Release Notes for Cisco NCS 5000 Series Routers, Release 6.1.3

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Network Convergence System 5000 Series Routers—Opening the Architecture

Note *This software release has reached end-of-life status. For more information, see the* End-of-Life and End-of-Sale Notices.

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Key Capabilities

Flexible Packaging—Easy Routine Upgrades and Maintenance

Flexible packaging is an enhancement that modularizes and delivers the Cisco IOS XR operating system as RPM packages.

The base software is becoming leaner that contains only required mandatory packages. Other optional packages are separated out and made available as individually installable RPM packages. Users have the flexibility to select and install the services they want by choosing relevant RPMs. Redhat Package Manager (RPM) based delivery of packages enable easier and faster system updates.

Flexible packaging also supports automatic dependency management whereby, while the user is updating an RPM, the system identifies all relevant dependent packages and updates them. The system uses standard LINUX tools to manage dependency during upgrades.

For the detailed list of release specific feature set matrix (packages) and associated filenames, see , Release 6.1.3 Packages, on page 3

Data Models—Faster Programmatic and Standards-based Configuration

Data models are a programmatic and standards-based way of configuring and collecting operational data of a network device, replacing the process of manual configuration. Using Data models, Cisco IOS XR operating system supports the automating of configurations that belong to multiple routers across the network. Data models are written in a standard, industry-defined language, which can define a new configuration and state an existing configuration on a network.

Traditional CLI-based configurations, are proprietary, cumbersome, and highly text-based. Managing automated operations on a large network using CLIs is a challenge.

Cisco IOS XR supports the YANG data modeling language. YANG can be used with the Network Configuration Protocol (Netconf) or with gRPC (google-defined Remote Procedure Calls) to automate programmable network operations. Data models allow administrators to customize settings easily and automatically, without wasting time on manual configuration.

To get started with using data models, see the Obtain Data Models section in Cisco IOS XR Programmability Configuration Guide for the NCS 5000 Series Router.

Application Hosting—Efficient Leverage of Third-Party Tools

Application hosting gives administrators a platform for leveraging their own tools and utilities. Cisco IOS XR supports third-party off-the-shelf applications built using Linux tool chains. Users can run custom applications cross-compiled with the software development kit that Cisco provides. Application hosting is offered in two variants: Native and Container.

With networking rapidly moving to virtual environments, the need for a network operating system that supports operational agility and efficiency through seamless integration with existing tool chains became a key requirement for our customers.

Cisco IOS XR uses a 64-bit Linux-based operating system that simplifies the integration of applications, configuration management tools, and industry-standard zero touch provisioning mechanisms to meet the DevOps style workflows for service providers.

To access the SDK to build packages that use the Linux distribution offered by Cisco, and to host applications natively, see *Build RPMs for Native Application Hosting* section in the *Cisco IOS XR Application Hosting Configuration Guide* .

Telemetry—Push Towards Smarter Visibility

Streaming telemetry lets users direct data to a configured receiver for analysis and troubleshooting purposes in order to maintain the health of the network. This is achieved by leveraging the capabilities of machine-to-machine communication.

Traditionally, organizations used the pull model to collect data, where a client pulls data from network elements. This pull model, however, does not scale when there is more than one network management station in the network. These traditional techniques do not cater to all the underlying information of the router, and they require manual intervention.

Tuning a network based on real-time data is crucial for seamless operation of the network. Instead of a pull model, using a push model to continuously stream data out of the network enhances the operational performance and reduces the troubleshooting time. Data can be pushed out at intervals determined by the administrator, at a cadence as low as 10 seconds. Using sophisticated algorithms, a back-end server can then analyze data received from the Cisco IOS XR operating system. The data can be encoded in JavaScript Object Notation (JSON) or Google Protocol Buffers (GPB). This analysis enables back-end management systems to measure and even predict control-plane and data-plane trends.

Software Features Introduced in Cisco IOS XR Software Release 6.1.3

There are no new software features introduced in this release.

Hardware Features Introduced in Cisco IOS XR Software Release 6.1.3

There are no new hardware features introduced in this release.

Release 6.1.3 Packages

This table lists the Cisco IOS XR Software feature set matrix (packages) with associated filenames.

Table 1: Release 6.1.3 Packages for Cisco NCS 5000 Series Router

Composite Package		
Feature Set	**Filename**	**Description**
Cisco IOS XR IP Unicast Routing Core Bundle	ncs5k-mini-x.iso	Contains base image contents that includes: • Host operating system • System Admin boot image • IOS XR boot image • Alarm co-relation
Individually-Installable Optional Packages		
Feature Set	**Filename**	**Description**
Cisco IOS XR Manageability Package	ncs5k-mgbl-3.0.0.0-r613.x86_64.rpm	XML, Parser, HTTP Server, Telemetry, and gRPC.
Cisco IOS XR MPLS Package	ncs5k-mpls-2.2.0.0-r613.x86_64.rpm	Label Distribution Protocol (LDP), MPLS forwarding , MPLS operations , Administration and maintenance (OAM), Layer3-vpn , layer-2 vpn.
Cisco IOS XR Security Package	ncs5k-k9sec-3.1.0.0-r613.x86_64.rpm	Support for Encryption, Decryption, and Secure Shell (SSH),
Cisco IOS XR Multicast Package	ncs5k-mcast-2.0.0.0-r613.x86_64.rpm	Multicast routing protocols (PIM, IGMP, Auo-rp, BSR) and infrastructure (Multicast routing information Base) , Multicast forwarding (mfwd)
Cisco IOS XR ISIS package	ncs5k-isis-1.1.0.0-r613.x86_64.rpm	Supports ISIS
Cisco IOS XR OSPF package	ncs5k-ospf-1.0.0.0-r613.x86_64.rpm	Supports OSPF

Supported Packages and System Requirement

Supported Hardware

For a complete list of supported optics, hardware and ordering information for NCS 5001 and NCS 5002 series router, see the *Cisco NCS 5000 Series Data Sheet*

For a complete list of supported optics, hardware and ordering information for NCS 5011 router, see the *Cisco NCS 5011 Series Data Sheet*

To install the Cisco NCS 5000 series routers, see *Hardware Installation Guide for Cisco NCS 5000 Series Routers*.

Determine Software Version

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

```
RP/0/RP0/CPU0:router# show version

Cisco IOS XR Software, Version 6.1.3
Copyright (c) 2013-2016 by Cisco Systems, Inc.

Build Information:
Built By     : <username>
Built On     : Mon Feb 13 10:46:40 PST 2017
Build Host   : iox-lnx-031
Workspace    : /auto/srcarchive14/production/6.1.3/ncs5k/workspace
Version      : 6.1.3
Location     : /opt/cisco/XR/packages/

cisco NCS-5001 () processor
System uptime is 14 minutes
```

Caveats

Caveats describe unexpected behavior in Cisco IOS XR Software releases.

Identifier	Description
CSCvc99273	Ports down observed after a fresh bake and launch
CSCvc73714	L2VPN shows BVI as Up."show interface BVI" says Down -after shut/no-shut on BVI Interface

Determine Firmware Support

Log in to the router and enter **show hw-module fpd** command in Admin mode:

For NCS 5001

```
RP/0/RP0/CPU0:router(admin)# show hw-module fpd

                                                                      FPD Versions
                                                                     ==============
Location  Card type         HWver FPD device       ATR Status    Run     Programd
-------------------------------------------------------------------------------
0/RP0     NCS-5001          2.0   BIOS                 CURRENT    1.11    1.11
0/RP0     NCS-5001
```

For NCS 5002

```
RP/0/RP0/CPU0:router(admin)# show hw-module fpd

                                                                      FPD Versions
                                                                     ==============
Location  Card type         HWver FPD device       ATR Status    Run     Programd
-------------------------------------------------------------------------------
0/RP0     NCS-5002          3.0   BIOS                 CURRENT    1.11    1.11
```

```
0/RP0      NCS-5002          3.0    IOFPGA               CURRENT     0.17     0.17
```

For NCS 5011

```
RP/0/RP0/CPU0:router(admin)# show hw-module fpd

                                                                        FPD Versions
                                                                       ===============
Location  Card type         HWver FPD device       ATR Status    Run     Programd
-------------------------------------------------------------------------------
0/RP0     NCS-5011          1.0   BIOS                 CURRENT     1.11     1.11
0/RP0     NCS-5011
```

The above show output lists the hardware components that are supported in current release with their status. The status of the hardware must be CURRENT; Running and Programd version must be similar.

Upgrading Cisco IOS XR Software

Cisco IOS XR Software is installed and activated from modular packages, allowing specific features or software patches to be installed, upgraded, or downgraded without affecting unrelated processes. Software packages can be upgraded or downgraded on all supported card types, or on a single card (node).

Related Documentation

The most current Cisco Network Convergence System 5000 Series documentation is located at this URL:

http://www.cisco.com/c/en/us/support/routers/network-convergence-system-5000-series/tsd-products-support-series-home.html

The document containing Cisco IOS XR System Error Messages (SEM) is located at this URL:

https://www.cisco.com/c/en/us/td/docs/ios_xr_sw/error/message/ios-xr-sem-guide.html

Production Software Maintenance Updates (SMUs)

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

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

Communications, Services, and Additional Information

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- To submit a service request, visit Cisco Support.
- To discover and browse secure, validated enterprise-class apps, products, solutions and services, visit Cisco Marketplace.
- To obtain general networking, training, and certification titles, visit Cisco Press.
- To find warranty information for a specific product or product family, access Cisco Warranty Finder.

Cisco Bug Search Tool

Cisco Bug Search Tool (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.

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