoFpgaGolden             YES      1.00     0.48     0.1
                     SsdIntelS3520            YES      1.21     1.21     0.0
                     SsdIntelS4510            YES     11.02    11.02     0.0
                     SsdMicron5100            YES      7.01     7.01     0.0
                     x86Fpga                  YES      1.00     1.00     0.0
                     x86FpgaGolden            YES      1.00     0.48     0.0
                     x86TamFw                 YES      5.06     5.06     0.0
                     x86TamFwGolden           YES      5.06     5.05     0.0
------------------------------------------------------------------------------
PWR-1.4KW-ACPE       DC-PrimMCU               NO      31.00    31.00     0.0
                     DC-SecMCU                NO      16.00    16.00     0.0
------------------------------------------------------------------------------
```

```
PWR-1.4KW-ACPE-TLV   DC-PrimMCU                NO     31.00   31.00    0.0
                     DC-SecMCU                 NO     16.00   16.00    0.0
-------------------------------------------------------------------------------
PWR-1.4KW-ACPI       DC-PrimMCU                NO     31.00   31.00    0.0
                     DC-SecMCU                 NO     16.00   16.00    0.0
-------------------------------------------------------------------------------
PWR-1.4KW-ACPI-TLV   DC-PrimMCU                NO     31.00   31.00    0.0
                     DC-SecMCU                 NO     16.00   16.00    0.0
-------------------------------------------------------------------------------
PWR-2KW-ACPE         PO-PrimMCU                NO     17.54   17.54    0.0
-------------------------------------------------------------------------------
PWR-2KW-ACPE-TLV     PO-PrimMCU                NO     17.54   17.54    0.0
-------------------------------------------------------------------------------
PWR-2KW-ACPI         PO-PrimMCU                NO     17.56   17.56    0.0
-------------------------------------------------------------------------------
PWR-2KW-ACPI-TLV     PO-PrimMCU                NO     17.56   17.56    0.0
-------------------------------------------------------------------------------
PWR-2KW-DCPE         PO-PrimMCU                NO      1.07    1.07    0.0
-------------------------------------------------------------------------------
PWR-2KW-DCPE-TLV     PO-PrimMCU                NO      1.07    1.07    0.0
-------------------------------------------------------------------------------
PWR-2KW-DCPI         PO-PrimMCU                NO      1.07    1.07    0.0
-------------------------------------------------------------------------------
PWR-2KW-DCPI-TLV     PO-PrimMCU                NO      1.07    1.07    0.0
```

Cisco 8812

```
RP/0/RP0/CPU0:router# show fpd package
================================= ==============================================
                                        Field Programmable Device Package
                                  ==============================================
                                           Req     SW      Min Req   Min Req
Card Type            FPD Description       Reload  Ver     SW Ver  Board Ver
==================== ========================= ====== ======= ======== =========
-------------------------------------------------------------------------------
8800-LC-36H          Bios                   YES     1.15    1.15    0.0
                     BiosGolden             YES     1.15    1.15    0.0
                     EthSwitch              YES     1.01    1.01    0.0
                     EthSwitchGolden        YES     1.01    0.07    0.0
                     IoFpga                 YES     1.01    1.01    0.0
                     IoFpgaGolden           YES     1.01    0.08    0.0
                     SsdIntelS3520          YES     1.21    1.21    0.0
                     SsdIntelS4510          YES    11.02   11.02    0.0
                     SsdMicron5100          YES     7.01    7.01    0.0
                     x86Fpga                YES     1.01    1.01    0.0
                     x86FpgaGolden          YES     1.01    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     1.15    1.15    0.0
                     BiosGolden             YES     1.15    1.15    0.0
                     EthSwitch              YES     1.01    1.01    0.0
                     EthSwitchGolden        YES     1.01    0.07    0.0
                     IoFpga                 YES     1.01    1.01    0.0
                     IoFpgaGolden           YES     1.01    0.08    0.0
                     SsdIntelS3520          YES     1.21    1.21    0.0
                     SsdIntelS4510          YES    11.02   11.02    0.0
                     SsdMicron5100          YES     7.01    7.01    0.0
                     x86Fpga                YES     1.01    1.01    0.0
                     x86FpgaGolden          YES     1.01    0.33    0.0
                     x86TamFw               YES     5.06    5.06    0.0
                     x86TamFwGolden         YES     5.06    5.05    0.0
-------------------------------------------------------------------------------
```

```
8800-RP              Bios                    YES     1.15    1.15    0.0
                     BiosGolden              YES     1.15    1.15    0.0
                     BmcFitPrimary           YES     0.550   0.550   0.0
                     BmcFpga                 YES     1.01    1.01    0.0
                     BmcFpgaGolden           YES     1.01    0.19    0.0
                     BmcTamFw                YES     5.06    5.06    0.0
                     BmcTamFwGolden          YES     5.06    5.05    0.0
                     BmcUbootPrimary         YES     1.00    1.00    0.0
                     EthSwitch               YES     1.00    1.00    0.0
                     EthSwitchGolden         YES     1.00    0.07    0.0
                     SsdIntelS3520           YES     1.21    1.21    0.0
                     SsdIntelS4510           YES    11.02   11.02    0.0
                     SsdMicron5100           YES     7.01    7.01    0.0
                     TimingFpga              YES     1.00    1.00    0.0
                     TimingFpgaGolden        YES     1.00    0.11    0.0
                     x86Fpga                 YES     1.02    1.02    0.0
                     x86FpgaGolden           YES     1.02    0.24    0.0
                     x86TamFw                YES     5.06    5.06    0.0
                     x86TamFwGolden          YES     5.06    5.05    0.0
-------------------------------------------------------------------------------
8808-FAN             FTFPGAGolden            NO      1.00    0.16    0.0
                     FTFPGAUpgrade           NO      1.00    1.00    0.0
-------------------------------------------------------------------------------
8808-FC              IoFpga                  YES     1.00    1.00    0.0
                     IoFpgaGolden            YES     1.00    0.05    0.0
-------------------------------------------------------------------------------
8812-FAN             FTFPGAGolden            NO      1.00    0.16    0.0
                     FTFPGAUpgrade           NO      1.00    1.00    0.0
-------------------------------------------------------------------------------
8812-FC              IoFpga                  YES     1.00    1.00    0.0
                     IoFpgaGolden            YES     1.00    0.05    0.0
                     Retimer                 YES     2.00    2.00    0.0
-------------------------------------------------------------------------------
8818-FAN             FTFPGAGolden            NO      1.00    0.16    0.0
                     FTFPGAUpgrade           NO      1.00    1.00    0.0
-------------------------------------------------------------------------------
8818-FC              IoFpga                  YES     1.00    1.00    0.0
                     IoFpgaGolden            YES     1.00    0.05    0.0
                     Retimer                 YES     2.00    2.00    0.0
-------------------------------------------------------------------------------
PSU6.3KW-HV          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      3.00    3.00    0.0
                     DT-Prim1MCU             NO      3.00    3.00    0.0
                     DT-Prim2MCU             NO      3.00    3.00    0.0
                     DT-Sec1MCU              NO      3.00    3.00    0.0
                     DT-Sec2MCU              NO      3.00    3.00    0.0
-------------------------------------------------------------------------------
PWR-4.8KW-DC         PrimMCU                 NO      0.02    0.02    0.0
```

Note The **show fpd package** command lists 8818-FC, and 8818-FAN. However, these hardware are not supported. There is no functionality impact on the router.

Other Important Information

- 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.

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