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Transfer of a Single PON Port to an Optical Cross-Connector



Overview

In the upstream direction, a Cisco Catalyst PON Series ONT is connected to the optical splitter through the PON port.

Key Takeaways

Transferring a single PON port to an optical cross-connector involves rerouting the fiber from the OLT through the optical distribution network (ODN) to a new splitter or patch point while maintaining signal integrity and service continuity.Understanding the Components

In a GPON or PON network, the key components involved in a port transfer include:

• Optical Line Terminal (OLT): The central device managing multiple PON ports, each capable of serving multiple ONTs/ONTs via splitters .

• Optical Distribution Network (ODN): The passive fiber infrastructure connecting the OLT to splitters and ultimately to ONTs/ONUs .

• Optical Splitters: Passive devices that divide a single fiber signal into multiple outputs, typically in ratios like 1:32 or 1:64 .

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• Optical Cross-Connector (OCC): A patch panel or cross-connect point where fibers can be rerouted or reassigned without splicing, allowing flexible network reconfiguration .

Steps for Transferring a PON Port

• Identify the PON Port and Fiber Path: Determine which OLT port is currently serving the target ONT/ONU and trace the fiber through the ODN to the existing splitter or cross-connect .

• Prepare the Optical Cross-Connector: Ensure the OCC has available ports for the incoming OLT fiber and the outgoing fiber to the desired splitter or ONT. Clean all connectors to prevent signal loss .

• Disconnect and Patch: Carefully disconnect the fiber from the current splitter or patch panel and connect it to the designated port on the optical cross-connector. Use SC/APC connectors for GPON networks to maintain low return loss and proper alignment .

• Verify Signal Integrity: After patching, test the optical power levels and signal quality using an optical power meter or OTDR to ensure the PON port is delivering adequate downstream and upstream signals .

• Update Network Configuration: If necessary, update the OLT configuration to recognize the reassigned port and ensure the ONT/ONU is correctly registered and synchronized via the OMCI channel .

• Document Changes: Record the new fiber routing, port assignments, and any changes in the splitter or cross-connector for future maintenance and troubleshooting .

Considerations

• Minimize Service Disruption: Schedule the transfer during low-traffic periods or use temporary bypass fibers if possible.

• Connector Type Consistency: GPON networks typically use SC/APC connectors; mismatched connectors can cause high insertion loss.

• Loss Budget: Ensure the total optical loss from OLT to ONT remains within the GPON specifications (typically 13–28 dB depending on split ratio and distance) .

• Safety: Handle fibers carefully to avoid breakage and follow laser safety protocols.

By following these steps, a single PON port can be successfully transferred to an optical cross-connector, enabling flexible network management and efficient reallocation of OLT resources without extensive downtime.

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The PON manager and its corresponding database are hosted on either an external system or specialized hardware,

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In the CO or head end, the OLT (optical line terminal) has a port that connects to a single fiber, transmitting data bidirectionally at

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All You Need to Know About Passive Optical Network (PON) Fiber

Passive Optical Network (PON) is capable of distributing voice, video and data to the desktop over one singlemode fiber, and offers

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

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