

Columbia OTN Router OSFP



Overview

IP Routing: OSPF Configuration Guide The OSPF MIB defines an IP routing protocol that provides management information IP Routing: OSPF Configuration Guide.

Key Takeaways

OSPF can be configured on OTN routers to manage IP routing over optical transport networks, with OSPF-TE enabling traffic engineering and path control. OTN Overview

An Optical Transport Network (OTN) router aggregates multiple traffic types such as Ethernet, SONET, SDH, and packet over OTN at rates from 1.25 Gbps to 100 Gbps. OTN circuits are managed by ODUk controllers, which can be cross-connected via fabric cards. OTN supports Automatic Protection Switching (APS) and Tandem Connection Monitoring (TCM) to ensure high availability and rapid failover in case of link failures . APS typically uses a 1+1 protection architecture, where a working circuit is backed by a protect circuit, and switching occurs at the tail-end or coordinated bidirectionally using a Protection Communication Channel (PCC), .

OSPF and OSPF-TE on OTN Routers

OSPF (Open Shortest Path First) is an Interior Gateway Protocol (IGP) that maintains a consistent topology database across an autonomous system and calculates shortest-path routing tables . On OTN routers, OSPF-TE (Traffic Engineering) allows operators to control the path of data packets based on network resources such as bandwidth and link availability . This is particularly useful when integrating IP routing with OTN circuits, as it enables:

- Routing of areas and protection paths
- Minimization of routing protocol traffic
- Integration with MPLS-TE to map traffic flows to label-switched paths (LSPs) based on available resources

Configuration Considerations

When configuring OSPF-TE on OTN routers (e.g., Cisco NCS 4000 series):

- Create the optics controller before setting refresh optical intervals.
- Enter RSVP mode and configure the OTU4 controller.
- Specify the refresh interval (180–86400 seconds) and the number of missed messages (1–110000) to maintain OSPF-TE state .
- For MPLS-TE integration, enter MPLS-TE configuration mode on the OTN controller to map traffic flows to LSPs .

Interaction with Optical Layer

Routers without OTN interfaces cannot directly monitor optical links. In such cases, optical layer protection and restoration mechanisms (OTN or SDH/SONET) operate transparently, and OSPF sees only the IP layer connectivity. If a failure occurs at the optical layer, APS or TCM mechanisms handle protection switching, which may trigger OSPF reconvergence indirectly . Routers supporting ITU-T G.709 can monitor optical paths and integrate FEC (Forward Error Correction) for improved reliability .

Summary

Configuring OSPF on an OTN router involves understanding both IP routing and optical transport mechanisms. OSPF-TE provides traffic engineering capabilities, while APS and TCM ensure high availability. Proper configuration of optics controllers, refresh intervals, and MPLS-TE integration is essential for efficient and resilient network operation .

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