

## **Huawei Constructs a Best-in-Class Optical Transport Network for ÖBB**

**Huawei deployed an Optical Transport Network (OTN) using Dense Wavelength Division Multiplexing (DWDM) for Austrian Federal Railways (ÖBB). DWDM technology enables 100Gbit/s performance and the ability to expand broadband network systems efficiently. Customized for ÖBB, Huawei's DWDM OTN products are now deployed at multiple sites across Austria and Germany.**



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### **One of the Most Reliable Railway Operators in Europe**

One of Austria's leading rail transportation companies, the ÖBB group transports 459 million passengers and 115 million tons of goods per year. It is among the most reliable railway operators in Europe with a punctuality rate of 96 percent. More than 40,000 employees across the group ensure that nearly 1.3 million passengers reach their destination safely every day. With a 10 to 15 percent annual growth rate for rail transportation, ÖBB faced increasing congestion on the backbone networks the company was using for dispatch and ticketing traffic.

Also important is the requirement that faster trains have modernized train control that is also based on ICT. With plans to extend its rail network to reach 90 percent of the country, ÖBB is preparing to build more stations and increase the available bandwidth resources on local and backbone networks. All current and future stations will be equipped with High-Definition (HD) video surveillance systems, intelligent office systems, and other digital railway information systems. A new high-speed backbone network was required to keep up with the growing demand for rail services throughout Austria.

### **A Best-in-class Network is the Trump Card**

ÖBB's 10G legacy network suffered from inadequate device performance because more than 80 percent of its network bandwidth was already in use. New requirements for wireless train control, centralized dispatch, and automatic operations could not be met due to a lack of adequate bandwidth. Intelligent offices and modern production systems needed to be connected to a unified high-speed backbone carrier network to allow communications and dispatch. Additionally, railway service characteristics require network communication systems to be absolutely secure and reliable.

ÖBB believes building a stable, fast, and high-quality network is the basis for railway communication development. In other words, a best-in-class network is the trump card for a leading railway operator. Based on such an understanding, ÖBB sought a mature partner capable of deploying networks in industrial environments.

### **Huawei DWDM Technologies**

Based on ÖBB's requirements, Huawei used DWDM technologies commonly applied in the telecommunications carrier market to construct optical transport networks.

The OTN tributary/line-separation architecture maximizes the utilization of line bandwidth, allows access to multiple types of services, and greatly improves the flexibility of service configuration and grooming.

The new network uses its Multi-Service OTN (MS-OTN) function to support OTNs, Virtual Circuits (VCs), and packet cross-connections, thereby enabling end-to-end management for all types of services and resulting in a future-proof intelligent network.

In the new coherent system, the bandwidth has been increased up to 100 Gbit/s per wavelength, or up to 8 Tbit/s over each pair of fibers. Future upgrades will expand the bandwidth from 100G to 400G, 1T, and 2T channels per wavelength.

The Fiber Doctor (FD) and Optical Doctor (OD) functions apply automatic commissioning and optimization to minimize the Operations and Maintenance (O&M) costs that keep the network in an optimal state.

Protection mechanisms at the electrical and optical layers allow fast switching and eliminate service interruption. Thanks to these inherent attributes, DWDM technologies can be used to carry crucial safety-related data.

In the summer of 2016, Huawei and NIC Solutions jointly deployed a new OTN at 52 sites in Austria and Germany, including an Ethernet-based management system. Once operational, the OTN achieved positive results that have been mutually beneficial to both ÖBB and its customers.

### **Competitive Advantage in Operational Management**

ÖBB's new OTN infrastructure has generated immediate and considerable benefits; including the resolution of legacy performance issues and delivery of sufficient bandwidth for customers. The OTN supports flexible service-access modes and facilitates high device utilization, simplified data processing, and efficient O&M management. The results give ÖBB a competitive advantage in operational management. Moreover, the new OTN will contribute to the continuous optimization of ÖBB's products and services.

For more information, please visit <http://e.huawei.com/topic/leading-new-ict-en/obb-optical-transport-network->

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