

Features of Routers with Integrated Optical Modules



Article Overview

Routers with integrated optical modules combine high-capacity routing with coherent optical transceivers, enabling direct IP-to-DWDM mapping, simplified network layers, and advanced automation for scalable, high-performance optical networks.

Key Features

1. **Integrated Coherent Optical Modules** These routers embed ZR/ZR+ or digital coherent optics (DCO) modules directly into the routing platform, allowing IP traffic to be mapped directly onto DWDM wavelengths without the need for external transponders or muxponders . This integration reduces optical-electrical-optical (OEO) conversions, lowers latency, and improves bandwidth efficiency. 2. **High-Density and High-Capacity Routing** Modern platforms, such as Cisco 8000 and 8800 series, provide high port density (up to hundreds of 400 GbE ports) and multi-terabit throughput (up to 260 Tbps), supporting large forwarding tables, deep buffers, and flexible packet operations . These routers are optimized for 100G/400G/800G traffic and can scale efficiently for metro, long-haul, and data center interconnects. 3. **Simplified Network Architecture** By integrating optical modules, these routers collapse multiple network layers (IP, OTN, WDM) into a single, unified layer, simplifying management and reducing operational complexity . This architecture supports end-to-end multi-layer automation and can interoperate with ROADM-based networks or traditional transponders. 4. **Advanced Automation and SDN Integration** Integrated optical routers support open data models, standard APIs, and SDN-based control, enabling automated provisioning, monitoring, and optimization of both IP a...

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