Release Notes for Cisco Routed PON, Cisco IOS XR Release 25.1.1

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Cisco Routed PON Solution on Cisco IOS XR Release 25.1.1

This release note covers the new features and updates for Cisco Routed PON in Cisco IOS XR release 25.1.1.

For more details on the Cisco IOS XR release model and associated support, see Guidelines for Cisco IOS XR Software.

Required Versions for Cisco Routed PON Solution

Ensure that you use the specifed versions of PON controller, PON manager, OLT or ONU firmware, and Netconf for the Cisco IOS XR 25.x.x release.

Table 1: Cisco Routed PON - IOS XR 25.x.x Release

IOS XR Release	PON Controller	PON Manager	OLT/ONU Firmware	Netconf
25.1.1	5.0.0	5.0.0	5.0.0	5.0.0

Cisco Routed PON Overview

With the advancements in broadband technology, the customer demands have expanded to high-resolution audio and video playback, seamless audio and video streaming, immersive Virtual Reality (VR) experiences, and responsive gaming. These technologies require high bandwidth with low latency to function smoothly. Today this is achieved with the help of a large Optical Line Terminal (OLT) chassis that connects at the access layer within the network infrastructure.

Cisco Routed PON Solution is a transformational approach that condenses the OLT chassis into a pluggable form factor. The solution becomes a part of the access router by plugging the Cisco PON SFP+ into 10G ports of NCS540, NCS5500, and NCS5700 series routers. You have the option to use a scalable model based on your bandwidth requirements, choosing between PON pluggable optics or Ethernet optics for your requirements.

The Cisco Routed PON eliminates the dedicated PON chassis, which removes vendor lock-in due to proprietary hardware and software. The OLT tranceiver SFP not only costs less than the PON chassis, but also doesn’t require additional power supply and rack space. This solution enables you to adopt a scalable 'pay-as-you-grow' approach, allowing you to incrementally select and add the necessary hardware enhancements to accommodate your increasing bandwidth requirements over time. Some other benefits of the Cisco Routed PON solution are:

- Compatible with non-proprietary ONTs
- Enhanced income generation through a network focused on service delivery
- Accelerated deployment of new services to the marketplace

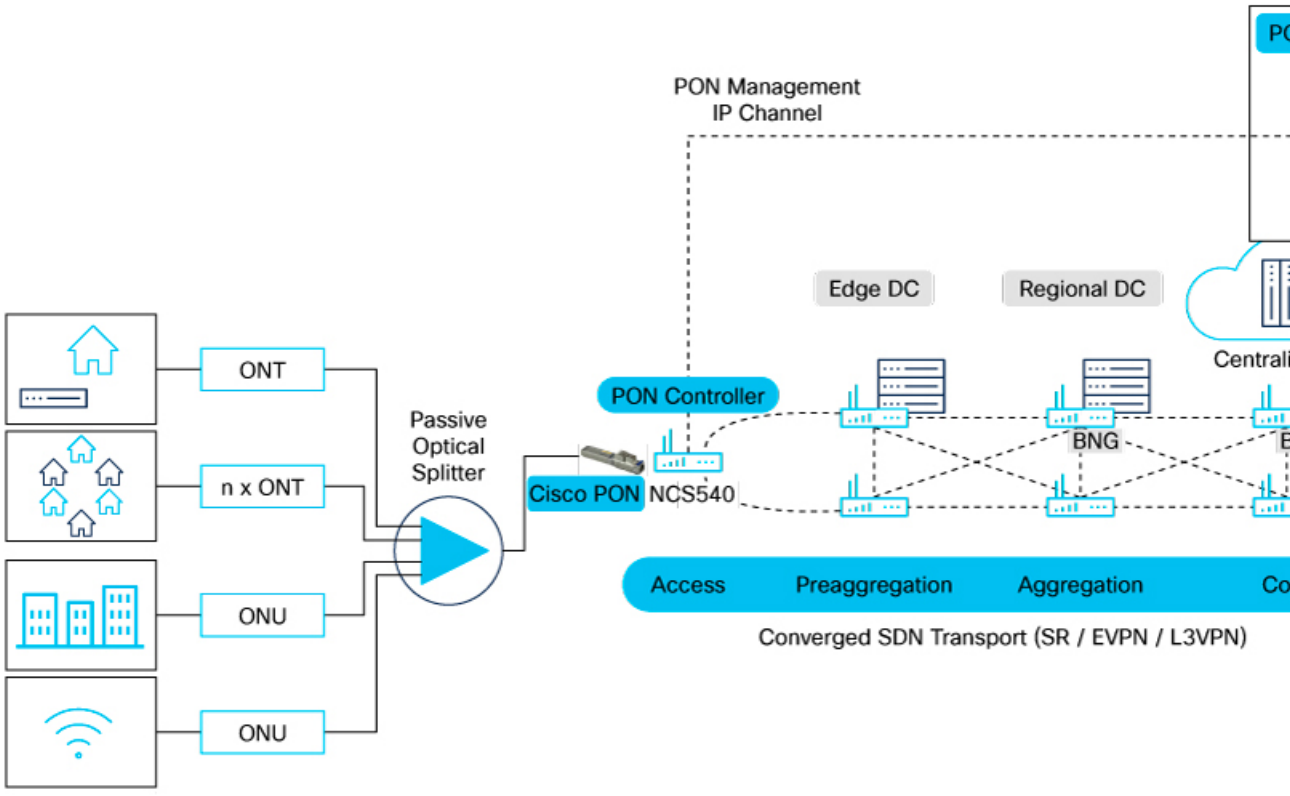
- Maximized efficiency in fiber bandwidth usage

The Cisco IOSXR Release 25.1.1 supports the PON Controller on the following Cisco router variants:

- N540-24Z8Q2C-SYS
- N540-ACC-SYS
- N540X-16Z4G8Q2C-A, N540X-16Z4G8Q2C-D
- N540-28Z4C-SYS-A, N540-28Z4C-SYS-D
- N540-24Q8L2DD-SYS
- NCS-55A1-24Q6H-SS
- NCS-55A2-MOD-S
- NCS-57C1-48Q6D
- NCS-57C3-MODS-SYS

Cisco Routed PON Architecture

Figure 1: Cisco Routed PON Architecture



As shown in the illustration, the Cisco PON pluggable OLT is inserted into the SFP+ ports on the routers. The PON Manager is a Graphical User Interface (GUI) web page used to provide a user-friendly interface for monitoring and managing the network. The PON controller provides a secure communication channel between

the PON manager and the OLTs and ONUs. These three components of the solution are discussed in detail below.

Components of the Cisco Routed PON Solution

The various components of the Cicso Routed PON solution are:

Cisco PON pluggable OLT - The Cisco PON pluggable OLT is designed for software-defined broadband network deployment and comes in a hot-pluggable SFP+ form factor. This module is equipped with an integrated chip that enables connection from a PON network to a point-to-point Ethernet SFP+ port located on routers. It supports symmetric 10G upstream and downstream rates.

Cisco PON Controller - The Cisco PON controller serves as a device driver and management application that is stateless, tasked with the configuration and supervision of endpoints within a PON network. This lightweight application is deployable as a Docker container and is compatible with the NCS540, NCS5500, and NCS5700 series routers.

Cisco PON Manager - The Cisco PON manager consists of a web-based application along with an associated REST API, which together offers a graphical user interface to oversee the PON network. The REST API is designed to facilitate access to MongoDB, enabling the management of both PON users and the PON network.

MongoDB database - The MongoDB database stores and manages the configuration and operational state of the PON network. MongoDB acts as a middle layer between the PON Manager and the PON Controller. The REST API provided by the PON Manager is designed to facilitate access to the operational state maintained in MongoDB, thus enabling the management of both the PON subscribers and the PON network.

Cisco Routed PON Netconf server - The Netconf Server for Cisco Routed PON offers a management interface for administering PON Controllers, OLTs, and ONUs through the use of established NETCONF protocols and associated tools.

What's New in Cisco Routed PON for Cisco IOS XR 25.1.1

Software Features Introduced

In Cisco IOS XR Release 25.1.1 release, the **show tech-support** command is introduced. This command helps you to gather required information when there is any problem reported on the PON controller.

show tech-support ponctlr

```
RP/0/RP0/CPU0:ios#show tech-support ponctlr
Wed Jun 11 10:08:55.634 UTC
++ Show tech start time: 2025-Jun-11.100855.UTC ++
Wed Jun 11 10:09:03 UTC 2025 Waiting for gathering to complete
..
Wed Jun 11 10:09:16 UTC 2025 Compressing show tech output
Show tech output available at 0/RP0/CPU0 :
/harddisk:/showtech/showtech-pon_ctlr-2025-Jun-11.100855.UTC.tgz
++ Show tech end time: 2025-Jun-11.100917.UTC ++
```

Hardware Introduced

In Cisco IOS XR Release 25.1.1 release, there is no new hardware introduced.

Restrictions and Limitations on the Cisco Routed PON Solution

- IEEE 802.1X (Dot1x) authentication is not supported for the Cisco OLT interface.

Caveats on Cisco IOS XR Release 25.1.1

Resolved Caveats

There are no resolved caveats in this release.

Open Caveats

There are no open caveats in this release.

Related Documentation

The documentation related to installation and management of the Cisco Routed PON Solution is as follows:

Document Name	Description
Cisco Routed PON Deployment Guide	Refer to this document understand and deploy the Cisco Routed PON solution.
Cisco Routed PON Installation Guide	Refer to this document to install the various components of the Cisco Routed PON solution such as the PON Manager, the MongoDB database, and the PON Controller. This document also contains various sizing requirements for the components along with the complete steps to install the components.
Cisco Routed PON Manager User Guide	Refer to this document to understand the configuration, security features, and usage information for the PON Manager.
Cisco Routed PON REST API Developer Guide	Refer to this document to understand the architecture and design of the Application Programming Interface (API), the structure of the REST endpoints, request, and response formats, and reference and usage information for the REST API.
Cisco Routed PON Netconf Server ConfD Addendum	Refer to this document to deploy the ConfD implementation of the Netconf Server. This supplement provides an overview of architecture, installation instructions, configuration and server administration information for the ConfD based Netconf Server.

Document Name	Description
Cisco Routed PON Whitepaper	Refer to this document to understand Cisco's approach to the Routed PON Solution.
Cisco 10G Routed PON Modules Data Sheet	Refer to this document for the product specifications, dimensions, and warranty information of the Cisco Routed PON.
Cisco Routed Passive Optical Network Controller Vulnerabilities	Refer to this document for information on vulnerabilities related to the Cisco Routed PON Controller.