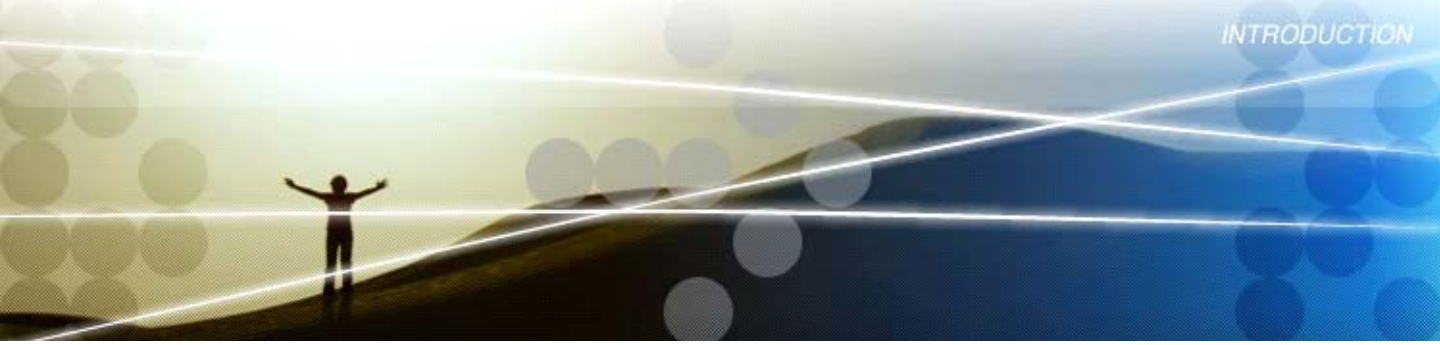
\Orchestrating a brighter world NEC

NEC's Packet-optical Transport XTM-Series

Carrier Class Packet-optical Transport Solutions for Metro/Regional Networks



An Innovative Packet-Optical Metro Network

- Industry-leading key metro capabilities
- From the customer premises to 100G core
- Cost-optimized for your application

Our XTM Series packet-optical networking platform delivers high-performance metro access, metro aggregation and metro core networks with industry-leading capabilities in areas such as power, density, latency and synchronization across Layer 0 to 2.5.

Whether it's used to push wavelength division multiplexing (WDM) all the way up to the antenna or to the cell site in mobile networks, to connect enterprises together or to the cloud, or to deliver high-definition TV (HDTV), the XTM Series provides all the capabilities needed to meet your requirements for a flexible and future-proof metro network.

Supporting Layer 0 optical wavelengths to Layer 2.5 multi-protocol label switching transport profile (MPLS-TP), using technologies such as Ethernet, optical transport network (OTN), synchronous digital hierarchy (SDH) /synchronous optical network (SONET), and Intelligent WDM (iWDM®), the XTM Series builds on key design philosophies such as low power, high density and a high level of scalability.

High Density + Low Power = Lower Cost

The XTM Series has a heritage of low power and compact products and solutions, fitting ideally in metro deployments or remote access sites where space is scarce and expensive.

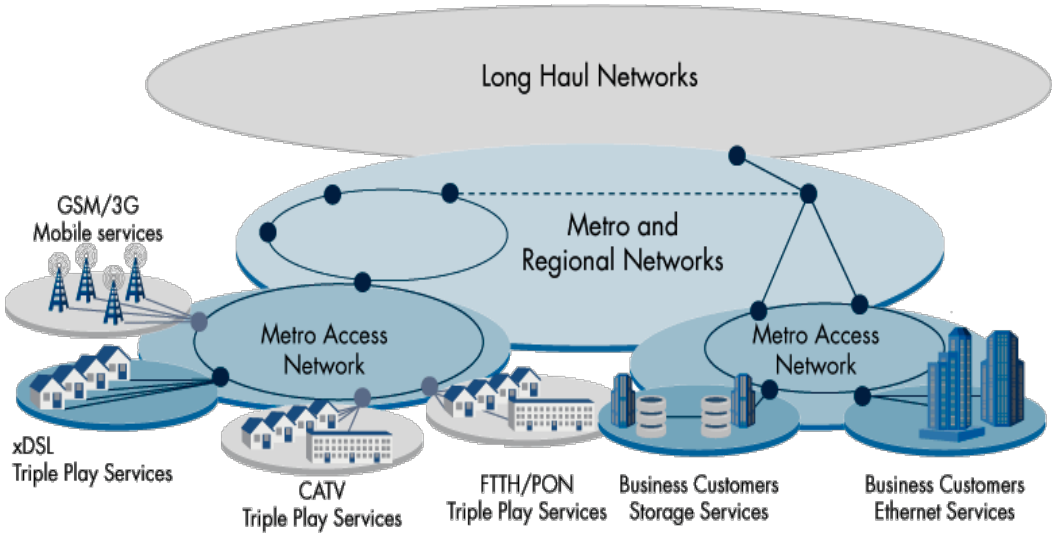
Single-slot transponders and muxponders are successfully combined with reconfigurable optical add-drop multiplexers (ROADM) and/or packet-optical transport switches (EMXP) in configurations that prove our leading density and low-power capabilities for both Layer 1 optical and Layer 2 Ethernet services.

For example, our 10 gigabit per second (Gb/s) services use just 5 watts (W) of power, the equivalent of an iPhone charger.

Add to this the XTM Series' wide range of chassis options, from small single rack unit (RU) chassis to large 11 RU chassis, and it becomes even easier to right-size the network, matching your requirements for low power as well as space.

LOW POWER DESIGN

HIGH DENSITY DESIGN



Mobile Fronthaul and iWDM-PON -- Innovations Supporting Mobile and Access Networks

The XTM Series offers a multitude of unique capabilities that make the platform ideal in a number of key applications.

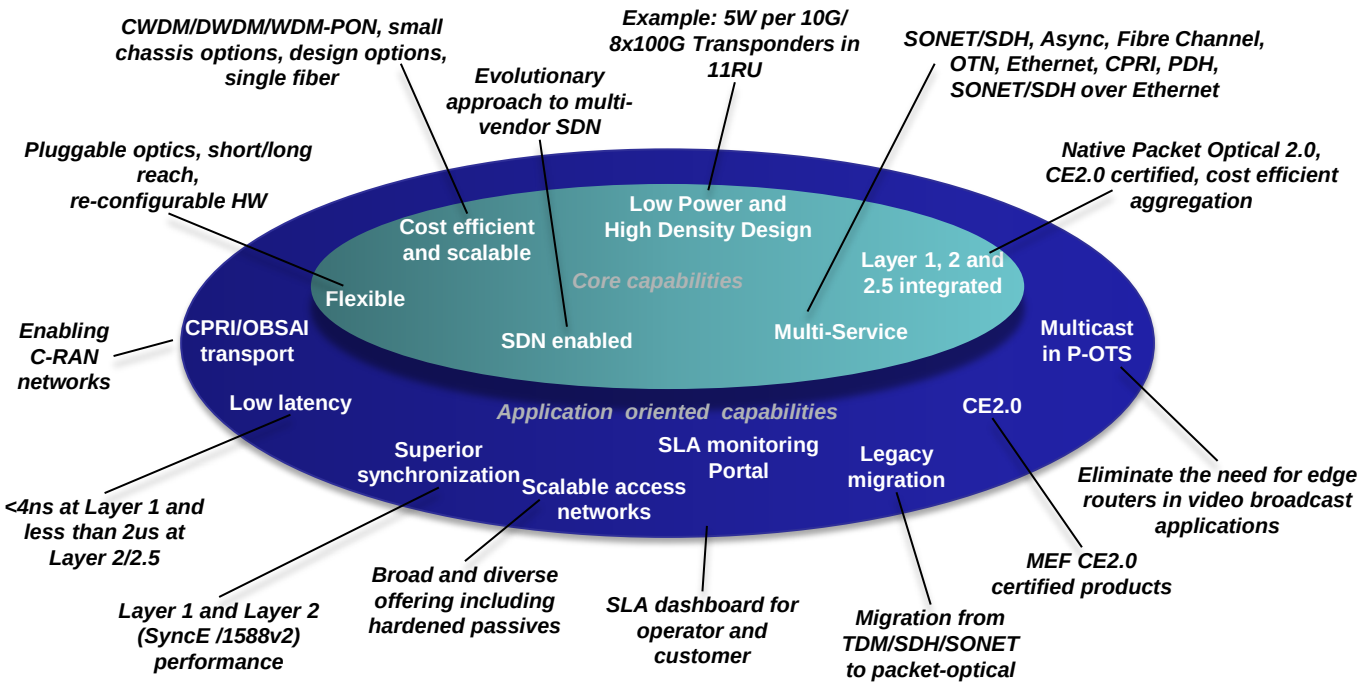
Examples include:

- Superior sync capabilities that are vital in mobile backhaul, especially as networks evolve to support LTE-A
- Support for CPRI/OBSAI, enabling WDM in C-RAN architectures and mobile front-haul applications
- iWDM®-PON, the WDM-passive optical network (WDM-PON) solution, enables scalable access networks that are easy to install and configure, making them ideal for FTTx business access applications
- Intelligent SFP (iSFP) enabling transparent delivery of SDH/SONET services over a packet-optical architecture, and eventually a smooth migration of legacy TDM networks to a common Ethernet /TDM network that fulfills strict sync and availability requirements
- True Layer 1 /Layer 2 (forward error correction [FEC], OTN transport, MPLS-TP, long-reach optics) all on one blade

An SDN-enabled Packet-Optical Platform Optimized for Metro Supporting 100G or Beyond

To manage the network and the services deployed with the XTM Series, we offer our multi-layer management suite, Enlighten®. In a lifecycle approach, Enlighten and the XTM Series provide a software defined network (SDN)-enabled transport network that makes network and service management simple and highly scalable.

With tools such as the Enlighten Portal, a web-based service level agreement (SLA) dashboard for multi-layer networks, our customers, and optionally their customers in turn, are given full visibility of the performance of the SLAs for services deployed in their networks. For applications such as business Ethernet or wholesale services, this is a vital tool to prove the service quality and fulfillment of SLAs.



Technical Specifications

					
Chassis	Type		TM-102/II	TM-301/II	TM-3000/II
	Card Slot		1 full size + 1 half size	4 full size slots (up to 2 full size can be used as half.)	16 full size slots (up to 5 full size can be used as half.)
	Power Supply		90 to 264V AC, -48V DC, max 85W	90 to 264V AC, -48V DC, max 595W	90 to 264V AC, -48V DC, max 1000W
	Dimensions (H x D x W) mm		44 (1U) x 249 x 449.4	133 (3U) x 280 x 447.4	489 (11U) x 298 x 442
	Rack Type		ETSI Rack, 19-inch Rack, 23-inch Rack		
	EMC		ETSI EN 300 019-1-3 class T3.1, VCCI class-A		
Trans-ponder	4G	TPQMP	4xMultirate (100Mb/s to 4Gb/s) for STM-1/4/16, OC-3/12/48, FE/GbE, CPRI 1.2G/2.4G/3.0G/4.9G, 1G/2G/4G FC		
	10G	TPQ10GFEC/I	4x10G FEC for 10GbE-LAN/WAN, STM-64, OC-192, 1+3 Line Protection, CRC/B1 monitor		
		TPHEX10GOTN	6xSTM-64/OC-192, 10GbE-LAN, OTU2/2e		
		TPMRHEX-L/16G	6xMultirate, 1GbE-10GbE, STM-4/16/64, 1GFC-16GFC, OTU-2/2e, CPRI/OBSAI		
	100G	TP100GOTN	100G Tunable Transponder for 100GbE-LAN, OTU4, Line format OTU4		
Mux-ponder	4G	MS-MXP	GbE, 1G/2G FC, STM-1/4/16, OC-3/12/48, Line Protection, B1 monitor, Regenerator		
	10G	MS-MXP/10G	10xMultiservice FEC, STM-1/4/16, OC-3/12/48, GbE, 1G/2G/4G FC, Line Protection, B1/CRC monitor		
		FH-MXP/10G	10xMultiservice for Mobile Front Haul, CPRI 2.4G/3.0G, FE, GbE		
		GBE9-MXP10GFEC	9xGbE, Dual 10G FEC Line Ports, 1+1 Line Protection, in-band management VLAN		
		MXP10GOTN	10xGbE(via ODU0), STM-16/OC-48(via ODU1) , Fibre Channel(1G, 2G, 4G) Muxponder Line format OTU2		
	100G	MXP100GOTN	10x 10GbE-LAN, 10xSTM-64/OC-192, OTU-2/2e, Line format OTU4		
Ethernet Mux-ponder	GBE10-EMXP10/II		10xGbE,2x10GbE	E-Line (EPL and EVPL), E-LAN (EP-LAN and EVP-LAN) E-Tree(EP-Tree), E-Access CE2.0 Compliant, MEF 9+14 Policing using bandwidth profiles, Flexible Traffic Classification e.g. based on DSCP, CoS, port and inner/outer VLAN 8 Strict priority / WRR queues, Min and Max Shaping, WRED 802.1ad Q-in-Q SVLAN, Independent learning per VLAN, G.8032 ERPv2, MPLS-Transport Profile RFC5960 iSFP STM-1/OC-3, STM-4/OC-12, STM-16/OC-48, E1 via circuit emulation over Ethernet	
	GBE22-EMXP10/II		22xGbE,2x10GbE		
	EMXP48/IIe		8xGbE,4x10GbE		
	EMXP62/IIe		22xGbE,4x10GbE		
	EMXP120/IIe		12x10GbE		
	EMXP220/IIe		12x10GbE,1x100GbE		
	EMXP240/IIe		24x10GbE		
	PT-Fabric	EMXP/III	8xMPO 100G(SR10), 10G or OTU2e via PTIO-10G, 100G(LR4) or OTU4 via TP100GOTN		
		PTIO-10G	72 x10G LAN or OTU2e with MPO connector		
Lambda	DWDM	Fiber Pair	80ch/80λ @50GHz spacing, 40ch/40λ @100GHz spacing		
		Bidirectional	20ch/40λ @100GHz spacing		
	CWDM	Fiber Pair	16ch/16λ (1270 to 1610nm)		
		Bidirectional	8ch/16λ (1270 to 1610nm)		
Others	ROADM		1x2 ROADM @50GHz/100GHz spacing, 1x4 ROADM @100GHz, 1x8 ROADM @50GHz		
	Tunable Filter		16port Colorless 50GHz Filter		
	OCM		2 port Optical Channel Monitor, monitoring OAMP/ROADM and controlling VOA for flatness		
	NID-GE (media converter)		1GbE optical/electrical client port, OAM, loss/delay measurement		
	Ethernet Demarcation Unit		EDU 1G type, EDU 10G type, in-service packet jitter/latency measurement		
NMS	TNM Server	Windows ～100NE	OS : Windows Server 2008 R2 or 2012 R2 64-bit, CPU:6-core, RAM:16GB, Storage:100GB		
		Linux ～6000NE	OS : Red Hat Enterprise Linux 6.6 or 7.1, CPU:24-core, RAM:128GB, Storage:300GB		
	TNM Client	Windows	OS : Windows 7 Professional, CPU : Intel Pentium 2.0 GHz, Memory:4GB, JRE8, Web browser		
	ENM	Browser	Internet Explorer, Firefox		
	Others		SNMP, telnet		

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