

## XTM SERIES

# ETHERNET DEMARCATION UNIT (EDU)

## High-performance Service Demarcation of Ethernet Services in Packet Optical Networks

In response to the demand for ever-increasing accuracy and capacity in Ethernet service delivery, Infinera provides a range of Ethernet demarcation units (EDUs) for both gigabit and 10G Ethernet services. The EDUs, which are a powerful part of the XTM Series, provide seamless integration of Ethernet services into Infinera's widely-deployed coarse wavelength-division multiplexing (CWDM) and dense wavelength-division multiplexing (DWDM) networks, and provide operators with industry-leading service demarcation of Layer 2 Ethernet services.

### High-performance Design Eliminating Delay and Jitter

The range of EDUs provides a service assurance platform with ultra-low latency and jitter capabilities.

Unlike network processor-based architectures, the all-silicon design provides wire-speed pass-through performance without adding jitter or delay, while at the same time providing microsecond measurement resolution.

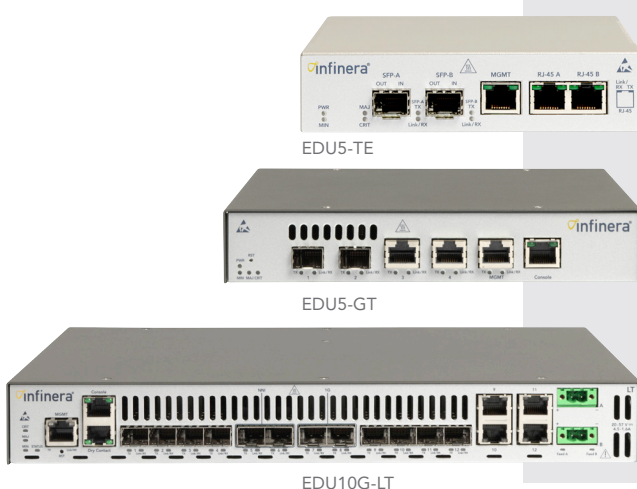
### Service Mapping

Service mapping allows providers to quickly create Ethernet virtual circuits (EVCs) for E-Line, E-LAN, E-Tree and E-Access services. The service creation selectively applies customer/service VLAN tags with configurable service class.

### Versatile Range of EDUs

With high-performance design, excellent service level agreement (SLAs) abilities and flexible service creation, the EDU5 and EDU10G models are the perfect gigabit or 10G Ethernet service demarcation in most network applications. The EDU models are well-proven in numerous successful solutions, both small and large.

For the most demanding network applications, requiring advanced Ethernet ring protection switching (ERPS) resilience, hierarchical quality of service (H-QoS) capabilities and high performance Y.1564



### Key benefits:

- Low delay and jitter with Ethernet wire-speed performance for unprecedented QoS and SLA fulfillment
- Provides Metro Ethernet Forum (MEF) Carrier Ethernet 2.0 (CE 2.0)-compliant E-Line, E-LAN, E-Tree and E-Access services
- Highly accurate and precise operations, administration and management OAM and performance monitoring through microsecond resolution
- Per-service visibility for all key operation administration and management (OAM) and SLA parameters, enabling individual SLA monitoring and service differentiation
- Synchronous Ethernet capabilities
- Provides seamless integration of Ethernet services into flexible CWDM and DWDM networks
- Hardened product options available

service activation, the EDU models provide high-end GbE and 10G Ethernet service demarcation.

### End-to-end Service OAM

The range of EDUs delivers high-performance service assurance monitoring for mission-critical, high-density Ethernet applications. The EDUs enable highly accurate and precise OAM performance monitoring for large-scale wireless backhaul and business service applications.

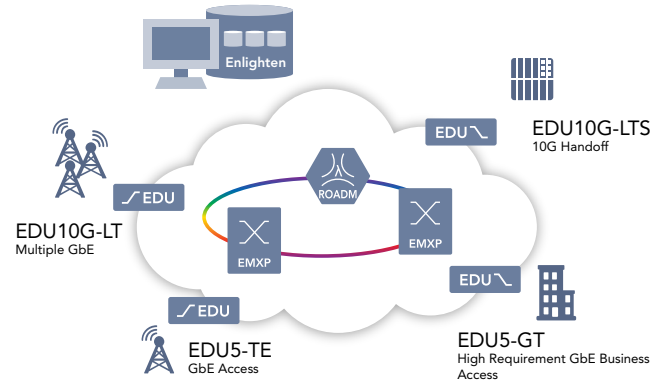
### Advanced Network Troubleshooting

The EDUs accept loop-up commands sent in-band by leading packet, VoIP and IPTV test sets and monitoring systems. Using this functionality, network technicians can continue to test using the equipment they already have without requiring far-end test sets at remote sites.

Advanced Layer 1–4 loopbacks can be established by VLAN, source or destination address, TCP/UDP port, service level, or any combination thereof.

### Management Integration

Infinera’s Digital Network Administrator for XTM Series (DNA-M) provides service creation and assurance over the full range of EDUs and EMXPs, which enables an operator to conveniently deploy new Ethernet services including service OAM definitions using the full range of Infinera Ethernet and CWDM/DWDM products.



**Fig 1.** Using Multiple EDUs Throughout the Network, Providing High-performance Service Demarcation.

**Specifications**

Service Mappings	Identifies traffic flows based on frame characteristics <ul style="list-style-type: none"> <li>• Source or destination MAC or IP addresses, masks, Ethertype, Port(s), DSCP, IP Precedence or PCP</li> <li>• Customer and providers VLAN ID (C-VLAN, S-VLAN). Single or double-tagged. Sets or VIDs</li> </ul> Applies one or more actions <ul style="list-style-type: none"> <li>• C/S-VLAN tagging (selective push) and VLAN overwrite. Double tagging (EDU5-GT and EDU10G-LT)</li> <li>• CoS mapping (set C/S-VLAN tag priority based on DSCP, IP precedence or PCP, drop eligibility)</li> </ul>		
Pure Hardware Data-path (Fast-Thru Architecture)	Throughput: always full wire-speed Intrinsic pass-through traffic latency: <3.3 μs with delay variation: < 0.1 μs		
Synchronous Ethernet (EDU5)	ITU-T G.8262 Synchronous Ethernet Equipment Clocks ITU-T G.8264 Ethernet Synchronization Messaging Channel (ESMC)		
Resilience	IEEE 802.3ad Link Aggregation (LAG / LACP) using Active/Standby <50 ms Ethernet Ring Protection Switching (ERPS). Both v1 and v2 supported. (EDU5-GT and EDU10G-LT)		
Ethernet Services	E-Line (EPL and EVPL), E-LAN (EP-LAN, EVP-LAN) E-T (EP-Tree) and E-Access MEF9+14 certified, UNI Type II compliant (MEF 20) Jumbo frames support (up to 10,240 bytes) and L2CP tunneling Upstream and downstream CIR/EIR and (CBS, EBS) per EVC, CoS or for all traffic Zero-latency traffic shaping with no delay added to highest-priority traffic Hierarchical QoS capabilities (EDU5-GT and EDU10G-LT) Error propagation (ETH-CC and ETH-CSF) with link down		
Management	SNMP v1 and v2c. FTP, SFTP, TFTP and SCP. NTP (server and client) and PTP (client) RADIUS and TACACS+ authentication and authorization Secure web GUI via SSL, secure CLI via SSH (HTTP and Telnet also available). Management ACL Configuration import/export using configuration binary and export to editable CLI format Remote and local syslog. 1-step and 2-step software upgrade		
Performance Monitoring and OAM	IEEE 802.3ah Ethernet OAM including Dying Gasp (via 802.3ah or SNMP traps) IEEE 802.1ag Service Layer OAM (Connectivity Fault Management) ITU-T Y.1731 Performance Monitoring (1 μs resolution) of packet loss, delay and jitter (delay variation) Service availability as defined by MEF 10.2.1 Up to seven days of statistics in configurable history buckets. XML or CSV reporting RFC2544 and/or Y.1564 Service Activation Testing. (two flows on EDU5-TE, eight flows on EDU5-GT/EDU10G-LT) Continuous in-service monitoring of layer of packet loss, delay and jitter (delay variation) Packet and byte statistics per VLAN, per Ethertype, per ToS, per CoS, per MAC, etc. TWAMP Light reflector (all EDUs) and generator (EDU5-GT and EDU10G-LT)		
Product Variants	EDU5-TE	EDU5-GT	EDU10G-LT / EDU10G-LTS
• Interface Options	2xSFP / 2xRJ45 or 4xSFP	2xSFP / 2xRJ45 or 4xSPF	2xSFP+ / 10xSFP (4xRJ45) or 4xSFP+ / 8xSFP (4xRJ45)
• Number of OAM Sessions	100	300	1000
• Number of EVCs	16	100	110
• Number of BW Policies	16	100	250
Power Options	Dual (A/B), 20 – 57V DC Convection cooled (no fans) External AC/DC adapter	Dual (A/B), 20 – 57V DC Integrated fans Internal single or dual AC	Dual (A/B) 20-57 VDC, 4.5 – 1.6A Max External AC/DC adapter (100-240VAC auto-sensing, 50-60Hz)
Dimensions (HxWxD)	35x145x153 mm / 1.4x5.7x6 in	38x200x172 mm / 1.5x7.9x6.8 in	1U high, 19" standard rack mount 45x330x225 mm / 1.75x13.0x8.9 in
Weight	0.66 kg / 1.45 lb	1.35 kg / 3 lb	2.7 Kg / 6.0 lb
MTBF (at 25° C per Telcordia SR-332 Method 2)	MTBF ~ 53 yrs	MTBF ~ 30 yrs	MTBF ~ 72 yrs
Power Consumption	7.5 W typical, 10 W max	15 W typical, 22 W max	90 W max
Environmental	Standard operating temperature: -5 to +40 °C / 23 to 104 °F Storage temperature: -40 to +70 °C / -40 to 158 °F Hardened operating temperature (-H): -40 to +65 °C / -40 to 149 °F		
Regulatory and Certifications	IEC 60950, FCC Part 15 Class A and NEBS Level 3 MEF9+14-certified. MEF CE 2.0-compliant CE Marking and RoHS Compliant, WEEE Compliant		

Specifications and Features Are Subject to Change

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