

Infinera 7100 Series

Compact and Flexible Packet Optical Transport for the Metro

Metro bandwidth is growing strongly, driven primarily by internet video, data center interconnect (DCI), and enterprises migrating their IT to public data centers and cloud services. In addition, metro networks are confronted with increasingly unpredictable traffic patterns and a constantly evolving set of end-user services and applications. Faced with this environment, a wide range of network operators rely on the Infinera 7100 Packet Optical Transport Solutions, which include the 5RU/six-slot Infinera 7100 Nano Packet Optical Transport Platform, the 2RU/two-slot Infinera 7100 Pico Packet Optical Transport Platform, and the 1RU Infinera 7100 PSX-3S packet switch.

ADDRESS A WIDE RANGE OF METRO APPLICATIONS WITH A FLEXIBLE SET OF TECHNOLOGIES

The 7100 Series addresses a broad range of applications, including business and wholesale Ethernet services, mobile backhaul, fixed broadband backhaul, SONET/SDH migration, router interconnect, DCI, cloud connect, SAN services, native video services, and private enterprise networks. The 7100 Nano and 7100 Pico can be deployed as OTN ADMs, passive or amplified WDM systems with transparent 10G/100G, or optical line amplifiers. The 7100 Nano, 7100 Pico, and 7100 PSX-3S can be deployed as standalone packet switches. The 7100 Nano can also be deployed as a ROADM or SONET/SDH ADM, while the 7100 Pico can also be deployed as customer-premise equipment. Furthermore, both the 7100 Nano and 7100 Pico support configurations combining multiple technologies in a single platform.

ROADM-on-a-blade	Power Monitoring	Fabricless Switching	Carrier Ethernet and MPLS-TP	Integrated Testing
Pluggable Optical Layer	OTDR	OTN ADM/Switch	SONET/SDH ADM	Zero-touch Provisioning
Colorless and Directionless	High-density 10G and 100G	Payload Encryption	SDN	GMPLS and vASON

Figure 1: Key Infinera 7100 Series technologies

BENEFITS OF THE INFINERA 7100 SERIES

- **Select** from a wide range of technologies, including fabricless switching, transparent 10G/100G, ODU payload encryption, ROADM-on-a-blade, and the Pluggable Optical Layer
- **Deliver** MEF CE 2.0-certified Ethernet services with up to 1.2 Tb/s of packet switched interfaces, support for Carrier Ethernet and MPLS-TP, and RFC 2544/Y.1564 Ethernet service activation testing
- **Reduce** footprint and power consumption with compact 5RU, 2RU, and 1RU shelves, highly integrated modules, and converged packet optical
- **Maximize** network availability with Y-cable, 1+1 OCh, 1+1 OTS, ODUk SNC, G.8031 VLAN protection, G.8131 MPLS-TP LSP protection, G.8032v2 ERP, ASON/GMPLS, and vASON restoration
- **Minimize** operational costs with zero-touch provisioning (ZTP), automated per-channel power balancing, PRBS test and loopback, OTDR, and extensive OTN and packet OAM



Infinera 7100 Nano



Infinera 7100 Pico



Infinera 7100 PSX-3S

SPEED WAVELENGTH PROVISIONING AND REDUCE OPEX WITH ROADM-ON-A-BLADE

The 7100 Nano supports up to eight ROADM degrees with 88 channels, leveraging compact ROADM-on-a-blade technology. ROADM-on-a-blade integrates key functions including the WSS, input amplifier, output amplifier, optical channel power monitoring, and optical supervisory channel (OSC) into a single module. In addition to reducing cost, space, and power, ROADM-on-a-blade simplifies installation with reduced cabling. Options include a single-slot eight-degree module and a cost-effective double-slot four-degree module. Up to six degrees can be supported in a single 7100 Nano shelf. Directionless and colorless/directionless add/drop options and an integrated OTDR option are also available.

MIX AND MATCH OPTICAL LAYER FUNCTIONS WITH THE PLUGGABLE OPTICAL LAYER

By shrinking optical layer functions, including EDFA-based amplifiers, EVOAs, OSC, and OTDR, to compact pluggables, the Pluggable Optical Layer enables network planners to mix and match optical layer functions to optimally meet the requirements of their networks in the short term, with the ability to extend functionality over time as needs evolve. The Pluggable Optical Layer can support a wide range of applications including CWDM, fixed DWDM, and ROADM. The 7100 Nano and 7100 Pico can support active pluggables in the Pluggable Optical Carrier Card (POCC), while the 7100 Pico also supports active pluggables, including amplifiers, in its auxiliary slot. These pluggables can be deployed alongside the passive elements of the Pluggable Optical Layer to support a wide variety of CWDM and DWDM applications.

TRANSPORT A WIDE RANGE OF PROTOCOLS WITH TRANSPONDERS AND MUXPONDERS/ADMS

The 7100 Nano and 7100 Pico support a wide range of client interfaces from 155 Mb/s to 100 Gb/s, including Ethernet, SONET/SDH, OTN, Fibre Channel, and native video. The single-slot HGTM-S3 provides a QSFP28 client and a coherent CFP2-DCO line interface, while the single-slot HGTM-MS3 provides 10 x 8G/10G/16G SFP+ clients and a CFP2-DCO line. Both modules support wire-speed ODU payload encryption, while two HGTM-MS3s can be paired via the backplane to provide an OTN ADM with 400 Gb/s switching capacity.

Up to 48 x 10G transponders are supported in the 7100 Nano and up to 16 in the 7100 Pico with the HDTG2 high-density 10G transponder module. The OMM-X module provides eight low-speed SFP ports with support for Ethernet, SONET/SDH, OTN, Fibre Channel/FICON, native video, and anyrate interfaces up to 5 Gb/s and two 10G/OTU2 XFP line interfaces. The OMM-X can be used as a single unprotected muxponder, a muxponder with line protection, a dual muxponder, or a 10G ADM with 40 Gb/s OTN switching capacity. The 7100 Nano also supports up to 120 Gb/s of OTN switching with the OSM20 modules, while paired SMTM-UX modules provide a cost-effective SONET/SDH ADM option.

CONVERGE FEATURE-RICH PACKET SWITCHING AND WDM IN A SINGLE PLATFORM

The 7100 Nano, 7100 Pico, and 7100 PSX-3S support flexible and feature-rich packet switching with support for MPLS-TP (including VPLS/H-VPLS) and Carrier Ethernet (VLAN cross-connect and Ethernet bridging). Fabricless switching via the meshed backplane enables an aggregate 1.2 Tb/s of packet interface capacity in the 7100 Nano with the 200 Gb/s PSM-2S (16 x SFP/SFP+ and 4 x SFP+) and PSM-2C (2 x SFP/SFP+, 8 x SFP+, and 1 x CFP) packet switching modules, which also enable up to 400 Gb/s packet switching in the 7100 Pico. Leveraging the same software and packet switching technology, the 7100 PSX-3S provides up to 376 Gb/s in 1RU with a flexible mix of 100 GbE, 10 GbE, OTU2, and GbE interfaces.

Quality of service is ensured with classification based on port, MAC, or L2/L3 header information; multiple queues per port and per VLAN/LSP; multi-level hierarchical scheduling and policing; and NMS-enabled CAC. Packet protection mechanisms include G.8032v2 Ethernet Ring Protection, G.8031 1:1 VLAN protection, G.8131 1:1 LSP protection, and 802.1AX link aggregation. Supported OAM features are Y.1731 and 802.1 CFM OAM, 802.3 Link OAM, IETF-based MPLS-TP LSP fault management, and RFC 2544/Y.1564 Ethernet service activation testing. Synchronous Ethernet and in-band management VLANs are also supported.

SIMPLIFY OPERATIONS WITH COMPREHENSIVE MANAGEMENT AND ORCHESTRATION

Features that simplify installation and operations include ZTP, PRBS test and loopback on all interface modules, per-channel power monitoring and automated wavelength balancing, an integrated OTDR option, comprehensive OTN and packet OAM, and in-band management via OSC, GCC, or VLAN. End-to-end management and control are provided by the Infinera Transcend Network Management System (TNMS) and the Infinera Transcend Controller.