Cisco Catalyst PON Manager Overview Guide

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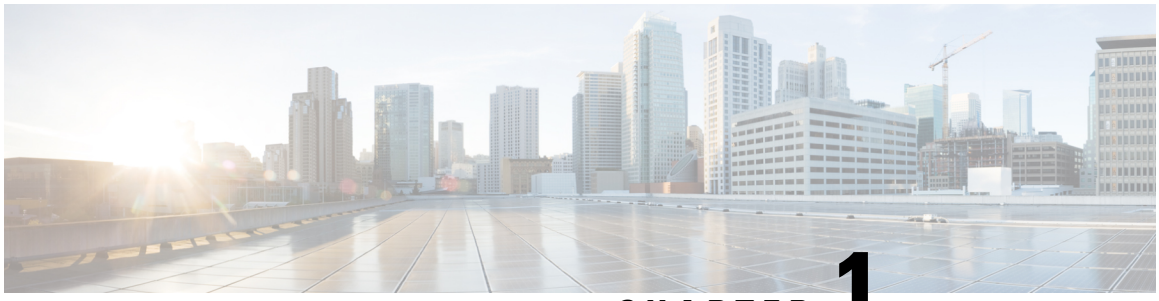

CHAPTER 1

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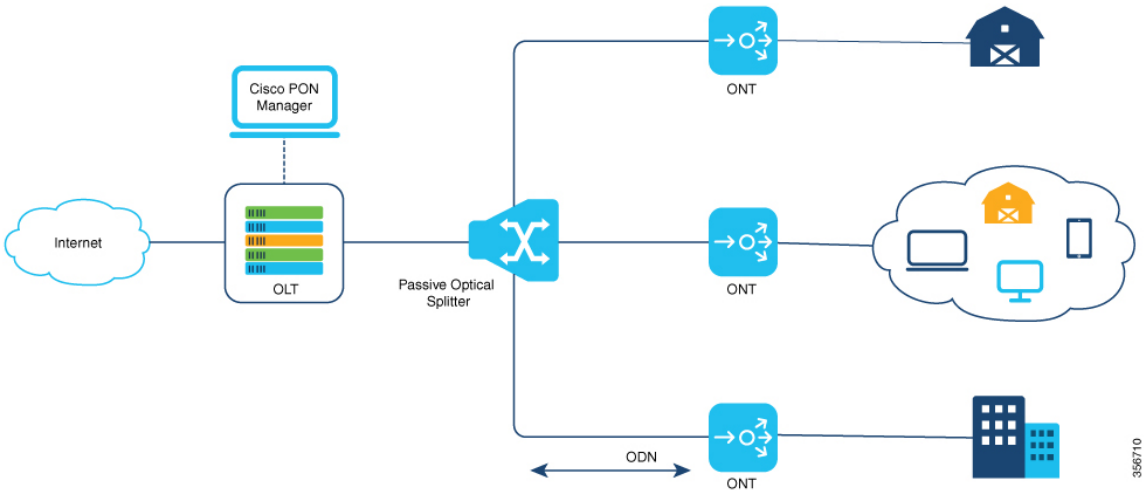
Introduction to GPON

Gigabit Passive Optical Network (GPON) is a point-to-multipoint (P2MP) network that uses a combination of active transmission equipment and passive cable components to provide network connectivity to end user devices. This network is suitable for building access networks such as Fiber-To-The-Home (FTTH) or Fiber-To-The-Office (FTTO) or Fiber-To-The-Company (FTTC) for providing Internet access by running fiber optic cable directly from an Internet Service Provider to a user's home or business.

The data, voice, and video signals of terminal users are sent to ONTs. The signals are converted into Ethernet packets and then transmitted over optical fibers to the OLT using the GPON uplink ports on the ONTs.

GPON Components and Roles

Figure 1: Components of GPON



The following are the components of GPON and their role in the network:

- **OLT (Optical Line Terminal)**

  An OLT is a terminal equipment connected to the fiber backbone. It is an aggregation device located at the central office for terminating the PON protocol.

- **Optical Splitter**

  A splitter divides optic signals into separate paths which can range up to 128.

- **ONT (Optical Network Terminal)**

  An ONT is a device that terminates any one of the endpoints of a fiber to the premises network. They are located on the user side, providing various ports for connecting to user terminals.

- **ODN (Optical Distribution Network)**

  An ODN is composed of passive optical components, such as optical fibers, and passive optical splitters. It provides optical channels between the OLT and ONTs. It interconnects the OLT and ONTs and is highly reliable.

Cisco Catalyst PON Manager

Cisco Catalyst PON Manager is a series of broadband data network products providing management functions from network element management to network management, providing operators with comprehensive network management solutions. The product line includes terminal management systems and integrated network management system.

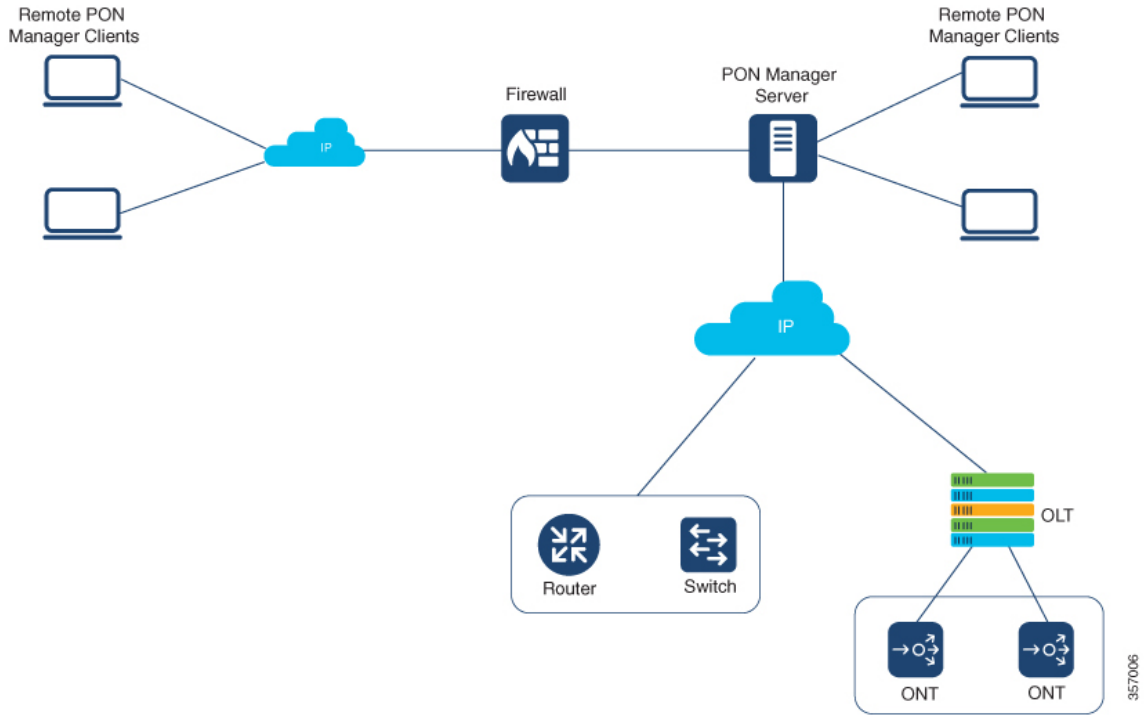
Cisco Catalyst PON Manager is used for remote centralized network management of PON devices. The integrated network management system adopts a friendly and fully graphical interface, which is easy to operate and use.

It helps to –

- Centrally manage widely distributed broadband access devices and reduce network maintenance costs.
- Monitor and detect network failures, improve the stability of network operations, and discover potential instability factors in the network.
- Analyze and plan network resources to improve resource utilization and reduce network operation costs.

You can manage the OLT device by command lines as well as using the Cisco Catalyst PON Manager.

The ONT device can be managed by the PON manager, the local Web Graphic User Interface (GUI), and the ONU Management Control Interface (OMCI).



There are three modes in Cisco Catalyst PON Manager networking: local mode, remote mode and mixed mode depending upon the network nodes distance.

Local networking is the most common and simple mode in a network management system. In this mode, the server, client and network nodes are all located in the same LAN. The Cisco Catalyst PON Manager and network nodes managed by Cisco Catalyst PON Manager must be at one physical site. The Cisco Catalyst PON Manager acts as the centralized management on the network as a whole.

When client and Cisco Catalyst PON Manager server are not in the same LAN, the remote networking mode is used. Its network topology and principle are the same as the local networking.

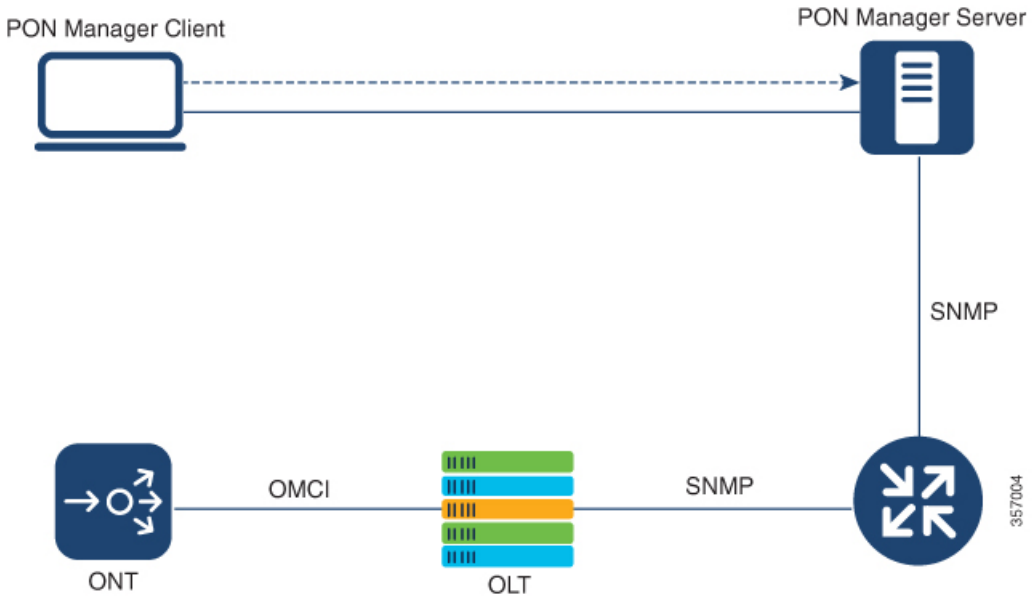
All networking modes need transmission devices as well as data communication equipment such as routers, transporting data between WAN to LAN via TCP/IP protocols.

As far as Cisco Catalyst PON Manager is concerned, centralized management is recommended which facilitates the privilege distribution and management, data storage and management in a centralized style.

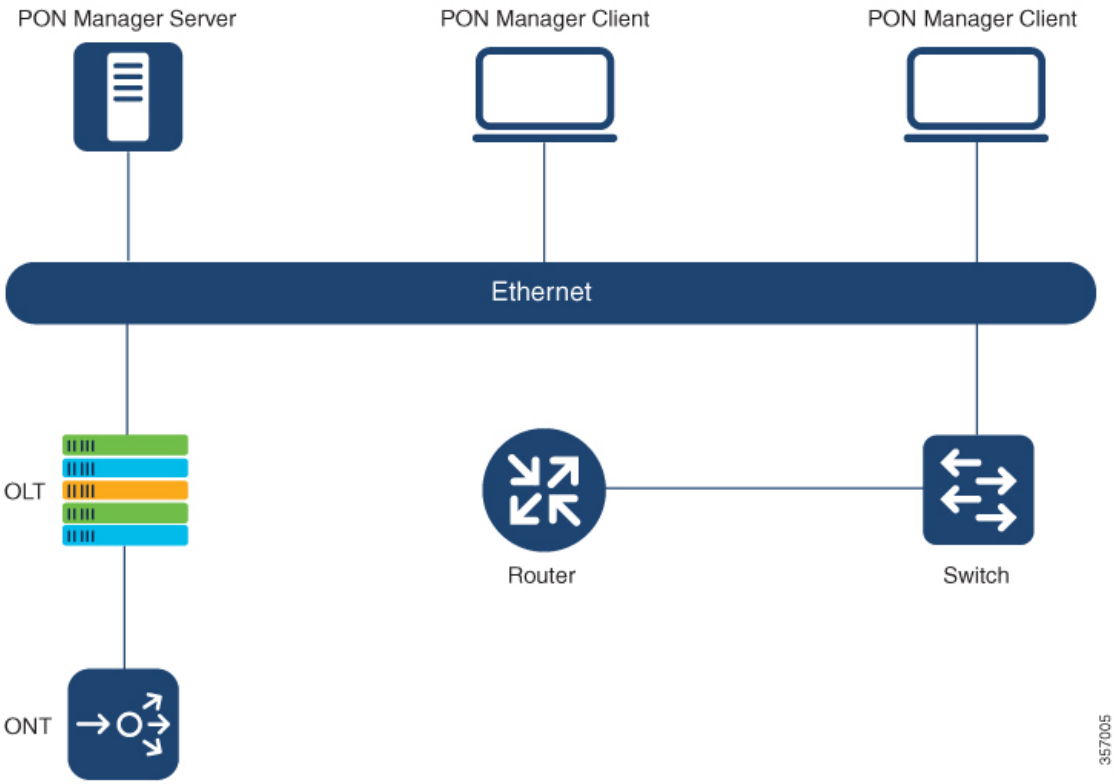
The Cisco Catalyst PON Manager can manage a maximum of 2000 OLT devices and a maximum of 4,000,000 ONT devices at a time. It can provision OLT and ONT devices, perform network and node discovery, device maintenance, fault management, performance monitoring, log management, task management, and so on.

Architecture

The Cisco Catalyst PON Manager adopts client/server structure. That is, a server connects with several clients in the Cisco Catalyst PON Manager. The PON Manager Server provides network nodes (OLT or ONT) data processing and storing functions. Users can operate and maintain network nodes via the PON Manager Client. The following figure shows the Cisco Catalyst PON Manager hardware architecture.



Components and Roles



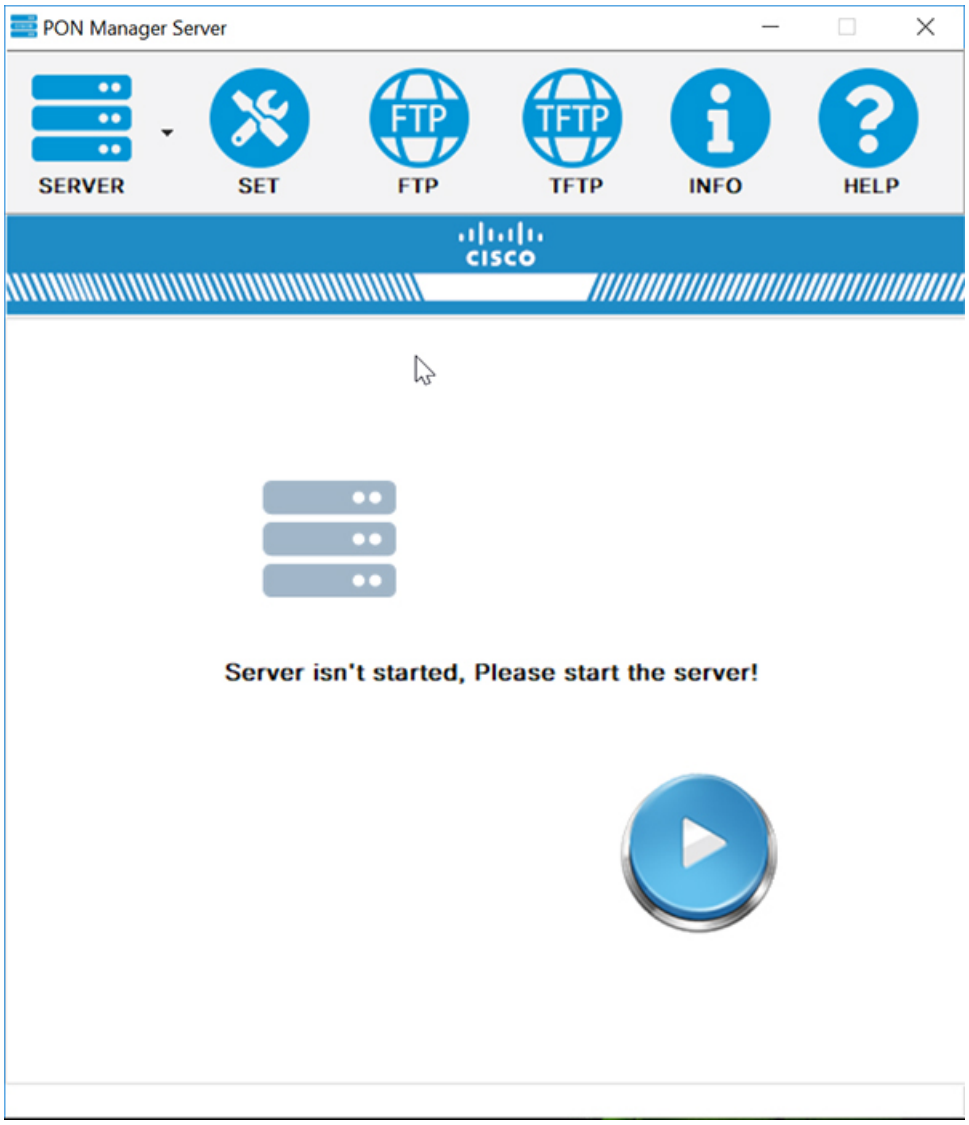
A typical network setup is composed of Cisco Catalyst PON Manager (server and client), switch, router, and other optional accessories such as printer and audio enclosure.

- **Server**

  Server is the core of the Cisco Catalyst PON Manager. It interacts with network nodes and retrieves the required results and forwards the result to the clients.

  Generally, a server provides all functions in terms of application or database. These functions can also be divided and respectively run by two or more servers for load distribution.

  By default, the configuration is standalone configuration.

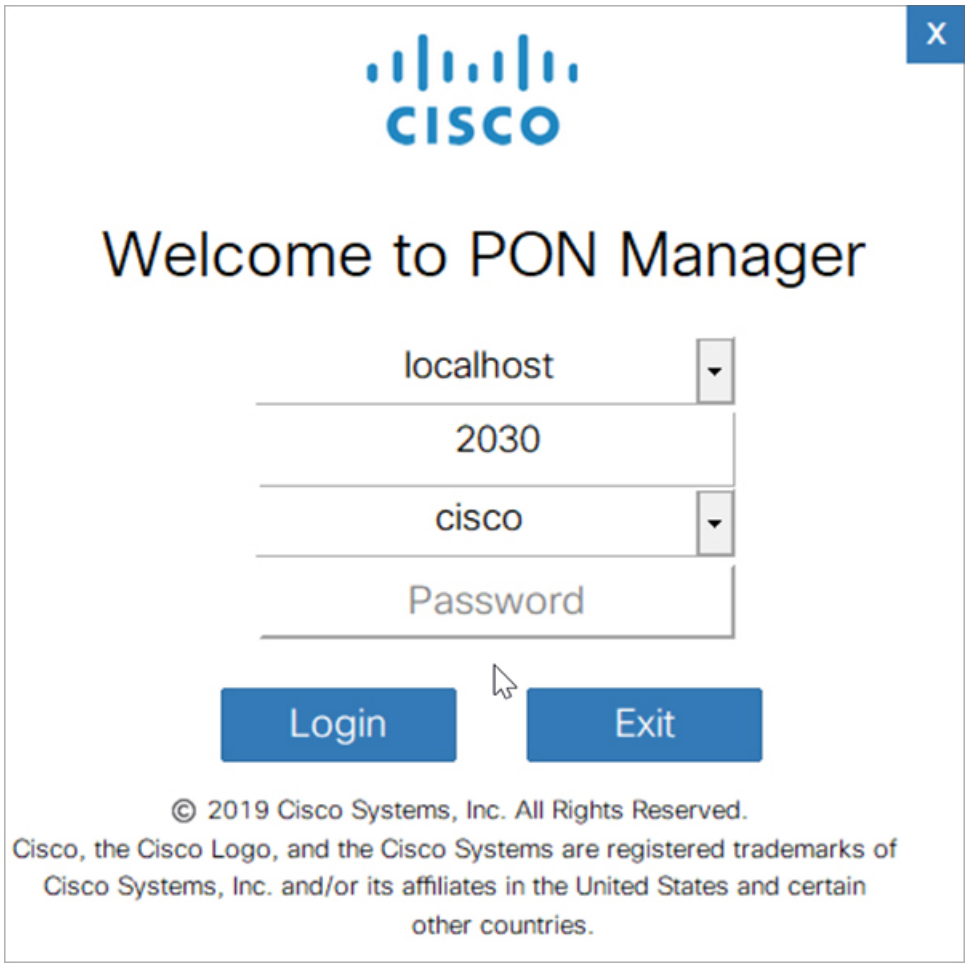


- **Client**

  The PON Manager Client is a Windows-based graphical user interface. The Cisco Catalyst PON Managersupports multi-client architecture to accomplish network node management, operation, and maintenance. With the client, a user can remotely achieve all the operations that used to be done by command line.

  Clients can be classified into two groups by the server they connect to and the location of network nodes managed by them.

  - Local client: The client is located in the same LAN as its server.
  - Remote client: network nodes and server are located in one LAN but the client is located in a remote LAN.



- **Network equipment**

  Network equipment is used to connect the Cisco Catalyst PON Manager with network nodes or upper-layer servers. It commonly consists of switch and router.

- **Other accessories**

  Other accessories are optional such as printer and audio enclosure.

Cisco Catalyst PON Manager Requirements

This section describes the requirements for setting up Cisco Catalyst PON Manager on your device.

PON Manager Server Hardware Requirements

The following table describes the hardware requirements for the PON Manager Server:

Network Size	CPU Frequency	CPU Number	Memory	Hard Disk	Network Card
Managed network nodes: 100,000 to 1 million	Intel® Xeon® processor X7460, 2.66GHZ	4	64G	2*1TB, the disk on which the PON Manager is to be installed (default is D) is not less than 100GB, and is NTFS format	Gigabit Network Adapter
Managed network nodes: 1,000 to 100,000	Intel® Xeon® processor E5506, 3GHZ	2	32G	2*500GB, the disk on which the PON Manager is to be installed (the default is D disk) is not less than 50GB, which is NTFS format.	Gigabit Network Adapter
Managed network nodes: less than 1,000	Intel® Core® i5 processor	1	16G	500GB, the disk on which the PON Manager is to be installed (the default is D disk) is not less than 50GB, which is NTFS format.	Gigabit Network Adapter

PON Manager Server Software Requirements

The following operating systems are supported: Windows Server 2008, Windows Server 2012, Windows Server 2016, Windows Server 2019, Windows 7, and Windows 10.

The database supported is MySQL.

PON Manager Client Hardware Requirements

The following table describes the hardware requirements for the PON Manager Client:

Network Size	CPU Frequency	CPU Number	Memory	Hard Disk	Network Card
Managed network nodes: 100,000 to 1 million	Intel® Core® i3 processor, 3.4 GHZ	1	16G	250GB	Gigabit Network Adapter

Network Size	CPU Frequency	CPU Number	Memory	Hard Disk	Network Card
Managed network nodes: less than 100,000	Intel® Core® i3 processor, 3.4 GHZ	1	8G	250GB	Gigabit Network Adapter

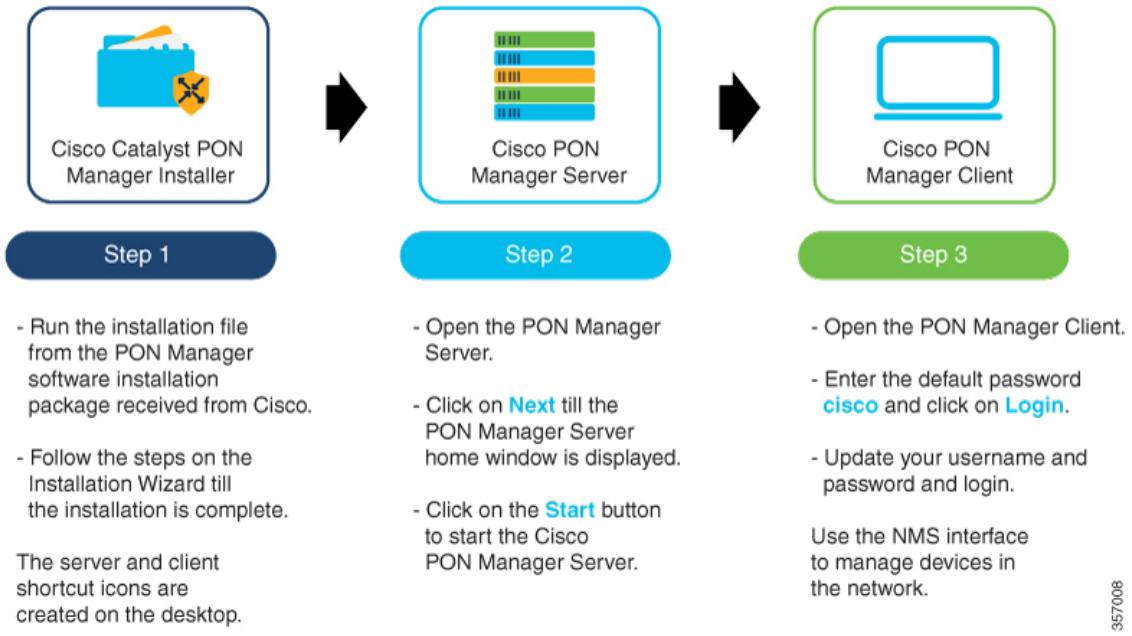
PON Manager Client Software Requirements

The following operating systems are supported: Windows 7 and Windows 10.

To find out the specifications required for setting up Cisco Catalyst PON Manager, refer to the *Cisco Catalyst PON Series Switches Hardware Installation Guide*.

Cisco Catalyst PON Manager Installation

Perform the following steps to install Cisco Catalyst PON Manager on your device:



Note To avoid software conflicts during the installation of Cisco Catalyst PON Manager, turn off all the antivirus applications on your device

Additional References

Related Documents

Related Topics	Document Title
For information about Cisco Catalyst PON series supported switches	Cisco Catalyst PON Series Switches Release Notes
For information about the hardware specifications and installation procedures for Cisco Catalyst PON series	Cisco Catalyst PON Series Switches Hardware Installation Guide
For information about Cisco Catalyst PON series OLT configuration	Cisco Catalyst PON Series Switches OLT Configuration Guide
For information about Cisco Catalyst PON series ONT configuration	Cisco Catalyst PON Series Switches ONT Configuration Guide
For complete syntax and usage information for the commands used in Cisco Catalyst PON series OLT configuration	Cisco Catalyst PON Series Switches OLT Command Reference
For help with using the Cisco Catalyst PON Manager Server	Cisco Catalyst PON Manager Server OLH
For help with using the Cisco Catalyst PON Manager Client	Cisco Catalyst PON Manager Client OLH