

Infinera mTera Universal Transport Platform

Flexible, Scalable, and Future-proof Transport for Metro, Regional, and Long Haul Networks

Network operators are facing challenges including bandwidth growth driven by video, cloud, and data center interconnect and unpredictable traffic patterns. These trends are only likely to accelerate as mobile networks migrate to 5G and IoT adoption accelerates. At the same time, network operators need to reduce operational costs including space and power consumption, migrate from legacy technologies such as SONET/SDH, and grow revenues by offering next-generation Ethernet services and new SDN-enabled services. They also need to maximize network and service availability cost effectively.

REDUCE CAPEX AND OPEX WITH CONVERGED ELECTRICAL AND OPTICAL SWITCHING

The Infinera mTera Universal Transport Platform (UTP) is a flexible and scalable universal transport platform that helps network operators address these challenges by providing OTN, MPLS-TP, Carrier Ethernet, and SONET/SDH switching at the electrical layer with the option of an integrated DWDM layer based on ROADM-on-a-blade technology. It is available as both a 10RU/12RU 4 Tbps 8-slot shelf and a 19RU 7 Tbps 14-slot shelf, with paired 14-slot shelves able to deliver 12 Tbps of electrical switching. The backplane of both mTera UTP shelves is capable of supporting 1 Tbps per slot, which is designed to provide a path to even higher switching capacities in the future.

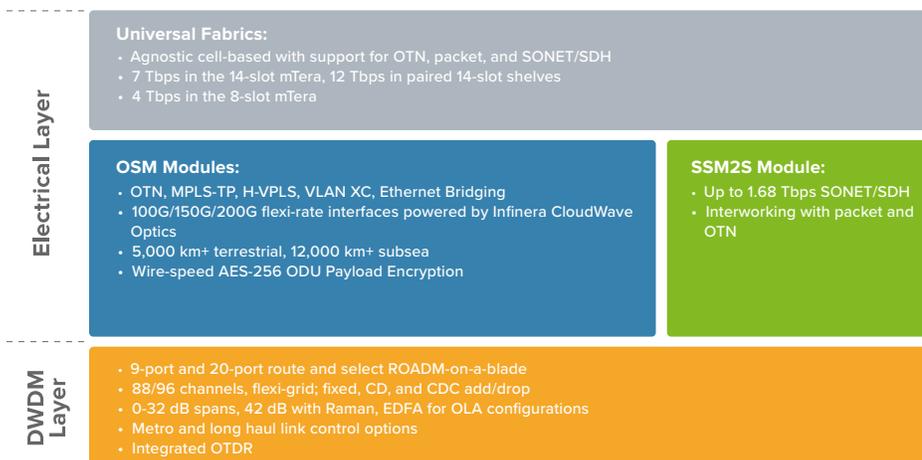


Figure 1: Infinera mTera UTP High Level Overview

BENEFITS OF THE INFINERA mTera UTP

- **Adapt** to changing traffic patterns and service demands with the ability to define any interface/virtual interface for OTN, MPLS-TP, or Carrier Ethernet switching
- **Minimize** 100G+ interface costs with efficient native grooming of OTN, packet, and SONET/SDH onto the same high speed wavelength
- **Reduce** operational costs, such as space and power, by converging electrical switching with optical layer technologies including flexi-grid route and select ROADM-on-a-blade, Raman, OTDR, CD, and CDC add/drop
- **Deliver** MEF CE 2.0 certified services leveraging the mTera UTP's scalable and feature-rich packet switching
- **Migrate** SONET/SDH to next-generation packet optical technologies including MPLS-TP, Carrier Ethernet, OTN, and up to 1.68 Tbps of STS-1/ VC-4 switching
- **Maximize** network and service availability with Y-cable, SNC protection, G.8031 VLAN protection, G.8032 ERP, G.8131 MPLS-TP protection, and ASON/GMPLS and vASON restoration

ADAPT TO CHANGE WITH THE UNIVERSAL SWITCHING OF OTN, PACKET, & SONET/SDH

The agnostic cell-based fabrics of the mTera UTP support the universal switching of OTN, packet, and SONET/SDH at the electrical layer. The OSM modules provide the ability to select OTN, MPLS-TP (including VPLS/H-VPLS), and Carrier Ethernet (including VLAN cross-connects and Ethernet bridging) for each interface or virtual interface with the option of wire-speed AES-256 encryption of ODU payloads. The SSM2S module supports SONET/SDH switching and interworking to packet and OTN on the OSM modules.

This support for OTN, packet, and SONET/SDH switching results in significant savings in terms of CapEx, footprint, and power consumption relative to the alternative of multiple single technology switches, with additional savings resulting from a reduced number of network elements to install, manage, and maintain and fewer spares to purchase and inventory. Furthermore, the ability to reassign physical resources between switching types enables network operators to quickly respond to changes in traffic patterns and to quickly provision new services as their customers' requirements evolve.

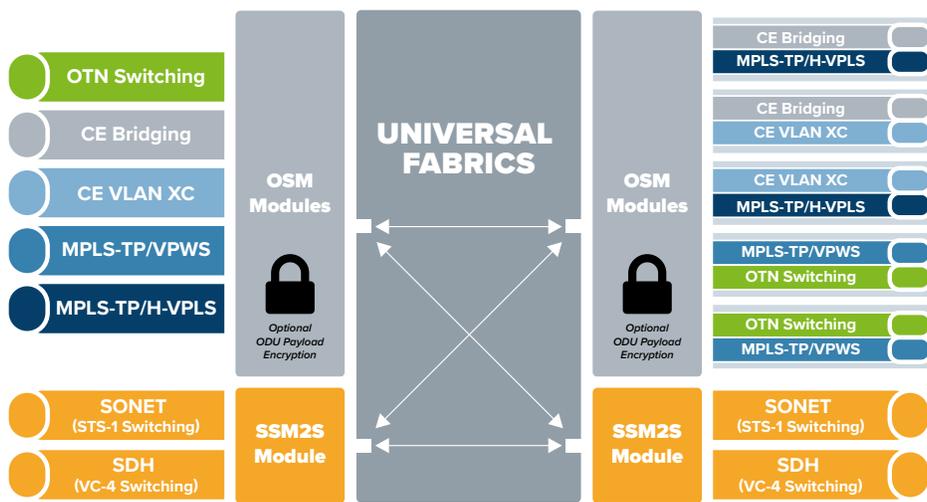


Figure 2: Universal Switching of OTN, Packet, and SONET/SDH

PREPARE FOR THE FUTURE WITH SCALABLE, FLEXIBLE ROUTE AND SELECT ROADM

The mTera UTP provides the option to converge both electrical switching and optical switching in a single platform. The mTera UTP optical layer modules include 9-port and 20-port route and select ROADM-on-a-blades, colorless/directionless (CD) modules, a colorless/directionless/contentionless (CDC) module, a Raman amplifier, an EDFA amplifier for optical line amplifier (OLA) applications, and an Optical Time Domain Reflectometer (OTDR) pluggable. These optical layer modules are supported in both the 14-slot mTera shelf and the 8-slot mTera shelf. ROADM systems can be deployed in a single shelf, or to maximize availability, ROADM degrees and add/drop modules can be distributed over multiple shelves. The mTera UTP optical layer modules can be deployed with electrical switching in the same shelf, or they can be deployed in optical-only shelves that avoid the cost and power consumption of the electrical switching fabrics.

BOOST REACH AND SPECTRAL EFFICIENCY WITH CLOUDWAVE-ENABLED FLEXI-RATE INTERFACES

The mTera UTP also provides the option of flexi-rate interfaces powered by Infinera CloudWave Optics technology with support for 100G (QPSK), 150G (8QAM), and 200G (16QAM). Ideal for long haul applications, these interfaces enable reach of over 5,000 km in terrestrial networks and over 12,000 km in subsea networks. 200G (16QAM) and super-channel support enable high spectral efficiency with over 25 Tbps per fiber pair. Additional Infinera CloudWave Optics benefits include low power consumption, robust performance under challenging fiber conditions, fast protection, comprehensive performance monitoring, and compatibility with existing networks including mixed 10G/100G networks. In the near future, we anticipate even greater reach and spectral efficiency will be enabled with the integration of Infinera CloudWave T Optics technology.

MAXIMIZE NETWORK AND SERVICE AVAILABILITY WITH COMPREHENSIVE PROTECTION AND RESTORATION

Designed to offer protection against single points of failure of its common equipment modules, each module in the mTera UTP receives power from two independent external sources. The platform supports N:1 fabric redundancy, which provides cost-effective protection against a fabric failure. Equipment protection also includes the fans and processor modules. At the network level, in addition to a comprehensive set of OTN, packet, and SONET/SDH protection mechanisms, the mTera UTP supports restoration with both traditional ASON/GMPLS and SDN-enabled vASON.