Release Notes for Cisco NCS 540 Series Routers, Cisco IOS XR Release 6.6.1

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Release Notes for Cisco Network Convergence System 540 Series Routers, IOS XR Release 6.6.1

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The Cisco Network Convergence System 540 Routers (NCS 540) complements Cisco's offerings for IP RAN solutions for the GSM, UMTS, LTE, and CDMA. Cisco NCS 540 Series routers are designed with I-Temp grade devices.

The Cisco NCS 540 Series routers are designed for cost-effective delivery of these next-generation services. These routers are temperature-hardened, high-throughput, small form factor, low-power-consumption devices suitable for both outdoor and indoor deployments. They combine a comprehensive and scalable feature set of Layer 2 VPN (L2VPN) and Layer 3 VPN (L3VPN) services and a rich set of mobile features for a cost-optimized converged access platform. Capabilities such as advanced packet classification, segment routing, ultrawide ECMP, programmable network management, and telemetry are added to the robust and mature features already present in Cisco IOS XR Software.

This release notes describe the features provided in the Cisco IOS XR Software Release. See the Features Introduced in Cisco IOS XR Software Release 6.6.1 section in this document for information on new software features.

System Requirements

Cisco IOS XR Release 6.6.1 is a limited availability (LA) release. All Cisco IOS XR Release 6.6.1 features are available in Cisco IOS XR Release 6.6.25, which is a general availability (GA) release. For more information on IOS XR Release 6.6.25, see *Release Notes for Cisco NCS 540 Series Routers, Release 6.6.25*

Release 6.6.1 Packages

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

Table 1: Release 6.6.1 Packages for Cisco NCS 540 Series Router

Composite Package		
Feature Set	**Filename**	**Description**

Cisco IOS XR IP Unicast Routing Core Bundle	ncs540-mini-x.iso-r6.6.1	Contains base image contents that includes: • Host operating system • System Admin boot image • IOS XR boot image • BGP packages
Individually-Installable Optional Packages		
Feature Set	**Filename**	**Description**
Cisco IOS XR Manageability Package	ncs540-mgbl-1.0.0.0-r661.x86_64.rpm	Extensible Markup Language (XML) Parser, Telemetry, Netconf, gRPC and HTTP server packages.
Cisco IOS XR MPLS Package	ncs540-mpls-1.0.0.0-r661.x86_64.rpm ncs540-mpls-te-rsvp-1.0.0.0-r661.x86_64.rpm	MPLS and MPLS Traffic Engineering (MPLS-TE) RPM.
Cisco IOS XR Security Package	ncs540-k9sec-1.0.0.0-r661.x86_64.rpm	Support for Encryption, Decryption, Secure Shell (SSH), Secure Socket Layer (SSL), and Public-key infrastructure (PKI)
Cisco IOS XR ISIS package	ncs540-isis-1.0.0.0-r661.x86_64.rpm	Support ISIS
Cisco IOS XR OSPF package	ncs540-ospf-1.0.0.0-r661.x86_64.rpm	Support OSPF
Lawful Intercept (LI) Package	ncs540-li-1.0.0.0-r661.x86_64.rpm	Includes LI software images
Multicast Package	ncs540-mcast-1.0.0.0-r661.x86_64.rpm	Support Multicast

Determine Software Version

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

```
RP/0/RP0/CPU0:router# show version
Fri Dec 21 20:56:19.185 IST
Cisco IOS XR Software, Version 6.6.1
Copyright (c) 2013-2018 by Cisco Systems, Inc.

Build Information:
 Built By     : hlo
 Built On     : Thu Dec 20 18:56:25 PST 2018
 Built Host   : iox-lnx-028
 Workspace    : /auto/srcarchive16/prod/6.6.1/ncs540/ws
 Version      : 6.6.1
 Location     : /opt/cisco/XR/packages/

cisco NCS-540 () processor
System uptime is 41 minutes
```

Determine Firmware Support

Use the **show hw-module fpd** command in EXEC mode to view the hardware components with their current FPD version and status. The status of the hardware must be CURRENT; Running and Programed version must be the same.

```
RP/0/RP0/CPU0:Router# show hw-module fpd
Fri Dec 21 20:59:22.093 IST
                                                                    FPD Versions
                                                                   ==============
Location  Card type         HWver FPD device       ATR Status    Run     Programd
-------------------------------------------------------------------------------
0/RP0     N540-24Z8Q2C-M    0.5   Bootloader           CURRENT    1.11    1.11
0/RP0     N540-24Z8Q2C-M    0.5   CPU-IOFPGA           CURRENT    0.03    0.03
0/RP0     N540-24Z8Q2C-M    0.5   MB-IOFPGA            CURRENT    0.18    0.18

RP/0/RP0/CPU0:router# show install committed

Fri Dec 21 20:56:35.227 IST
Node 0/RP0/CPU0 [RP]
  Boot Partition: xr_lv19
  Committed Packages: 9
        ncs540-xr-6.6.1 version=6.6.1 [Boot image]
        ncs540-li-1.0.0.0-r661
        ncs540-mgbl-1.0.0.0-r661
        ncs540-mpls-te-rsvp-1.0.0.0-r661
        ncs540-k9sec-1.0.0.0-r661
        ncs540-isis-1.0.0.0-r661
        ncs540-mpls-1.0.0.0-r661
        ncs540-ospf-1.0.0.0-r661
        ncs540-mcast-1.0.0.0-r661

Node 0/0/CPU0 [LC]
  Boot Partition: xr_lcp_lv20
  Committed Packages: 9
        ncs540-xr-6.6.1 version=6.6.1 [Boot image]
        ncs540-li-1.0.0.0-r661
        ncs540-mgbl-1.0.0.0-r661
        ncs540-mpls-te-rsvp-1.0.0.0-r661
        ncs540-k9sec-1.0.0.0-r661
        ncs540-isis-1.0.0.0-r661
        ncs540-mpls-1.0.0.0-r661
        ncs540-ospf-1.0.0.0-r661
        ncs540-mcast-1.0.0.0-r661
```

Supported Software Features

64 MPLS ECMP Support - Per Level

The currently supports 32-way ECMP and hence you can deploy upto 32 ECMP paths to the next hop. This feature enhances the maximum number of ECMP paths you can deploy on the router to 64.

AC-Aware VLAN bundle

The AC-Aware VLAN Bundle feature allows you to configure more than one subinterface on the same main port in an EVPN enabled bridge domain. When you configure this feature using the **ac-aware-vlan-bundling** command, the BGP Extended Community (ExtCom) is set to the VLAN of the subinterface on the MAC synchronization routes, which enables you to distinguish between the subinterfaces.

BGP Support

BGP uses TCP as its transport protocol. Two BGP routers form a TCP connection between one another (peer routers) and exchange messages to open and confirm the connection parameters.

Conditional Marking of MPLS Experimental bits for L2VPN Traffic

In earlier releases, conditional marking of MPLS experimental bits was available for L3VPN traffic. From Release 6.6.1 onwards, this feature is also available for L2VPN traffic. You can now set up the conditional marking of MPLS experimental bits for L2VPN traffic on the Provider Edge routers in the imposition direction.

DHCPv4 Relay on IRB

The Dynamic Host Configuration Protocol for IPv4 (DHCPv4) Relay on IRB feature provides DHCP support for the end users in EVPN all-active multihoming scenario. This feature enables reduction of traffic flooding, increase in load sharing, faster convergence during link and device failures, and simplification of data center automation.

DHCPv4 relay agent relay request packets coming over access interface towards external DHCPv4 server to request address (/32) allocation for the end user. DHCPv4 relay agent acts as stateless for end users by not maintaining any DHCPv4 binding and respective route entry for allocated address.

DHCPv4 Relay Synchronization for All-Active Multihoming

DHCPv4 Relay Synchronization for All-active Multihoming feature enables a transitory entity between the end user and DHCPv4 server and does not create any DHCPv4 binding. This feature supports the equal distribution of DHCP control-plane packets among end users across point of attachment (PoA). All DHCP control packets for single users exist on the same DHCPv4 relay (PoA) so that end users can lease IP address allocation without any intervention and delay.

DHCPv6 PD Synchronization for All-Active Multihoming using Session Redundancy

The DHCPv6 PD Synchronization for All-Active Multihoming using Session Redundancy feature provides load balancing for both control and data packets. This feature helps in efficient utilization of devices with respect to throughput (line rate) and processing power.

Prior to this release, Session Redundancy (SeRG) mechanism supported active-standby to address access failure, core failure, and node or chassis failures. In all these cases, one active point of attachment (PoA) is responsible to create sessions and synchronize binding information using SeRG across the PoA. This mechanism did not serve the purpose of EVPN all-active multihoming as PoAs are in primary-subordinate mode for a given access-link in SeRG group. This restricts only one node that acts as primary to process control packets, create bindings, and forward data path.

This feature allows you to define both POAs to be active unlike in primary-subordinate mode. Also, there is no need to exchange or negotiate the roles of respective PoAs.

DHCPv6 Relay IAPD on IRB

The Dynamic Host Configuration Protocol for IPv6 (DHCPv6) Relay Identity Association for Prefix Delegation (IAPD) on IRB feature allows you to manage link, subnet, and site addressing changes. This feature allows you to automate the process of assigning prefixes to a customer for use within their network. The prefix delegation occurs between a provider edge (PE) device and customer edge (CE) device using the DHCPv6 prefix delegation option. After the delegated prefixes are assigned to an user, the user may further subnet and assign prefixes to the links in the customer’s network.

EVPN E-TREE

The EVPN E-Tree feature provides a rooted-multipoint Ethernet service over MPLS core. The EVPN Ethernet Tree (E-Tree) service enables you to define attachment circuits (ACs) as either a root site or a leaf site, which helps in load balancing and avoid loops in a network.

EVPN: Dual PIM-DR - IPv4

After IGMP snooping has been enabled and this information has been synced with the peer, both the peers need to act like a last hop router and send PIM join upstream.

G.8275.2 Support

The G.8275.2 is a PTP profile for use in telecom networks where the phase or time-of-day synchronization is required. The G.8275.2 profile is based on the partial timing support from the network and uses PTP over IPv4 and IPv6 in unicast mode.

Hardware timestamp support for QoS

In earlier releases, the timestamp for hardware data collection was synchronized to the time when Cisco telemetry was manually run, and not the time when the hardware *actually* collected the data. This resulted in inaccurate data rate calculation with telemetry data. From Release 6.6.1 onwards, the telemetry timestamp is updated with the timestamp when the hardware collects data. Which means that when you run telemetry, the timestamp in the telemetry data that it collects is in sync with what was collected by the hardware.

IAPD Route Distribution and withdrawal in DHCPv6 Relay

This feature enables the propagation of the Attachment Circuit (AC) interface status to the DHCPv6 relay agent. Based on the AC interface status, route distribution and withdrawal towards the core MPLS network takes place. In the EVPN Multi-homing Active-Active Model, this feature prevents traffic block hole for the core-to-subscriber traffic of DHCPv6 IAPD Sessions that are associated with the Attachment Circuits (ACs) that are down. The traffic for the ACs that are down are withdrawn and directed towards the core network.

IEEE 802.1X Port-Based Authentication

The IEEE 802.1X port-based authentication protects the network from unauthorized clients. It blocks all traffic to and from devices at the interface, until the client is authenticated by the authentication server. After successful authentication, the port is open for traffic.

IGMP L2 EVPN State Sync

After IGMP snooping has been enabled, this information has to be synced with the peer using the L2 EVPN sync feature.

IGMP Snooping on Layer2

IGMP snooping provides a way to constrain multicast traffic at Layer 2. By snooping the IGMP membership reports sent by hosts in the bridge domain, the IGMP snooping application can set up Layer 2 multicast forwarding tables to deliver traffic only to ports with at least one interested member, significantly reducing the volume of multicast traffic.

Inter-AS Option-C

Inter-AS Option-C for Layer 2 VPN provides recursive FEC through ECD notification. VPLS supports flooding for Layer 2 broadcast, unknown unicast, and multicast (BUM) traffic, and forwarding for the known destination. For VPWS, the same VPLS unicast forwarding is used.

IP-tunnel decapsulation statistics (GRE+IPinIP)

Generic Routing Encapsulation (GRE) is a tunnelling protocol that provides a simple generic approach to transport packets of one protocol over another protocol by means of encapsulation. GRE encapsulates a payload, that is, an inner packet that needs to be delivered to a destination network inside an outer IP packet. The GRE tunnel behave as virtual point-to-point link that have two endpoints identified by the tunnel source and tunnel destination address. Encapsulation by the outer packet takes place at the tunnel source whereas decapsulation of the outer packet takes place at the tunnel destination. With this feature, along with encapsulation statistics, decapsulation statistics is available.

IPv4 - Enhanced Designated Forwarder Election for Multicast

After IGMP snooping has been enabled and this information has been synced with the peer, both the peers need to act like a last hop router and send PIM join upstream. Once traffic arrives on both the peers, only one should forward it to the receiver. Designated Forwarder Election elects one peer to do the forwarding.

IPv6 Multicast for Multiple Sources

Before this release IPv6 multicast support was limited to a single source for each multicast group. However, when multiple sources were involved then it resulted in duplicating multicast flows of multiple sources to all interested receivers.

IPv6 Multicast Listener Discovery Snooping over BVI

Multicast Listener Discovery (MLD) snooping provides a way to constrain multicast traffic at L2. By snooping the MLD membership reports sent by hosts in the bridge domain, the MLD snooping application can set up L2 multicast forwarding tables. This table is later used to deliver traffic only to ports with at least one interested member, significantly reducing the volume of multicast traffic.

MLDv2 support over BVI enables implementing IPv6 multicast routing over a L2 segment of the network that is using an IPv6 VLAN. The multicast routes are bridged via BVI interface from L3 segment to L2 segment of the network.

MLDv2 snooping over BVI enables forwarding MLDv2 membership reports received over the L2 domain to MLD snooping instead of MLD.

SRv6 IS-IS

Intermediate System-to-Intermediate System (IS-IS) protocol already supports segment-routing with MPLS data plane (SR-MPLS). This feature enables extensions in ISIS to support segment-routing with IPv6 data plane (SRv6). The extensions include exchanging a node’s SRv6 capabilities and node and adjacency segments as SRv6 SIDs.

L3VPN QoS Traffic-class Marking in Segment Routing IPv6

The L3VPN QoS traffic-class marking in Segment Routing IPv6 feature enables the marking of traffic-class headers and propagates the traffic-class from the IPv4 header of incoming traffic. This enables prioritization of traffic for Segment Routing in an IPv6 network.

To enable this feature use the **hw-module profile segment-routing srv6 encapsulation traffic-class** command and reload the router for the configuration to take effect.

L3VPN Support in Segment Routing IPv6

This feature enables Layer 3 Virtual Private Network in Segment Routing in an IPv6 network.

MPLS-TE FSM Unexpected Event Counters

Starting with Cisco IOS XR Release 6.6.1, this feature enhances the MPLS-TE traces to display the unexpected Finite State Machine (FSM) unexpected event counters and clears the counters after viewing. The following commands are introduced:

- **show mpls traffic counter unexepcted-events**
- **clear mpls traffic counter unexpected-events** | **all**

Multicast Listener Discovery over BVI

Multicast IPv6 packets received from core, which has BVI as forwarding interface, is forwarded to access over snooped L2 AC or interface.

Note

- As per MLDv2 RFC recommendation the MLDv2 reports should carry the Hop-by-Hop options header for the reports to get punted up.
- MLDv2 is supported over BVI only when BVI is configured as a forwarding interface.

MLD and BVI Overview

Routers use the Internet Group Management Protocol (IGMP) (IPv4) and Multicast Listener Discovery (MLD) (IPv6) to learn whether members of a group are present on their directly attached subnets. Hosts join multicast groups by sending IGMP or MLD report messages.

MLDv1 and MLDv2 are supported on . However, MLDv2 is enabled when you configure MLD by default.

MLDv2 shares feature parity with IGMPv3 with respect to all supported interface types with the exception of PPoE and subinterfaces. MLDv2 enables a node to report interest in listening to packets only from specific multicast source addresses.

A BVI interface is a routed interface representing a set of interfaces (bridged) in the same L2 broadcast domain. MLD join messages coming in or out of this broadcast domain passes through the BVI interface.

Multicast Route Statistics

Multicast route statistic feature provides information about the multicast routes. The multicast statistics information includes the rate at which packets are received.

Before enabling multicast route statistics, you must configure an ACL to specify which of the IP route statistics to be captured.

NetFlow to Report Physical Bundle Member

NetFlow to Report Physical Bundle Member is supported on the platform from the Cisco IOS XR Release 6.6.1. This feature enables a user to report actual underlying members of the bundle interface which carries the data traffic.

NetFlow to report Physical Bundle Member is useful in cases of capacity planning and for traffic engineering purposes.

Proactive ARP and ND

This feature ensures that CEF (Cisco Express Forwarding) proactively triggers ARP (Address Resolution Protocol) or ND (Neighbor Discovery) in order to resolve any missing next-hop information, retrying every 15 seconds until the next-hop information is resolved. Thus, when you configure a static route which has an incomplete next-hop information, this feature automatically triggers ARP or ND resolution.

QOS-Pipe Mode

A BVI integrates Layer2 domain with Layer3 domain by creating a virtual interface in between them. The traffic flow supported for QoS is from the bridged to routed interface.

The following features are supported:

- Classification
- Policing (level 1 and level 2)
- Ingress marking

Revised OC-platform model version

Support for openconfig-platform.yang (OC-platform) model is revised from version 0.4.0 to version 0.11.0. In addition to retreiving basic component information, this revised version of the model extracts additional details such as operational state, available and utilized memory, allocated and used power, temperature, power-supply, fan, linecard and so on.

Segment Routing for IS-IS Flexible Algorithm

Segment Routing (SR) allows a flexible definition of end-to-end paths within IGP topologies by encoding paths as sequences of topological sub-paths, called segments. It also defines an algorithm that defines how the path is computed and provides a way to associate prefix-SID with an algorithm. This allows IGPs to compute the path based on various algorithms and forward the traffic on such a path using the algorithm-specific segments. No additional segments are required for traffic to stay on the computed paths as in the case of the SR-TE.

SRv6 Base

Segment routing can be applied on both MPLS and IPv6 data planes. In a SR-MPLS enabled network, an MPLS label is used as the segment identifier and the source router chooses a path to the destination and encodes the path in the packet header as a stack of labels. However, 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 IP packet. This release introduces base support for Segment Routing using IPv6 data plane.

SRv6 L3VPNv4 OAM

This feature enables to use the existing Internet Control Message Protocol version 6 (ICMPv6) mechanism for basic Operations, Administration, and Maintenance (OAM) functionality to address the OAM requirements for SRv6 enabled L3VPN networks.

Segment Routing with OSPFv2

This feature contains the following sub-features for segment routing with OSPFv2:

- segment routing local block (SRLB)

- microloop avoidance
- local unequal cost multipath (UCMP)
- extended traffic engineering (TE) metric type-length-value (TLV)

The segment routing local block (SRLB) feature introduces support for configuring adjacency segment ID (SID) statically for segment routing with OSPFv2. The static adjacency SID helps to force the traffic over a specific link while implementing SR-TE. The segment routing microloop avoidance feature detects if microloops can occur following a topology change. With this enhancement, SRTE tunnel for microloop avoidance is created only if number of labels required for microloop avoidance exceeds the number of labels the router can impose.

Bandwidth based local unequal cost multipath (UCMP) feature allows OSPF to perform load sharing on ECMP or UCMP paths based on configured weights on interface or interface bandwidth.

The extended traffic engineering (TE) metric TLV feature allows OSPF to distribute network performance information including link delay and bandwidth parameters.

Smart Licensing

Smart Licensing is a cloud-based, software license management solution that enables you to automate time-consuming, manual licensing tasks. The solution allows you to easily track the status of your license and software usage trends.

Smart Licensing uses Flexible Licensing consumption model which is based on the capacity of ports configured. If you purchase a chassis that supports Flexible licensing, you need to configure flexible licensing to enable it. You can configure Flexible Licensing consumption model through the **license smart flexible-consumption enable** command. Flexible licensing checks usage across all ports of a system on a daily basis and reports license usage results to the Smart Licensing Manager at Cisco.com.

Support for new XR NETCONF actions

IOS-XR and System admin actions are RPC statements that trigger an operation or execute a command on the router. The following NETCONF actions are introduced in this release:

- copy
- delete

Telemetry support for OC LACP

The OpenConfig-Link Aggregation Control Protocol (OC-LACP) model defined by the OC community, helps manage LACP-enabled bundles and member interfaces. Cisco IOS XR supports OC-LACP version 1.0.2. Currently, the support is extended to version 1.1.0. Telemetry support for (OC-LACP) is provided only for LACP state data at global, bundle and member level.

SRv6 Based IS-IS TI-LFA

Topology-Independent Loop-Free Alternate (TI-LFA) provides link protection in topologies where other fast reroute techniques cannot provide protection. TI-LFA with ISIS SR-MPLS is already supported. This feature introduces support for implementing TI-LFA using segment routing over IPv6 (SRv6) for the IS-IS protocol.

TWAMP Light

TWAMP LIGHT defines a flexible method for measuring round-trip IP performance between any two devices and thereby helpsthe customers check the IP SLA compliance. It is a light-weight model of TWAMP (Two-Way Active Measurement Protocol) as it

eliminates the need for a TWAMP control session. Thus it removes the overhead of establishing and tearing down a control session, and thereby eliminates the need for a TWAMP server entity to be maintained at the reflector end.

VLAN Bundle Sub Interface Support

The maximum number of supported Ethernet link bundles is increased to 1024 and also the maximum number of supported bundle sub interfaces is increased to 1024.

VRRP Scale Increase from 16 to 225

The Virtual Router Redundancy Protocol (VRRP) feature allows for transparent failover at the first-hop IP router, enabling a group of routers to form a single virtual router. The LAN clients can then be configured with the virtual router as their default gateway. The virtual router, representing a group of routers, is also known as a VRRP group.

The maximum VRRP has been optimized from 16 to 225 from the Cisco IOS XR Release 6.6.x.

Supported Hardware Features

There are no new hardware features supported in this release.

Supported Optics

The following optics are supported on the Cisco NCS 540 Series router in this release:

- GLC-BX40-D-I
- GLC-BX40-DA-I
- GLC-BX40-U-I
- RCO12SV1-IITiS1M
- GLC-BX80-DI
- GLC-BX80-UI
- SFP-10G-BX-D-I
- SFP-10G-BXU-I
- SFP-10G-BX40-DI
- SFP-10G-BX40-UI
- GLC-LX-SM-RGD
- SFP-10/25G-LR-S
- GLC-T-RGD

Supported MIBs

The Cisco NCS 5500 MIB support list is also applicable to the Series Routers. For the list of supported MIBs, see the Cisco NCS5500 MIB Support List.

Restrictions and Limitations on the Cisco NCS 540 Series Router

The following restrictions are applicable only to Cisco N540-24Z8Q2C-SYS, N540X-ACC-SYS, and N540-ACC-SYS variants.

- In the Cisco IOS XR Release 7.0.1, the Packet IO feature is not supported on bundle interfaces.
- The **show inventory** and the **show diagnostic** commands do not display the fan serial number.
- The interface ports 0/0/0/24 to 0/0/0/31 do not support 1G Copper SFPs.
- Remove the speed settings on the 1G Copper optics when 10M/100M is configured and replaced with 1G SFP optics.
- The **hw-module profile mfib statistics** command is not supported.

Caveats

This section describes open and resolved severity 1 and 2 caveats and select severity 3 caveats:

- The “Open Caveats” sections list open caveats that apply to the current release and may apply to previous releases. A caveat that is open for a prior release and is still unresolved applies to all future releases until it is resolved.
- The “Resolved Caveats” sections list caveats resolved in a specific release, but open in previous releases.

The bug IDs are sorted alphanumerically.

Note The Caveats section includes the bug ID and a short description of the bug. For details on the symptoms, conditions, and workaround for a specific caveat you must use the Bug Search Tool.

Cisco Bug Search Tool

Cisco Bug Search Tool (BST), the online successor to Bug Toolkit, is designed to improve effectiveness in network risk management and device troubleshooting. You can search for bugs based on product, release, and keyword, and aggregates key data such as bug details, product, and version. For more details on the tool, see the help page located at http://www.cisco.com/web/applicat/cbsshelp/help.html.

Cisco IOS XR Caveats

No new caveats for this release.

Communications, Services, and Additional Information

- To receive timely, relevant information from Cisco, sign up at Cisco Profile Manager.
- To get the business impact you’re looking for with the technologies that matter, visit Cisco Services.
- 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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