



Nokia builds multi-terabit optical network across India for Tier 1 operator

A Tier 1 operator in India is implementing Nokia Optical Transport Network (OTN) technology across its national footprint.

The upgraded optical network enables the operator to offer massive capacity to enterprises, operators and hyperscalers.

The new optical network is helping to transform India's digital infrastructure and empower enterprises to thrive in the growing digital economy.



Challenges and opportunities

A key player in India's telecommunications sector, the operator was looking to seize new opportunities fueled by the growing bandwidth needs of enterprises and hyperscalers.

The impending launch of 5G networks and nationwide push for broadband connectivity presented a complex landscape that demanded innovative solutions.

Adding backhaul transport capacity was the top priority, mainly because the evolution towards denser 5G mobile networks would require higher speeds. The operator also knew it would need a robust optical network infrastructure to support wholesale connectivity for emerging applications such as smart grids and data center interconnect (DCI), along with other business services. Because the challenge went beyond expansion, it needed a strategic network transformation approach that would ensure seamless integration and scalability.

In this dynamic environment, delivering on strict service-level agreements (SLAs) was a focal point. The surge in demand necessitated an increase in capacity and service-level performance to meet the stringent requirements of diverse applications and use cases.

The operator needed to deliver faster and more reliable broadband services to support the new use cases. It turned to Nokia for a solution that would address these multifaceted challenges and align perfectly with its vision for a thriving, digitally connected India.





Solution

To address the challenges of building a multi-terabit optical network across India, the operator chose to deploy Nokia 1830 PSS-x OTN switches in its National Long-Distance (NLD) network, which connects major cities across India. The new switches will enable significant leaps forward by delivering greater capacity, reliability and cost-effectiveness.

The integration of advanced Nokia optical solutions, specifically the 1830 PSS-x OTN switches, into the operator's NLD core network enhances its service delivery infrastructure throughout India. The deployment of compact and energy efficient 1830 PSS optical systems in the operator's access and metro networks enables cost-effective scaling of the end-to-end network.

Tying the network together and enabling simplified multilayer service provisioning is an intelligent multilayer control plane that provides

coordinated optimization and restoration of services across the WDM (L0) and OTN (L1) layers. This hybrid architecture allows the operator to leverage OTN to provide efficient wavelength aggregation (filling the “pipes”) and WDM to increase transport efficiency and scalability. The decision to utilize these cutting-edge technologies underscores the operator's commitment to meeting the evolving demands of its customers.

The anticipated benefits are substantial. The operator's customers stand to gain from the enhanced capacity, which will ensure that the network is well equipped to handle India's growing data traffic demands—an essential requirement in one of the world's fastest-growing telecom markets. Meeting current and future bandwidth demand will help the operator solidify its position as a leader in the Indian telecommunications sector.

Benefits and advantages

Meeting the demands of the digital era

By seamlessly upgrading its legacy optical transport switching infrastructure across its pan-Indian network footprint, the operator is prepared to meet the escalating demands of the digital era. This upgrade is part of a forward-looking initiative to ensure the transport network is robust and ready to adapt to evolving customer requirements.

The upgrade is significant because it allows the operator to keep pace with transport network traffic demands and enhance performance and reliability at the same time. The operator recognizes that transport network evolution requires a proactive approach. Integrating high-capacity OTN switching and utilizing additional spectrum, including L-band wavelengths, demonstrates its commitment to being proactive.

With the 1830 PSS-x OTN switches, the operator gets a long haul- and metro-optimized solution that can

scale switching capacity to 1 terabit per slot and up to 48 terabits per rack. By supporting different modulation schemes, the solution maximizes reach and spectral efficiency to meet varying requirements. The solution also supports multilayer (photonic layer 0 and OTN layer 1) control plane-driven restoration that can manage multiple faults and ensure an alternate path is always available so services can continue uninterrupted.

This transformative upgrade gives the operator a strategic advantage. The revamped network supports a better quality of service, increased reliability and faster data speeds, which directly translates to a better customer experience. It lays the foundation for an adaptive network that scales with high efficiency and dynamically adapts to changing capacity requirements and application demands. All of this will help the operator foster the growth of India's digital economy and deliver the services its customers need.



Why the operator chose Nokia

The operator decided to partner with Nokia to build out the pan-Indian optical network because of its expertise and commitment to future-ready solutions. The adoption of OTN switching, specifically the Nokia 1830 PSS-x OTN switches, provides several advantages, making it the optimal choice for the operator's strategic vision.

- **Bandwidth efficiency:** The implementation of OTN switching enhances bandwidth efficiency. By efficiently utilizing high-speed wavelengths and combining traffic from different client interfaces, OTN switching uses fewer wavelengths and high-speed line interfaces. This optimizes network resources and reduces OPEX.
- **Superior SLAs:** End-to-end path layer monitoring, a powerful feature of OTN, allows the operator to adhere to stringent SLAs. With the ability to monitor signal quality at multiple, user-defined endpoints, the operator can guarantee a superior level of service, a critical capability in large, interconnected networks.

- **Cost-effectiveness:** OTN switching helps to reduce overall transport costs. The solution can transport multiple clients on a single wavelength and preserve their specific requirements. This leads to efficient bandwidth utilization and a direct, positive impact on the bottom line.
- **Resiliency and protection:** Service protection is critically important to the operator. OTN's support for carrier-grade service protection and restoration using Generalized Multi-Protocol Label Switching (GMPLS) provides a foundation for a robust and resilient network.

In a broader context, the adoption of multilayer networks, including OTN and reconfigurable optical add-drop multiplexers (ROADMs), enables the operator to benefit from superior scalability and flexibility. This approach reduces total cost of ownership (TCO) through better grooming and power optimization at layer 1 and eases service monetization with granular SLAs at layer 0. The integration of automation and network planning further contributes to operational efficiency, aligning perfectly with the operator's goal of implementing a future-ready and economically sustainable network infrastructure.

Learn more about Nokia optical networking solutions at (<https://www.nokia.com/networks/optical-networks/>)



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As a B2B technology innovation leader, we are pioneering networks that sense, think and act by leveraging our work across mobile, fixed and cloud networks. In addition, we create value with intellectual property and long-term research, led by the award-winning Nokia Bell Labs.

With truly open architectures that seamlessly integrate into any ecosystem, our high-performance networks create new opportunities for monetization and scale. Service providers, enterprises and partners worldwide trust Nokia to deliver secure, reliable and sustainable networks today – and work with us to create the digital services and applications of the future.

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